Department of Energy

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December 15, 2023

Ms. April Webb
Interim Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-10025945-24C

Mr. Victor Weeks
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
Federal Facilities Branch
61 Forsyth Street
Atlanta, Georgia 30303

Dear Ms. Webb and Mr. Weeks:

TRANSMITTAL OF THE REMEDIAL INVESTIGATION REPORT FOR THE C-400 COMPLEX OPERABLE UNIT AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2474&D2

References:

1. Letter from B. Begley to A. Ladd, "KDWM Submittal of Comments to the Remedial Investigation / Feasibility Study Report for the C-400 Complex Operable Unit (DOE/LX/07-2474&D1), Paducah Site, Paducah, McCracken County, Kentucky, KY8-890-008-982," dated May 5, 2023
2. Letter from V. Weeks to A. Ladd, "U.S. Environmental Protection Agency Region 4 acknowledgement of receipt and review for the Department of Energy's Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474&D1, transmittal date of January 5, 2023," dated May 4, 2023

Please find enclosed the *Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2474&D2 (C-400 RI Report). The Federal Facility Agreement (FFA) parties agreed to bifurcate the C-400 remedial investigation (RI)/feasibility study (FS) report and agreed to the submittal of separate RI and FS reports, as documented in the November 2, 2023, FFA milestone modification. This C-400 RI Report is a primary document under the Paducah FFA. In accordance with Section XX.G and Appendix F of the FFA, the U.S. Environmental Protection Agency and the Kentucky Department for Environmental Protection have a 30-day review period.

If the FFA parties have no substantive comments, then the U.S. Department of Energy requests a letter of concurrence.

If you have any questions or require additional information, please contact Richard Bonczek at (859) 321-7127.

Sincerely,

APRIL LADD Digitally signed by APRIL LADD Date: 2023.12.15 14:39:23 -06'00'

April Ladd
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. *Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2474&D2—Clean
3. *Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2474&D2—Redline
4. Comment Response Summary—EPA
5. Comment Response Summary—KDEP

Administrative Record File—ARF 400OUREMEDIAL

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CERTIFICATION

Document Identification: ***Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-2474&D2, December 2023**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Four Rivers Nuclear Partnership, LLC

MYRNA REDFIELD (Affiliate) Digitally signed by MYRNA REDFIELD (Affiliate)
Date: 2023.12.07 12:31:47 -06'00'

Myrna E. Redfield, Program Manager — Date Signed
Four Rivers Nuclear Partnership, LLC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U.S. Department of Energy

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Date: 2023.12.15 14:39:40 -06'00'

April Ladd, Paducah Site Lead — Date Signed
Portsmouth/Paducah Project Office
U.S. Department of Energy

DOE/LX/07-2474&D2
Primary Document

Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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DOE/LX/07-2474&D2
Primary Document

Remedial Investigation Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Date Issued—December 2023

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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CONTENTS

FIGURES

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TABLES

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ACRONYMS

ACM	asbestos-containing material
AEC	anion exchange capacity
AL	action level
amsl	above mean sea level
AOC	Administrative Order by Consent
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BHHRA	baseline human health risk assessment
BRA	baseline risk assessment
CEC	cation exchange capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
COC	contaminant of concern
COE	U.S. Army Corps of Engineers
COPC	chemical or radionuclide of potential concern
COPEC	chemical of potential ecological concern
cpm	counts per minute
CSF	cancer slope factor
CSM	conceptual site model
D&D	decontamination and decommissioning
DAF	dilution attenuation factor
DNAPL	dense nonaqueous-phase liquid
DOE	U.S. Department of Energy
DQO	data quality objective
DyeLIF	dye-enhanced laser induced fluorescence
EDD	electronic data deliverable
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ERH	electrical resistance heating
EVS	environmental visualization system
FFA	Federal Facility Agreement
f_{oc}	fraction of organic carbon
FOE	frequency of exceedance
FR	*Federal Registry*
FS	feasibility study
FY	fiscal year
GC	gas chromatograph
gpm	gallons per minute
GPS	global positioning system
GWS	gamma walkover survey
HI	hazard index
HQ	hazard quotient
HU	hydrogeological unit
IUR	inhalation unit risk

K_d	distribution coefficient
KDEP	Kentucky Department for Environmental Protection
KPDES	Kentucky Pollutant Discharge Elimination System
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LRGA	lower Regional Gravel Aquifer
MCL	maximum contaminant level
MDL	method detection limit
MIP	membrane interface probe
MOA	Memorandum of Agreement
MRGA	middle Regional Gravel Aquifer
MRL	minimal risk level
MS	matrix spike
MSD	matrix spike duplicate
MW	monitoring well
mya	million years ago
N/A	not applicable
NAL	no action level
NAPL	nonaqueous phase liquid
ncmp	net counts per minute
NCP	National Contingency Plan
NEPCS	Northeast Plume Containment System
NFA	no further action
NRHP	National Register of Historic Places
NSDD	North-South Diversion Ditch
OREIS	Oak Ridge Environmental Information System
OU	operable unit
PEMS	Project Environmental Measurements System
PGDP	Paducah Gaseous Diffusion Plant
PID	photoionization detector
PNOD	permanganate natural oxidant demand
POE	point of exposure
ppb	parts per billion
ppm	parts per million
PPRTV	provisional peer-reviewed toxicity value
PQL	practical quantitation limit
PRG	preliminary remediation goal
PTW	principal threat waste
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RAIS	Risk Assessment Information System
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RDSI	remedial design support investigation
RE	relative emittance
RfC	reference concentration
RfD	reference dose
RG	remedial guide
RGA	Regional Gravel Aquifer
RI	remedial investigation

RL	reporting limit
RMD	Risk Methods Document
ROD	Record of Decision
RPD	relative percent difference
SERA	screening-level ecological risk assessment
SI	site investigation
SMO	sample management office
SMP	site management plan
SPH	six-phase heating
SRE	screening risk evaluation
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TSCA	Toxic Substances Control Act
TVA	Tennessee Valley Authority
UCRS	Upper Continental Recharge System
URGA	upper Regional Gravel Aquifer
USEC	United States Enrichment Corporation
USGS	U.S. Geological Survey
VI	vapor intrusion
VISL	vapor intrusion screening level
VOC	volatile organic compound
WAG	waste area grouping
WKWMA	West Kentucky Wildlife Management Area
XRF	X-ray fluorescence

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EXECUTIVE SUMMARY

The Paducah Site is an inactive uranium enrichment facility that is owned by the U.S. Department of Energy (DOE). DOE is conducting environmental remediation activities at the Paducah Site in accordance with the requirements of the Paducah Federal Facility Agreement (FFA), which coordinates Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup requirements. The Paducah Site was placed on the National Priorities List in 1994. DOE, the Kentucky Natural Resources and Environmental Protection Cabinet (which has since been renamed the Kentucky Energy and Environment Cabinet), and the U.S. Environmental Protection Agency (EPA) entered into the *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant* in 1998 (EPA 1998).

In August 2017, the *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (C-400 MOA) was signed by DOE, EPA, and Kentucky Department for Environmental Protection (KDEP); this C-400 MOA established the C-400 Complex Operable Unit (OU) and the requirement to conduct a remedial investigation/feasibility study (RI/FS) to support remedy selection for a final remedial action (DOE 2017a). The following two subprojects were included in the C-400 Complex OU.

- C-400 Decontamination and Decommissioning (D&D)
- C-400 Final Remedial Action

In September 2022,[1] the FFA parties formally agreed to incorporate the physical demolition of the C-400 Cleaning Building into the C-400 Final Remedial Action. Because demolition of the C-400 Cleaning Building has been incorporated into the C-400 Final Remedial Action, a non-time-critical removal action to complete the C-400 Complex OU D&D is no longer necessary. The FFA parties agreed to bifurcate the C-400 RI/FS Report and agreed to the submittal of separate RI and FS reports, as documented in the November 2, 2023, FFA milestone modification.

The C-400 Complex OU (C-400 Cleaning Building and area bounded by adjacent streets) contains solid waste management units (SWMUs) and contaminated environmental media/debris (e.g., groundwater, soils,[2] concrete slabs) (Figure ES.1) and is a primary source of off-site trichloroethene (TCE) and technetium-99 groundwater contamination at the Paducah Site.

This RI report has been developed to present the results of the field investigation, document the nature and extent of contamination, determine contaminant fate and transport, characterize risk, and support a future remedial decision for the C-400 Complex OU under CERCLA.

ES.1 PROJECT SCOPE AND OBJECTIVES

The scope and objectives for the C-400 Complex OU RI/FS are consistent with those established in the FFA; *Site Management Plan Paducah Gaseous Diffusion Plant Paducah, Kentucky*, *Annual Revision—FY 2023* (DOE 2022); the C-400 MOA negotiated among DOE, EPA, and KDEP; and subsequent FFA parties' agreements. The C-400 Complex RI/FS followed the investigation and study outlined in the

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[1] Letter PPPO-02-10022494-22, dated September 28, 2022.
[2] In this document, "soil" is used as a geotechnical term, meaning the unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may contain organic matter.

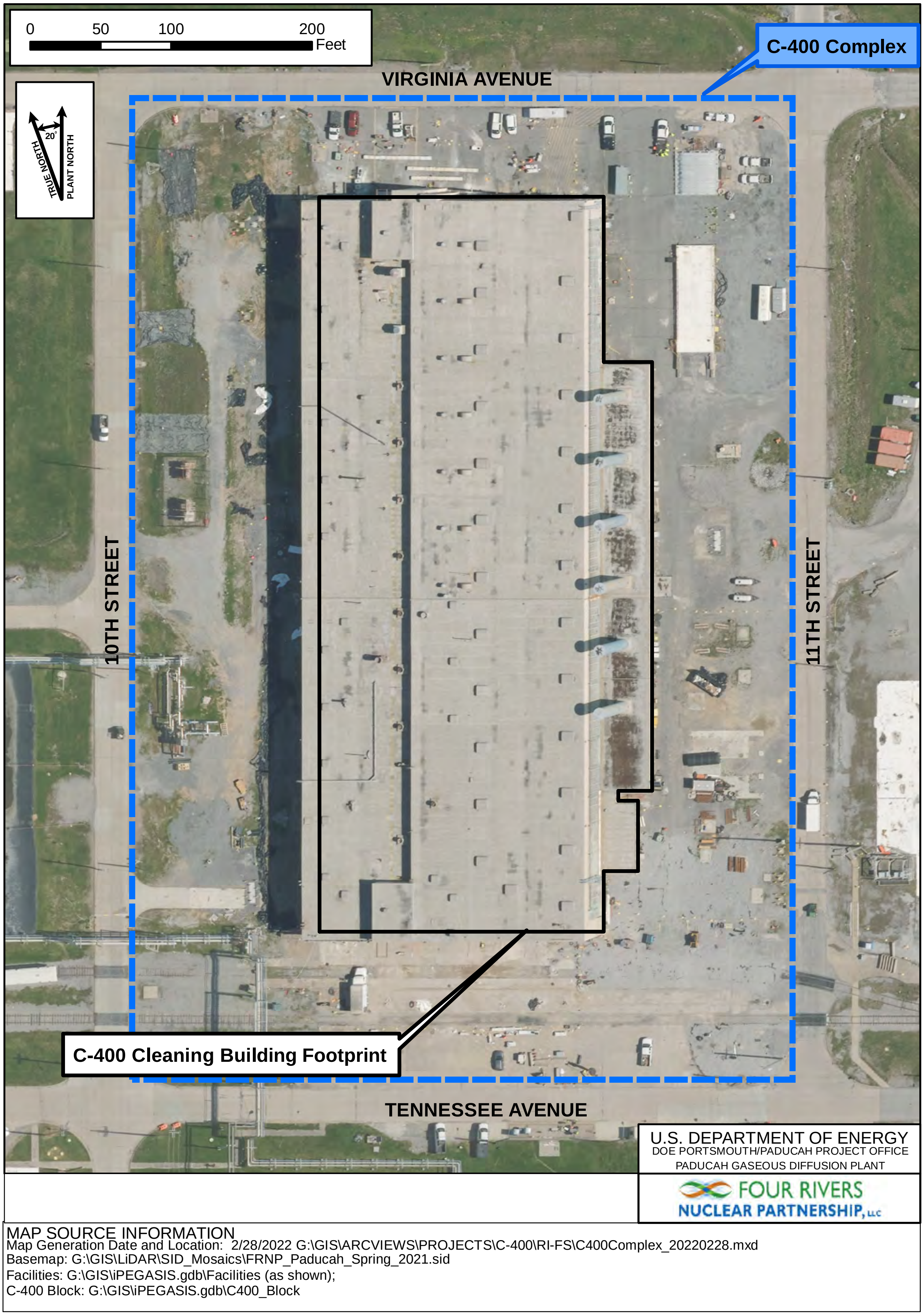

Figure ES.1. C-400 Complex Operable Unit

Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2433&D2/R1, (C-400 Complex RI/FS Work Plan) (DOE 2020). The work plan utilized the data quality objective (DQO) process as a planning tool to assist in the identification of environmental problems and to define the data collection process needed to support decisions. The following is the overall problem statement developed for the DQO process.

> Hazardous substances that historically have been present and/or migrated from the C-400 Complex and its SWMUs have been released to surrounding environmental media. These substances, in turn, have infiltrated into groundwater and been transported through subsurface pathways. The nature and extent of contamination have been defined adequately for some SWMUs, and areas and risk assessments have been prepared. For other SWMUs and areas, the nature and extent of contamination have not been defined adequately to assess whether potential contaminants pose unacceptable risks to human health and the environment at the C-400 Complex and at downgradient exposure points. Data gaps must be identified so that a comprehensive RI/FS report can be prepared for the C-400 Complex.

The C-400 Complex OU final remedial action is intended to evaluate fully and take the necessary actions to address all environmental contamination in order to achieve a final remedial action for the entire C-400 Complex OU. The C-400 Complex OU final remedial action will address all sources of contamination within the defined footprint of the C-400 Complex, including, but not limited to, principal threat waste (PTW) such as TCE dense nonaqueous-phase liquid (DNAPL) and areas of high concentration TCE contamination.

In accordance with the work plan and subsequent FFA parties' agreements, the scope of C-400 Complex OU CERCLA final remedial action consists of the following:

- Conduct a combined RI/FS for the C-400 Complex OU that includes an investigation of all remaining building structure(s) (e.g., slab and subsurface structures) and releases of any hazardous substances to soils and/or groundwater associated with the C-400 Cleaning Building and C-400 Complex area operations (including, but not limited to, TCE DNAPL and high concentration areas considered PTW).

- RI/FS characterization to define the full nature and extent of all contamination within the C-400 Complex [from the surface down through the Regional Gravel Aquifer (RGA)] and to include the Upper McNairy Formation.

- Remedy selection [proposed plan and Record of Decision (ROD)] to document a final remedial action(s) for all source areas and related contaminants of concern (COCs) requiring remediation for the entire C-400 Complex, as well as physical demolition of the C-400 Cleaning Building.

- Post-ROD documents (e.g., remedial design report, remedial action work plan) and implementation of a final remedial action(s) as specified in the ROD.

The following are key points that were agreed to by the FFA parties during scoping meetings and documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

- The C-400 Complex is located within a large industrial facility; therefore, the current land use is industrial.

- The current land use can be expected to continue in the foreseeable future; consequently, the most plausible future land use of the C-400 Complex also is industrial.

- There is no use of groundwater drawn from the RGA at the C-400 Complex.
- Future use of groundwater drawn from the RGA at the C-400 Complex is not expected.
- The final remedial action is expected to address contamination (removing, preventing, reducing, and/or controlling contaminant sources), including PTW in the Upper Continental Recharge System (UCRS) and RGA to include the Upper McNairy contributing to groundwater contamination originating from inside the C-400 Complex.
- Dissolved-phase groundwater contamination will be addressed as part of the Dissolved-Phase Plumes Remedial OU (DOE 2022).

As documented in the C-400 Complex RI/FS Work Plan, the following are goals for the C-400 Complex RI/FS (DOE 2020).

Goal 1: Characterize Nature of Source Zone(s)—Characterize the nature of contaminant source materials by using existing data and collecting additional data, as necessary.

Goal 2: Define Extent of Source and Contamination in Soil and Remaining Structures in the OU Area—Define the nature, extent (vertical and lateral), and magnitude of contamination in soils; perform a multimedia evaluation (e.g., groundwater, concrete) to ensure that all exposure pathways for the OU area are assessed adequately to support cleanup decisions.

Goal 3: Evaluate Surface and Subsurface Transport Mechanisms and Pathways—Assess existing data and collect additional data, as necessary, to analyze contaminant transport mechanisms and support the development of an RI/FS.

Goal 4: Complete a Risk Assessment for the C-400 Complex—Conduct a screening risk evaluation (SRE) of the combined newly generated data and historical data to complement the previously performed Baseline Human Health Risk Assessment for Waste Area Grouping 6 (DOE 1999) and conduct a screening-level ecological risk assessment (SERA) (Steps 1 and 2 of the assessment only).

Goal 5: Identify, Develop, and Evaluate Remedial Alternatives—Use historical and newly collected data to identify, develop, and evaluate final action alternatives that will reduce risk to human health and the environment and meet the remedial action objectives (RAOs) identified.

The first four work plan goals are achieved by this RI report while the fifth goal will be addressed by a future FS report.

ES.2 CONCLUSIONS OF THE REMEDIAL INVESTIGATION

The C-400 Complex contains SWMUs and contaminated environmental media/debris (e.g., soil, concrete, groundwater) and is a primary source of off-site TCE and technetium-99 groundwater contamination at the Paducah Gaseous Diffusion Plant (PGDP). Chemical releases have been associated with processes that occurred within the C-400 Cleaning Building and with ancillary features (e.g., acid and discard waste line; sewers; storage/transfer areas). Significant quantities of chemicals (primarily TCE) and a variety of other constituents have been released to the environment at various areas within the C-400 Complex throughout its operational history; these chemicals are present in sludges, concrete/brick, soil, and groundwater. The remaining portions of the C-400 Cleaning Building following deactivation contain hazardous substances that are present in the infrastructure. The hazardous substances in the infrastructure of the C-400 Cleaning Building include the following.

- Asbestos-containing material
- Polychlorinated biphenyls (PCBs)
- Radionuclides
- Uranium metal
- Lead
- TCE

Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites defines a DNAPL source zone as the overall volume of the subsurface containing residual and/or pooled DNAPL (EPA 2009). Not all portions (e.g., soils lenses, laminations, fractures) of the DNAPL source zone will contain residual and/or pooled DNAPL. A confirmed/probable source zone is the part of the source zone where it is known or highly likely for DNAPL to exist. The potential source zone is the part of the source zone where it is possible that DNAPL exists, but the lines of evidence indicating DNAPL presence are either fewer or are not as strong as those associated with a confirmed/probable source zone. EPA suggests a 1% rule of thumb as a generality that sampled groundwater concentrations in excess of 1% effective solubility (TCE = 11,000 μg/L) indicate that DNAPL may be present in the vicinity of any direction of the monitoring point of interest. This RI follows EPA's terminology and uses the terms "confirmed/probable" and "potential" when discussing the source zones related to DNAPL.

For the purposes of this RI report, source zones composed of TCE DNAPL and high concentration TCE contamination at the C-400 Complex have been defined using multiple lines of evidence including, but not limited to, areas with TCE concentrations in groundwater exceeding 33,000 μg/L, TCE concentrations in soil exceeding 100,000 μg/kg, membrane interface probe (MIP) photoionization detector (PID) responses > 700,000 μV, and dye-enhanced laser-induced fluorescence (DyeLIF) responses > 5% relative emittance (RE). TCE groundwater concentrations > 33,000 μg/L (3% effective solubility) are considered one line of evidence of a confirmed/probable source zone. TCE groundwater concentrations between 11,000 and 33,000 μg/L (1% and 3% effective solubility) are considered one line of evidence to support the presence of a potential source zone. The use of TCE groundwater concentrations > 11,000 μg/L to indicate a potential source zone is consistent with EPA's terminology. The use of TCE groundwater concentrations > 33,000 μg/L to indicate a confirmed/probable source zone is based on multiple lines of evidence, such as the coincidence of areas exceeding 33,000 μg/L of TCE in groundwater with areas where the MIP PID and DyeLIF RE responses also exceed their respective thresholds. Other volatile organic compounds (e.g., TCE degradation products) identified in soil and groundwater, if present as potential sources, likely occur within the TCE source zones delineated using these lines of evidence.

The presence of a confirmed/probable source zone, composed of TCE DNAPL and high concentration TCE contamination, was evaluated and identified in the southern portion of the C-400 Complex. The confirmed/probable source zone in the southeastern portion of the C-400 Complex, in Sectors 1A, 1B, and 4, occurs in the UCRS, RGA, and the Upper McNairy Formation. Previous interim actions have remediated portions of this source area. The UCRS portion of the source is mostly located beneath the southeastern corner of the building (southeastern portion of Sector 1), but a couple of smaller zones in the UCRS are also present in Sector 4. TCE was found in UCRS, RGA, and McNairy groundwater with a maximum detection in groundwater of 645,000 μg/L [MW407-PRT1 (UCRS)] in Sector 4. The maximum detection of TCE in soils within Sector 4 was 6,940,000 μg/kg {400S4-12 [Upper McNairy at 94–95 ft below ground surface (bgs)]}. Another, smaller confirmed/probable source zone, composed of TCE DNAPL and high concentration TCE contamination, is located near the southwestern portion of the C-400 Complex in Sector 5. The maximum TCE in soil in Sector 5 was 144,000 μg/kg [400S5-08 (upper UCRS at 5.5–6.5 ft bgs)]. This confirmed/probable source zone was particularly shallow, occurring at depths of less than 20 ft bgs. This source zone is located above the Phase I Southwest Treatment Area that was previously treated with electrical resistance heating at depths below 20 ft bgs.

A likely source of technetium-99 contamination was identified in the southern end of Sector 1C. In this area, technetium-99 is present from depths of 20–55 ft bgs, with a maximum activity of 1,020 pCi/g within that depth interval. The highest result of technetium-99 in this area was 1,390 pCi/g in a sample collected from 3–4 ft bgs. Technetium-99 activity in soil > 35.7 pCi/g is the site-specific soil activity calculated to result in groundwater contamination to the RGA of 900 pCi/L or greater.

Groundwater transport represents a significant route of contaminant migration at PGDP. Although lithologic heterogeneity may cause localized groundwater flow patterns to vary, the general groundwater flow direction is northward towards the Ohio River.

Uranium metal and uranium-238 exceeded the industrial worker and/or excavation worker action levels (ALs) in several sectors in the C-400 Complex. Uranium metal exceeded the excavation worker ALs in Sectors 1, 2, 4, and 6; uranium-238 exceeded industrial worker and/or excavation worker ALs in Sectors 1, 2, 4, 5, and 6. The locations of uranium metal and uranium-238 exceeding these ALs were shallow, with the estimated volume above the industrial worker and/or excavation worker ALs located within the upper 10 ft of soil (or other shallow media).

Source zones for COCs and Priority COCs also were evaluated against risk-based values and other EPA guidance, as appropriate.

Consistent with agreements reached during project scoping and because the C-400 Complex area already has been subjected to a baseline risk assessment (BRA) that concluded actions needed to be taken, a new BRA was not performed under this RI. Instead, an SRE and a SERA were conducted to evaluate the current and potential future risk to human health and the environment and to identify COCs and the media containing these COCs. Together the SRE, the SERA, and the previous risk assessments constitute a full BRA, as documented in the C-400 Complex RI/FS Work Plan (DOE 2020.

Risk was characterized for surface soil (0–1 ft bgs) and surface and subsurface soil (0–16 ft bgs). Uranium-238 was identified as the primary risk driver in surface soil across the C-400 Complex. In this context, a "primary risk driver" refers to those COCs that contribute greater than 50% of the cumulative risk or hazard for the majority of soil sectors. For surface soils, thorium-230, uranium metal, and uranium 235/236 were also identified as priority COCs in certain sectors. A "priority COC" refers to a COC within a use scenario that exceeds either an excess lifetime cancer risk (ELCR) of 1E-04 or a hazard quotient (HQ) of 1. For surface and subsurface soils, uranium metal is identified as the primary risk driver across the C-400 Complex. Thorium-230 was also identified as a priority COC in Sector 6. TCE was identified as a priority COC in two sectors, Sectors 4 and 5.

There are a large number of COCs identified as priority COCs in groundwater, particularly in the RGA. There are five primary risk drivers identified in RGA groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE.

The SERA identified seven surface soil chemicals of potential ecological concern (COPECs) that may cause excess risk to ecological receptors. These include bis(2-ethylhexyl)phthalate, polycyclic aromatic hydrocarbons, mercury, thallium, total PCBs, *cis*-1,2-dichloroethene, and TCE. Risk managers should be aware of the uncertainties related to identifying COPECs in surface soil at the C-400 Complex. The primary uncertainty with evaluating surface soil at the C-400 Complex is whether the exposure pathway is complete for ecological receptors. There are areas within the PGDP property that could be suitable terrestrial habitat for ecological terrestrial receptors; however, the C-400 Complex is within an industrial use area, and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. It is highly unlikely that terrestrial ecological receptors would be exposed to contaminants in the C-400 Complex for a duration that would result in unacceptable risk; however one COPEC, TCE, was identified for RGA groundwater. TCE has the potential to cause excess risk to surface water ecological receptors if groundwater under the C-400 Complex migrates and discharges to surface water.

Overall, the results of the RI show that characterization of the C-400 Complex is comprehensive. The representative data set used for the C-400 Complex is sufficient to support decision-making and indicates that a future FS is appropriate. Other information, such as geotechnical and geochemical data, was gathered during the RI in support of the evaluation of remedial alternatives. Contaminant source areas are generally known and delineated.

ES.3 RECOMMENDED REMEDIAL ACTION OBJECTIVES

Recommended RAOs are goals for the protection of human health and the environment. RAOs provide a general description of what a CERCLA cleanup is designed to accomplish. Recommended RAOs for the C-400 Complex OU RI, developed in accordance with National Contingency Plan (NCP) requirements, consist of site-specific goals for protecting human health and the environment and meeting applicable or relevant and appropriate requirements (ARARs) in the absence of an ARAR waiver. The recommended RAOs were developed from the conceptual site model; the historical human health risk assessment results and the SRE that identified the COCs; and the contaminant migration pathways and exposure scenarios that the remedial action will address.

The RI includes the recommended infrastructure- and media-specific RAOs for addressing source areas, including treatment and/or removal of PTW consistent with CERCLA, the NCP (including the preamble), and any pertinent EPA guidance. The following general recommended RAOs were developed during scoping meetings conducted among EPA, KDEP, and DOE and documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

- Contribute to the protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination;
- Prevent exposure to waste, groundwater, soils, slab, and subsurface structures, including exposure to vapors from these environmental media and structures that present an unacceptable risk; and
- Treat or remove PTW wherever practicable, consistent with 40 *CFR* § 300.430 (a)(1)(iii)(A).

The general recommended RAOs were refined based on the results of the RI. Recommended RAOs were developed for infrastructure, soil, and groundwater. Infrastructure refers to construction materials (e.g., concrete, brick, metal, paint, coatings, caulk); piping material; and surface and subsurface infrastructure (e.g., utilities, auxiliary systems, railroads) inside the C-400 Complex that remained following deactivation activities.

Infrastructure RAO: Eliminate, reduce, or otherwise mitigate the potential for releases of hazardous substances from infrastructure (including slabs, aboveground structures, and subsurface structures) to soil, groundwater, or surface water.

Soil RAO 1: Treat PTW inside the C-400 Complex OU, consistent with 40 *CFR* § 300.430(a)(1)(iii)(A), or remove, wherever practicable. If treatment or removal of PTW is not practicable, then reduce or control PTW, wherever practicable.

Soil RAO 2: Prevent exposure to contaminated subsurface waste source material (e.g., DNAPL), soils, sediment, and sludge inside the C-400 Complex OU that exceeds revised preliminary remediation goals (PRGs) selected from risk-based, background-based, and ARAR-based chemical-specific values. The acceptable cumulative risk levels for this RAO are defined as follows:

- Surface Soil: cumulative ELCRs < 1E-05 and cumulative target organ noncancer hazard index ≤ 1 for a current and future industrial worker; and

- Surface and Subsurface Soil: cumulative ELCR < 1E-05 and cumulative target organ hazard index ≤ 1 for a future excavation worker.

Soil RAO 3: Contribute to the protection of groundwater by eliminating, reducing, or controlling non-PTW sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values in soil/sediment/sludge inside the C-400 Complex OU to reduce the migration of COCs to groundwater.

Soil RAO 4: Contribute to the protection of groundwater by eliminating, reducing, or controlling non-PTW sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values in soil/sediment/sludge inside the C-400 Complex OU to minimize migration of COCs to surface water and air.

Groundwater RAO 1: Prevent exposure to groundwater inside the C-400 Complex OU, including exposure to vapors that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values.

Groundwater RAO 2: Contribute to the protection of groundwater by eliminating, reducing, or controlling (PTW[3] and non-PTW[4]) sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values of groundwater COCs inside the C-400 Complex OU in the UCRS, RGA, and Upper McNairy Formation.

Groundwater RAO 3: Restore contaminated groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. If restoration of groundwater to beneficial uses is determined to not be practicable, then prevent further migration of the plume, prevent exposure to contaminated groundwater, and evaluate further risk reduction.

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[3] Nonaqueous-phase liquids.
[4] Contaminants sorbed to soil in saturated zones (e.g., perched UCRS, RGA, McNairy).

1. INTRODUCTION

This remedial investigation (RI) report was prepared to support a future remedial decision for the C-400 Complex Operable Unit (OU) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. The C-400 Complex (C-400 Cleaning Building and area bounded by adjacent streets) is located at the U.S. Department of Energy (DOE) Paducah Site, located west of Paducah, Kentucky (Figure 1.1). Specifically, the C-400 Complex is between 10th and 11th Streets to the west and east, respectively, and between Virginia and Tennessee Avenues to the north and south, respectively (Figure 1.2).

In August 2017, the *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (C-400 MOA) was signed by DOE, the U.S. Environmental Protection Agency (EPA), and the Kentucky Department for Environmental Protection (KDEP) (DOE 2017a). The C-400 MOA established the C-400 Complex OU; included resequencing the approved fiscal year (FY) 2015 Site Management Plan (SMP) milestones; established the requirement to conduct a comprehensive RI/feasibility study (FS) to support remedy selection for a final remedial action; and required integration of the Phase IIb Interim Action source area into the final action for the C-400 Complex. The following two subprojects were included in the C-400 Complex OU.

- C-400 Decontamination and Decommissioning (D&D)
- C-400 Final Remedial Action

In September 2022,[5] the Federal Facility Agreement (FFA) parties formally agreed to incorporate the physical demolition of the C-400 Cleaning Building into the C-400 Final Remedial Action. Because demolition of the C-400 Cleaning Building has been incorporated into the C-400 Final Remedial Action, a non-time-critical removal action to complete the C-400 Complex OU D&D is no longer necessary. The FFA parties agreed to bifurcate the C-400 RI/FS Report and agreed to the submittal of separate RI and FS reports, as documented in the November 2, 2023, FFA milestone modification.

1.1 PURPOSE OF THE RI REPORT

The purpose of the RI report is to summarize information about the nature and extent of contamination in the C-400 Complex and the potential impact this contamination has on human health and the environment, and to provide information to support assessing the feasibility of possible solutions to the contamination identified in the area in a future FS report. The information presented in this RI report, along with information in a future FS report, will form the technical basis for a remedial decision by DOE, EPA, and KDEP for the C-400 Complex.

The C-400 Complex OU RI was conducted in accordance with the C-400 Complex OU RI/FS Work Plan (DOE 2020). The work plan utilized the data quality objective (DQO) process as a planning tool to assist in the identification of environmental problems and to define the data collection process needed to support decisions regarding the problem statement:

> Hazardous substances that historically have been present and/or migrated from the C-400 Complex and its [solid waste management units] SWMUs have been released to

[5] Letter PPPO-02-10022494-22, dated September 28, 2022.

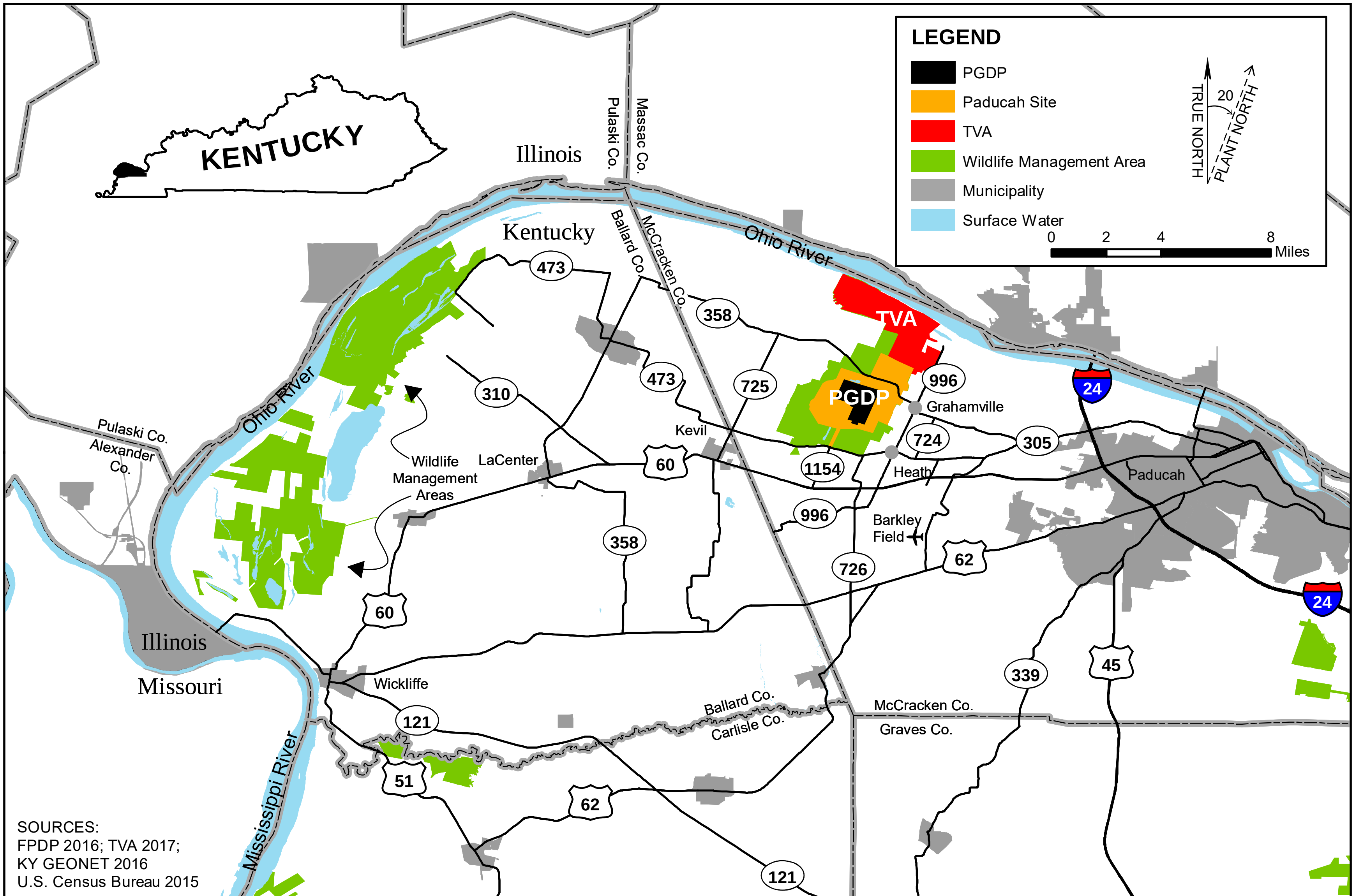

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Figure 1.1. Paducah Site Vicinity Map

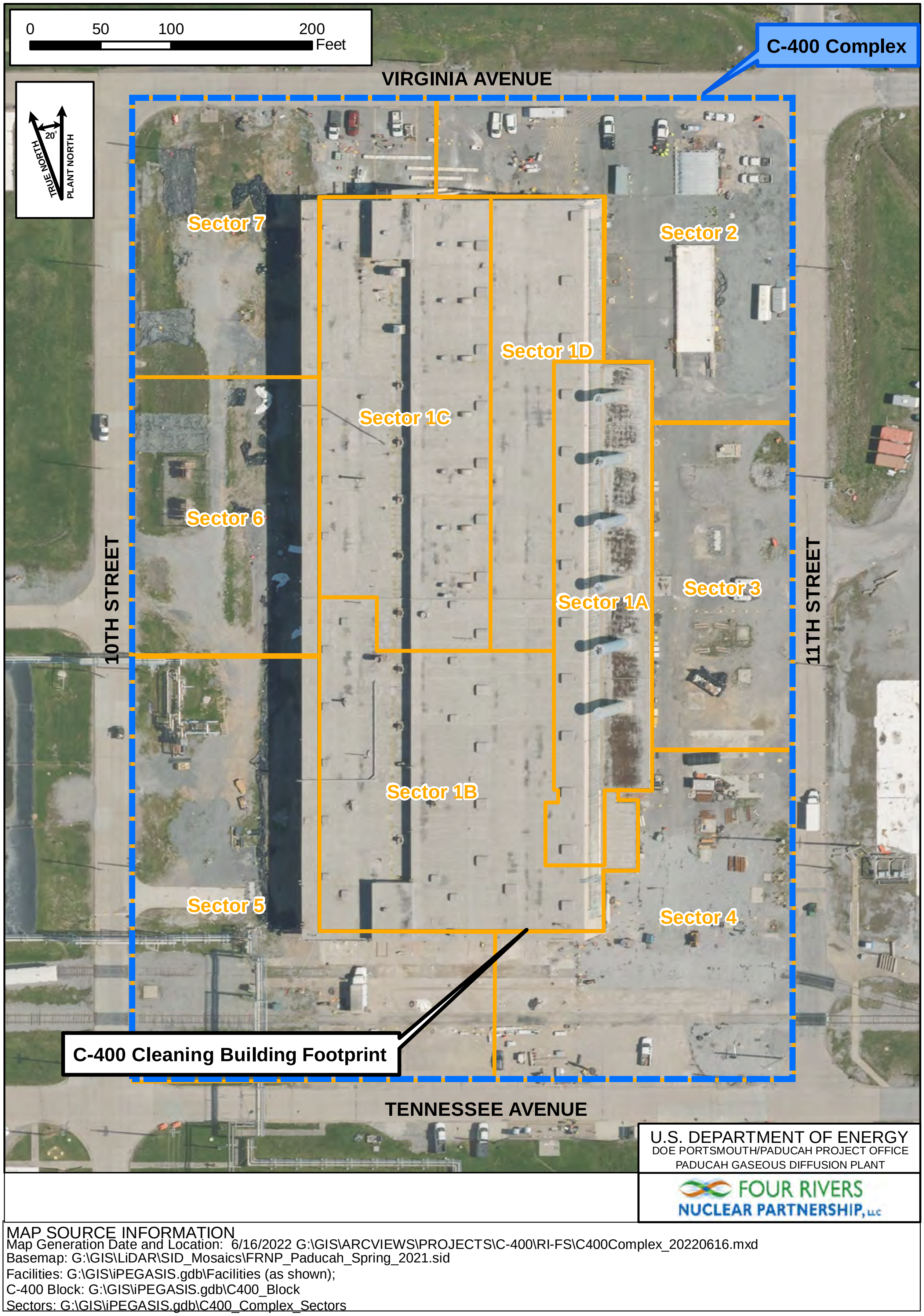

Figure 1.2. C-400 Complex Operable Unit

surrounding environmental media. These substances, in turn, have infiltrated into groundwater and been transported through subsurface pathways. The nature and extent of contamination have not been defined adequately to assess whether potential contaminants pose unacceptable risks to human health and the environment at the C-400 Complex and at downgradient exposure points. Data gaps must be identified so that a comprehensive RI/FS report can be prepared for the C-400 Complex.

1.2 PROJECT SCOPE AND RATIONALE

The C-400 Complex contains SWMUs and contaminated environmental debris and/or media (e.g., infrastructure soils[6]/sediment/sludge, groundwater) and is a primary source of off-site trichloroethene (TCE) groundwater contamination at Paducah Gaseous Diffusion Plant (PGDP). Figure 1.3 shows the identified groundwater contaminant plumes in relation to the C-400 Complex. The C-400 Complex final remedial action is intended to evaluate fully and take the necessary actions to address all environmental contamination in order to identify a final remedial action for the entire C-400 Complex.

The presence of hazardous substances in the C-400 Cleaning Building has been determined to pose an actual or potential threat of release to the environment. The remaining portions of the C-400 Cleaning Building contain hazardous substances that are present in the infrastructure. The *C-400 Process and Structure Review* includes a comprehensive list of hazardous substances suspected to have been associated with the C-400 Cleaning Building structure or processes (MMES 1995). The hazardous substances in the infrastructure of the C-400 Cleaning Building include the following:

- Asbestos-containing material (ACM)
- Polychlorinated biphenyls (PCBs)
- Radionuclides
- Uranium metal
- Lead
- TCE

The C-400 Complex final remedial action will address all sources of contamination within the defined footprint of the C-400 Complex, including, but not limited to, principal threat waste (PTW) [e.g., TCE dense nonaqueous-phase liquid (DNAPL) and high concentration TCE contamination]. In accordance with the C-400 Complex OU RI/FS Work Plan (DOE 2020) and subsequent FFA parties' agreements, the C-400 Complex final remedial action consists of the following:

- Conduct a combined RI/FS for the C-400 Complex area that includes an investigation of all remaining building structure(s) (e.g., slab and subsurface structures) and releases of any hazardous substances to soils and/or groundwater associated with the C-400 Cleaning Building and C-400 Complex area operations (including, but not limited to, TCE DNAPL and high concentration areas considered PTW).

- Conduct an RI/FS characterization to define the full nature and extent of all contamination within the C-400 Complex from the surface down through the Regional Gravel Aquifer (RGA) and to include the Upper McNairy Formation.

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[6] In this document, "soil" is used as a geotechnical term, meaning the unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may contain organic matter.

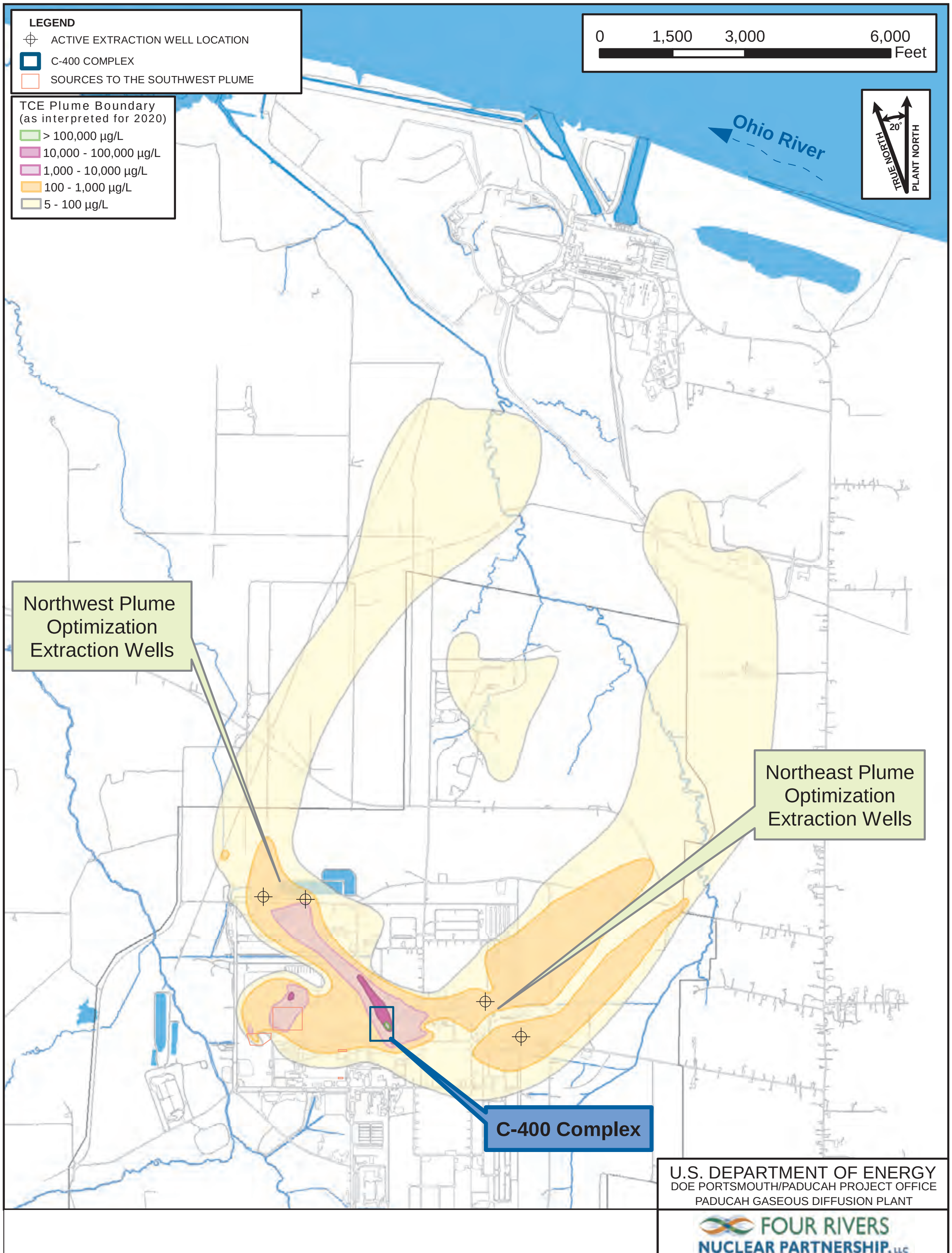

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Figure 1.3. Groundwater Contaminant Plumes in Relation to the C-400 Complex

- Perform a remedy selection [proposed plan and Record of Decision (ROD)] to document a final remedial action(s) for all source areas and related contaminants of concern (COCs) requiring remediation for the entire C-400 Complex, as well as physical demolition of the C-400 Cleaning Building.

- Develop post-ROD documents (e.g., remedial design report, remedial action work plan) and implementation of a final remedial action(s) as specified in the ROD.

The C-400 Complex RI/FS Work Plan (DOE 2020) specified the following goals.

Goal 1: Characterize Nature of Source Zone(s)—Characterize the nature of contaminant source materials using existing data and by collecting additional data, as necessary. Section 4 of this RI report characterizes the nature of contaminant source materials and defines source zones.

Goal 2: Define Extent of Source Contamination in Soil and Remaining Structures in the C-400 Complex OU—Define the nature, extent (vertical and lateral), and magnitude of contamination in soils and perform a multimedia evaluation (e.g., groundwater, concrete) to ensure that all exposure pathways for the C-400 Complex OU are assessed adequately to support cleanup decisions. Section 4 defines the nature, extent (vertical and lateral), and magnitude of contamination in soil. Section 5 describes the process and results of the multimedia evaluation that was completed for all exposure pathways for the C-400 Complex.

Goal 3: Evaluate Surface and Subsurface Transport Mechanisms and Pathways—Assess existing data and collect additional data, as necessary, to analyze contaminant transport mechanisms and support development of an RI/FS. Section 5 describes the contaminant transport mechanisms evaluated in this RI.

Goal 4: Complete a Risk Assessment for the C-400 Complex—Conduct a screening risk evaluation (SRE) of the combined newly generated data and historical data to complement the previously performed Baseline Human Health Risk Assessment (BHHRA) and conduct a screening-level ecological risk assessment (SERA) (Steps 1 and 2) (DOE 1999, DOE 2019). Section 6 summarizes the results of the human health SRE and the SERA.

Goal 5: Identify, Develop, and Evaluate Remedial Alternatives—Use historical and newly collected data to identify, develop, and evaluate final action alternatives that will reduce risk to human health and the environment, and meet the remedial action objectives (RAOs) identified. (Remedial alternatives will be developed and evaluated in a future FS report.)

The first four goals are achieved by this RI report. The fifth goal will be addressed by a separate FS report. The achievement of the work plan goals fulfills the first two bullet points of the C-400 Complex CERCLA final remedial action described above.

The following key points were agreed to during scoping meetings and documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

- The C-400 Complex is located within a large industrial facility; therefore, the current land use is industrial.

- The current land use can be expected to continue in the foreseeable future; consequently, the most plausible future land use of the C-400 Complex also is industrial.

- There is no use of groundwater drawn from the RGA at the C-400 Complex.

- Future use of groundwater drawn from the RGA at the C-400 Complex is not expected.

- The final remedial action is expected to address contamination (e.g., removing, preventing, reducing, and/or controlling contaminant sources) including PTW in the Upper Continental Recharge System (UCRS) and RGA including the Upper McNairy contributions to groundwater contamination originating from inside the C-400 Complex.

- Dissolved-phase groundwater contamination will be addressed as part of the Dissolved-Phase Plumes Remedial OU (DOE 2022).

1.3 SITE BACKGROUND AND HISTORY

The Paducah Site, including PGDP, is located within the Jackson Purchase region of Western Kentucky (Figure 1.1) approximately 10 miles west of Paducah, Kentucky, and 3.5 miles south of the Ohio River in the western part of McCracken County. PGDP is an inactive uranium enrichment facility owned by DOE.

Construction of PGDP began in 1951, and operations initiated in 1952. PGDP was owned and managed first by the Atomic Energy Commission and the Energy Research and Development Administration, DOE's predecessors; DOE then managed PGDP until 1993. On July 1, 1993, the United States Enrichment Corporation (USEC) assumed management and operation of PGDP enrichment facilities under a lease agreement with DOE. Until 2013, USEC enriched uranium at PGDP to supply nuclear fuel to electric utilities worldwide. In 2014, USEC returned the leased facilities to DOE control and enrichment operations ceased.

From 1953–1977, most of the uranium hexafluoride used by PGDP was produced from feedstock in the feed plant (C-410 Former Feed Plant building), which was designed to process both natural uranium and uranium from reactor tails. The reactor tails included uranium that had been returned for re-enrichment from the plutonium production reactors at the DOE Hanford and Savannah River plants. As a result of nuclear reactions in the plutonium production reactors, the reactor tails contained technetium-99 and are believed to be the sole source of technetium-99 released to the environment at PGDP. Beginning in 1977, PGDP was supplied with uranium hexafluoride feedstock from commercial vendors, such as Honeywell in Metropolis, Illinois, and from foreign sources.

The C-400 Cleaning Building was one of the first buildings constructed in the early 1950s and was operational from 1952 to 2014 (the former plant laundry remained operational in the building until July 2016 before it was moved to the C-720 Complex). The building and adjacent structures have been used in a wide variety of functions to support operations at the plant. The primary functions of the C-400 Cleaning Building included cleaning (e.g., clothes laundry, machinery parts) and cleaning/maintaining equipment from the uranium enrichment process buildings (MMES 1995). Other functions of the C-400 Cleaning Building included metal etching and plating, radioactive materials stabilization and recovery, metals recovery, uranium hexafluoride cylinder washing, uranium trioxide production, diffusion process equipment testing, treatment of radiological waste streams, and uranium tetrafluoride (green salt) pulverization. TCE was the primary degreasing solvent used in the C-400 Cleaning Building; trichloroethane was used to a lesser extent. The building also housed other processes and activities, including recovery of precious metals (other contractual work) and treatment of radiological waste streams. The *Cultural Resources Survey for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, identified that the C-400 Cleaning Building was eligible for the National Register of Historic Places (NRHP) due to the facility's military significance during the Cold War and for its role in commercial nuclear power development (BJC 2006). As such, the C-400 Cleaning Building is subject to NRHP requirements. Photographs and existing drawings representative of the C-400 Complex have been compiled and submitted to the Kentucky Heritage Council/Kentucky State Historic Preservation Office in a letter dated January 3, 2019 (Letter PPPO-02-5323415-19).

The TCE present in the soil and groundwater at the C-400 Complex has originated from activities formerly conducted at PGDP including the use of TCE as a degreaser and as a cleaning solvent. Environmental media and debris contaminated with TCE may carry hazardous waste codes F001, F002, and U228 under Resource Conservation and Recovery Act (RCRA). Also, TCE DNAPL might be considered RCRA toxicity characteristic waste (D040) if it fails the regulatory level of 0.5 mg/L for TCE characteristic waste. Little documentation exists regarding TCE leaks and spills in C-400. There were two periods of marked increase of TCE use in C-400 that are associated with cascade improvement/upgrade programs. TCE use ranged between 500 and 2,000 gal/month during the first program, occurring from August 1954 to June 1961. During the second program, from March 1973 to September 1981, TCE use increased to over 15,000 gal/month. Three processes associated with TCE use in C-400 are known to have generated TCE releases: (1) unloading railroad tank cars of TCE product, (2) leaks of TCE from a storm sewer located near the southeast corner of the C-400 Cleaning Building, and (3) leaks of TCE in the bottom of the main degreaser.

A railroad tank car unloading station was located immediately outside the southeast corner of the C-400 Cleaning Building. Anecdotal evidence indicates the seals of pumps that were used to unload TCE product into a storage tank at C-400 leaked. DOE conducted a six-phase heating (SPH) treatability study in 2003 for a large TCE DNAPL zone in the UCRS and RGA that was adjacent to the former railroad tank car unloading station. The treatability study recovered approximately 1,900 gal of TCE, but was ineffective at heating/remediating the middle and lower RGA (LRGA).

In June 1986, a routine construction excavation along the 11th Street storm sewer adjacent to the C-400 Cleaning Building revealed TCE-contaminated soil. Before the discovery of the leak site, it was not known that the storm sewer was connected by piping with a sump inside C-400 and near the C-400 degreaser. Approximately 310 ft^3 of TCE-contaminated soil was drummed and disposed of from the leak site. Concerns for the foundations of the C-400 TCE storage tank and the adjacent 11th Street prevented further excavation of soil. Subsequent RIs delineated a TCE DNAPL zone in the UCRS under and east of 11th Street. This area, later named the East Treatment Area, was remediated by the Phase I electrical resistance heating (ERH) remedial action for C-400 in 2010. Phase I, which also addressed a lesser Southwest Treatment Area DNAPL zone, removed approximately 535 gal of TCE.

C-400 operations noted leaks in the tank bottom of the main TCE degreaser beginning in 1973 (which was not replaced until 1978). Also in 1973, the pump failed in the sump located adjacent to the TCE degreaser. Overflow of the sump flowed to floor drains situated adjacent to nearby chemical cleaning tanks. These floor drains were piped to the inground C-403 Neutralization Tank, located in the northeast sector of the C-400 block. Water samples of the C-403 Neutralization Tank indicate some TCE is present. The C-400 Complex RI delineated a large TCE DNAPL zone, in the UCRS, RGA, and shallow McNairy Formation soils beneath the area of the main TCE degreaser and extending south. Likely, this TCE leaked from supply piping to the main degreaser, the sump, and/or the pipeline that formerly connected the sump to the storm sewer.

In August 1988, off-site groundwater contamination was detected in groundwater wells north of the Paducah Site. In August 1988, DOE and EPA Region 4 entered into an Administrative Order by Consent

(AOC) under Sections 104 and 106 of CERCLA. KDEP provided regulatory review of the CERCLA AOC documents, but was not a signatory on the agreement. DOE conducted a Phase I and Phase II CERCLA site investigation (SI), that began in 1989 and concluded in 1992, to (1) evaluate the nature and extent of off-site contamination originating at PGDP, and (2) evaluate on-site sources of contamination and to develop sufficient characterization data for supporting an assessment of remedial alternatives. The investigations found that various hazardous, nonhazardous, and radioactive wastes resulting from ongoing operations had been generated and disposed of at PGDP. The SI determined that TCE and technetium-99 in groundwater and uranium metal and PCBs in surface water and sediment were the four primary environmental COCs at the facility (CH2M HILL 1991; CH2M HILL 1992). TCE was used as a cleaning solvent beginning with the plant's construction, but its use was discontinued on July 1, 1993.

PGDP (CERCLIS# KY8-890-008-982) was placed on the National Priorities List on May 31, 1994. In accordance with Section 120 of CERCLA, DOE entered into an FFA with EPA and KDEP on February 13, 1998 (EPA 1998). The FFA established one set of consistent requirements for achieving comprehensive site remediation in accordance with the RCRA and CERCLA, including community relations and other stakeholder involvement. As established by the FFA, DOE is the lead agency for remedial actions, and EPA and KDEP have regulatory oversight responsibilities.

There are 22 SWMUs located within the boundaries of the C-400 Complex (Table 1.1). Five of the 22 SWMUs (349, 350, 351, 352, and 353) are DOE material storage areas that were under the sole oversight authority of KDEP pursuant to the 2003 Agreed Order and were excluded from cleanup under the FFA. Ten of the SWMUs (48, 49, 50, 51, 52, 53, 54, 383, 384, and 537) have been designated as no further action (NFA) (FY 2022 SMP, Appendix 4). As a result, only seven of the 22 SWMUs (11, 40, 47, 98, 203, 480, and 533) located within the boundaries of the C-400 Complex (Figure 1.4) require further CERCLA evaluation in this RI Report. SWMU 40 (C-403 Neutralization Tank slab and underlying soils) was the subject of a recent removal action, as described in the Action Memorandum for the Soils OU Inactive Facilities (DOE 2009a). Because a 30-inch water line located adjacent to SWMU 40 required rerouting prior to removal that would have interfered with site operations, a change in schedule for the C-403 Neutralization Tank was determined to be necessary. The removal action will be implemented and addressed as part of the C-400 Complex OU final remedial action.[7]

Table 1.1. SWMUs in the C-400 Complex

SWMU No.	Description
11	***C-400 Trichloroethylene Leak Site***
40*	***C-403 Neutralization Tank slab and underlying soils***
47	***C-400 Technetium Storage Tank Area***
48	Gold Dissolver Storage Tank (DMSA C400-03)
49	C-400-B Waste Solution Storage Tank
50	C-400-C Nickel Stripper Evaporation Tank
51	C-400-D Lime Precipitation Tank
52	C-400 Waste Decontamination Solution Storage Tanks
53	C-400 NaOH Precipitation Unit
54	C-400 Degreaser Solvent Recovery Unit
98	***C-400 Basement Sump***
203	***C-400 Discard Waste System slab and underlying soils***
349	C-400-01

[7] Letter PPPO-02-10022027-22, dated August 22, 2022.

Table 1.1. SWMUs in the C-400 Complex (Continued)

SWMU No.	Description
350	C-400-04
351	C-400-05
352	C-400-06
353	C-400-07
383	G-400-01
384	G-400-02
480	***C-402 Lime House Building Slab and Underlying Soils***
533	***TCE Spill Site from TCE Unloading Operations at C-400***
537	S-400-001

SWMUs in ***bold italics*** require further CERCLA evaluation as part of the C-400 Complex OU.
*SWMU 40 includes the tank, slab, and underlying soils.

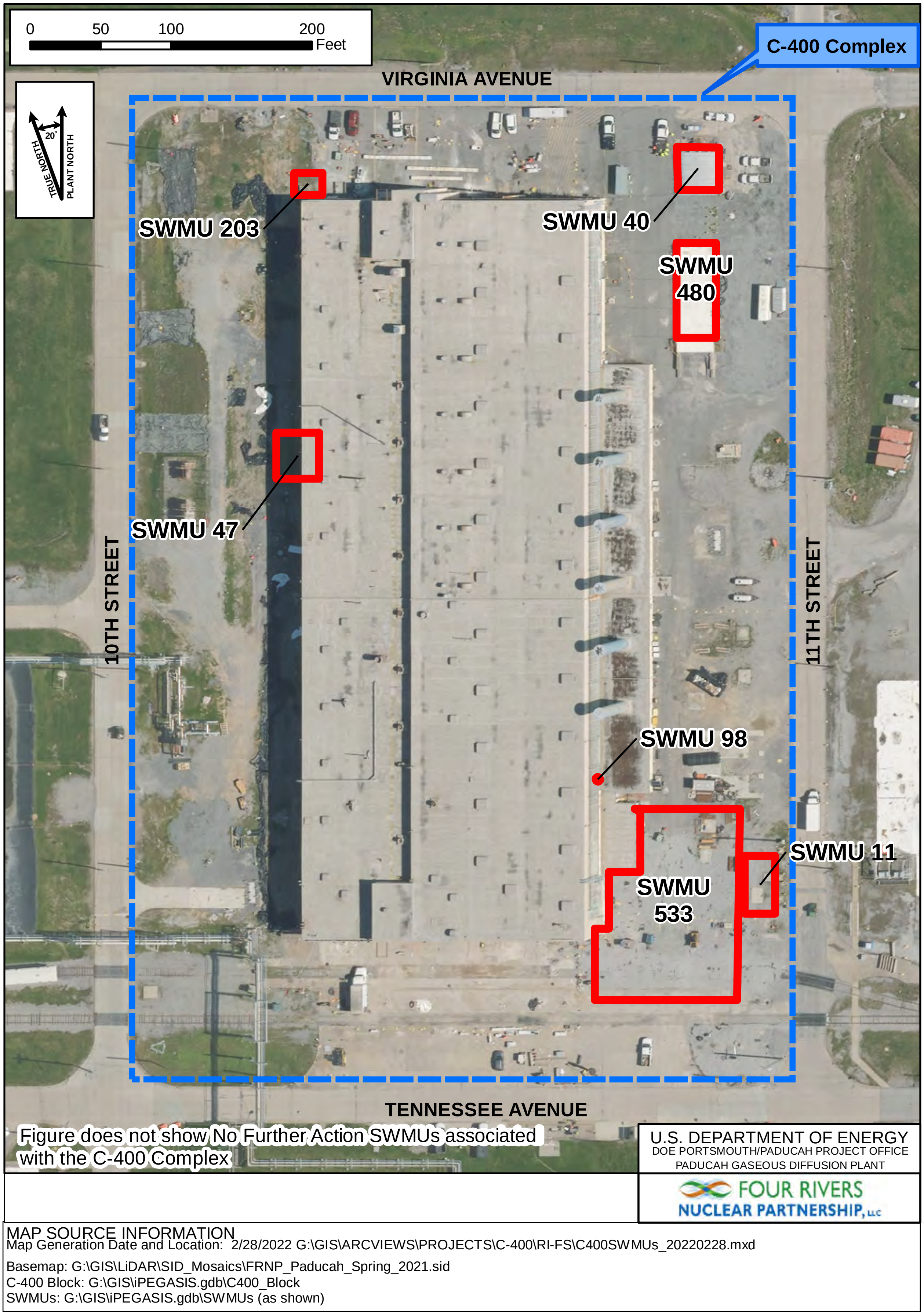

Figure 1.4. Remaining C-400 Complex SWMUs

1.4 PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

Source units and areas of contamination at the Paducah Site have been combined into OUs for evaluation of remedial alternatives. These OUs include the C-400 Complex OU, the Groundwater OU, Surface Water OU, the Lagoons OU, the Burial Grounds OU, the Soils OU, the Soils and Slabs OU, the Facility D&D OU, the Depleted Uranium Hexafluoride Footprint Underlying Soils OU, the CERCLA Waste Disposal Alternatives OU, and the Comprehensive Site OU. Each OU is designed to remediate contaminated media associated with PGDP (DOE 2020). The focus of this RI report is the C-400 Complex OU.

After the discovery of a TCE leak in June 1986, soils were excavated to reduce the contamination in the area. Excavation was halted to prevent structural damage to an adjacent TCE storage tank and to 11th Street. Approximately 310 ft^3 of TCE-contaminated soil was drummed and disposed of off-site. The excavation was backfilled with clean soil, and the area was capped with a layer of clay.

The Phase I and Phase II CERCLA SIs included the C-400 Cleaning Building area within their scopes, with the installation of soil borings and groundwater monitoring wells (MWs) (CH2M HILL 1991; CH2M HILL 1992). These investigations confirmed that TCE contamination at the southeast corner of C-400 extended from the surface to the base of the RGA at approximately 92 ft below ground surface (bgs). A subsequent Groundwater Monitoring Phase IV Investigation, an investigation that was mostly focused on the Northeast Plume at the Paducah Site, demonstrated that the presence of both TCE and technetium-99 in groundwater samples of the investigation's westernmost soil borings linked the C-400 Complex area to the Northwest Plume (DOE 1995b).

An investigation of sensitive ecological resources inside PGDP was conducted in 1994 (CDM Federal 1994). This study included identification and discussion of sensitive habitats and threatened/endangered species at the plant. Wildlife opportunities in the C-400 Complex OU are limited to those that are common to industrial settings. More information related to this investigation and the ecological setting is provided in Section 2.7 of this RI report.

The primary goal of the Waste Area Grouping (WAG) 6 RI was to characterize the nature and extent of contamination around the C-400 Cleaning Building (DOE 1999). Analytical results from the WAG 6 RI indicated that the primary site-related volatile organic compounds (VOCs) in the subsurface soil and groundwater in the C-400 Cleaning Building area are TCE and its breakdown products (*trans*-1,2-dichloroethene, *cis*-1,2-dichloroethene, and vinyl chloride) and 1,1-dichloroethene. The WAG 6 RI concluded that zones of DNAPL TCE existed in the UCRS and RGA adjacent to and potentially beneath the C-400 Cleaning Building. The *Feasibility Study for the Groundwater Operable Unit at Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1857&D2 presented a summary of the characterization data for the C-400 area DNAPL zones and documented the DNAPL conceptual model for the area (DOE 2001). Data from the WAG 6 RI, as well as other investigations and studies, indicated that DNAPL zones in the southeast area of the C-400 Cleaning Building area accounted for the majority of the known mass of DNAPL at PGDP.

A treatability study was conducted in 2003 to test the full-scale deployment of ERH technology in the area adjacent to the southeast corner of the C-400 Cleaning Building (DOE 2004a). Note that this treatability study focused on the soil of the UCRS and RGA, and no treatability studies have been completed for the McNairy Formation; therefore, there is uncertainty related to the ability of any remedial technology evaluated in a future FS report to work effectively in the McNairy Formation. Figure 1.5 illustrates the location of this treatability study, as well as subsequent treatability studies and interim remedial actions,

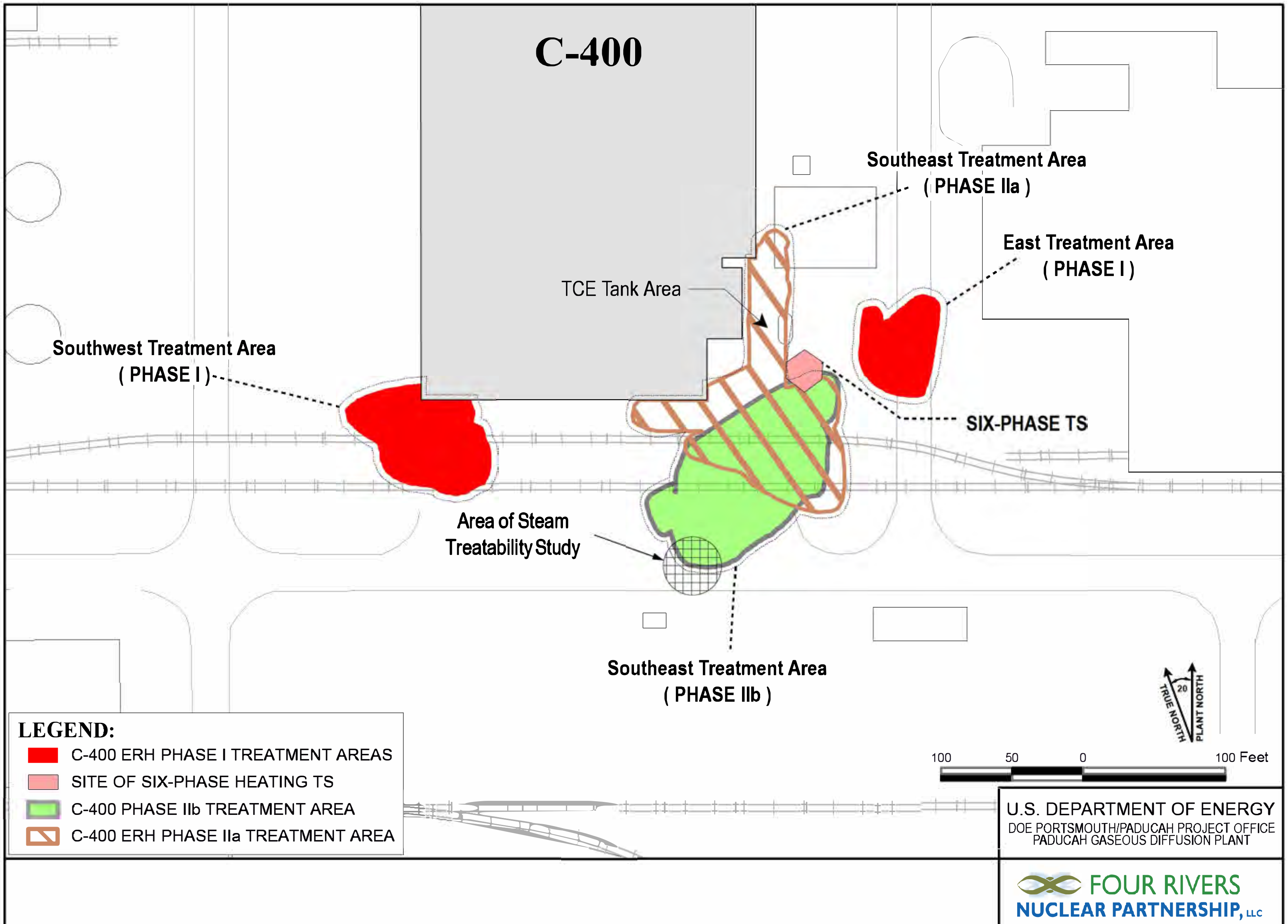

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Figure 1.5. C-400 Cleaning Building Treatability Study and Interim Remedial Action Locations

with respect to the C-400 Cleaning Building. This 2003 treatability study included the installation and operation of one SPH treatment array and a vapor recovery system.

The SPH treatability study began in February 2003 and was discontinued in September 2003. Comparison of pretreatment and post-treatment sample results was used to measure treatment efficacy. Approximately 1,900 gal of TCE was removed from the subsurface. The SPH treatability study achieved an estimated 98% reduction of TCE concentrations in UCRS soils and an estimated 99.1% reduction of TCE concentration in RGA groundwater, which met the removal efficiency criteria. The residual contaminant levels averaged 2,493 µg/kg, with a maximum of 112,500 µg/kg in soil, and averaged 5,770 µg/L, with a maximum of 9,440 µg/L in groundwater within the RGA and inside the treatment zone (DOE 2004a).

DOE conducted a Remedial Design Support Investigation (RDSI) in 2006 with the purpose of improving the ERH design by determining the subsurface soil conditions and the presence and relative concentration of VOCs in the UCRS, the RGA, and the RGA/McNairy interface. This RDSI used MIP technology to define the extent of source zones of TCE (DOE 2005a). During the RDSI, 18 MIP borings were completed through the UCRS to a depth of approximately 55 ft bgs, and 33 MIP borings were completed to the base of the RGA to a depth of approximately 100 ft bgs. The RDSI characterization plan optimized the location and depth of the MIP borings to complement the existing characterization data from the WAG 6 RI. These data characterized the three-dimensional aspects of the TCE DNAPL source zones and demonstrated that the residual TCE distribution was consistent with the conceptual model from the WAG 6 RI. Based on interpretation of the RDSI data, it appeared the vertical extent of the DNAPL did not extend far (beyond 1 ft) into the McNairy Formation below the primary RGA DNAPL pool at the base of the RGA.

The *Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* selected ERH as the remedy to address VOC source mass in the UCRS and the RGA in treatment areas immediately adjacent to the C-400 Cleaning Building (DOE 2005b). ERH was implemented in two phases, Phase I (initiated in December 2008) and Phase IIa (initiated in September 2012). The Phase I ERH system consisted of a network of in-ground electrodes and vapor extraction wells, below 20 ft bgs, distributed throughout the east and southwest zones of contamination (Figure 1.5) in a three-phase heating pattern. The east and southwest areas were selected for Phase I because they were the smallest of the source areas near the C-400 Cleaning Building and had contaminants primarily in the UCRS. Phase I electrodes in the East Treatment Area extended through the middle to lower UCRS; Phase I electrodes in the Southwest Treatment Area extended through the middle to lower UCRS and RGA. Phase IIa followed Phase I to treat the Southeast Treatment Area, below 20 ft bgs, which was expected to contain a larger amount of source contamination in both the UCRS and the RGA.

Phase I ERH operations were completed in December 2010. Approximately 535 gal of VOCs (primarily TCE) was removed. Phase I ERH reduced UCRS soil TCE concentrations by 95% in the East Treatment Area and by 99% in the Southwest Treatment Area. The residual contaminant levels in soil averaged 29 µg/kg, with a maximum of 315 µg/kg in the East Treatment Area, and averaged 15 µg/kg, with a maximum of 228 µg/kg in the Southwest Treatment Area.

An important objective of Phase I was to evaluate the heating performance of the ERH design, below 20 ft bgs, through the RGA down to the McNairy Formation interface in the Southwest Treatment Area. During Phase I, temperature goals were not attained in the lower RGA (LRGA) in the Southwest Treatment Area, particularly below 70 ft bgs (refer to the Phase I Technical Performance Report) (DOE 2011a).

Also in 2010, additional characterization of soils in the C-400 Technetium Storage Tank Area (SWMU 47) located on the west side of the C-400 Cleaning Building was implemented as part of the Soils OU RI (DOE 2011b). Two grid samples, in addition to four subsurface grab samples, were collected for

SWMU 47. The two subsurface grab samples included analyses for VOCs. The Soils OU RI assessed the direct contact risks for SWMU 47, and the results of that risk characterization are as follows:

- The overall cancer risk to the future industrial worker from exposure to soil in SWMU 47 exceeds the PGDP *de minimis* level of 1.0E-06; and EPA's generally acceptable risk range of 1.0E-04 to 1.0E-06 (ELCR = 1.03E-03). The overall hazard index (HI) was less than the PGDP *de minimis* level of 1. The significant COCs for cancer risk to the industrial worker were polycyclic aromatic hydrocarbons (PAHs) (89% of total), beryllium (5% of total), and arsenic (4% of total). The driving exposure routes for cancer risk were dermal contact with soil (91% of total) and ingestion of soil (8% of total).

- The overall cancer risk to the excavation worker from exposure to soil in SWMU 47 exceeds the PGDP *de minimis* level of 1.0E-06, but is within EPA's generally acceptable risk range of 1.0E-04 to 1.0E-06 (ELCR = 1.68E-05). The overall HI was less than the PGDP *de minimis* level of 1. The significant COCs for cancer risk to the excavation worker were PAHs (83% of total); arsenic (8% of total); beryllium (3% of total); thorium-230 (2% of total); and TCE (2% of total). The driving exposure routes for cancer risk were dermal contact with soil (52% of total) and ingestion of soil (46% of total).

In 2011, an additional RDSI was completed in the Phase II Southeast Treatment Area. Soil and groundwater samples were collected to provide data for reevaluation of the TCE mass estimate. The goals of the investigation were (1) development of predictive relationships of previous and proposed MIP responses to current TCE concentrations, and (2) assessment of the TCE DNAPL mass and volume within the C-400 Phase II treatment area. Additional information regarding the predictive relationships and initial mass volume estimates was included in the C-400 Cleaning Building Remedial Design Report, Appendix A (DOE 2012). The C-400 Cleaning Building Remedial Design Report estimates the TCE mass volume for the Phase IIb area ranges from 576 to 4,500 gal.

Because of the inability of ERH to reach target temperatures in the LRGA during the Phase I remedy, the FFA parties agreed in 2011[8] to divide Phase II into Phase IIa (using ERH to address the UCRS and upper RGA (URGA) to a depth of 60 ft bgs) and Phase IIb (using a technology to be decided to address the LRGA) (DOE 2012). Phase IIb has been incorporated into this C-400 Complex OU project. Phase IIa operations were completed in the fall of 2014 and consisted of the implementation of ERH (using a three-phase heating pattern) in the UCRS, below 20 ft bgs, and URGA in the Southeast Treatment Area. Phase IIa operations removed approximately 1,137 gal of VOCs (primarily TCE). The median of TCE concentration reductions in collocated pre-operational versus post-operational soil samples of Phase IIa was 99.8%. The residual contaminant levels averaged 200 μg/kg, with a maximum of 10,000 μg/kg in the Phase IIa treatment area. Based on previous remedial actions and the estimate for the Phase IIb area, the estimated minimal volume of TCE DNAPL that was released at the C-400 Complex is in the range of 4,148 to 8,072 gal.

Another treatability study, to test Phase IIb steam injection in the RGA, followed in 2015 (April–June). The goals of this treatability study were to obtain data specific to understanding whether/how injected steam could heat the full thickness of the RGA, maintain target temperatures at the RGA/McNairy interface, and move the steam front effective distances from the injection wells (DOE 2016). Subsurface temperatures in the RGA were measured at various depths and distances from steam injection points throughout the duration of the treatability study to monitor the change in temperatures and the arrival of the steam front horizontally and vertically in the subsurface. Two nested steam injection wells allowed for steam injection at upper and lower screened intervals simultaneously, while maintaining the ability to isolate the upper and lower wells to focus steam injection to a single depth interval. The injection strategy was varied to assess the effects on steam front mobility, configuration, and heating effectiveness under varying steam injection conditions.

[8] Letter PPPO-02-1137622-11, dated February 24, 2011.

Thermal modeling, based on the pilot study, yielded simulations of a full-scale design. The treatability study concluded that the encountered site conditions are within the expected range, and that steam is technically implementable to heat the target zone to facilitate VOC remediation.

A vapor intrusion (VI) study was performed at C-400 between September 2017 and February 2018 and concluded that TCE-contaminated groundwater and soil adjacent to and under the C-400 Cleaning Building are considered sources of vapors (DOE 2018a). Sub-slab vapor sampling at the C-400 Cleaning Building detected primarily TCE, but also detected *cis*-1,2-dichloroethene. Subsurface conditions in the C-400 Complex are considered to allow vapor transport toward the building. Although TCE concentrations in the RGA near the C-400 Cleaning Building have decreased, groundwater concentrations still exceed EPA's groundwater Vapor Intrusion Screening Level (VISL). Vapor migration from subsurface groundwater and soil sources through the vadose zone is promoted by the presence of sand in the UCRS in the vicinity of the C-400 Complex, as well as the presence of gravel immediately beneath the building. The large number of utilities present in the vicinity of the building also may serve as preferential pathways for vapor migration. The C-400 Cleaning Building VI Study results show that the VI pathway for TCE is complete, and TCE concentrations exceeded the project action limit in indoor air at three locations. TCE concentrations measured in sub-slab vapor were above EPA's commercial sub-slab soil gas VISL at several locations, indicating that TCE concentrations in indoor air greater than the project action limit continue to be possible, particularly when building fans are off and doors are closed (i.e., fan off, closed-door conditions); however, cumulative ELCR, assuming chronic exposure by industrial workers, was less than 6.0E-06 at all individual locations and less than 2.0E-06 across all three scenarios. Cumulative hazards, assuming chronic exposure by industrial workers, were less than an HI of 1.0 at all individual locations except one [hazard quotient (HQ) = 1.4 to 1.6 under fan off, closed-door conditions] and less than 1.0 across all three scenarios.

1.5 REPORT ORGANIZATION

This RI report has been prepared consistent with the Integrated RCRA Facility Investigation/RI Report outline prescribed in Appendix D of the FFA (EPA 1998). It is organized to present the field investigation effort, nature and extent of contamination, contaminant fate and transport, and risk assessment. This RI report is organized into seven sections. Subsections have been added to the outline, as appropriate, to provide clarity and to enhance the organization of the document. Appendices are provided to present more detailed information in support of the RI sections and include the following:

Appendix A: Technical Memoranda on Field Activities

Appendix B: Contaminant Fate and Transport Modeling

Appendix C: Screening Risk Assessment

Appendix D: Drilling Logs/Subsurface Profiles

Appendix E: Analytical Data [including quality assurance (QA)/quality control (QC) evaluation] and Geotechnical Data

Appendix F: C-400 Complex Bibliography

2. PHYSICAL CHARACTERISTICS OF THE STUDY AREA

This section summarizes the physical characteristics of the Paducah Site and the region surrounding it, including the location, topography, meteorology/climatology, surface water hydrology, geology, hydrogeology, ecological setting, demographics, and land use. The discussion focuses on region-wide and sitewide characteristics in sufficient detail to support evaluations of the nature and extent and the fate and transport of contaminants exiting the C-400 Complex and entering the environment. Much of this information is based on previously conducted investigations at the site.

2.1 LOCATION

The Paducah Site is located approximately 10 miles west of Paducah, Kentucky, in the western part of McCracken County (Figure 1.1). The plant is located on a 3,556 acre DOE-owned site. Approximately 1,450 acres utilized for site operations, 133 acres are in acquired easements, and the remaining 1,973 acres are licensed to the Commonwealth of Kentucky as part of the West Kentucky Wildlife Management Area (WKWMA). Bordering the Paducah Site to the northeast is a Tennessee Valley Authority (TVA) reservation on which the Shawnee Fossil Plant is located. Figure 2.1 presents both the current land use and the 229 Boundary revision, per *Federal Register*, Notices, Vol. 83, No. 213, dated November 2, 2018. In subsequent figures that delineate the 229 Boundary, the 229 Boundary will be referred to as the fenced security area.

2.1.1 C-400 Cleaning Building Location and Description

The C-400 Cleaning Building is located inside the C-400 Complex OU, which is bounded by 10th and 11th Streets to the west and east, respectively, and by Virginia and Tennessee Avenues to the north and south, respectively. Figure 1.2 depicts the location of the C-400 Cleaning Building inside of the C-400 Complex OU.

The C-400 Cleaning Building is a rectangular structure with a footprint of approximately 116,000 ft^2 (roughly 200 ft × 520 ft, plus appurtenances that make up the remaining footprint). The C-400 Cleaning Building floor space is approximately 134,000 ft^2. The large east basement floor is approximately 18,000 ft^2 (approximately 60 ft × 300 ft). The depth of this basement varies, with an approximate maximum depth of 18.5 ft. The C-400 Cleaning Building is constructed of approximately 12-inch thick concrete exterior walls for approximately the first 8 ft of height. Above the concrete walls, the walls consist of windows and corrugated transite panels on steel framing. The east side of the building, as well as the central and southern portions of the west half of the building, housed disassembly and part cleaning equipment. The northwest section included the former laundry area.

Previous deactivation activities were conducted to place the building in a safe, stable condition and to prepare the C-400 Cleaning Building for demolition. The current status of the C-400 Cleaning Building includes, but is not limited to, the following:

- Building structure intact, including exterior and internal walls, windows, and roof;
- Floor and foundations (at grade and below grade) intact;
- Dip tanks removed;
- Utility systems isolated; and
- Fixative applied to down post radiological areas and prevent cross contamination.

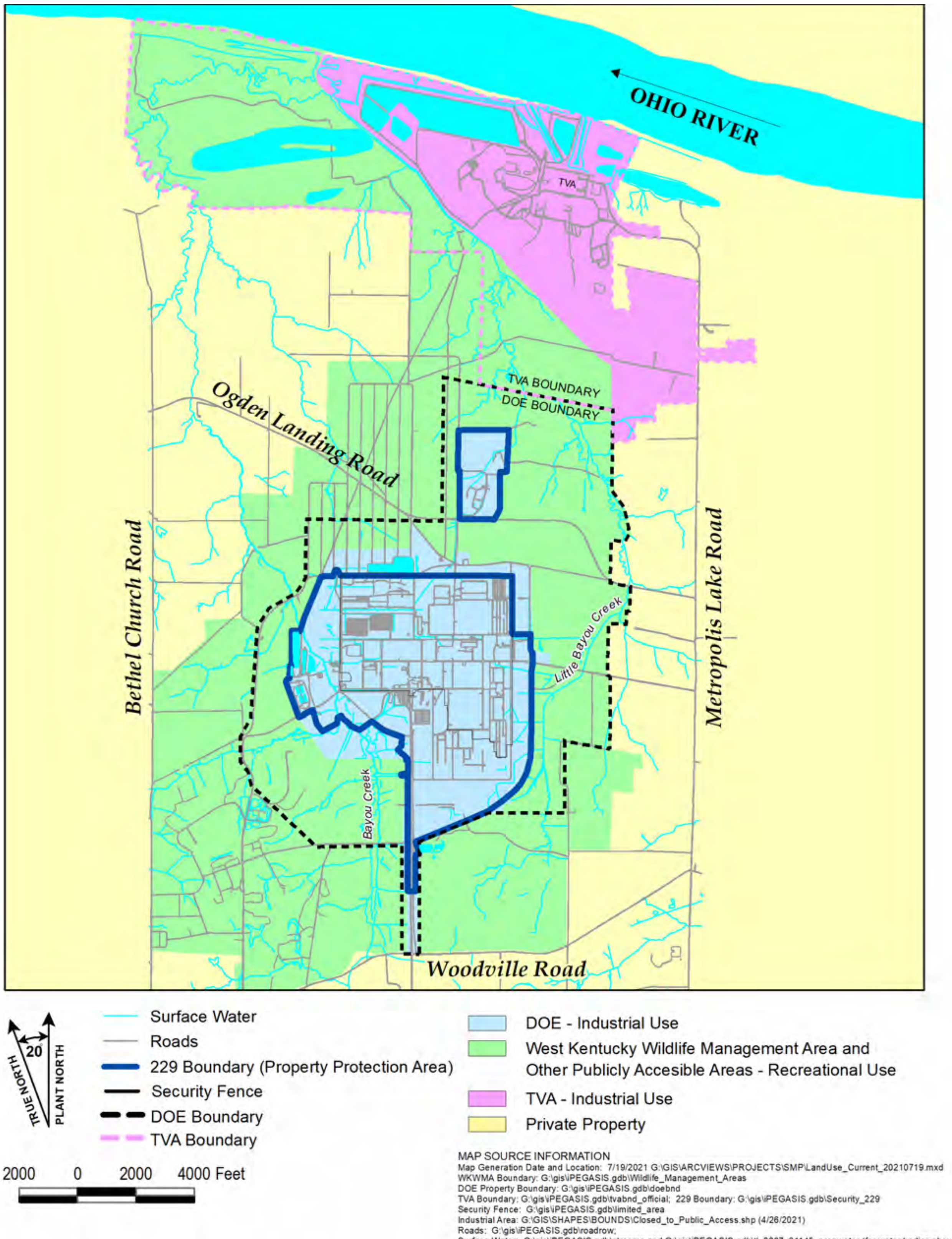

Figure 2.1. Current Land Use at the Paducah Site

2.2 REGIONAL TOPOGRAPHY, SURFACE, AND SUBSURFACE FEATURES

The topographic features at the site include nearly level to gently sloping dissected plains and the flood plain of the Ohio River. The elevations of the stream valleys in the dissected plains are up to 30 ft lower than the adjoining uplands. Local elevations range from 290 ft above mean sea level (amsl) along the Ohio River to 450 ft amsl southwest of the Paducah Site. Generally, the topography in the Paducah Site area slopes toward the Ohio River at an approximate gradient of 27 ft per mile (CH2M HILL 1992). Ground surface elevations vary from 360 to 390 ft amsl within the fenced security area and 340 to 420 ft amsl within the greater Paducah Site.

In the area of the C-400 Cleaning Building, the topography is relatively flat, with elevations ranging from approximately 370–376 ft amsl. Thick concrete aprons cover the heavy traffic areas immediately north and south of the building, while gravel or asphalt covers a majority of the areas on the east and west sides of the building (Figure 1.4). An active railroad track serves the south side of the building. An overhead gantry crane and loading dock were formerly located on the south side of the building, but have been removed. Aboveground steam lines are located on the west side of the building.

The area that composes the C-400 Complex OU is crossed by a number of utilities in the subsurface. The locations of those utilities (combined) are shown in Figure 2.2. The expected location, use, and condition of these subsurface utilities and any other physical subsurface infrastructure are described herein. Construction gravel of varying thicknesses (ranging from approximately 0–12 ft) was placed as base material under C-400 Complex building slabs, basements, and pits. These subsurface gravel beds house an assortment of drain lines (e.g., discard waste, acid waste, sanitary sewer, storm sewer systems).

Communication utilities (e.g., underground cabling) are present in the southern part of the C-400 Complex entering the southern end of the C-400 Cleaning Building. These communication cables are not considered to be an environmental hazard.

A large number of drain lines (e.g., sanitary, storm, acid, discard waste lines) are located in and around the C-400 Complex. All of the drain lines located within the building have been deactivated from their respective line portions located on the exterior of the building (i.e., disconnected from the exterior portions and plugged to secure the lines and prevent release of contaminants). A portion of these drain lines (approximately 10% of the total length) have been inspected with video borescope technology (see Appendix D of the C-400 Complex RI/FS Work Plan) (DOE 2020). During characterization of the C-400 basement slab and subsurface structures in 2018, a video borescope system was deployed into accessible drains to visually inspect the pipes/drains until refusal was encountered (see Appendix D of the C-400 Complex RI/FS Work Plan) (DOE 2020). Liquid and sludge samples from the drains were collected, when possible, and analyzed. The results were used to support development of the C-400 Complex RI/FS Work Plan. The results of the analyses indicated that VOCs, Total PCBs, total carcinogenic PAHs, anion (fluoride), metals, and radionuclides were present at concentrations exceeding risk-based screening values in the drains. Drain systems that were investigated with the video borescope included portions of the discard waste system and the acid drain system. While there is uncertainty with the inaccessible portions of the drain lines, the contamination in inaccessible portions of the lines is assumed to be similar to the portions of line that were accessed and sampled (e.g., the contamination levels likely exceed risk-based screening values) and the drain lines are likely sources of contamination. In addition, portions of the following drain systems were investigated with the borescope, where accessible.

- C-400 southeast acid waste cleanout vent
- SWMU 98, C-400 Basement Sump
- C-400 west center through-wall drain
- C-403 former neutralizing pit

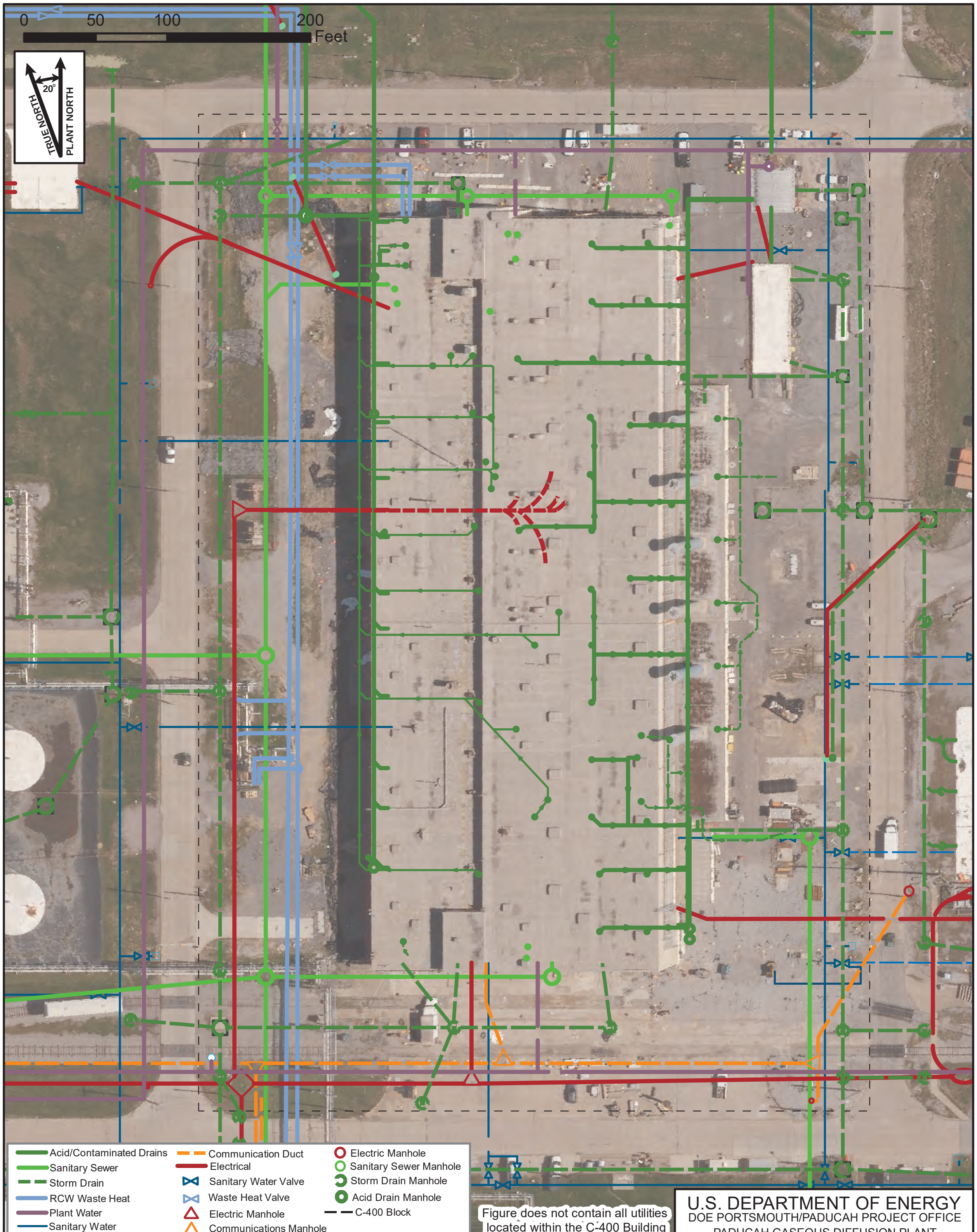

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Figure 2.2. Subsurface Utilities within and Adjacent to the C-400 Complex

- C-400 drain under spray booth
- C-400 northeast acid drain cleanout
- C-400 plenum room drains/valve pits (various)
- C-400 compressor pit sump drain

In addition, video borescoping of subsurface drains that were not accessible at the time of the July 2018 characterization (e.g., drains beneath the TCE degreaser) was attempted during this RI (Section 4.3.1.1 of this RI report). Results from video borescoping of the storm sewer from outside the building and the drains beneath the TCE degreaser are included in Appendix A. Analytical results associated with this effort are included in Appendix E.

As a part of the C-400 deactivation activities, the acid drain lines that traverse underneath the dip tanks to the C-403 Neutralization Pit (SWMU 40) were grouted after an acid drain cleanout at grade surface, located approximately 24 ft from the northeast corner of the C-400 Cleaning Building to mitigate the potential for liquid from C-403 to back feed into the acid drain lines. See Figure 1.4 for the location of SWMU 40 in relation to the C-400 Cleaning Building.

Most of the storm water from the C-400 Cleaning Building area flows to storm drain inlets around the building and discharges via the storm sewer on the south side of the building to Outfall 008, then to Bayou Creek on the west side of the site. Runoff from the north side of C-400 Cleaning Building area flows into the North-South Diversion Ditch (NSDD), then is pumped to the C-616 Lagoon and released through Outfall 001 to Bayou Creek.

All water supply lines (i.e., sanitary water, plant process water, recirculating cooling water) were present in the C-400 Cleaning Building. The recirculating cooling water no longer is in use at PGDP. The sanitary and plant process water utility systems would not be expected to contain or be the source of any process-related contaminants in the area of the C-400 Complex. These systems are still being utilized across the Paducah Site.

Electric power was supplied to or from the C-400 Cleaning Building in five locations as shown in Figure 2.2. The cabling associated with these five power access locations leads to electrical equipment located either within the C-400 Complex, but outside the C-400 Cleaning Building, or to equipment located completely outside the C-400 Complex. The portion of the cables that remain buried could remain in place if other reasons do not require their removal.

2.3 METEOROLOGY AND CLIMATOLOGY

The Paducah Site's climate is humid-continental. The term "humid" refers to the surplus of precipitation versus evapotranspiration that normally is experienced throughout the year. According to the National Weather Service for the period from 1991–2020, the average monthly precipitation is 4.19 inches, varying from an average of 3.11 inches in August (the monthly average low) to an average of 5.17 inches in April (the monthly average high). The "continental" nature of the local climate refers to the dominating influence of the North American landmass. Continental climates typically experience large temperature changes between seasons. The mean annual temperature for the Paducah area for 1991–2020 was 58.8°F, with the coldest month being January with an average temperature of 36.0°F and the warmest month being July with an average temperature of 79.7°F (https://www.weather.gov/pah/monthlynormals) (NWS 2021).

Information on wind direction and speed was obtained from the Barkley Regional Airport which is located approximately four miles southeast of the Paducah Site (WRCC 2021). Figure 2.3 provides a wind rose showing the mean wind speed and direction for the 10-year period from January 1, 2009–December 31,

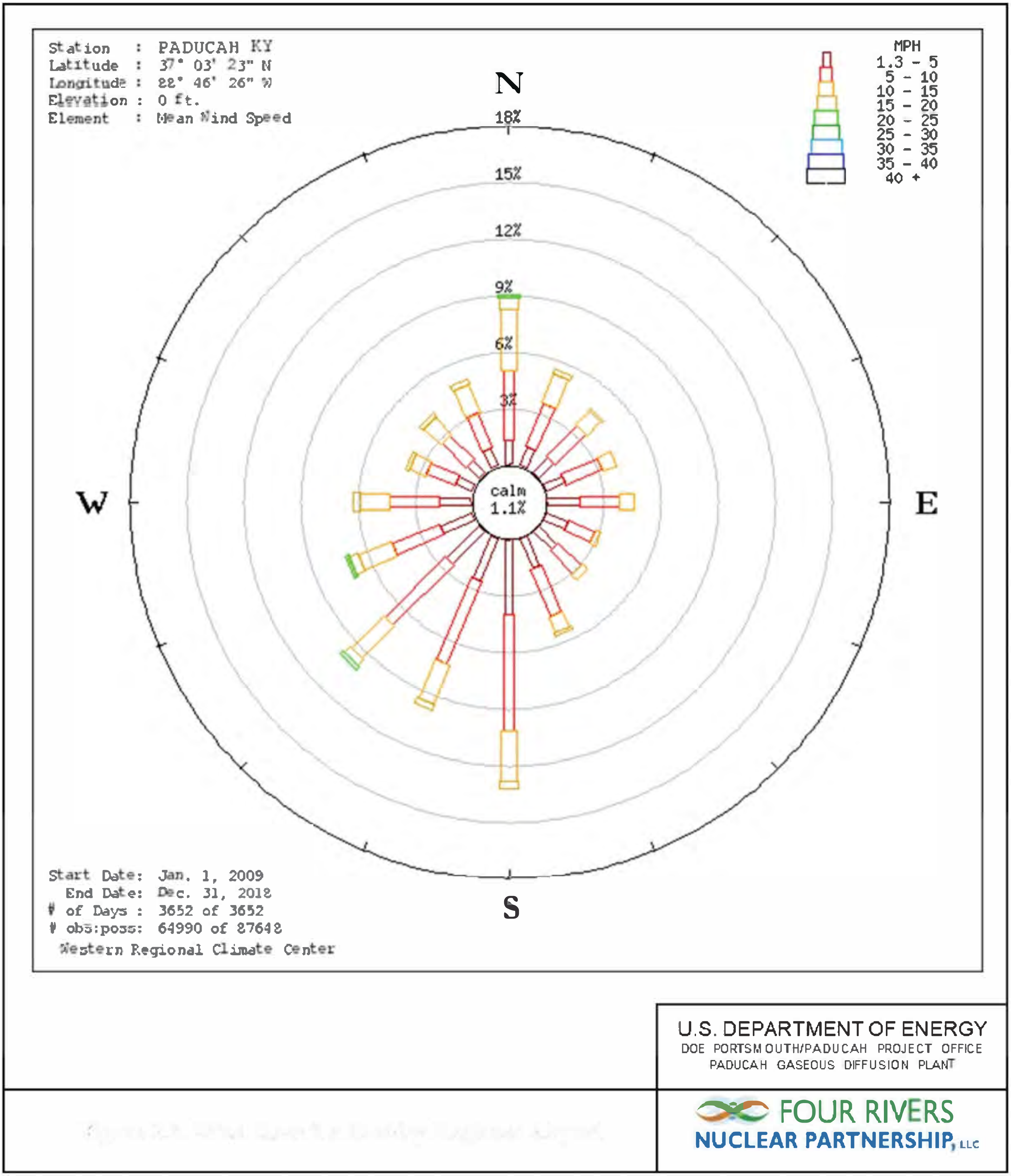

Figure 2.3. Wind Rose for Barkley Regional Airport

2018, at the Barkley Regional Airport. The prevailing wind during this 10-year period was from the south to southwest (33% of the time period evaluated) with mean speeds mostly ranging from 5–15 mph (the mean speed from all observations was 6.5 mph). Historically, stronger winds are recorded when the winds are from the southwest.

2.4 SURFACE WATER HYDROLOGY

The Paducah Site is situated in the western portion of the Ohio River basin, approximately 15 miles downstream of the confluence of the Ohio River with the Tennessee River and approximately 35 miles upstream of the confluence of the Ohio River with the Mississippi River. Locally, the Paducah Site is within the drainage areas of the Ohio River, Bayou Creek, and Little Bayou Creek.

The Ohio River is located approximately 3.5 miles north of the Paducah Site. It is the most significant surface-water feature in the region, carrying over 25 billion gal per day of water through its banks. Several dams regulate flow in the Ohio River. The Ohio River stage near the Paducah Site is measured upstream at Paducah, Kentucky, and downstream at Olmsted, Illinois, by U.S. Geological Survey (USGS) gauging stations.

River stage typically varied between 293 and 335 ft amsl near the Paducah Site over the course of a year until August 2018, when the Olmsted Locks and Dam became operational downstream of the Paducah Site. Subsequent to 2018, low stage on the Ohio River has varied between 300 and 305 ft amsl. Water levels on the lower Ohio River generally are highest in late winter and early spring and lowest in late spring and early summer. The fenced security area of the Paducah Site is above the historical high water floodplain of the Ohio River (CH2M HILL 1991) and above the local 100-year flood elevation of the Ohio River (333 ft).

The fenced security area is situated on the divide between Little Bayou and Bayou Creeks (Figure 2.4). Surface flow is east-northeast toward Little Bayou Creek and west-northwest toward Bayou Creek. Bayou Creek and Little Bayou Creek are classified as Warmwater Aquatic Habitat, Primary Contact Recreation, Secondary Contact Recreation, and Domestic Water Supply. [Reference: KPDES Permit Fact Sheet (2022-12-09 KPDES Permit Fact Sheet KY0004049) and 401 *KAR* § 10:026, Designation of uses of surface water.] Bayou Creek is a perennial stream on the western boundary of the plant that flows generally northward, from approximately 2.5 miles south of the site to the Ohio River along a 9-mile course. Bayou Creek has approximately 11,910 acres of watershed. Little Bayou Creek becomes a perennial stream at the east outfalls of the Paducah Site. The Little Bayou Creek drainage originates within WKWMA and extends northward and joins Bayou Creek near the Ohio River along a 6.5-mile course within a 6,000-acre watershed. Drainage areas for both creeks are generally rural; however, they receive surface drainage from numerous swales that drain residential, agricultural, and commercial properties, including the Paducah Site and the TVA Shawnee Fossil Plant. The confluence of the two creeks is approximately 3 miles north of the site, just upstream of the location at which the combined flow of the creeks discharges into the Ohio River.

A network of ditches discharges effluent and surface water runoff from the Paducah Site to the creeks. Site discharges are monitored at the Kentucky Pollutant Discharge Elimination System (KPDES) outfalls prior to discharge into the creeks. In addition, there is a CERCLA outfall, which was created for the discharge of treated groundwater into Little Bayou Creek that is not part of the KPDES monitoring system. The Northwest Plume (DOE 1993) and Northeast Plume (DOE 1995a) pump-and-treat systems were installed as part of selected interim remedies. Treated groundwater from these systems is discharged through outfalls as shown on Figure 2.4. During the period of uranium enrichment operations at PGDP, most of the flow within Bayou and Little Bayou Creeks was from process effluents and surface water runoff from the Paducah Site. Subsequent to the uranium enrichment operations, the discharge of the Paducah Site groundwater pump-and-treat systems is a primary component of the flow in both creeks.

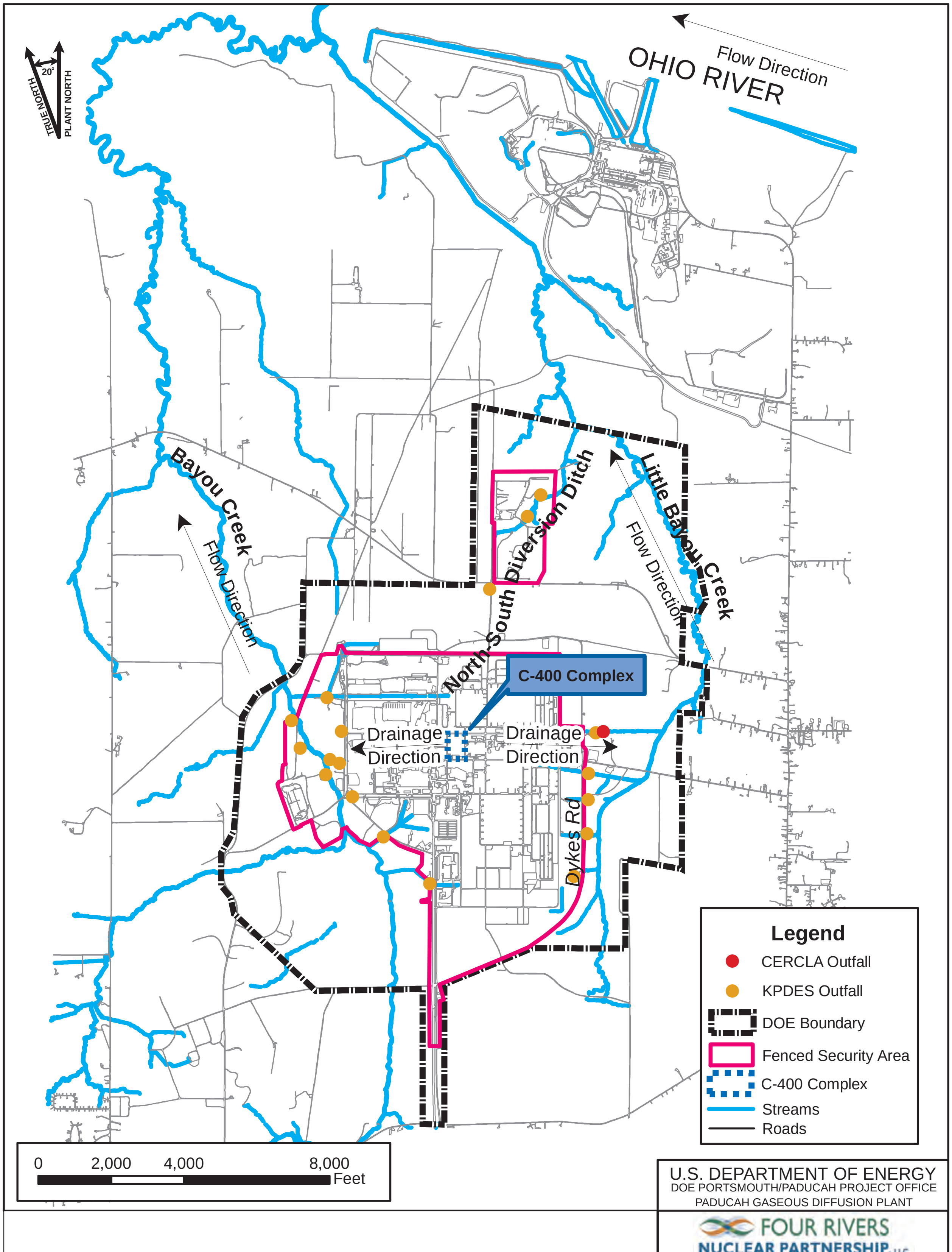

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Figure 2.4. Surface Water Features in the Vicinity of the Paducah Site

Other surface water bodies in the vicinity of the Paducah Site include Metropolis Lake, located east of the Shawnee Fossil Plant; several small ponds, formerly excavated clay and gravel pits with ponded water; settling basins; and a marshy area near the confluence of Bayou Creek and Little Bayou Creek. The smaller surface water bodies are expected to have only localized effects on the regional groundwater flow pattern.

2.5 GEOLOGY

The Paducah Site is located in the Jackson Purchase region of Western Kentucky, which represents the northern most extent of the Mississippi Embayment portion of the Coastal Plain Province. The stratigraphic sequence in the region consists of Cretaceous [144 to 65 million years ago (mya)]; Tertiary (65 to 1.8 mya); and Quaternary (1.8 mya to today) sediments unconformably overlying Paleozoic (543 to 248 mya) bedrock (Paleozoic strata younger than Mississippian are not present at the site). The unconsolidated sediments above the Paleozoic limestone bedrock in the C-400 Complex area are grouped into three major stratigraphic units (loess, Continental Deposits, and the McNairy Formation) as shown in Figure 2.5.

Some of the stratigraphic units shown in Figure 2.5, such as the Paleocene (65–54.8 mya) Porters Creek Clay and Eocene (54.8–33.7 mya) sands, occur in the southern portions of the Paducah Site but do not underlie the C-400 Complex. The Porters Creek Clay consists of dark gray to black silt with varying amounts of clay and fine-grained micaceous, commonly glauconitic, sand that subcrops along a buried terrace slope that extends east–west across the site, south of the C-400 Complex. This subcrop is the northern limit of the Porters Creek Clay and the southern limit of the Plio-Pleistocene (2.5 mya to 11,000 years) Lower Continental Deposits that underlie most of the industrialized portion of the Paducah Site. The Eocene sands overlie the Porters Creek Clay in the extreme southwestern part of the Paducah Site. The area includes undifferentiated quartz sands and interbedded and interlensing silts and clays of the Claiborne Group and Wilcox Formation (Olive 1980). These sands thicken south of the Paducah Site.

The Paducah Site is situated near the New Madrid Seismic Zone, which is a seismically active region. Geophysical investigations of the Paducah Site identify the south extension of high-angle, northeast-trending faulting in the bedrock beneath the Paducah Site that likely is associated with the Fluorspar Area Fault Complex of southern Illinois. The Barnes Creek Fault Zone that has been identified in southern Illinois (approximately 7.5 miles northeast of the site), if extended sufficiently southward below the Mississippi Embayment, most likely would pass under or near the east side of the gaseous diffusion plant. Another southern Illinois fault zone that could pass below or near the Paducah Site (possibly near the west side) is the Massac Creek Structure which is considered part of the Hobbs Creek Fault Zone (located approximately 8 miles northeast of the Paducah Site).

The two most recent seismic field studies that have been conducted at the Paducah Site for DOE were investigations of a potential CERCLA waste disposal facility referred to as Site 3A (DOE 2004b) and in support of the expansion of the current C-746-U Solid Waste Landfill (KRCEE 2006) (Figure 2.6). Site 3A is located in the southern portion of the fenced security area (DOE 2004b), and the C-746-U Landfill is located l mile north of PGDP (KRCEE 2006). These field studies identified subsurface faulting, exhibiting both normal and reverse displacement from the carbonate bedrock extending upward and into the Continental Deposits, in both locations.

2.5.1 Loess and Surficial Soil

The surficial deposits found in the vicinity of the Paducah Site are Pleistocene loess and Holocene alluvium (11,000 years ago to present). Both units commonly consist of silt or clayey silt and range in color from yellowish-brown to brownish-gray or tan, making field differentiation difficult.

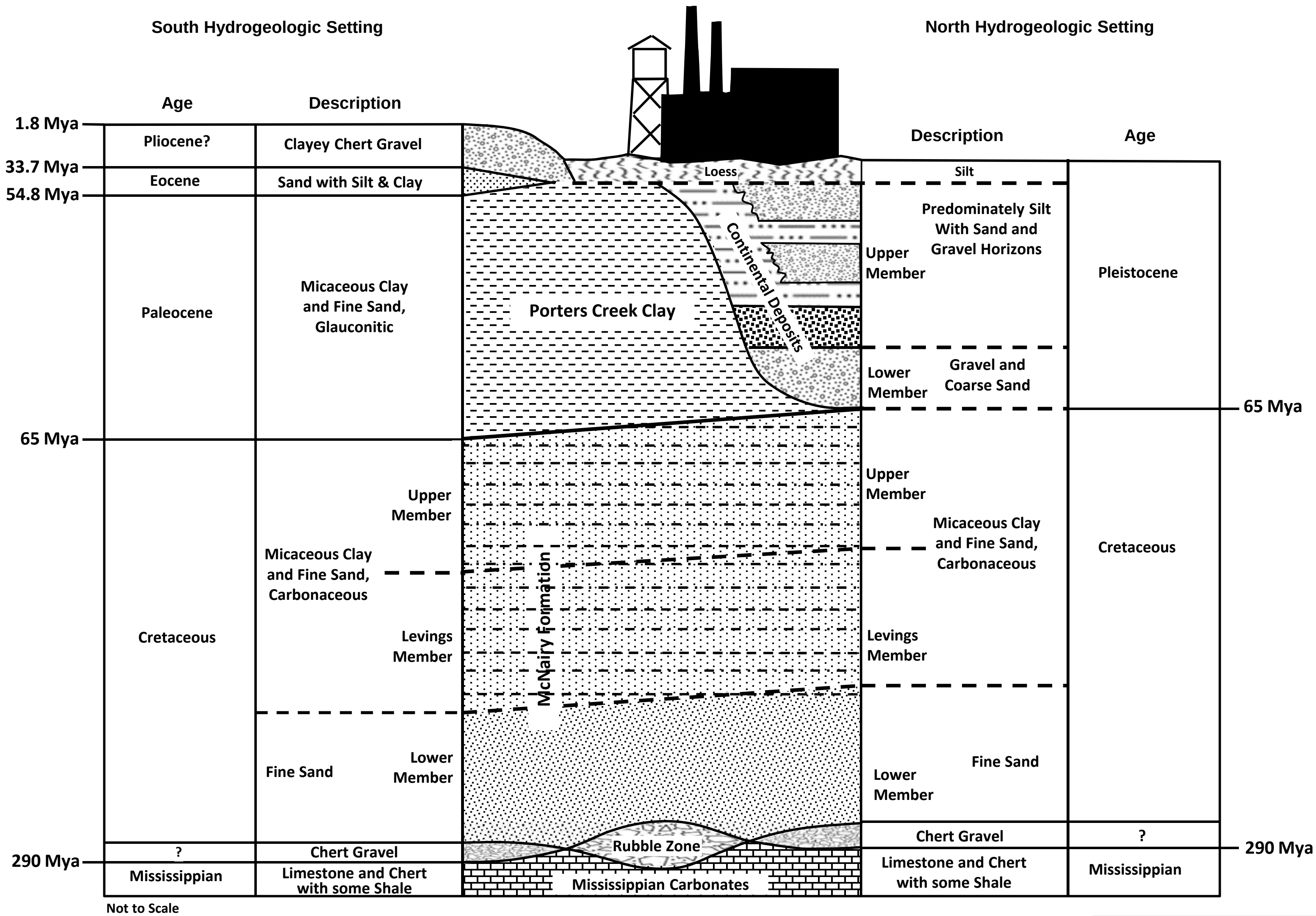

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Figure 2.5. Stratigraphy in the Vicinity of the Paducah Site

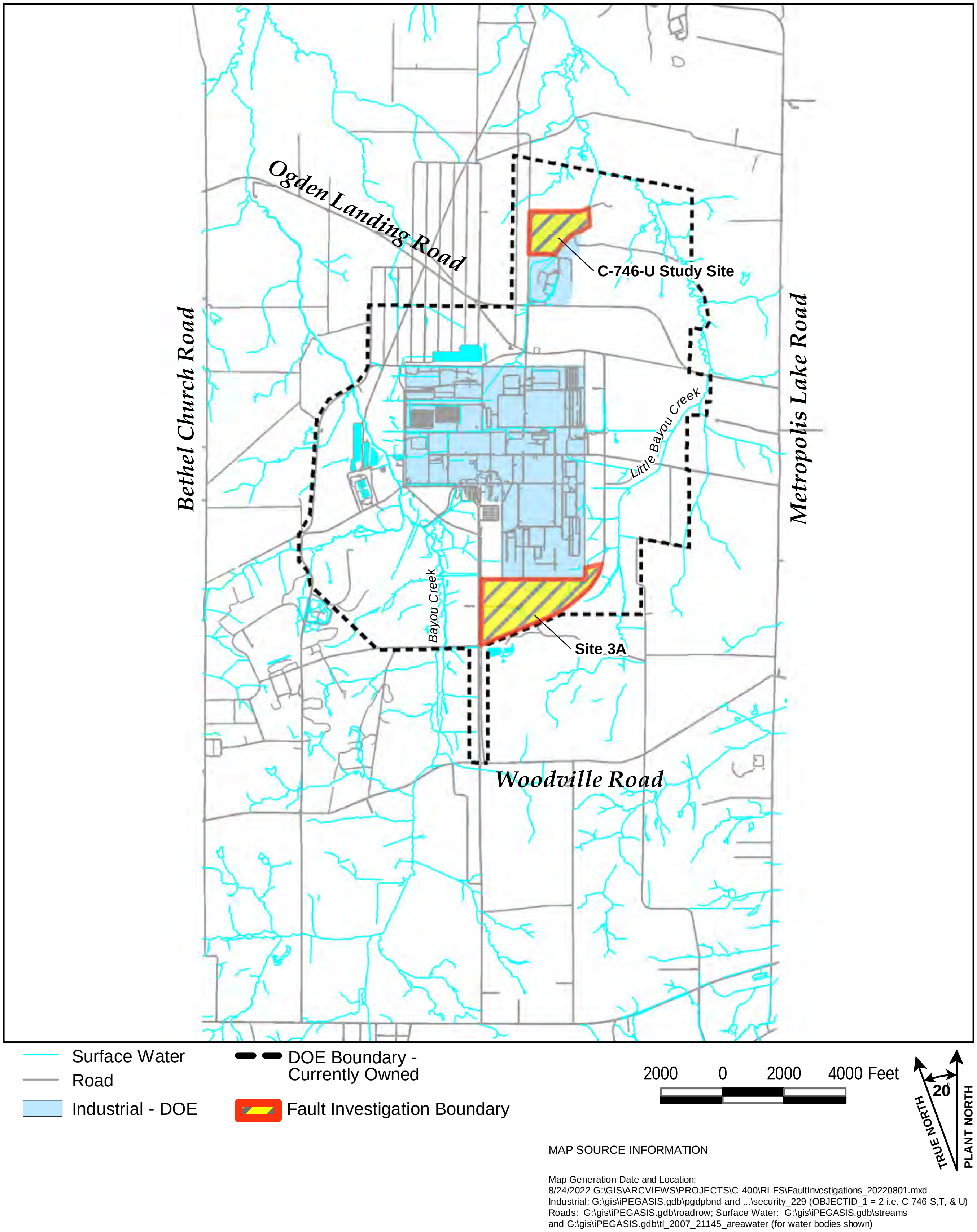


Figure 2.6. Location of Most Recent DOE Seismic Investigations

Across the Paducah Site, the upper-most stratigraphic unit consists primarily of wind-deposited, clayey silt, known as loess, extending from the surface to a depth of approximately 20 ft bgs. Loess deposition probably occurred in upland areas during all stages of the glaciation that extended into the Ohio and Mississippi River Valleys. Upland areas are located in the southern portion of the Paducah Site and are characterized by a gently northward sloping plain that is generally above 350 ft amsl. This area is underlain by loess soils, along with ridges with elevations above 380 ft amsl that are underlain by Pliocene gravel.

The general soil map for Ballard and McCracken Counties delineates three soil associations within the vicinity of the Paducah Site: the Rosebloom-Wheeling-Dubbs association, the Grenada-Calloway association, and the Calloway-Henry association (USDA 1976). Inside the fenced security area of the plant, the best description of the soil would be Urban, because many of the characteristics of these soil types have been changed due to construction and maintenance activities (USDA 2005).

2.5.2 Continental Deposits

Continental sediments [Pliocene (5.3 to 2.5 mya) to Pleistocene (2.5 mya to 11,000 years ago)] unconformably overlie the Cretaceous through Eocene strata throughout the area. These continental sediments were deposited on an irregular erosional surface consisting of several terraces and have a total thickness from near zero to about 120 ft. The thicker Continental Deposits sections represent Plio-Pleistocene valley fill sediments that comprise a general fining-upward sequence. The continental sediments have been informally divided into the following two distinct facies at the Paducah Site:

(1) Lower Continental Deposits. The Lower Continental Deposits is a gravel facies consisting of chert, ranging from pebbles to cobbles, in a matrix of well graded sand and silt. Gravels of the Lower Continental Deposits overlie three distinct terraces in the Paducah Site area (the Lower Continental Deposits of the upper and intermediate terraces are referred to collectively as the Terrace Gravel).

- The upper terrace of the Lower Continental Deposits consists of Pliocene gravel units, ranging in thickness from near 0–30 ft, occurring in the southern portion of the Paducah Site at elevations greater than 350 ft amsl. This gravel unit overlies the Eocene sands and Porters Creek Clay (where the Eocene sands are missing due to erosion).

- Pliocene gravels of the Lower Continental Deposits also occur on an intermediate terrace eroded into the Porters Creek Clay at an elevation of approximately 320–345 ft amsl in the southeastern and eastern portions of the Paducah Site. The thickness of this unit typically ranges from 15–20 ft.

- The third and most prominent of the Lower Continental Deposits members consists of a Plio-Pleistocene gravel deposit resting on an erosional surface at an elevation of approximately 280 ft amsl. This gravel underlies most of the plant area and the region to the north, but pinches out under the south side of the Paducah Site along the subcrop of the Porters Creek Clay. The Plio-Pleistocene member of the Lower Continental Deposits averages approximately 30 ft in thickness. Trends of greater thickness, as much as 50 ft, fill deeper scour channels of the ancestral Tennessee River.

(2) Upper Continental Deposits. The Upper Continental Deposits is a Pleistocene age, fine-grained facies that commonly overlies the Lower Continental Deposits. This unit ranges in thickness from 15–55 ft. The Upper Continental Deposits includes three general horizons beneath the Paducah Site: (1) an upper silt and sand interval, (2) an intermediate interval of common sand and gravel lenses (sand and gravel content generally diminishes northward), and (3) a lower silt, sand, and clay interval. The upper silt and

sand interval consists of the Peoria Loess and Roxana Silt (KRCEE 2006). The Peoria Loess and Roxana Silt blanket the entire Paducah Site area and range from zero to about 30 ft in thickness.

2.5.3 McNairy Formation

The McNairy Formation consists of Upper Cretaceous sediments of gray to yellow to reddish-brown, very fine- to medium-grained sand interbedded with grayish-white to dark gray micaceous silt and clay. A basal sand member also is present beneath the Paducah Site. The total thickness of the McNairy Formation ranges from 190–250 ft thick and is approximately 245 ft thick beneath the C-400 Cleaning Building. In the vicinity of the Paducah Site, the McNairy Formation includes an upper silt and sand member; a middle silt, clay, and sand member (known as the Levings Member); and a lower sand-dominant member. Laterally extensive, smaller scale bedding has not been identified in the McNairy members in the proximity of the Paducah Site.

The upper member of the McNairy Formation primarily consists of interlensing, fine-grained, silt and sand. In the area of the Paducah Site, the Paleocene age Clayton Formation and upper member of the Cretaceous age McNairy Formation are indistinguishable based on soil textures and are referred to collectively as the McNairy upper member. The top of the McNairy upper member underlies the Porters Creek Clay under the south portion of the Paducah Site at an elevation of approximately 285 ft amsl. The irregular erosional surface created by the ancestral Tennessee River, at an approximate elevation of 250–280 ft amsl is the top of the McNairy upper member under the north portion of the Paducah Site.

The Levings Member of the McNairy Formation is an interval of generally finer-grained clastic sediments that exists beneath the Paducah Site and adjacent areas. The lithologic character and stratigraphic position of this finer-grained interval is consistent with the description of the Levings Member by Pryor and Ross (Pryor and Ross 1962). In the area of the Paducah Site, the contact of the upper member and Levings Member appears relatively planar, at an approximate elevation of 217 ft amsl.

The lower member of the McNairy Formation predominately consists of poorly graded, fine sand with lesser silt and clay interbeds. As noted by regional studies (Moneymaker and Grant 1954; Pryor 1960; and Davis, Lambert, and Hansen, Jr. 1973), the Lower McNairy Formation sands are characteristically fine-grained and poorly graded. Beneath the industrial complex of the Paducah Site, the top of the McNairy lower member occurs at an approximate elevation of 155 ft amsl, and the base is at an approximate elevation of 35 ft amsl.

While multiple investigations at the Paducah Site have provided lithologic logs of the Upper McNairy member, relatively few soil borings transect all (or most) of the McNairy Formation. Site-specific data for the McNairy Formation (lithology and geophysical logs) include the following:

- Two deep Z-series locations, Z-9/Z-12 and Z-14/Z-16, on the north and west sides of the Paducah Site (ERCE 1990),
- Soil boring P4F8 completed during the Groundwater Monitoring Phase IV Investigation, located in the north central area of the industrial complex (DOE 1995b),
- Deep MWs MW345, MW346, and MW347 installed by the *Sitewide Remedial Evaluation for Source Areas Contributing to Off-Site Groundwater* (DOE 2000), located north of the industrial complex, and
- Soil boring DB01 from the siting investigation for a potential CERCLA waste disposal facility, located immediately south of the industrial complex (DOE 2004b).

The WAG 6 RI report provided lithologic logs for the Upper McNairy member in the C-400 Complex for 11 soil borings, with total depths ranging from 104 to 147 ft bgs. The predominant soil textures that were described in those borings ranged from clay to fine sand (DOE 1999). No Upper McNairy member lithologic units could be correlated across the C-400 Complex area.

A rubble zone of chert gravel is commonly encountered in soil borings between the McNairy Formation and the bedrock. The age and continuity of the rubble zone remain undetermined. Where it occurs, the rubble zone ranges from approximately 5–20 ft in thickness.

2.5.4 C-400 Complex Geology

The general geologic sequence, including hydrogeological units (HUs) at the C-400 Complex, based on newly collected soil boring data, consists of the following (from top to bottom):

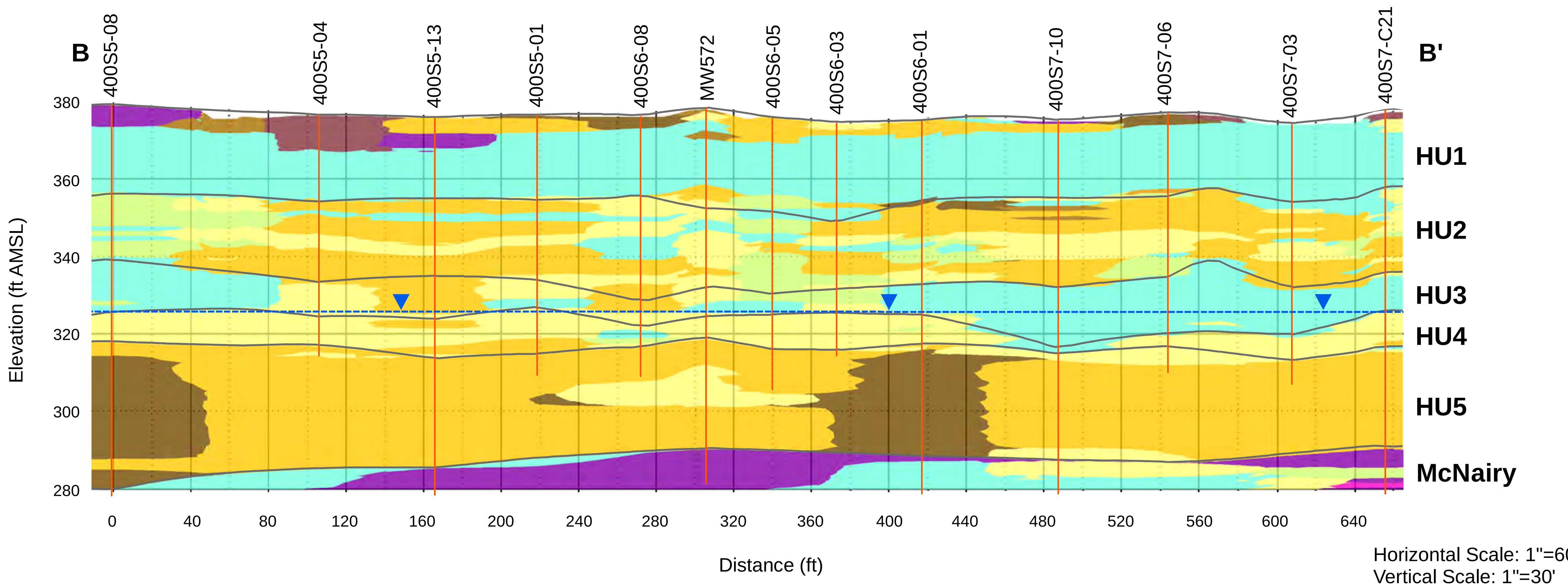
- Silt and sandy silt to a depth of approximately 24 ft (disturbed soils and loess) (HU1);
- Sand and gravel units (ranging from 2–5-ft thick), separated by fine sands and silts to a depth of approximately 43 ft (Upper Continental Deposits) (HU2);
- Silt to silty sand to a depth of approximately 54 ft (Upper Continental Deposits) (HU3);
- Very fine sand to a depth of approximately 60 ft (Upper Continental Deposits) (HU4);
- Sand and gravel to a depth of approximately 90 ft (Lower Continental Deposits) (HU5); and
- Interbedded clay, sand, and silt to the total depth of the borings (McNairy Formation).

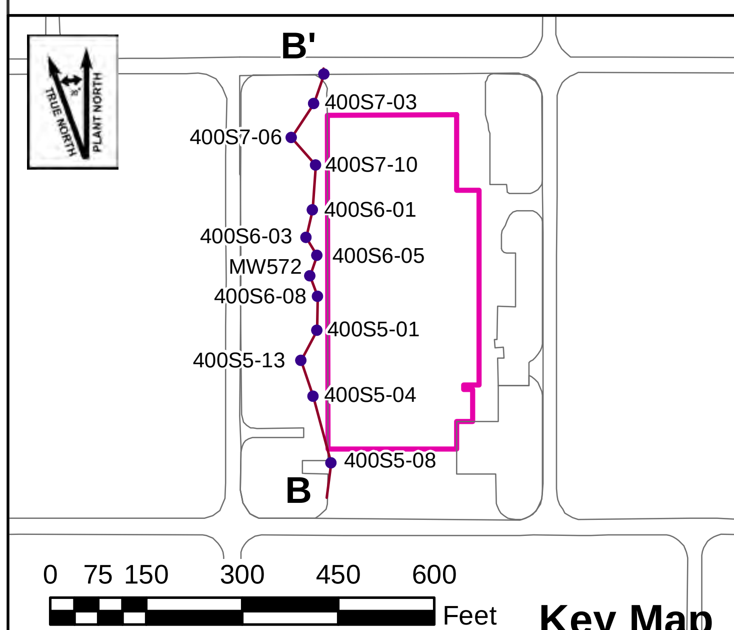
Numerous soil borings define lateral trends of the geologic units in the C-400 Complex. With few exceptions, the geologic units above the McNairy Formation are laterally extensive.

In the C-400 Complex, the gravel member of the Lower Continental Deposits generally consists of well graded chert-gravel with discontinuous thin lenses of fine sand. The erosional surface that is the top of the McNairy Formation has over 9 ft of relief under the south end of C-400 Cleaning Building, with a structural low in the area south of the C-400 Cleaning Building. The depth of the base of the Lower Continental Deposits/top of the McNairy Formation is variable throughout the area of the C-400 Complex.

Several geologic cross sections are provided to illustrate the lithological profiles of the subsurface in the study area. Other geologic cross sections are provided in Appendix D.

- Figure 2.7 is cross section B-B' showing a south to north transect along the western side of the C-400 Cleaning Building.
- Figure 2.8 is cross section D-D' showing a south to north transect through the middle of the C-400 Complex OU.
- Figure 2.9 is cross section I-I' showing a west to east transect across the central portion of C-400 Complex OU.
- Figure 2.10 is cross section K-K' showing a west to east transect across the southern portion of the C-400 Complex OU.





Legend

- November 2021 RGA Water Level
- Soil Boring/Monitoring Well
- Surface Soil (Concrete/Gravelly Sand)
- Silt/Clay
- Clay (CL)
- Silt (ML)
- Sand with Fines
- Poorly Graded Sand (SP)
- Well Graded Sand (SW)
- Clayey Sand (SC)
- Silty Sand (SM)
- Gravel wtih Fines
- Poorly Graded Gravel (GP)
- Well Graded Gravel (GW)

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MAP SOURCE INFORMATION

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Figure 2.7. Geologic Cross-Section B-B'

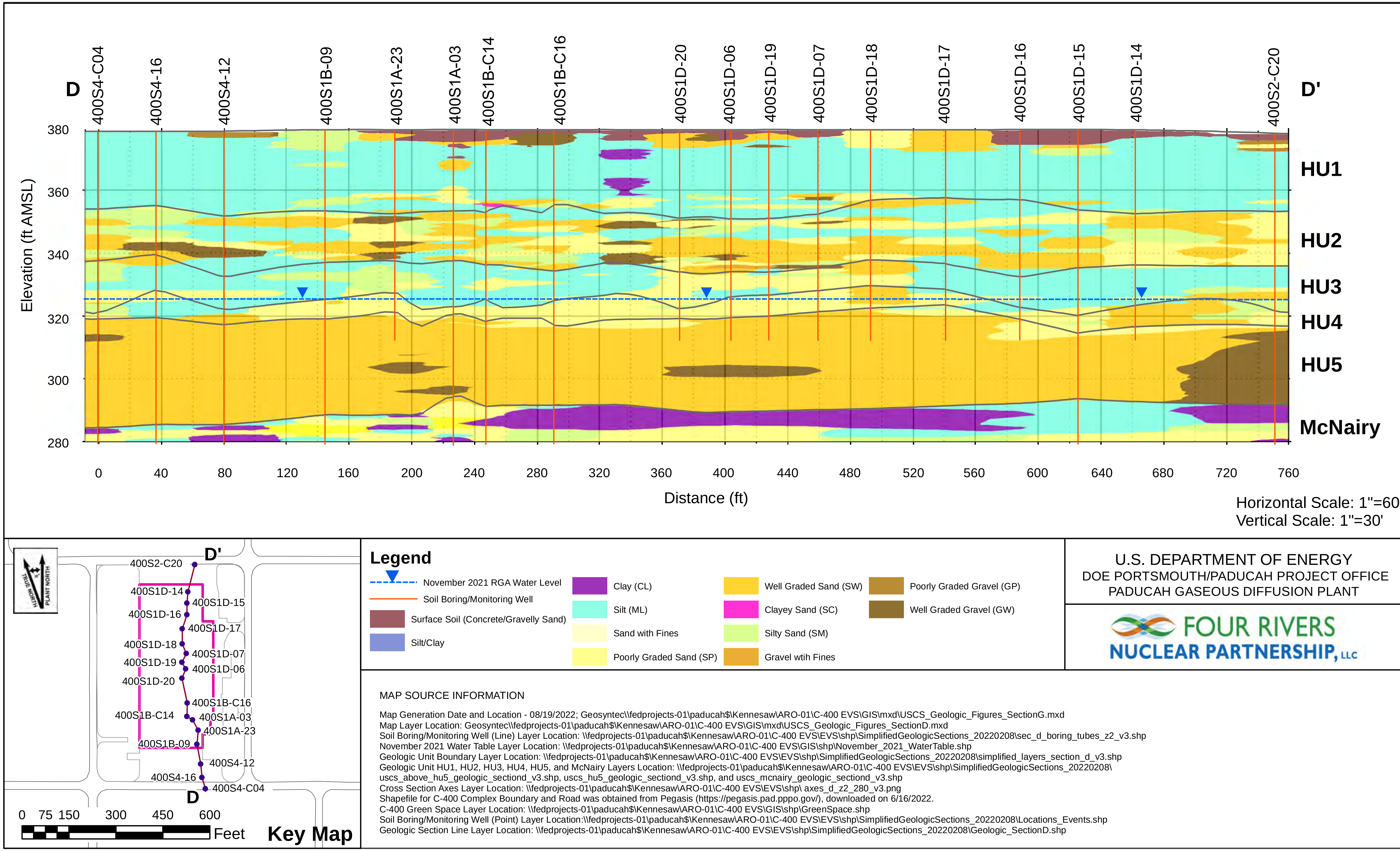
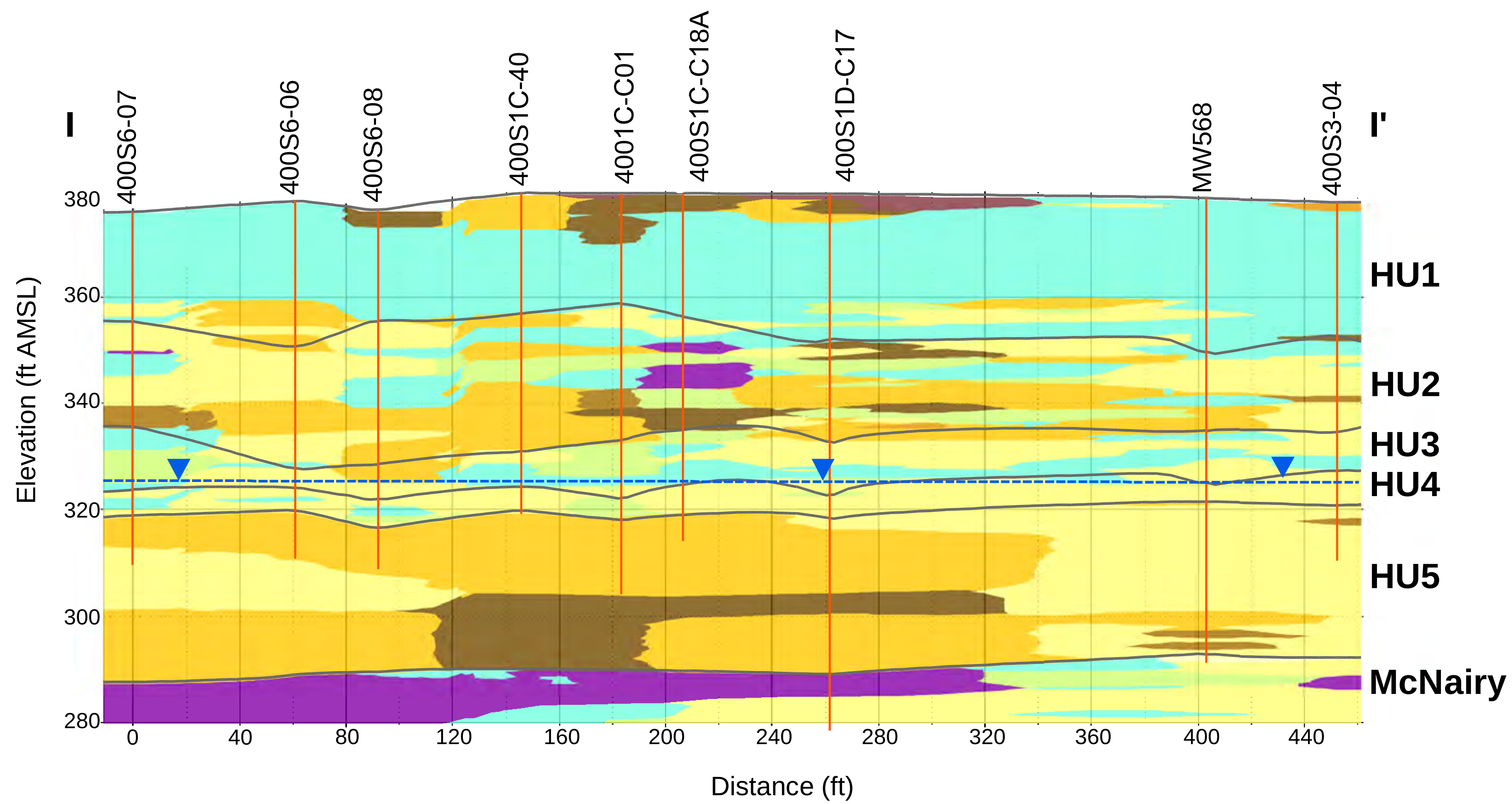
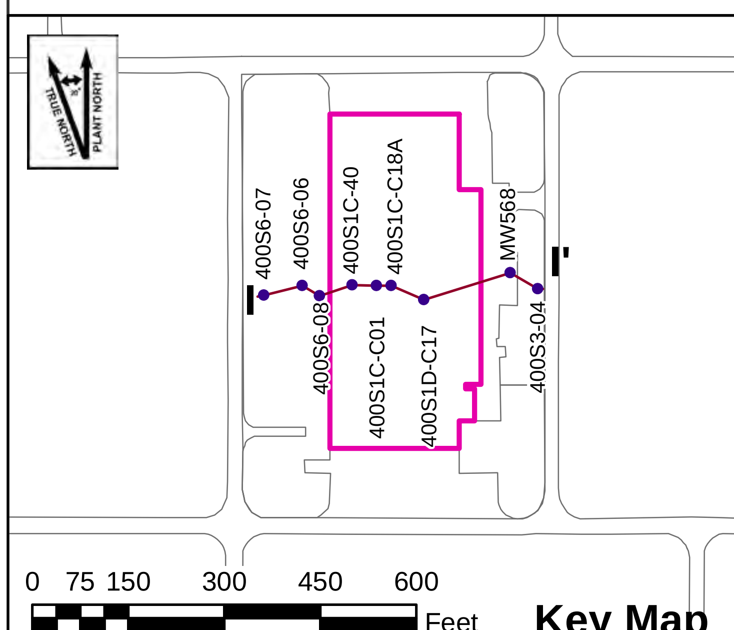


Figure 2.8. Geologic Cross-Section D-D'





Legend

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Soil Boring/Monitoring Well	Silt (ML)	Clayey Sand (SC)	Well Graded Gravel (GW)
Surface Soil (Concrete/Gravelly Sand)	Sand with Fines	Silty Sand (SM)	
Silt/Clay	Poorly Graded Sand (SP)	Gravel wtih Fines	

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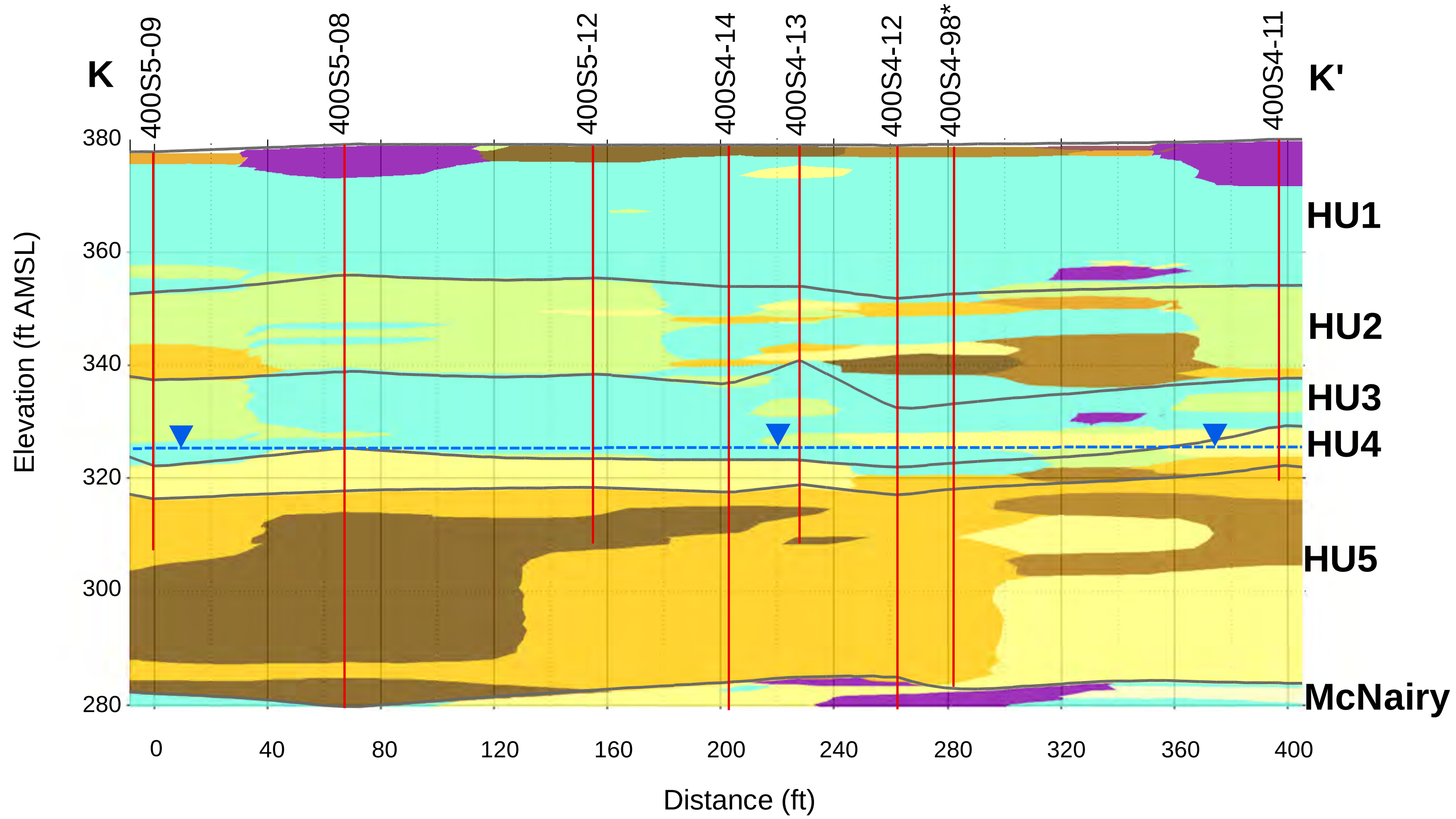
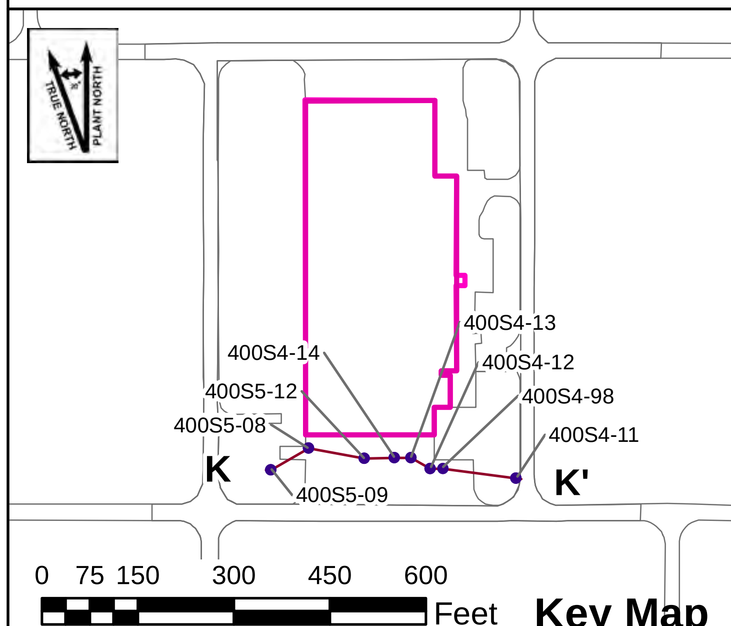
Figure 2.9. Geologic Cross-Section I-I'



Horizontal Scale: 1"=60'
Vertical Scale: 1"=30'



Legend

November 2021 RGA Water Level
Soil Boring/Monitoring Well
Surface Soil (Concrete/Gravelly Sand)
Silt/Clay
Clay (CL)
Silt (ML)
Sand with Fines
Poorly Graded Sand (SP)
Well Graded Sand (SW)
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Gravel wtih Fines
Poorly Graded Gravel (GP)
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Note:
* - Because geologic data from boring 400S4-98 is not available, data from adjacent boring was used.

Figure 2.10. Geologic Cross-Section K-K'

Appendix D provides lithologic logs for 64 soil borings that penetrated to the base of the Continental Deposits with 50 of those borings continuing from 20 to 53 ft deep into the McNairy Formation. The white paper, *Detailed Correlations between Lithologic Units in the McNairy Formation across the Paducah Gaseous Diffusion Plant*, includes a stratigraphic assessment of the McNairy Formation in the deeper soil borings (FRNP 2022). None of these soil borings contained evidence of faulting.

2.6 HYDROGEOLOGY

The significant geologic units relative to shallow groundwater flow at the Paducah Site include the Terrace Gravel and Porters Creek Clay (south portion of the Paducah Site), and the Continental Deposits and McNairy Formation (underlying the industrialized portion of the Paducah Site and adjacent areas to the north). The ancestral Tennessee River channel is filled with thick sand and gravel deposits overlain by a sequence of silts and clays. Southward advance of the ancestral Tennessee River during the Pliocene and Pleistocene Epochs eroded away the Porters Creek Clay beneath and north of the Paducah Site. The presence of the Porters Creek Clay south of the Paducah Site and the absence of the Porters Creek Clay beneath the Paducah Site and to the north define the two distinct hydrogeologic settings.

South of the Paducah Site, significant groundwater flow is restricted to the sediments above the Porters Creek Clay. A shallow water table system is developed in the Pliocene gravels and Eocene sands where they overlie the Porters Creek Clay. Groundwater flow in this shallow water table system discharges as baseflow to Bayou Creek and its tributaries and also can migrate across the buried terrace slope as underflow to the UCRS/RGA flow system.

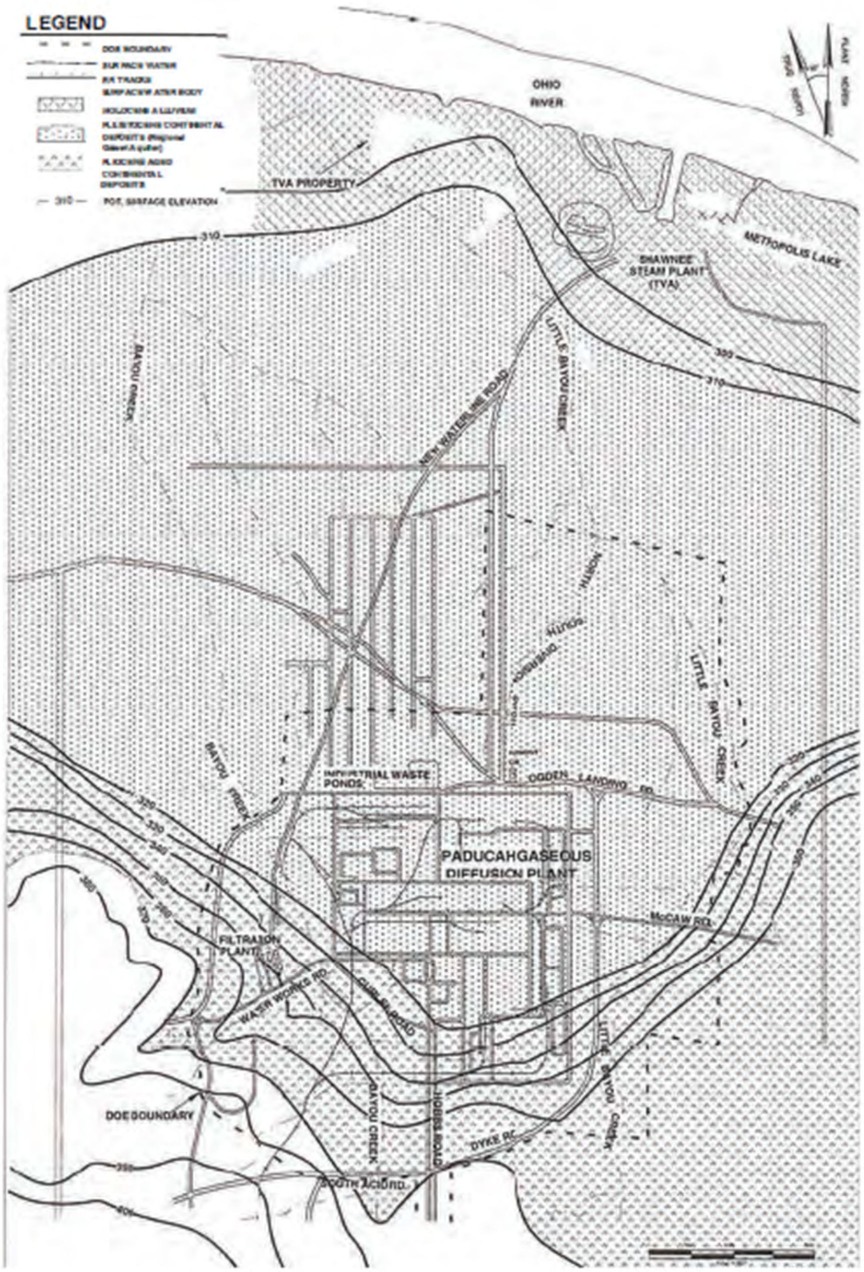
Beneath the Paducah Site and north, shallow groundwater flows downward through the silts and fine sands (i.e., UCRS) until it encounters the RGA sand and gravel deposit. Once in the RGA, groundwater flow is generally north, toward the Ohio River. Lateral flow in the RGA dominates this hydrologic regime, with comparatively little groundwater migrating downward into the underlying McNairy Formation. Lateral groundwater flow in the more permeable pathways of the RGA is approximately 1 to 3 ft/day.

RGA groundwater is a potential drinking water aquifer (Class II) in accordance with EPA's 1986 Groundwater Classification Guidance; however, the DOE Paducah Site has provided bottled water for drinking water to site personnel through a commercial vendor since 2016. RGA groundwater is not used as a source of drinking water at the C-400 Complex OU or within the Paducah Site boundary because land use controls are in place that prevent the use of the groundwater at the C-400 Cleaning Building area through institutional controls (e.g., the current excavation/penetration permit program), deed restrictions, and alternate sources of water being available. The Water Policy Box has been implemented outside of the Paducah Site boundary to prevent groundwater use and to protect human health and the environment.

Figure 2.11 illustrates the general water level elevations, the dominant potentiometric surface trends, and geologic units of the shallow groundwater flow systems at the Paducah Site. Groundwater flow in the Plio-Pleistocene Continental Deposits (the combined Terrace Gravel Flow System and RGA) is a primary pathway for transport of dissolved contamination. The following discussion provides the framework for the shallow groundwater flow system at the Paducah Site (adapted from DOE 2000).

2.6.1 Terrace Gravel Flow System

The Porters Creek Clay, with a vertical hydraulic conductivity of 1.5E-04 to 1.4E-01 ft/day, is a confining unit to downward groundwater flow south of the Paducah Site (DOE 2004b). A shallow water table flow system is present in the Terrace Gravel, where it overlies the Porters Creek Clay south of the Paducah Site.



Source: DOE 1999

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[1] U.S.G.S Hydrologic Investigations Atlases HA-168 (Heath Quadrangle) and HA-171 (Joppa and Metropolis Quadrangles) provide the water level contours.

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Figure 2.11. Water Level Trends of the Shallow Groundwater Flow Systems in the Vicinity of the Paducah Site[1]

Discharge from this water table flow system provides baseflow to Bayou Creek and underflow to the Continental Deposits of the ancestral Tennessee River to the southeast and east of the Paducah Site.

The elevation of the top of the Porters Creek Clay is an important control to the area's groundwater flow. A distinct groundwater divide (located south of the Terrace Slope) is centered in hills located approximately 9,000 ft southwest of the C-400 Complex, where the Terrace Gravel and Eocene sands, with a lateral hydraulic conductivity as high as 5 ft/day, overlie a "high" on the top of the Porters Creek Clay (Maxim 1997, Olive 1966). In adjacent areas where the top of the Porters Creek Clay approaches land surface, as it does immediately south of the Paducah Site and near the subcrop of the Porters Creek Clay to the west of the security-fenced area, the majority of groundwater flow is forced to discharge into surface streams (gaining reaches) and little underflow occurs into the Continental Deposits of the ancestral Tennessee River. To the east of the Paducah Site, the Terrace Gravel overlies a lower terrace and a thick sequence of Terrace Gravel occurs adjacent to the Continental Deposits of the ancestral Tennessee River, allowing significant underflow from the Terrace Gravel. Surface drainages in this area typically are losing reaches. Figure 2.12 presents hydraulic potential contours for the Terrace Gravel flow system (DOE 1997). Where there is uncertainty due to limited MW data from the area depicted in Figure 2.12, the water table contours are based on stream elevations and water levels in abandoned gravel pits (USGS 1978).

2.6.2 Upper Continental Recharge System

The UCRS is the upper strata where infiltration of surface water occurs and where the water table is found north of the Porters Creek Clay Terrace slope. The area infiltration rate for the Paducah Site is approximately 4.3 inches/year (DOE 2017b). Groundwater flow is primarily downward in the Upper Continental Deposits; however, lateral flow may occur over short distances.

The average thickness of the UCRS members at C-400, as measured in the C-400 Complex RI soil borings, consists of 24.3 ft of HU1, 18.0 ft of HU2 and, 10.8 ft of HU3; for a total average thickness of 53.1 ft. HU1 is predominantly silt (84%), with minor sand beds. The primary soil textures in HU2 are sand (66%), silt and silty sand (26%) and gravel (6%). HU3 is predominantly silt and silty sand (64%) with common sand interbeds (35%).

HU1 and most of HU2 typically are unsaturated. As measured in the C-400 Complex RI geotechnical samples, the porosity of HU1 averages 38% with approximately 95% water saturation. The porosity of HU2 averages 29% with 83% water saturation. HU3 has an average porosity of 35% and is saturated. The representative vertical hydraulic conductivity of the three dominant soil textures in HU3, as measured by permeameter test, range from 8.19E-04 ft/day for silt (55% of the HU3 thickness) to 1.81E-03 ft/day for silty sand (8% of the HU3 thickness) to 9.35E-03 ft/day for poorly graded sand (30% of the HU3 thickness).

The water table is > 30 ft deep in the C-400 Complex OU. Of the three UCRS wells in the C-400 Complex OU boundary where water level measurements can be attempted,[9] MW157, located in Sector 4, is the only one in which water is commonly present. In that well, the water table is typically 34 ft bgs. The vertical hydraulic gradient, as measured by water levels in MW157 and adjacent URGA MW156 is approximately 1 ft/ft downward.

Two piezometers were constructed in the gravel backfill that underlies the C-400 Cleaning Building slab during the C-400 Complex RI. Pressure transducer/data logger records for the piezometers over the period

[9] There are four multi-port wells with UCRS ports. Each of the screened and/or port intervals is sealed. Water levels cannot be measured in these wells.

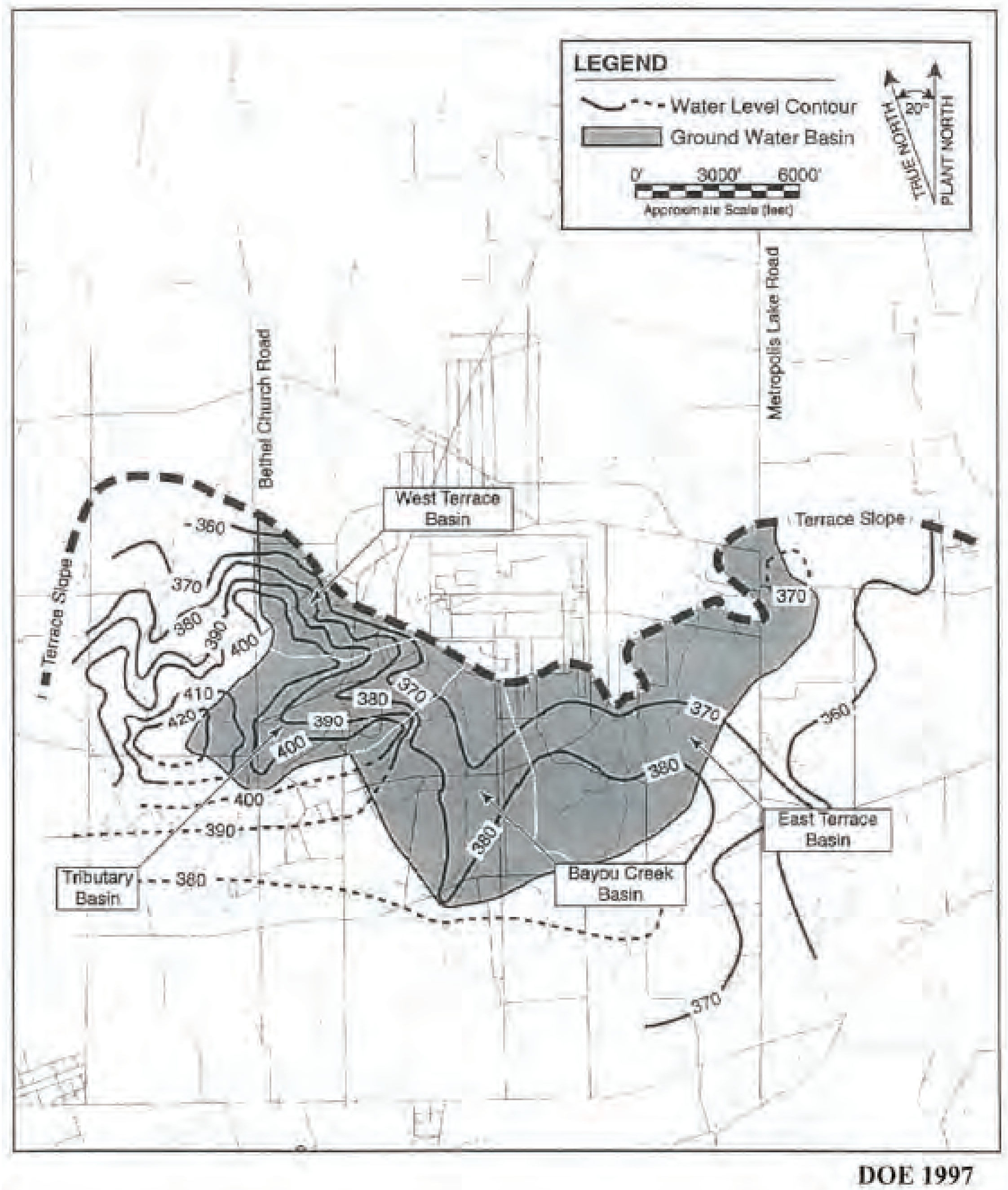

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Figure 2.12. Water Level in the Terrace Gravel Flow System South of the Paducah Site

of May 27, 2021, through April 1, 2022, document that the gravel backfill remained unsaturated over the nine-month period.

2.6.3 Regional Gravel Aquifer

Vertically infiltrating water from the UCRS primarily moves downward into a basal sand member of the Upper Continental Deposits and the Plio-Pleistocene gravel member of the Lower Continental Deposits and then laterally northward in the sand and gravel members toward the Ohio River. This lateral flow system is called the RGA (which is typically present between 60 and 90 ft bgs beneath the C-400 Complex). As documented in the Paducah Site groundwater flow model and based on site specific lithological data, the RGA is the shallow aquifer beneath the Paducah Site and contiguous lands to the north (DOE 2017b).

Hydraulic potential in the RGA declines toward the Ohio River, which controls the base level of the region's surface water and groundwater systems. The RGA potentiometric surface gradient beneath the Paducah Site is commonly less than 6E-04 ft/ft, but increases by an order of magnitude near the Ohio River.

The conceptual site model (CSM) of groundwater flow at C-400 before the RI/FS assumed the primary groundwater flow path under C-400 to be to the northwest because the primary C-400 TCE source zone was in Sector 4 (southeast C-400 Complex) and the Northwest Plume was present off the northwest corner of C-400. The trend of the Northwest Plume (flow in a northwest direction inside the PGDP industrial area) has been consistent since the discovery of the plume and is well documented. Moreover, the extraction wells of the Northwest Plume Containment System are a hydraulic stress that enforces flow to the northwest.

Consequently, the CSM of groundwater flow assumed hydraulic potential decreased uniformly from the southeast corner of the C-400 Complex to the northwest corner of the C-400 Complex. Groundwater elevations in MWs around the C-400 Cleaning Building were consistent with this interpretation. The only competing hydraulic stress was pumping of the Northeast Plume Containment System (NEPCS), inducing some groundwater flow eastward from near the C-400 Complex.

The C-400 RI included the installation of additional MWs both inside and outside the C-400 Cleaning Building, with near-continuous water level record (by pressure transducer/data logger system), quarterly water level measurements, and colloidal borescope tests. Collectively, the well measurements[10] and dissolved groundwater contaminant trends define a more complex flow pattern in the RGA under the C-400 Complex OU, which varies over time and in response to pumping by the NEPCS. Figures 2.13 through 2.16 provide RGA potentiometric surface maps for periods coincident with the quarterly colloidal borescope tests. The number of reported colloidal borescope tests vary among quarters because test results were inconclusive during some quarters.

2021–2022 overall RGA trends: Over the 10 months of pressure transducer water level records (April 28, 2021–March 1, 2022), the water level measurements were collected on 15-minute intervals in 24 RGA MWs (including upper, middle, and LRGA MWs) at 9 locations (Figure 2.17). All 10-month records show the same cycle of highest water level during the period late May to mid-June and lowest water level during the period late November to early January (Figure 2.18). In all cases, upper, middle, and LRGA water levels were near-identical for each location. The groundwater elevation data collected during this study shows that site-specific, episodic recharge, or vertical gradients were not present in the RGA.

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[10] Additional relationships used to prepare the potentiometric surface maps include MW507 water elevations which are commonly lower than water elevations in MW155 and MW421 water elevations which are commonly lower than water elevations in MW425.

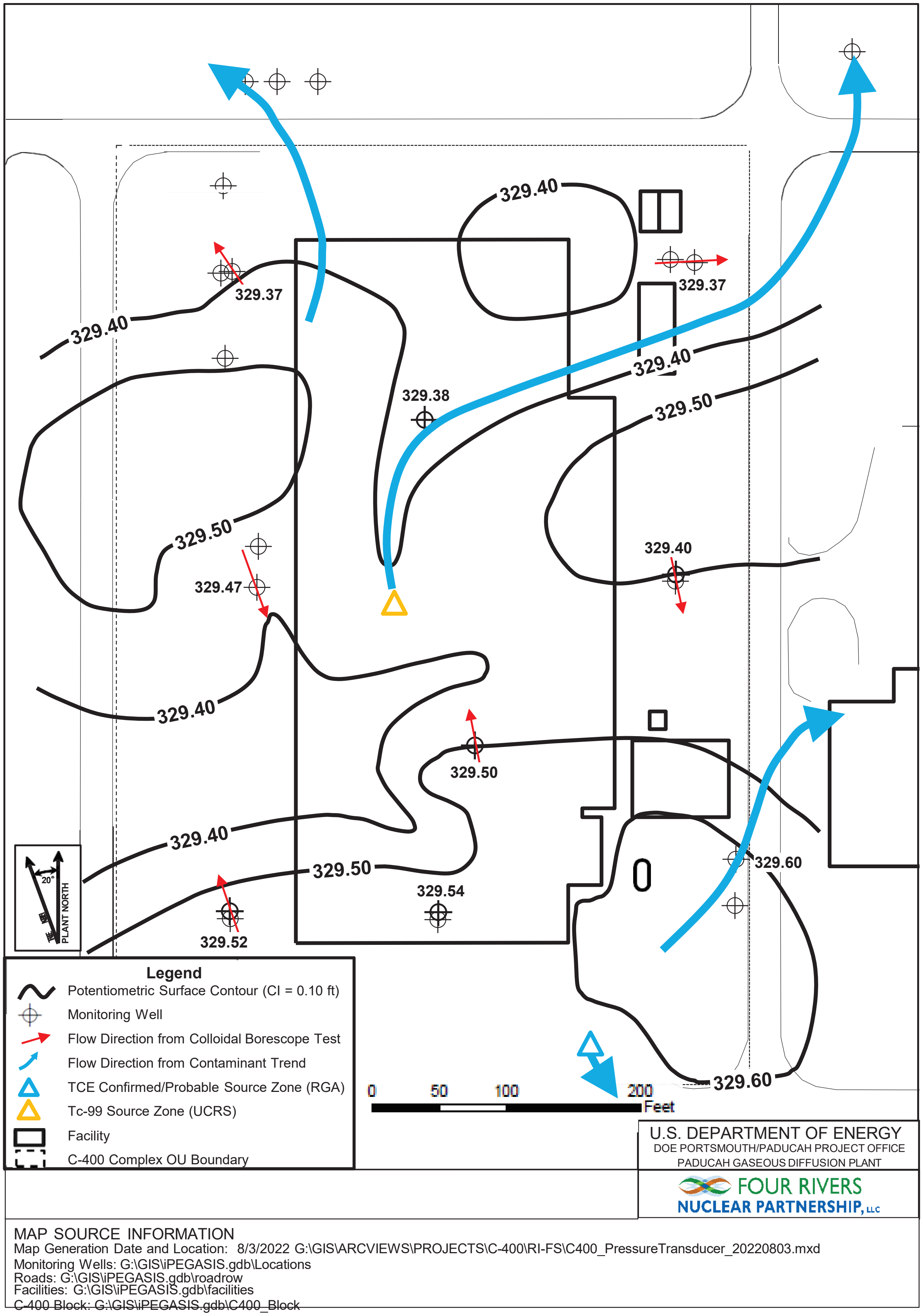


Figure 2.13. May 9, 2021, RGA Water Levels (from Pressure Transducers) (May 4–13, 2021, Colloidal Borescope Flow Directions)

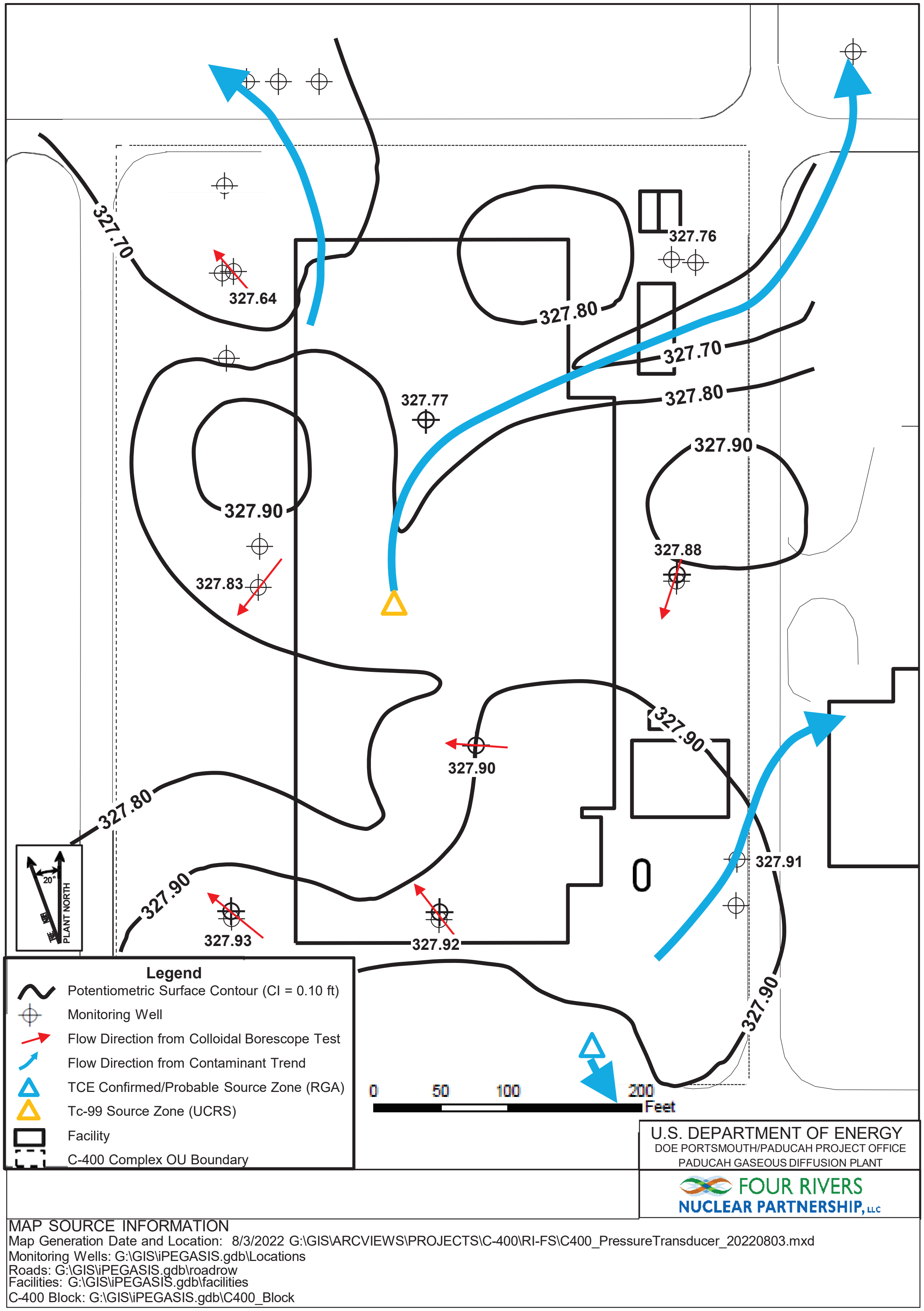


Figure 2.14. August 15, 2021, RGA Water Levels (from Pressure Transducers) (August 9–19, 2021, Colloidal Borescope Flow Directions)

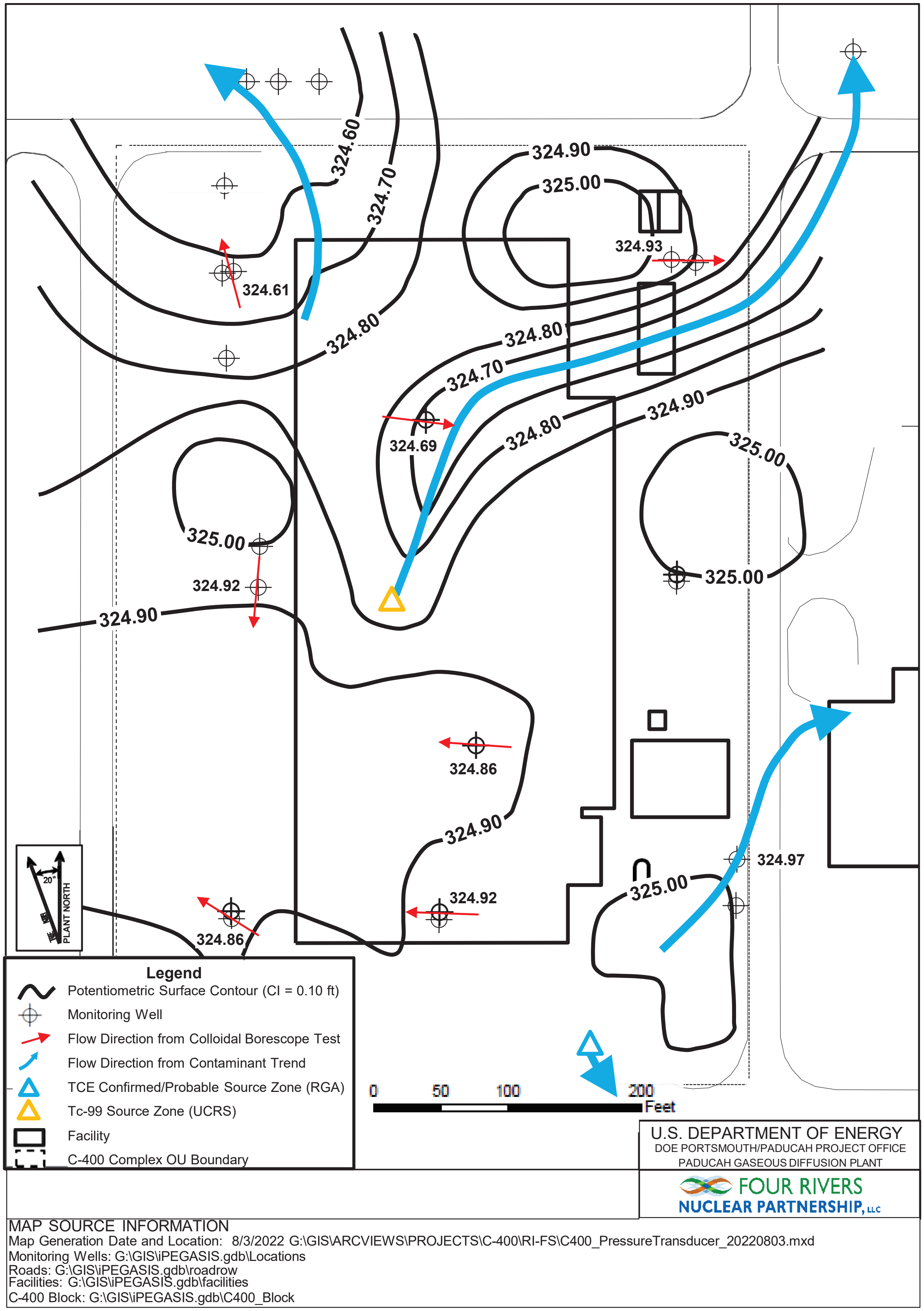


Figure 2.15. December 21, 2021, RGA Water Levels (from Pressure Transducers) (November 22–December 16, 2021, Colloidal Borescope Flow Directions)

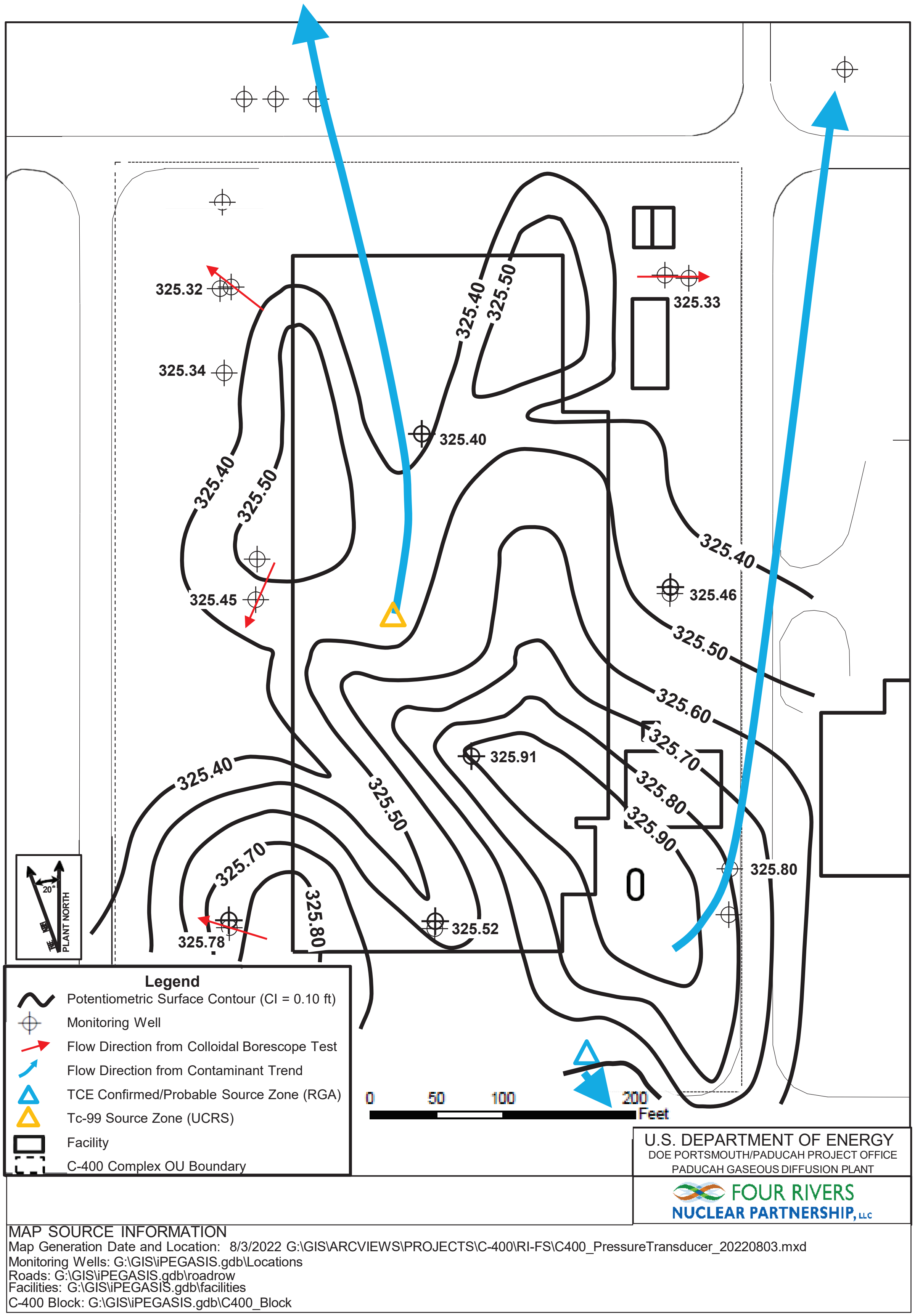


Figure 2.16. February 13, 2022, RGA Water Levels (from Pressure Transducers) (January 26–February 18, 2022, Colloidal Borescope Flow Directions)

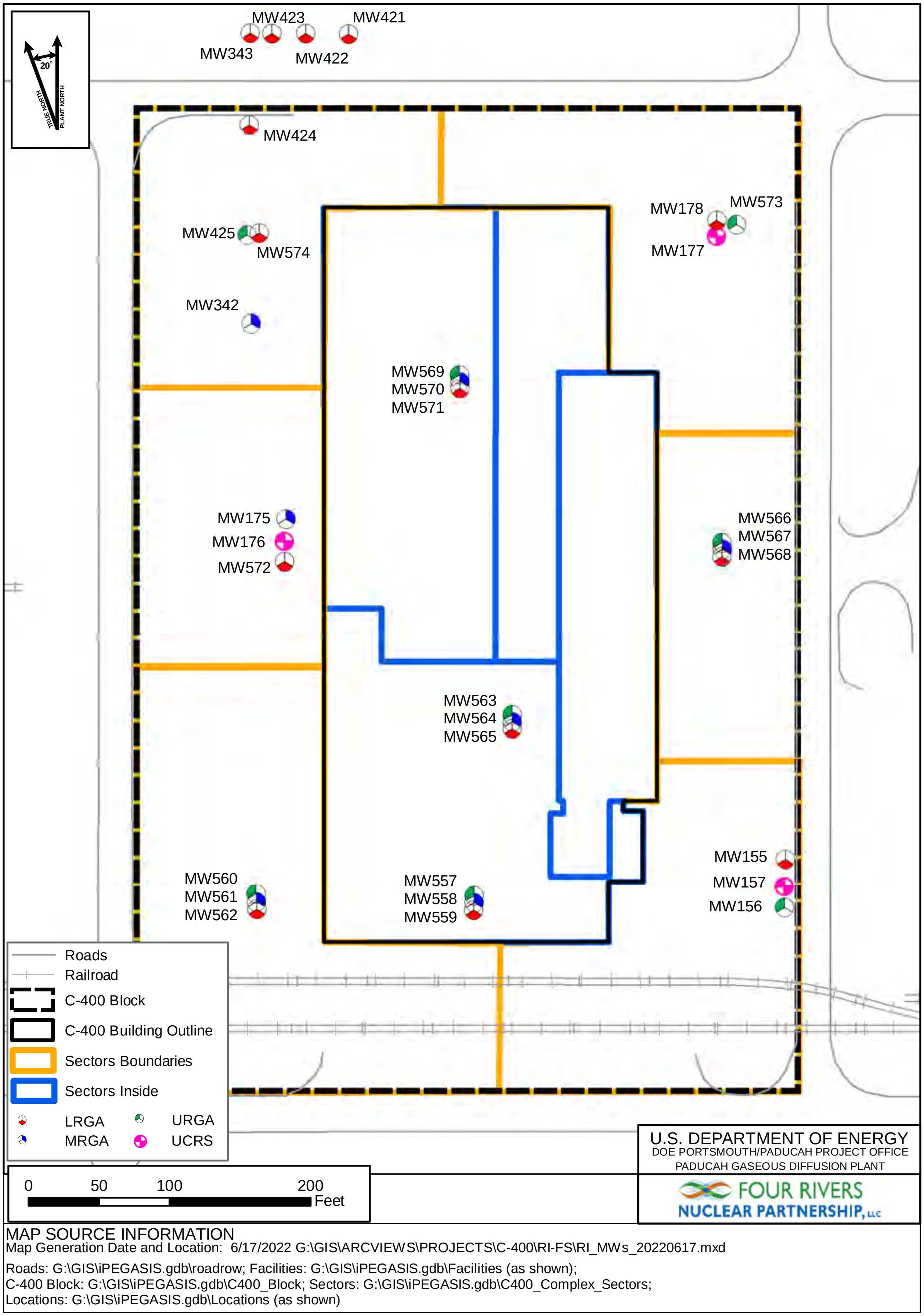


Figure 2.17. C-400 Complex RI Monitoring Wells for Water Levels

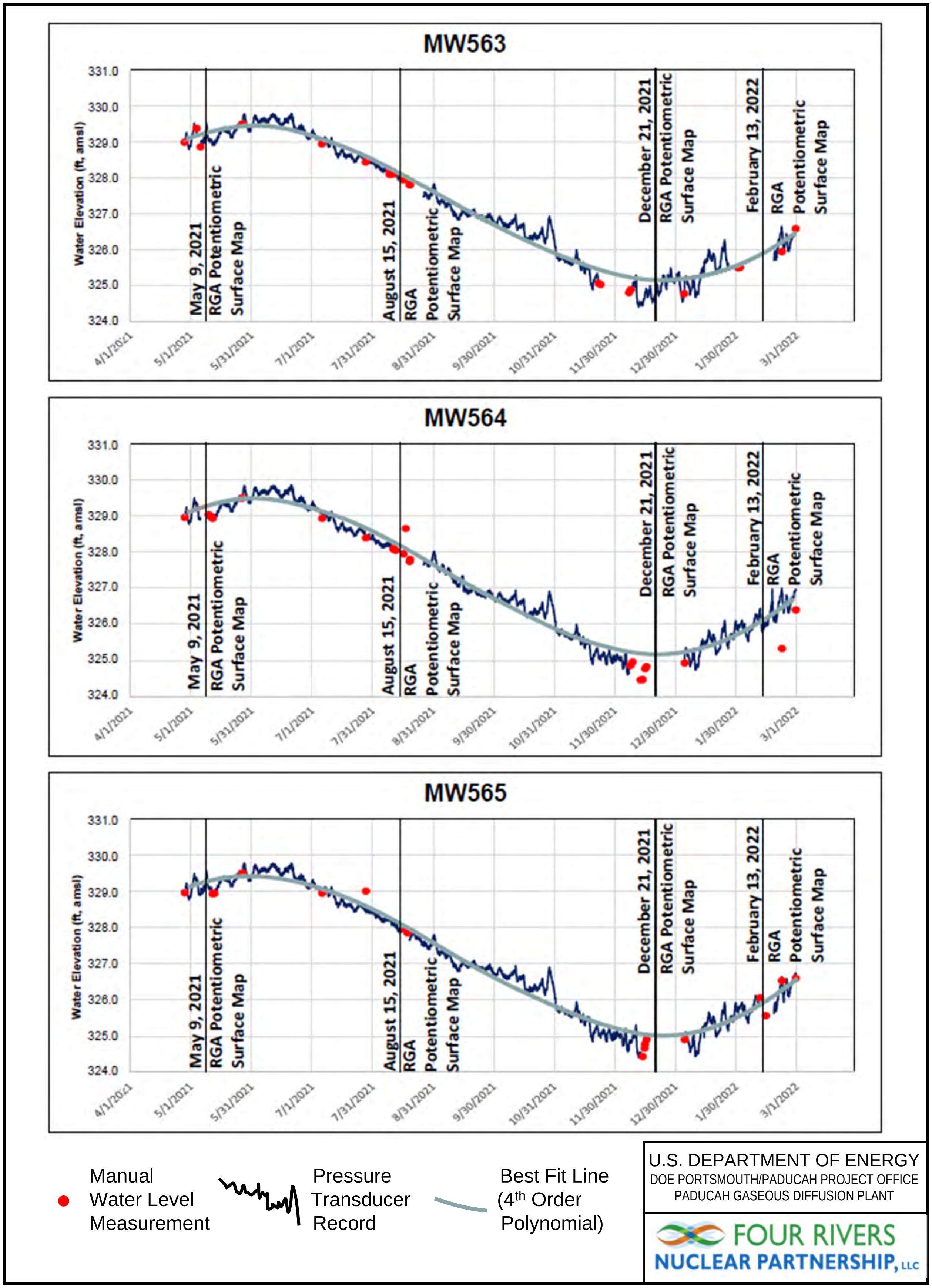


Figure 2.18. Example RGA Pressure Transducer Records

In general, LRGA MWs provided colloidal borescope tests (Appendix A) of flow direction measurements with less uncertainty than upper and middle RGA (MRGA) wells. More shallow MRGA and URGA wells such as MW557 (URGA) and MW558 (MRGA) of the south-central well cluster, MW560 (URGA) and MW561 (MRGA) of the southwest well cluster, and MW574 (URGA) located outside of the northwest corner of the C-400 Cleaning Building are exceptions to this trend. Collectively, the colloidal borescope tests indicate that the groundwater flow rate/hydraulic conductivity is greatest in the LRGA and areas of greater groundwater flow in the URGA and MRGA occur under the south end of C-400 Cleaning Building and off the southwest and northwest corners of the building.

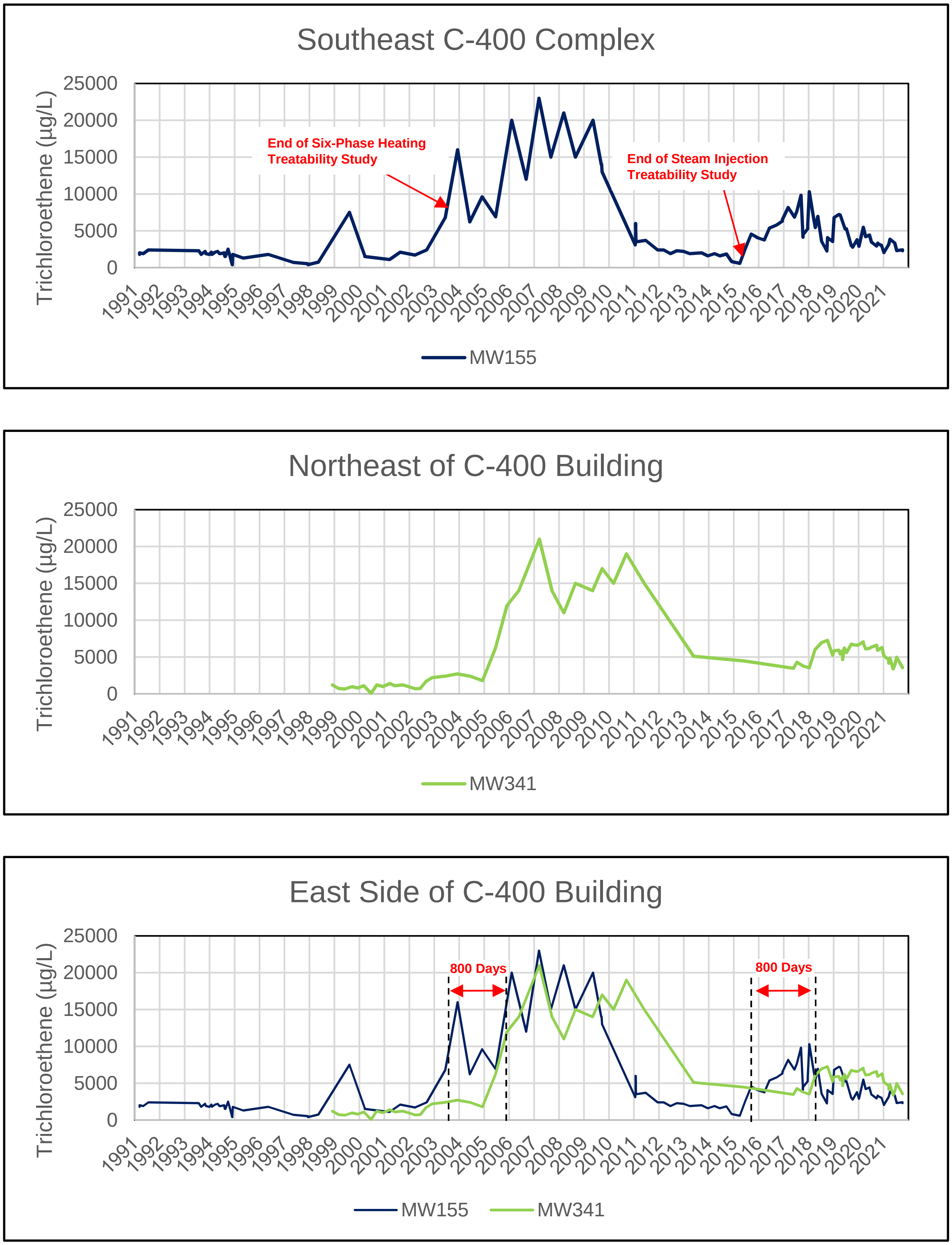
RGA groundwater flow in the southeast corner of the C-400 Complex: A forensic analysis of the TCE trends (levels of TCE and durations of higher and lower concentration periods) in MW155 (LRGA) (located in the southeast C-400 Complex) and MW341 (MRGA) (located outside the northeast corner of the C-400 Complex) reveals that the two wells were in the same north-flowing groundwater flow path prior to the start of operations in October 2017 of the optimized NEPCS (Figure 2.19). Hydraulic assessments of the optimized NEPCS and quarterly groundwater contaminant trend analyses indicate that extraction well EW234 of the NEPCS redirects groundwater flow in MW155 to the northeast (DOE 2018b).

Nested wells MW505 (URGA), MW506 (MRGA), and MW507 (LRGA) are located south of Sector 4. A spike in TCE concentrations in MW506 in June 2015, associated with the Steam Injection Treatability Study (DOE 2016), followed by an extended TCE decline (Figure 2.20) was previously interpreted as displacement of dissolved-phase TCE to the south of the C-400 Complex OU. After completion of the Steam Injection Treatability Study, the groundwater flow direction was assumed to be toward the C-400 Complex. The reassessment of RGA hydraulic trends at C-400 as part of this RI identified that a recharge area with a continuous mound of hydraulic potential exists under the gravel-covered area of the southeast corner of the C-400 Complex and groundwater flow is southward towards the MW505/MW506/MW507 well cluster. The TCE trend in MW507 reflects southward groundwater flow with an episodic spike of the dissolved-phase TCE level resulting from the Steam Injection Treatability Study.

RGA groundwater flow under the southwest corner of the C-400 Cleaning Building: Quarterly groundwater level measurements and groundwater flow directions derived from colloidal borescope tests identify a hydraulic potential swale under the south end of the C-400 Cleaning Building (west side) that directs groundwater flow to the west. When EW234 of the NEPCS is operating, northward groundwater flow under the south end of the C-400 Cleaning Building proceeds eastward to EW234 or westward in the hydraulic potential swale.

RGA groundwater flow under the center of the C-400 Cleaning Building: RGA groundwater level trends and colloidal borescope tests in MW571 and MW573 distinguish a high hydraulic conductivity zone under the north-center of the C-400 Cleaning Building that extends to the northeast (through MW341 and towards EW234). When EW234 is not operating, as was the case during the January/February 2022 period of colloidal borescope tests, groundwater flow is to the northwest. Soil and groundwater samples of the RI identified a subsurface technetium-99 source zone in the area of soil borings S1C-CB01 and S1C-29 (near the center of the C-400 Cleaning Building). The technetium-99 trend in MW341 (Figure 2.21) defines a breakthrough curve that is the arrival front of a technetium-99 plume migrating from the source zone towards EW234.

RGA groundwater flow under the northwest corner of the C-400 Complex: Groundwater levels for the north end of the C-400 Complex and the colloidal borescope tests in MW574 show that groundwater flow under the northwest corner of the C-400 Cleaning Building consistently flows to the northwest.



NOTE: 800 days is approximate period of offset of matching TCE trends in MW155 and MW341.

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Figure 2.19. MW155 and MW341 TCE Trends

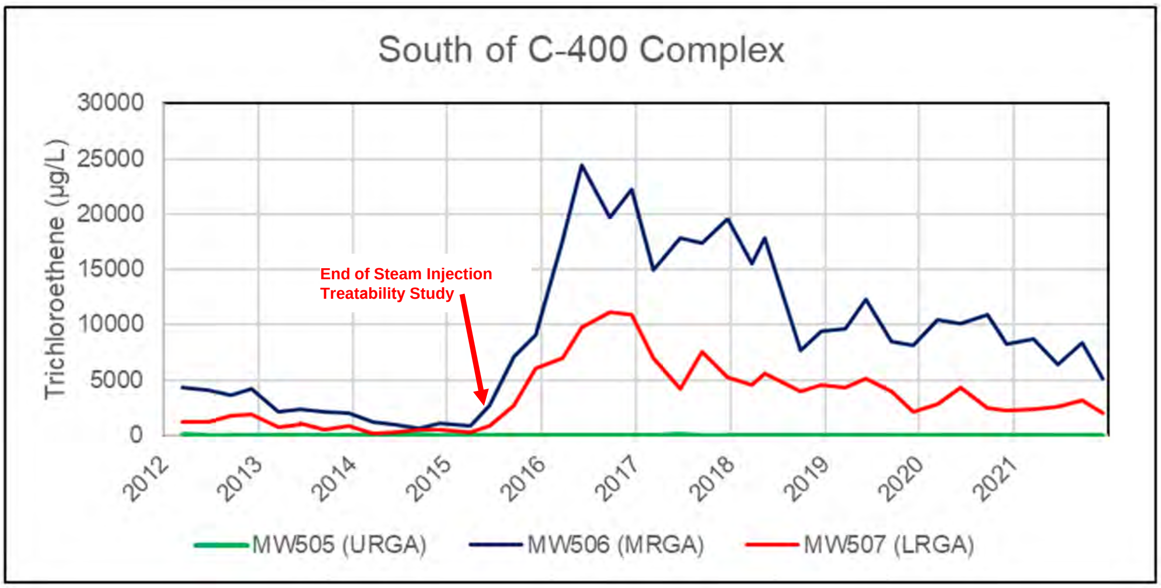

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Figure 2.20. MW505, MW506, and MW507 TCE Trends

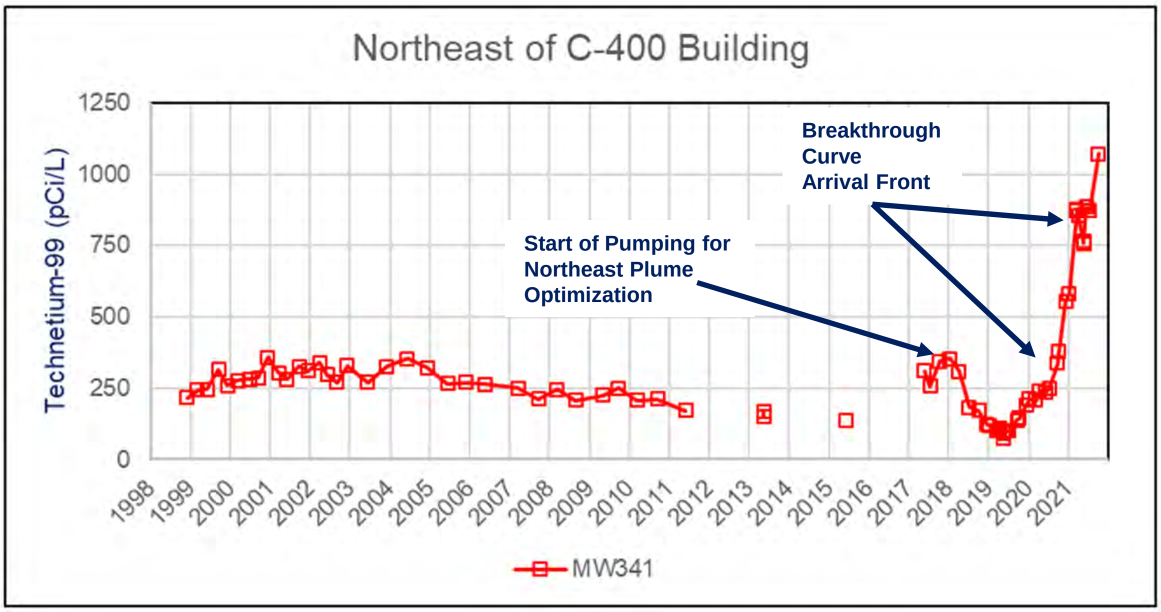

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Figure 2.21. MW341 Technetium-99 Trend

RGA hydraulic properties within the C-400 Complex OU: On average, the top of the RGA occurs at a depth of 53.5 ft and the base of the RGA occurs at a depth of 89.7 ft in the 64 C-400 RI soil borings that penetrated the full thickness of the RGA. The top HU4 sand member averages 6.5 ft thick. Geologists' logs describe the HU4 primarily as a poorly-graded sand, with lesser silt content. The porosity of the HU4, based on geotechnical analyses for the RI, ranges from 25% to 37%.

The bottom HU5 sand and gravel member averages 29.7 ft thick and consists of poorly- to well-graded sand and gravel. Porosity of the HU5 geotechnical samples for the RI ranges from 17 to 33%, with an average of 26%. Effective porosity of the RGA is assumed to be 25% for hydrologic calculations consistent with landfill permit reporting.

Matching TCE trends in MW155 and MW341 support a calculation of the hydraulic conductivity of the RGA over a representative distance. Comparison of the time offset matching TCE trends in the graphs defines the travel time between the two wells to be approximately 800 days (Figure 2.19). Prior to the start of operation of EW234 (October 2017), groundwater flow was nearly direct from MW155 to MW341. The distance between the two wells is 613 ft. Given the large magnitude of the TCE concentration peaks and the relatively short distance between the wells, retardation of TCE on the aquifer matrix is inconsequential.

Same-day historical water level measurements are available in MW156[11] and MW341 to determine the representative hydraulic gradient between the two wells (Table 2.1). The hydraulic conductivity of the RGA is calculated as the distance between the two wells divided by travel time and then multiplied by the quotient of effective porosity and the gradient between the two wells. Using the median of the HU5 porosity measurements (28.3%) and the median of gradient measurements between MW156 and MW341 (3.91E-04 ft/ft), the calculated hydraulic conductivity is 555 ft/day. For comparison, the Steam Injection Treatability Study estimated the hydraulic conductivity of the LRGA to be approximately 300 ft/day (DOE 2016).

Table 2.1. MW155 to MW341 Gradient Calculation

Water Level Measurements (ft amsl)				
Date	**MW156**	**MW341**	**Difference**	**Gradient (ft/ft)**
6/27/2003	330.84	330.59	0.25	4.08E-04
9/23/2003	328.66	327.84	0.82	1.34E-03
12/23/2003	325.68	325.23	0.45	7.34E-04
3/31/2004	327.81	327.45	0.36	5.87E-04
6/11/2004	328.00	327.57	0.43	7.01E-04
9/28/2004	325.99	325.66	0.33	5.38E-04
12/21/2004	324.98	324.74	0.24	3.91E-04
3/29/2005	329.38	329.16	0.22	3.59E-04
6/30/2005	329.18	328.92	0.26	4.24E-04
9/30/2005	325.96	325.72	0.24	3.91E-04
12/22/2005	323.82	323.64	0.18	2.93E-04
3/22/2006	324.65	324.42	0.23	3.75E-04
6/16/2006	326.18	325.97	0.21	3.42E-04
9/9/2006	326.03	325.82	0.21	3.42E-04
12/19/2006	326.47	326.25	0.22	3.59E-04
6/14/2007	329.39	329.12	0.27	4.40E-04

GRADIENT*	
MEAN:	4.57E-04
GEOMEAN:	4.34E-04
MODE:	3.42E-04
MEDIAN:	3.91E-04

[11] Water levels in adjacent URGA MW156 and LRGA MW155 are identical.

Table 2.1. MW155 to MW341 Gradient Calculation (Continued)

Water Level Measurements (ft amsl)				
Date	MW156	MW341	Difference	Gradient (ft/ft)
9/27/2007	325.68	325.44	0.24	3.91E-04
1/1/2008	323.96	323.76	0.20	3.26E-04
3/28/2008	326.95	326.82	0.13	2.12E-04
6/17/2008	330.56	330.31	0.25	4.08E-04
8/29/2008	328.36	328.18	0.18	2.93E-04
9/26/2008	326.68	326.47	0.21	3.42E-04
3/18/2009	324.84	324.32	0.52	8.48E-04
6/19/2009	329.20	328.99	0.21	3.42E-04
9/4/2009	328.31	327.99	0.32	5.22E-04
10/11/2011	325.97	325.47	0.50	8.15E-04

*Disregarded highest and lowest values—outliers
Notes:
Water level elevations assume measurements using top of casing for reference.
Gradient assumes a travel distance of 613.4 ft.

2.6.4 McNairy Flow System

Groundwater flow in the fine sands and silts of the McNairy Formation is called the McNairy Flow System. The overall McNairy groundwater flow direction in the area of the Paducah Site is northward towards the Ohio River, similar to that of the RGA. The regional potentiometric surface of the McNairy groundwater flow system dips from an outcrop recharge area at Kentucky Lake westward and northward towards the Ohio River (Davis, Lambert, and Hansen 1987). Locally, groundwater flow in the McNairy Formation discharges to the Ohio River.

Potentiometric trends of the RGA and the McNairy Formation are similar at the Paducah Site. The Paducah Site has seven McNairy MWs with an extensive record of water level measurements, including 54 synoptic water level measurements during the period 1996 through 2011[12] (six of these McNairy wells have adjacent RGA wells with synoptic water level measurements). Because the RGA has a steeper hydraulic potential slope toward the Ohio River than does the McNairy Flow System, the vertical gradient reverses nearer the Ohio River. The "hinge line," which is where the vertical hydraulic gradient between the RGA and McNairy Flow System changes from a downward vertical gradient to an upward vertical gradient, parallels the Ohio River near the northern boundary of the DOE property.

Hydraulic potential is greater in the RGA than in the McNairy Flow System beneath the Paducah Site. Three of the McNairy MWs (MW122, MW239, and MW247) are located in close vicinity to RGA extraction wells in the Northeast and Northwest Plumes. The remaining four McNairy wells (MW102, MW120, MW121, and MW133) are located distal to the extraction wells in the Northeast and Northwest Plumes and provide opportunity for assessment of the vertical and horizontal gradients in the McNairy Formation. The measured vertical gradients (using the water level in the adjacent RGA well as the water level at the base of the RGA) range between -1.30E-02 (at MW121) and +1.40E-02 ft/ft (at MW133). Horizontal gradients measured between upgradient McNairy wells (MW102 and MW120) and downgradient McNairy wells (MW121 and MW133) are on the order of 4.65E-04 ft/ft and 4.20E-04 ft/ft,

[12] This is the interval of frequent (often quarterly) same-day and next-day water level measurements in all of the seven McNairy Formation MWs. Subsequent water level measurements typically are not same-day or next-day records in all seven MWs.

respectively (based on the median of water elevations in each well and corrected to a reference screen midpoint elevation of 219 ft amsl).

The contact between the Lower Continental Deposits and the McNairy Formation is a marked hydraulic properties boundary. Four previous Paducah Site investigations have measured hydraulic conductivity of the McNairy Formation. The Phase I SI measured horizontal hydraulic conductivity with slug tests in three McNairy MWs (CH2M HILL 1991). Results ranged from 8.16E-02 to 5.22E-01 ft/day (Table 2.2) with a median value of 2.75E-01 ft/day. Tests for siting investigations of the Northwest Plume Capture System and the C-746-U Landfill measured vertical hydraulic conductivity with permeameters from 18 soil borings and 20 discrete sample depths (Table 2.3). Vertical hydraulic conductivity values ranged from 5.10E-05 to 1.42E+00 ft/day with a median value of 1.04E-03 ft/day. The WAG 6 RI measured the vertical hydraulic conductivity of nine McNairy Formation soil samples from the C-400 Complex area (DOE 1999). Values ranged from 2.32E-04 to 3.09E+00 ft/day with a median of 3.77E-02 ft/day (Table 2.4).

Table 2.2. Slug Tests of McNairy Formation Monitoring Wells from the Phase I Site Investigation

MW	Screen Interval		Lithologies of the Screen Interval*	Hydraulic Conductivity (ft/day)
	Depth (ft)	Elevation (ft amsl)		
MW120	155–170	214–229	CLAY, silty and SAND	5.22E-01
MW121	198–210	162–174	SILT and SAND, silty	8.16E-02
MW122	144–158	205–219	SAND, medium and CLAY, sandy	2.75E-01
			Average:	**2.92E-01**
			Median:	**2.75E-01**

*Primary soil textures identified by all caps formatting.

Table 2.3. Permeameter Tests of McNairy Formation Samples Beyond the C-400 Vicinity

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Lithology*	Hydraulic Conductivity (ft/day)
GB-01D	86–88 #2	272.2–274.2	CLAY with sand interbeds	7.80E-04
	86–88#3			1.04E-03
GB-02D	88–90 #2	272.3–274.3	CLAY with silt interbeds	1.16E-04
	88–90 #3			2.06E-04
GB-03D	88–90 #2	271.9–273.9	CLAY with sand interbeds	1.32E-02
	88–90 #3			7.57E-03
GB-04D	83–85 #2	279.9–281.9	SAND, very fine	1.34E-01
	83–85 #3			1.17E-02
GB-05D	83–85 #2	278.4–280.4	CLAY, sandy	3.54E-03
	83–85 #3			5.81E-03
MW239	124–126	244.1–246.1	no description	5.95E-04
MW245	95–97	272.2–274.2	GRAVEL, sandy, silty	1.42E+00
MW247	118–120	247.0–249.0	no description	1.67E-02
MW248	98–100	268.5–270.5	no description	2.78E-01
MW250	95–97	270.8–272.8	SAND and CLAY, silty	3.40E-04
SB-28	114–116	253.9–255.9	SAND, fine above/CLAY below	1.16E-02
SB-29	114–116	253.8–255.8	CLAY with sand above/CLAY below	1.11E-04
SB-30	114–116	251.5–253.5	CLAY above/SAND and CLAY below	7.09E-04
SB-31	114–116	252.3–254.3	CLAY above/CLAY below	4.54E-04
SB-33	98–100	267.2–269.2	SAND and CLAY, interbedded	5.10E-05
	174–176	191.2–193.2	CLAY	3.69E-04
SB-36	118–120	246.3–248.3	no description	4.25E-01
SB-37	88–90	279.9–281.9	CLAY with little sand	1.36E-03
	114–116	253.9–255.9	CLAY	9.35E-04
SB-38	118–120	248.1–250.1	CLAY with sand	1.53E-04
			Average:	**9.33E-02**
			Median:	**1.04E-03**

*Primary soil textures identified by all caps formatting.

Table 2.4. Permeameter Tests of McNairy Formation Samples from the C-400 Area (WAG 6 RI)

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Lithology[a]	Hydraulic Conductivity (ft/day)
026001SA120	127–130	246.0–249.0	SAND	3.09E+00
400036SA110	10[b]	269.3	SAND, silty	1.03E+00
400036SA120	120[b]	258.3	SAND, clayey, silty	2.32E-04
400036SA140	141[b]	237.3	SAND, silty	5.98E-03
400038SA120	120–120.5[b]	258.4–258.9	CLAY, silty	1.34E-02
400038SA140	141–143.5	235.4–237.9	SILT, clayey	4.31E-02
400208SA140	126–128[b]	246.4–248.4	SILT, clayey	2.09E-01
400210SA110	115.5–116[b]	261.4–261.9	SAND, clayey, silty	3.77E-02
400212SA100	117–119.5[b]	256.3–258.8	SILT, clayey, sandy	3.74E-03
			Average:	**4.93E-01**
			Median:	**3.77E-02**

[a] Primary soil textures identified by all caps formatting.
[b] Depth of associated analytical sample.

The C-400 Complex RI tested 14 McNairy soil samples for vertical hydraulic conductivity using a permeameter (Table 2.5). Vertical hydraulic conductivity values ranged from 1.22E-06 to 5.39E-01 ft/day. The hydraulic conductivity of samples classified as clay commonly ranged between 1.22E-06 to 8.79E-05 ft/day; sandy samples commonly ranged between 2.15E-02 to 5.39E-01 ft/day.

Table 2.5. Permeameter Tests of the McNairy Formation Samples from the C-400 Area (C-400 Complex RI)

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Lithology[a]	Hydraulic Conductivity (ft/day)
400S3-07GEO	102.0–104.0	274.3–276.3	SAND	1.98E-01
400S4-17GEO	115.5–118.0	261.2–263.7	SAND	1.98E-01
400S4-17GEO	137.5–140.0	239.2–241.7	SILT, sandy	7.65E-05
400S5-03GEO	104.0–106.0	271.8–273.8	CLAY, sandy	8.79E-05
400S6-02GEO	86.5–88.5	283.6–285.6	CLAY, silty	1.22E-06
400S6-02GEO	109.5–111.5	260.6–262.6	SILT	1.25E-03
400S7-02GEO	87.5–90.0	281.9–284.4	SILT, clayey	1.84E-05
400S7-02GEO	101–103.5	268.4–270.9	CLAY, sandy	2.18E-02[b]
400S1B-24GEO	100.7–102.6	276.9–278.8	SAND	3.69E-01
400S1B-24GEO	104.1–106.6	272.9–275.4	CLAY, sandy	1.64E-05
400S1C-30GEO	103.7–106.2	273.3–275.8	SAND	5.39E-01
400S1C-30GEO	129.5–132.0	247.5–250.0	CLAY, silty	1.28E-06
400S1C-34GEO	92.5–95.0	284.6–287.1	SILT, clayey	5.10E-05
400S1C-34GEO	99.0–101.5	278.1–280.6	SAND, silty	2.15E-02
			Average:	**9.63E-02**
			Median:	**6.68E-04**

[a] Primary soil textures identified by all caps formatting.
[b] Identified as an outlier because it is a high value for sandy clay.

Several area investigations contribute measurements of other aquifer properties of the McNairy Formation at the Paducah Site. Table 2.6 summarizes measurements of natural moisture content and specific gravity of McNairy Formation soil samples and the derived porosity for the samples. Table 2.7 provides results of the C-400 Complex RI. Direct measurements of McNairy Formation porosity as part of the WAG 6 RI, summarized in Table 2.8, are similar to the area-wide results (DOE 1999).

Table 2.6. Porosity of McNairy Formation Samples

Soil Boring ID	Sample Number	Depth (ft bgs)	Elevation (ft amsl)	Grain Size Description*	Natural Moisture Content (%)	Specific Gravity (gm/cm^3)	Calculated Porosity (%)
S-7	27	135.0–137.5	244.8–247.3	SILT, sandy	42	2.65	65
Z-1	30	124.0–125.5	254.8–256.3	SAND, silty	23	2.56	43
Z-5	33	133.5–135.0	244.9–246.4	SAND, silty	30	2.56	52
Z-12	1	137.8–139.2	211.9–213.3	CLAY, silty	30	2.59	53
	4	197.8–199.2	151.9–153.3	CLAY, sandy	10	2.60	23
	7	257.8–258.9	92.2–93.3	SILT, sandy	19	2.62	38
	10	317.8–318.2	32.9–33.3	SAND, clayey	27	2.75	51
Z-14	31	123.5–125.0	246.5–248.0	CLAY, silty	27	2.70	49
Z-16	2	137.0–139.0	231.9–233.9	SAND, clayey	33	2.62	56
	5	167.7–169.2	201.7–203.2	CLAY, sandy	26	2.66	48
	6	177.7–179.2	191.7–193.2	SAND, silty	25	2.65	47
	8	197.7–199.2	171.7–173.2	CLAY, silty	24	2.63	46
	11	227.7–228.1	142.8–143.2	SAND, silty	27	2.67	50
	14	257.7–258.8	112.1–113.2	CLAY, silty	25	2.65	46
	17	287.7–288.2	82.7–83.2	SAND, silty	31	2.65	55
	19	307.7–308.2	62.7–63.2	SAND	28	2.66	51
					Average Porosity:		**48**

*Primary soil textures identified by all caps formatting.

Table 2.7. Measurements of McNairy Formation Samples as Part of the C-400 Complex RI

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Percentage			Porosity (%)
			Clay	Silt	Sand	
400S4-17GEO	110.0–118.0	261.2–269.2	8.2	7.7	84.1	43–44
400S4-17GEO	137.5–143.5	235.7–241.7	19.2	63.6	17.2	30–33
400S5-03GEO	89.5–95.0	282.8–288.3	42.7	54.0	3.3	52–59
400S5-03GEO	104.0–109.0	268.8–273.8	27.3	29.5	43.2	50–51
400S6-02GEO	86.5–90.5	281.6–285.6	49.8	41.1	9.1	52
400S6-02GEO	107.5–111.5	260.6–264.6	26.0	66.3	7.7	50–53
400S7-02GEO	87.5–93.5	278.4–284.4	36.7	47.0	16.3	41
400S7-02GEO	101.0–108.5	263.4–270.9	21.3	31.8	46.9	47–49
400SIB-24GEO	98.0–102.6	276.9–281.5	13.4	4.6	82	44–53
400S1B-24GEO	104.1–110.8	268.7–275.4	12.9	4.9	82.2	56
400SIC-30GEO	101.0–106.2	273.3–278.5	11.0	6.4	82.6	37–39
400S1C-30GEO	129.5–134.5	245.0–250.0	40.6	44.9	14.5	45–46
400S1C-34GEO	90.5–95.0	284.6–289.1	58.3	27.9	13.8	49–57
400S1C-34GEO	99.9–108.5	271.1–280.6	33.7	52	14.3	43–47
			Average Porosity:			**47**

Table 2.8. Measurements of McNairy Formation Samples as Part of the WAG 6 Remedial Investigation

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Percentage			Porosity (%)
			Clay	Silt	Sand	
026001SA120	127–130	246.0–249.0	1.9	5.0	93.1	41
400036SA110	109*	269.3	4.0	3.3	92.7	51
400036SA120	120*	258.3	27.5	15.3	57.2	52
400036SA140	141*	237.3	7.8	22.5	69.7	48

Table 2.8. Measurements of McNairy Formation Samples as Part of the WAG 6 Remedial Investigation (Continued)

Soil Boring ID	Depth (ft bgs)	Elevation (ft amsl)	Percentage			Porosity (%)
			Clay	Silt	Sand	
400038SA120	120–120.5*	258.4–258.9	54.0	37.7	8.3	45
400038SA140	141–143.5	235.4–237.9	27.8	58.6	13.6	32
400208SA140	126–128*	246.4–248.4	15.2	73.0	11.8	42
400210SA110	115.5–116*	261.4–261.9	16.0	33.8	50.2	56
400212SA100	117–119.5*	256.3–258.8	20.0	45.4	34.6	46
			Average Porosity:			**46**

*Depth of associated analytical sample.

Using the median vertical hydraulic conductivity based on permeameter test data [Table 2.4 (3.77E-02 ft/day)], the average porosity in the C-400 area [Table 2.8, (46%)], and assuming the vertical gradient for the C-400 area is similar to that at MW121 (i.e., 0.013 ft/ft downward), the vertical groundwater flow distance in the Upper McNairy Formation beneath C-400 is estimated to be on the order of 4.6 inches per year. Travel time for vertical advective flow across the 125-ft thickness of the Upper and Levings Members of the McNairy beneath C-400 is estimated to be approximately 328 years. Permeameter test results of the C-400 Complex RI indicate an even longer time would be required (18,000 years). Using the median horizontal hydraulic conductivity based on slug test data [Table 2.2 (2.75E-01 ft/day)], the average porosity, and assuming maximum calculated horizontal hydraulic gradient (i.e., 4.65E-04 ft/ft), the lateral groundwater flow distance in the Upper McNairy Formation beneath the Paducah Site is estimated to be 1.2 inches per year. As a result of the contrast between the hydraulic conductivity of the RGA and the McNairy, little interchange of groundwater flow occurs between the RGA and McNairy Flow System.

2.6.5 C-400 Complex Hydrogeology

Five HUs are commonly used to discuss the shallow groundwater flow system (UCRS and RGA) beneath the Paducah Site and the contiguous lands to the north (Figure 2.22). In descending order, the HUs are as follows:

- HU1 (UCRS): Loess that covers most of the site.
- HU2 (UCRS): Discontinuous sand and gravel lenses in a clayey silt matrix.
- HU3 (UCRS): Relatively impermeable unit that acts as the upper semiconfining-to-confining layer for the RGA. The lithologic composition of HU3 is predominantly silt and fine sand.
- HU4 (RGA): Sand unit with a silt matrix that forms the top of the RGA, where present. Typically 1-2 ft thick in the C-400 Complex area.
- HU5 (RGA): Sand and gravel, primary member of the RGA. The lower contact with the McNairy Formation is well defined.

Across the C-400 Complex, HU1 and most of HU2 are unsaturated. Saturated subsurface soils begin in the lower portion of HU2. Groundwater flow is dominantly vertical down through HU3 and dominantly horizontal in HU4 and HU5.

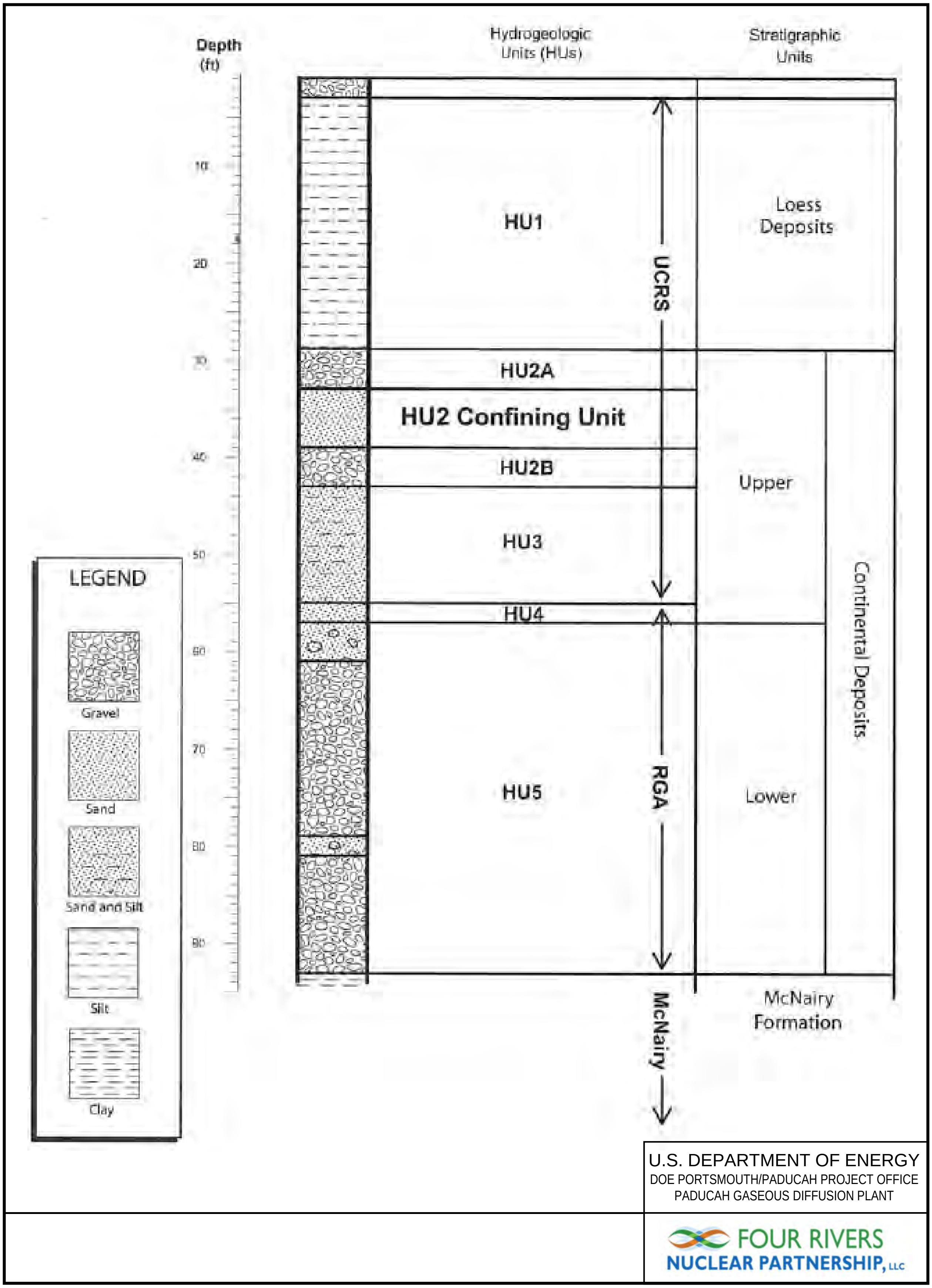


Figure 2.22. Major Hydrogeological Units beneath the Paducah Site

2.6.6 C-400 Complex Hydrogeologic Conceptual Site Model

A CSM for groundwater flow and contaminant migration has been developed from previous investigations at the Paducah Site and the CSM was refined for the C-400 Complex in the WAG 6 RI report (DOE 1999), the C-400 Complex RI/FS Work Plan (DOE 2020), and the data collected from the C-400 Complex OU RI. The CSM represents the current understanding of known site conditions (e.g., waste source information, a listing of site-related chemicals, current spatial distribution of the site-related chemicals), processes by which contaminants move through the surface/subsurface, and the physical properties (e.g., stratigraphy, hydrogeologic properties) controlling movement and migration. The CSM is the basis for interpreting the nature and extent of contamination, presented in Section 4, and the fate and transport of the contaminants, presented in Section 5.

- Potential contaminant source areas at the C-400 Complex include leaks of a TCE off-loading pump station, spills, overfills from sumps, and releases from tanks or underground piping. Releases from these sources would directly impact soils below or adjacent to the source area and/or sediments and surface water in nearby drainage ways. Continuing transport processes also may result in secondary releases that may impact larger areas or affect additional environmental media. Transport processes likely to be active at the site include vertical infiltration in soil, lateral and vertical migration in groundwater, soil erosion and surface runoff, volatilization/vapor transport, and mobilization of dust particles. Figure 2.23 illustrates the hydrogeological setting for the CSM.

- During construction of the C-400 Cleaning Building, the building footprint was excavated to allow for the installation of basements and building footers. Gravel backfill (ranging from approximately 8–12 ft under the building grade slab) was used as the base, potentially creating a permeable zone for contaminant migration. This gravel backfill is anticipated to exist beneath the building grade slab, including some pits. In shallow pits, the gravel thickness is anticipated to be less than 8–12 ft thick. In addition, footing drains were placed around the building footers in order to keep the footings dry and the area around the footers stable. Roof drains also are connected to the storm sewer lines that traverse beneath the building slab in some areas. Leaking and/or discharge from lines that traverse beneath the building slab periodically could flush contaminants into the subsurface.

Cleaning (clothes laundry and machinery parts), disassembly, and testing of cascade components are the primary activities the building was designed to support. The building has also housed many other activities, including recovery of precious metals and treatment of radiological waste streams. As indicated in the *C-400 Process and Structure Review*, the tank bottom of the TCE degreaser rusted out, and the resulting leakage of solvents and other contaminants flowed to a sump near the unit (MMES 1995). From the sump, they were discharged to the storm-water drain system via pipe. A hole in the underside of this pipe may have allowed solutions within the pipe to escape to surrounding media. In approximately 1973, the sump pump became inoperable and was removed from service. When sufficient liquid backed up, the liquid crossed the floor to the drains beneath the cleaning tanks. These floor drains were connected to the C-403 Neutralization Pit. The sump pump and degreaser body were replaced in approximately 1978.

The C-400 Spray Booth (which was used to clean large, radiologically contaminated items) originally was built out of common steel, and the unit's base degraded over time. During replacement of the original booth, the floor beneath was found to be gravel, not concrete, and that this material had eroded or had undergone severe settling. Figure 2.24 illustrates the CSM for historical releases related to the C-400 Complex.

The C-400 Complex is the source of many types of potential contaminants, including VOCs, semivolatile organic compounds (SVOCs), metals, and radionuclides. Primary contaminant sources are related to the following processes:

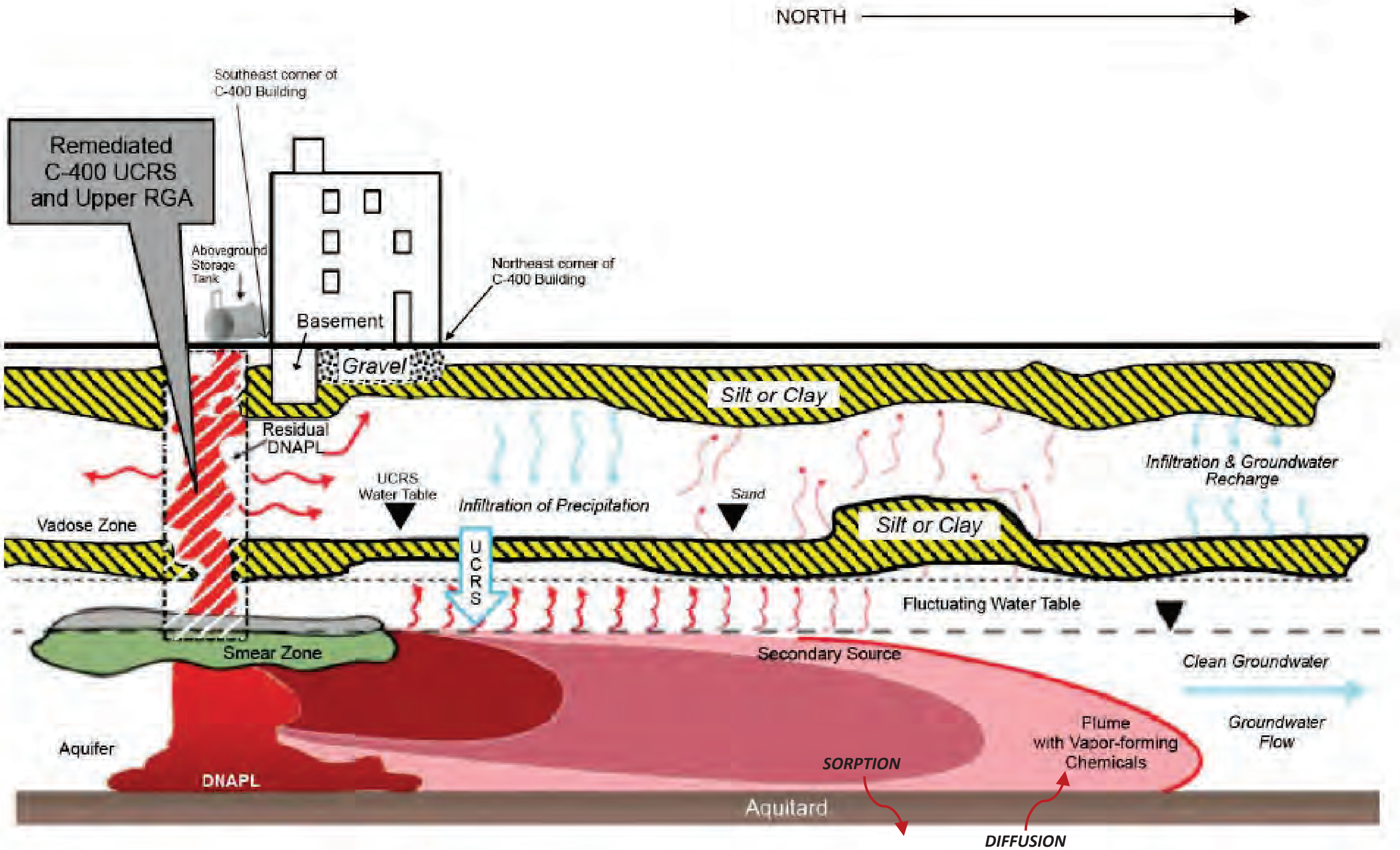


Figure 2.23. Hydrogeologic Setting for Conceptual Site Model

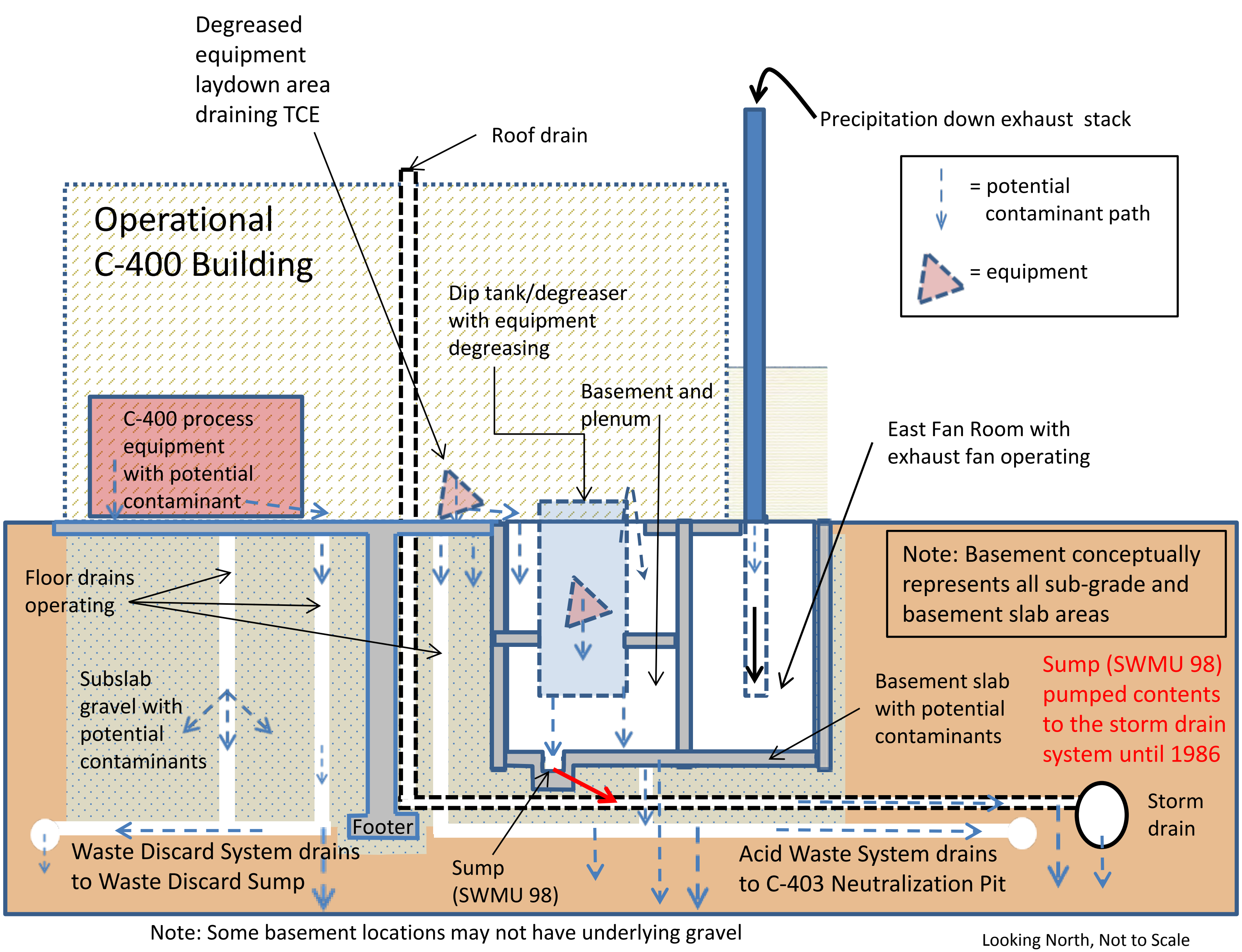


Figure 2.24. C-400 Cleaning Building Operational and Contaminant Release Conceptual Site Model

- TCE: truck and railroad delivery and pump and transfer system, storage tank systems, and vapor degreasers;

- PCBs: leaks of electrical transformers, leaks of gaskets and degradation of building wiring, and wall and floor coatings;

- Technetium-99: radionuclide recovery and storage and spray booth and degreasing operations; and

- Uranium: pulverizing and screening of the diffusion process heels and hydrostatic testing of product cylinders.

Extensive areas of soil surrounding the C-400 Cleaning Building have been impacted by releases of TCE and other contaminants into the shallow subsurface soil. Due to the DNAPL characteristics of TCE, the dominant dispersal pattern through the vadose soil to the top of the RGA is gravity-driven. Vertical DNAPL migration has penetrated to the base of the RGA where spill volumes were sufficiently large. Lateral transport of dissolved-phase contaminants within the RGA follows groundwater flow paths established by local and regional groundwater gradients. Releases of TCE at the C-400 Complex are among the sources for the downgradient Northwest and Northeast Plumes.

Because large releases of TCE occurred and TCE has penetrated the thickness of the RGA as a DNAPL, TCE DNAPL likely pooled at the top of the McNairy Formation. Where TCE pools obtained enough height to overcome the interfacial tension between the RGA and McNairy Formation soils, TCE DNAPL has migrated several feet deep into the Upper McNairy Formation.

2.6.6.1 Contaminant migration—vapor intrusion

TCE-contaminated groundwater and soil adjacent to and under the C-400 Cleaning Building are considered sources of vapors based on a VI study performed at C-400 (DOE 2018a). Sub-slab vapor sampling at the C-400 Cleaning Building detected primarily TCE, but also detected *cis*-1,2-dichloroethene. Subsurface conditions in the C-400 Complex allow VI into the building. Although TCE concentrations in the RGA near the C-400 Cleaning Building have decreased, groundwater concentrations still exceed EPA's groundwater VISL. Similarly, remedial actions have achieved > 95% reduction in soil concentrations, though post remedial residual concentrations remain. Vapor concentrations associated with the remaining TCE contamination in groundwater and soil are orders of magnitude higher than the commercial soil gas and sub-slab TCE VISL of 100 $\mu g/m^3$ (micrograms per m^3).

Vapor migration from subsurface groundwater and soil sources through the vadose zone is promoted by the presence of sand in the UCRS in the vicinity of the C-400 Complex, as well as the presence of gravel immediately beneath the building. A possible explanation for why TCE vapors were not present in some locations (i.e., North Fan Basement) during the VI study is that material beneath the slab in this portion of the building is clay (native soil), rather than the gravel backfill that was present at the other probe locations. The large number of utilities present in the vicinity of the building also may serve as preferential pathways for vapor migration away from the building.

The spatial association between elevated indoor air and sub-slab soil gas concentrations is consistent with a conclusion that the VI pathway is complete, particularly in the southern portion of the building. The presence of *cis*-1,2-dichloroethene in sub-slab vapor shows there is an underlying groundwater source of TCE. *cis*-1,2-dichloroethene is a common breakdown product of TCE dissolved in groundwater, where local groundwater conditions support reductive dechlorination. It is rarely present in commercial products, and it generally is not associated with TCE off-gassing from contaminated vadose zone soil because soils typically are sufficiently oxygenated to preclude reductive dechlorination of TCE (Rivett et al. 2011). In the northern portion of C-400 Cleaning Building, *cis*-1,2-dichloroethene was not detected in sub-slab soil gas, and TCE concentrations in sub-slab soil gas ranged from 14 to 200 μg/m^3, which is consistent with an absence of subsurface sources of TCE (in groundwater) that are significant to the VI pathway. In the southern portion of C-400 Cleaning Building, TCE concentrations in sub-slab soil gas ranged from 75–77,000 μg/m^3, and *cis*-1,2-dichloroethene was detected in sub-slab soil gas, consistent with a groundwater source of TCE and a complete VI pathway.

2.6.6.2 Contaminant migration—soil to groundwater pathway

Contaminants present in surface and subsurface soils may leach to the underlying aquifer. Several factors influence the dissolution of a chemical or radionuclide of potential concern (COPC) in soils and the rate of contaminant movement through soils. These include the physical/chemical properties of the contaminants [e.g., solubility, density, viscosity, distribution coefficient (K_d)] and the physical/chemical properties of the environment (e.g., rainfall, percolation rate, soil permeability, porosity, particle size, amount of organic carbon). Contaminants migrate to groundwater through infiltration, leaching, and the movement of subsurface water within the capillary fringe.

Generally, the groundwater is relatively deep at the C-400 Complex, and many of the potential source areas have been present for a long time; therefore, leaching potential is indicated by observed groundwater concentrations. The depth to the water table in many areas is approximately 35 ft, suggesting a long travel time from the surface to the water table. In areas beneath pavement or other low permeability zones, less infiltration would occur.

It is obvious that vertical migration has occurred at a much higher rate than indicated by advection/leaching, primarily due to diffusion and gravity-driven DNAPL migration. Diffusion can increase the rate of contaminant migration significantly as the chemical moves to counteract concentration gradients, which are assumed to be significant at the C-400 Complex. It appears that the dominant driving force for migration in the UCRS for many COPCs is diffusion while DNAPL migration is an important mechanism for TCE.

Chemicals can attenuate in the vadose zone. Chemicals that strongly sorb to soils, including most PAH compounds, tend to remain in or near the point of release. The retardation factors for these constituents indicate that they would be expected to migrate much more slowly than water in some instances. In addition to their strong tendency to adsorb, these compounds biodegrade during the slow transport, limiting the impacted area. Other constituents such as VOCs tend to volatilize in the unsaturated zone, decreasing their persistence in that medium.

A cosolvent effect may apply where there are two types of organic contaminants present: one type that is hydrophobic and sparingly soluble, (e.g., PAHs, PCBs), and another type that may function as a cosolvent for the sparingly soluble contaminant, making it moderately to highly soluble in water (Huling 1989). In order for a substance to behave as a cosolvent, it must be miscible with water, even to a small degree. The cosolvent effect is greatest if the cosolvent is fully miscible with water (e.g., ethanol or methanol) (Suresh et al. 1990, Li and Andren 1994). Nonspecific hydrophobic partitioning to solid phase materials also is understood to decline in the presence of an organic cosolvent.

The main cosolvency effect at the C-400 Complex is anticipated to be PCBs and/or PAHs in association with TCE. Where DNAPL is present, or if a small amount of DNAPL is captured in a sample, a "nugget effect" in the concentration levels of PAHs, PCBs, or other cosolved constituents may be observed in the analytical data. The "nugget effect" refers to a higher than expected concentration of the cosolved constituent.

2.6.6.3 Contaminant migration—RGA

The COCs in RGA groundwater identified in the WAG 6 RI include arsenic, beryllium, iron, chromium, lead, manganese, thallium, silver, TCE, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene, vinyl chloride, 1,1-dichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and several radionuclides (DOE 1999). VOCs are the most widespread of the COCs. The highest concentrations of VOCs have been reported in the southeast area of the C-400 Complex.

1,1-dichloroethene is formed from anaerobic biodegradation of TCE, trichloroethane, or the 1,1-dichloroethene intermediates. It subsequently degrades to ethene and/or ethane. The current data indicate that anaerobic biodegradation (e.g., TCE to 1,1-dichloroethene) is not a major process in the hydrogeological/geochemical environment at the C-400 Complex.

Once in the groundwater, COCs primarily move through the RGA via advection. COCs spread both horizontally and vertically due to the process of dispersion, while adsorption retards the movement of chemicals in groundwater. Dispersion generally causes chemicals to migrate from 10–20% farther than migration caused by advection alone. Adsorption, which retards the movement of chemicals, counteracts the advection and dispersion processes. Adsorption is generally described by a chemical's K_d.

In accordance with the COCs identified at the C-400 Complex, the most mobile constituents include the chlorinated VOCs and technetium-99. Other constituents, including PAHs, PCBs, and metals (such as lead and vanadium), are not readily transported in groundwater. Consistent with these properties, PAHs and PCBs were infrequently detected in the groundwater. The common occurrence of unfiltered metals in RI groundwater samples, such as iron, is the result of highly turbid groundwater samples and is not a result of migration or site-related activities.

2.6.6.4 Contaminant migration—McNairy

The low hydraulic conductivity of the fine-grained sediments of the McNairy Formation (interbedded fine sands, silts, and clays) sharply contrasts with the high hydraulic conductivity of the coarse grained sediments of the overlying RGA (gravelly sands and sandy gravels). This contrast of hydraulic conductivity within a low vertical, hydraulic gradient field, results in a dominant lateral flow regime in the RGA with little groundwater flow between the RGA and the McNairy Formation. Although the Lower McNairy member is an aquifer capable of producing residential water supplies, the Upper McNairy Formation in the area of the Paducah Site functions mostly as a lower aquitard to the RGA.

The rate of transport of dissolved contamination in the McNairy Formation by advective flow is much less than the rate of advective transport in the RGA. Diffusion may be a more important process promoting contaminant migration. The upper and middle McNairy Formation members have significant organic carbon content. Horizons of lignite are reported in some soil cores. Partitioning, biological transformation, and abiotic transformation likely are important processes of retardation and degradation of contaminants in the upper and middle members.

Analyses of grab samples of McNairy Formation groundwater samples beneath the TCE plumes from previous Paducah Site investigations [notably the Groundwater Monitoring Phase IV Investigation (DOE 1995b) and the WAG 6 RI (DOE 1999)] and the C-400 RI data indicate higher levels of TCE contamination (> 11,000 μg/L) are limited to the upper 20 ft of the McNairy Formation and define a general trend of declining TCE levels with increasing depth. The trend shows the vertical limit of TCE migration into the McNairy Formation from dissolved-phase sources is approximately 50 ft. (No C-400 Complex RI soil samples were collected from depths greater than approximately 55 ft into the McNairy Formation.) A cluster of 4 TCE results of higher value (95.5 to 843 μg/L) from 50 to 54.5 ft depth below the top of the

McNairy Formation is a notable exception to the trend. Of these sample locations, three underlie confirmed/probable source zones in the RGA where residual TCE DNAPL zones are suspected at the base of the RGA (i.e., near the main TCE degreaser, in the southeast corner of the C-400 Cleaning Building, and in the south end of the Phase IIb treatment area). These occurrences are evidence that higher TCE levels are present in the McNairy Formation beneath locations of basal RGA DNAPL pools but, even there, TCE levels decline rapidly with depth in the McNairy. Figure 2.25 summarizes the combined results.

In the C-400 Complex, where TCE DNAPL pools have obtained enough height to overcome the interfacial tension between the RGA and McNairy Formation soils, TCE is present as residual DNAPL in the upper 1–5 ft of the McNairy Formation. Unless the contaminated, fine-grained sediments of the McNairy Formation are remediated, they will continue to be a long-term source of dissolved TCE to the RGA through back diffusion. The forthcoming FS will evaluate remedial actions for the VOC source zones in the Upper McNairy Formation, with consideration of uncertainty as appropriate.

2.7 ECOLOGICAL SETTING

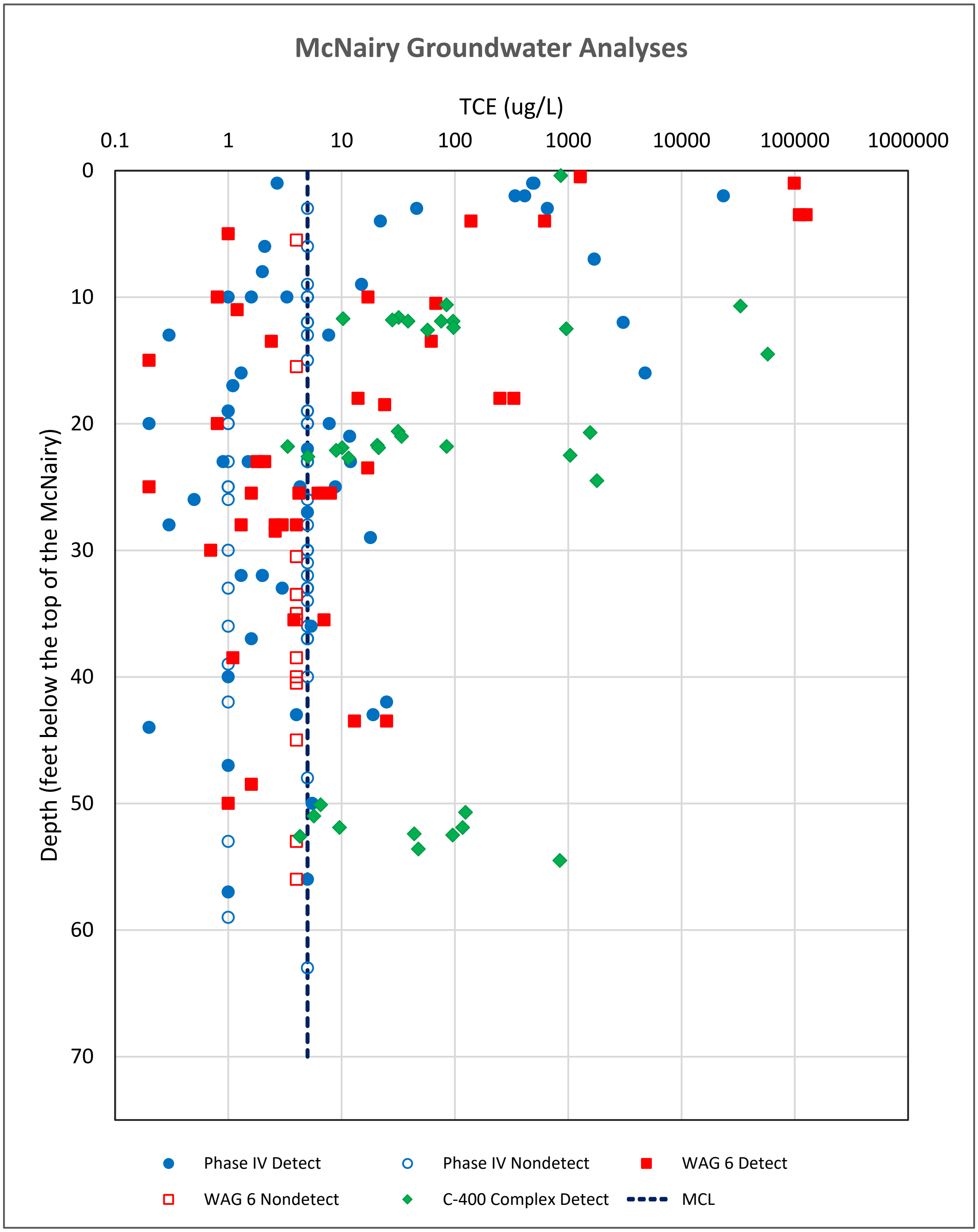
Wildlife opportunities in the C-400 Complex OU are limited to those that are common to industrial settings. The following sections give a brief overview of the terrestrial and aquatic systems at the Paducah Site. A more detailed description, including identification and discussion of sensitive habitats and threatened/endangered species, is contained in the *Investigation of Sensitive Ecological Resources Inside the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (CDM Federal 1994) and *Environmental Investigations at the Paducah Gaseous Diffusion Plant and Surrounding Area, McCracken County, Kentucky, Volume V: Floodplain Investigation,* Part A: Field Results of Survey (COE 1994). The information contained in these previous studies was reviewed as part of the *Work Plan for the Soils Operable Unit Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, and it was determined that the results were consistent with current conditions (DOE 2010). Also, *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, Volume 2. Ecological* (Ecological RMD) contains an updated list of ecological species/receptors (DOE 2019). While threatened and endangered species likely are present at the Paducah Site, no species are known to be present in the vicinity of the C-400 Complex OU. Additional information on threatened and endangered species can be found in Appendix C.

2.7.1 Terrestrial Systems

The terrestrial component of the Paducah Site ecosystem includes the plants and animals that use the upland habitats for food, reproduction, and protection. The upland vegetative communities consist primarily of grassland, forest, and thicket habitats with agricultural areas. The main crops grown in the area include soybeans, corn, tobacco, and sorghum.

DOE periodically mows much of the grassland habitat adjacent to the plant. The Kentucky Department of Fish and Wildlife Resources manages a large percentage of the adjacent WKWMA to promote native prairie vegetation by burning, mowing, and various other techniques.

Dominant overstory species of the forested areas include oaks, hickories, maples, elms, and sweetgum. Understory species include snowberry, poison ivy, trumpet creeper, Virginia creeper, and Solomon’s seal. Thicket areas consist predominantly of maples, black locust, sumac, persimmon, and forest species in the sapling stage with herbaceous ground cover similar to that of the forest understory.



Note: All C-400 Complex RI soil samples contained detectable TCE levels.

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DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

Figure 2.25. McNairy Formation Groundwater Sample TCE Analyses from the Groundwater Monitoring Phase IV Investigation, WAG 6 RI, and C-400 Complex RI/FS

Wildlife commonly found in the Paducah Site area consists of species indigenous to open grassland, thicket, and forest habitats. Small mammal surveys conducted on WKWMA documented the presence of southern short-tailed shrews, prairie voles, house mice, rice rats, and deer mice (KSNPC 1991). Large mammals commonly present in the area include coyotes, eastern cottontails, opossums, groundhogs, whitetail deer, raccoons, and gray squirrels. Mist netting activities in the area have captured red bats, little brown bats, Indiana bats, northern long-eared bats, evening bats, and eastern pipistrelles (KSNPC 1991). Typical birds of the area include European starlings, cardinals, red-winged blackbirds, mourning doves, bobwhite quails, turkeys, killdeer, American robins, eastern meadowlarks, eastern bluebirds, blue jays, red-tail hawks, and great horned owls.

Examples of a few amphibians and reptiles present include the cricket frog, Fowler's toad, common snapping turtle, green tree frog, chorus frog, southern leopard frog, eastern fence lizard, and red-eared slider (KSNPC 1991).

The C-400 Cleaning Building is located near the center of the PGDP industrial area. All equipment has recently been removed from the C-400 Cleaning Building as part of site decommissioning activities. Streets surround the C-400 Complex on all four sides. The immediate areas around the C-400 Cleaning Building are primarily paved or covered with gravel, with grassed ditches adjacent to the streets on two sides. The Paducah Site has an active infrastructure program that maintains lawns around the facility. No trees or bushes are present within the C-400 Complex. Wildlife opportunities in the C-400 Complex OU are limited to those common to industrial settings.

2.7.2 Aquatic Systems

The aquatic communities in and around the Paducah Site that could be impacted by plant discharges include two perennial streams [Bayou Creek (named in older documents as Big Bayou Creek) and Little Bayou Creek], the NSDD, a marsh located near the confluence of Bayou Creek and Little Bayou Creek, and other smaller drainage areas. The dominant taxa in all surface waters include several species of sunfish, especially bluegill and green sunfish, as well as bass and catfish. Shallow streams, characteristic of the two main area creeks, are dominated by bluegill, green and longear sunfish, and stonerollers. Algal and benthic macroinvertebrate and insect populations vary seasonally. Periphyton, benthic macroinvertebrates, and fishes found in Bayou and Little Bayou Creeks are described in *Final Report on Environmental Studies at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, to Union Carbide Corporation* (Battelle 1978). There are no aquatic systems in the C-400 Complex OU.

2.7.3 Wetlands and Floodplains

A study of the Paducah Site area by the U.S. Army Corps of Engineers (COE) groups the area wetlands into 16 vegetative cover types encompassing forested, scrub/shrub, and emergent wetlands (COE 1994). Wetland vegetation consists of species, such as sedges, rushes, spikerushes, and various other grasses and forbs in the emergent portions; red maple, sweet gum, oaks, and hickories in the forested portions; and black willow and various other saplings of forested species in the thicket portions. Wetlands inside the plant security fence are confined to portions of drainage ditches traversing the site (CDM Federal 1994).

At the Paducah Site, the Ohio River, Bayou Creek, and Little Bayou Creek cause local area flooding during precipitation events. A floodplain analysis performed by the COE found that much of the built-up portions of the plant lie outside the 100- and 500-year floodplains of the Ohio River and these creeks (COE 1994). In addition, the COE 1994 analysis determined that ditches within the plant area can contain the expected 100- and 500-year discharges. Wetlands and floodplains are not located within the C-400 Complex OU.

2.8 DEMOGRAPHY AND LAND USE

The C-400 Complex is located within a large industrial facility; therefore, the current land use is industrial. The current land use can be expected to continue in the foreseeable future; consequently, the most plausible future land use of the C-400 Complex also is industrial (DOE 2015, DOE 2022).

The Paducah Site is surrounded by WKWMA and sparsely populated agricultural lands. The closest communities to the plant are Heath, Grahamville, and Kevil, all of which are located within 3 miles of the Paducah Site boundaries. Metropolis, Illinois, is located 4 miles to the northeast, Paducah, Kentucky, is located approximately 10 miles to the east, and Cape Girardeau, Missouri, is located approximately 40 miles to the northwest.

Historically, the economy of Western Kentucky has been based on agriculture, although there has been increased industrial development in recent years. The Paducah Site employs approximately 1,400 people, while the TVA Shawnee Fossil Plant employs an additional 275 people. The total estimated 2020 population within the counties that lie within a 50 mile radius of the Paducah Site is approximately 737,733; and approximately 87,050 people live within the three counties that contain the 10-mile radius of the plant (Massac County, Illinois, and Ballard and McCracken Counties, Kentucky) (DOC 2021). The estimated population of Paducah, Kentucky, is approximately 25,000. The population of McCracken County is estimated to be approximately 65,644 (DOC 2021).

In addition to the residential population surrounding the plant, WKWMA draws thousands of visitors each year for recreational purposes. WKWMA is used by visitors, primarily for hunting and fishing, but other activities include horseback riding, dog trials, hiking, and bird watching.

3. C-400 COMPLEX OU INVESTIGATION

This section presents a description of the field investigation activities and methods used during the C-400 Complex RI, including sampling activities, procedures, equipment, and analyses conducted on the samples. All sampling was conducted in accordance with the medium-specific work instructions or procedures consistent with *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (EPA 2001a). Technical memoranda documenting details of field activities are included in the appendices of this report.

To facilitate the evaluation of the C-400 Complex, the area has been divided into geographically-related sectors, similar to the sectors used in the WAG 6 RI (DOE 1999). These sectors are illustrated in Figure 3.1. The WAG 6 RI also included two additional sectors outside the current C-400 Complex OU. In the WAG 6 RI, Sector 8 included the area to the far north and far northwest of the C-400 Cleaning Building (including the C-401 Transfer Line), and Sector 9 included the area to the far east and far northeast of the C-400 Cleaning Building. Groundwater contamination in some of the MWs located in WAG 6 RI Sector 8 is discussed in this RI report. The sectors are defined as follows and the SWMUs located inside the C-400 Complex that require further evaluation are shown in Figure 1.4.

- Sector 1—the area within the footprint of the C-400 Cleaning Building, which is further subdivided into Sectors 1A through 1D, based on C-400 Cleaning Building historical processes and the C-400 Basement Sump (SWMU 98).
- Sector 2—the area to the northeast of the C-400 Cleaning Building; contains the C-403 Neutralization Tank (SWMU 40) and C-402 Lime House (SWMU 480).
- Sector 3—the area to the east of the C-400 Cleaning Building; this sector does not contain a SWMU.
- Sector 4—the area to the southeast of the C-400 Cleaning Building; this sector contains the C-400 TCE Leak Site (SWMU 11) and a TCE off-loading pump station associated with the TCE Spill Site from TCE Unloading Operations at C-400 (SWMU 533).
- Sector 5—the area to the southwest of the C-400 Cleaning Building; this sector does not contain a SWMU, but includes a TCE spill site which has been treated with ERH below 20 ft bgs.
- Sector 6—the area to the west of the C-400 Cleaning Building; this sector contains the C-400 Technetium Storage Tank Area (SWMU 47).
- Sector 7—the area to the northwest of the C-400 Cleaning Building; this sector contains the C-400 Discard Waste System (SWMU 203).

3.1 DATA QUALITY OBJECTIVES

The DQO process was used as a planning tool for the C-400 Complex RI/FS to identify the environmental problem and to define and focus the sampling strategy and data collection process needed to support decisions regarding the environmental problem. The seven steps of the DQO process (*Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4) are used to formulate a set of criteria that is used to achieve the desired control of uncertainty, allowing future remedial decisions to be made with acceptable confidence (EPA 2006). All of the steps within the DQO process were completed

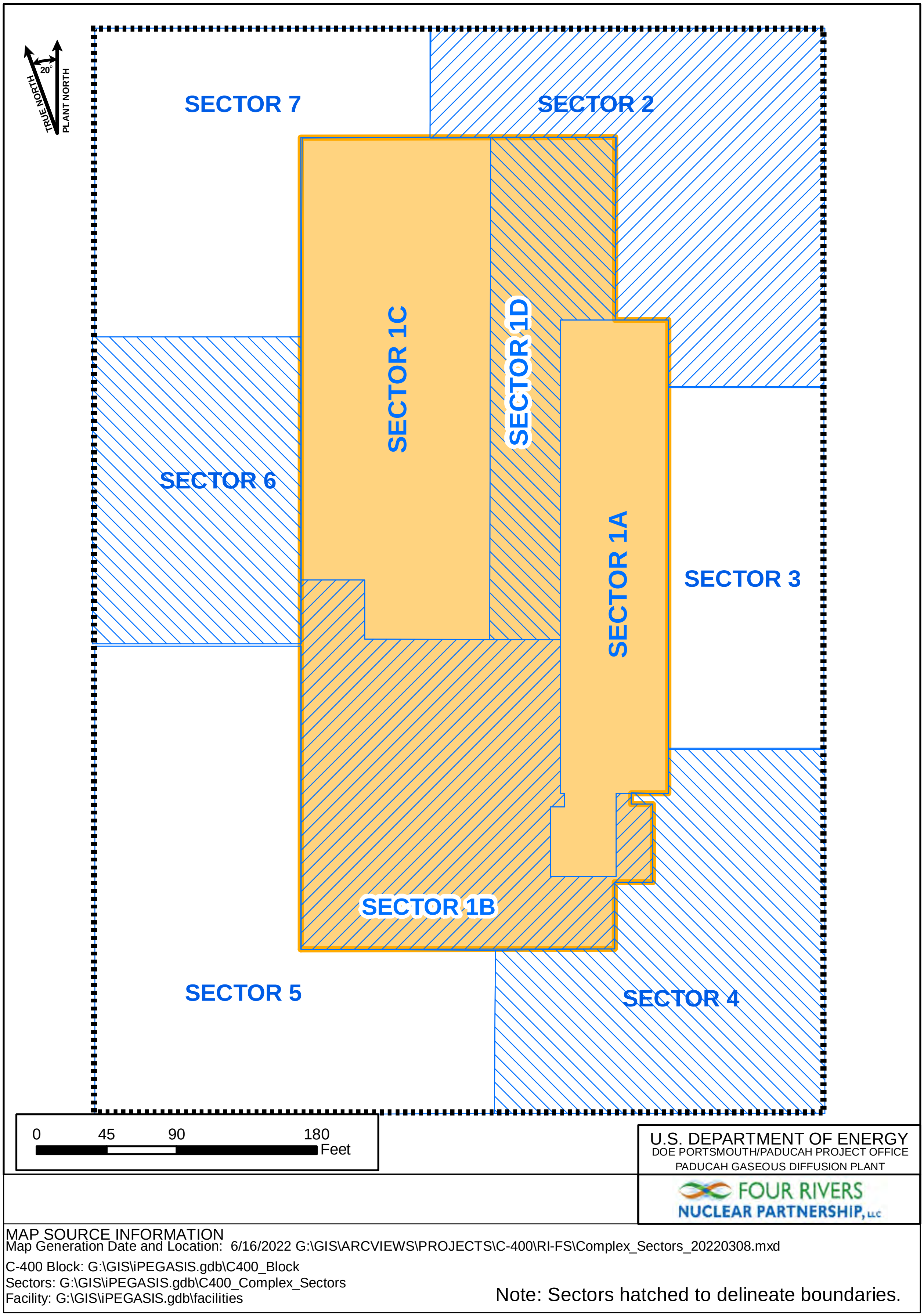


Figure 3.1. C-400 Complex Sectors

in accordance with the referenced guidance and are documented in the C-400 Complex RI/FS Work Plan (DOE 2020. Table 3.1 includes the DQO goals that were identified in the C-400 Complex RI/FS Work Plan to guide the RI data collection and to support the evaluation of alternatives for selection of the final remedial action(s).

Table 3.1. Goals Identified for the C-400 Complex RI/FS

GOAL 1: CHARACTERIZE NATURE OF SOURCE ZONE(S) **Decisions and questions** 1-1: What are the suspected contaminants? 1-2: What are the plant processes/activities that could have contributed to the contamination? When and over what duration did releases occur? 1-3: Are there hazardous substances present in the remaining building infrastructure at the time of the RI/FS? 1-4: What are the chemical concentrations and radionuclide activities at the source(s)? 1-5: What are the chemical and physical properties of associated material (e.g., groundwater, soil, concrete) at the source areas?
GOAL 2: DEFINE EXTENT OF SOURCE AND CONTAMINATION IN SOIL AND REMAINING STRUCTURES IN THE OU AREA 2-1: What are the past, current, and potential future migratory paths? 2-2: What are the past, current, and potential future release mechanisms? 2-3: What are the contaminant chemical concentrations or radionuclide activity gradients? 2-4: What is the vertical and lateral extent of contamination? 2-5: What is the extent of contamination to integrator units (i.e., groundwater, surface water)? 2-6: What is the area and volume of the source zone(s)? 2-7: Where is the source?
GOAL 3: EVALUATE SURFACE AND SUBSURFACE TRANSPORT MECHANISMS AND PATHWAYS 3-1: Are and how are the contaminants migrating from the source? 3-2: What is the direction of contaminant transport in groundwater? 3-3: What are the effects of building construction, underground utilities, previous remedial actions, treatability studies, and plant operations on migration pathways including ditches? 3-4: What is the role of the UCRS, RGA, and McNairy Formation in contaminant release and transport? 3-5: What are the physical, chemical, and hydrogeological properties of the formations and subsurface matrices?
GOAL 4: COMPLETE A RISK ASSESSMENT FOR THE C-400 COMPLEX 4-1: Where have contaminants been detected? 4-2: Are isolated AOCs present or is contamination general? 4-3: What are the COCs that define the contamination? 4-4: What are the characterization levels? 4-5: Are SWMUs within the C-400 Complex RI/FS similar enough to be addressed in the same manner?

Table 3.1. Goals Identified for the C-400 Complex RI/FS (Continued)

GOAL 5: IDENTIFY, DEVELOP, AND EVALUATE REMEDIAL ALTERNATIVES

5-1: What is the nature and extent of contamination?

5-2: What are stakeholder's perceptions of potential remedial alternatives?

5-3: What are the principal threats?

5-4: What media are contaminated to unacceptable levels?

5-5: What contaminant groups are present driving the unacceptable risk?

5-6: What are the preliminary RAOs?

5-7: What is unacceptable risk?

5-8: What are the PRGs?

5-9: What are the general remedial alternatives/what are the remedial technology types?

5-10: What is the schedule of remedial action?

5-11: What are the possible remedial technologies applicable for this unit?

5-12: Are potential remedial technologies incompatible?

5-13: Are cultural and infrastructure impediments present?

5-14: What are the potential remedial process option(s) to be used/what are the potential representative remedial technologies to be assessed?

5-15: What are the physical, chemical, and hydrogeological properties of media to be remediated?

5-16: What treatability studies would be required?

5-17: What is the area/volume of affected media?

5-18: Are potential remedial process options innovative or proven?

5-19: Are potential remedial process options applicable to multiple contaminant families?

5-20: What would be the impact of a potential remedial process option on and by other sources?

5-21: What would the impact of potential remedial process options on the integrator units (e.g., groundwater)?

5-22: Are there geologic limitations to potential remedial process options?

5-23: Are potential remedial process options acceptable to the community and state?

5-24: Are potential remedial process options reversible?

Additional details regarding the goals, decision rules, evaluation methods, and data needs that support the evaluation of alternatives for selection of the final remedial action(s) can be found in the C-400 RI/FS Work Plan (DOE 2020). The first four goals are achieved by this RI report. The fifth goal will be addressed by a future FS report.

3.2 SURFACE SOIL AND SHALLOW SOIL SAMPLING

3.2.1 Nonintrusive Data Collection—Gamma Walkover Surveys

Radiological walkover surveys of accessible areas were completed for Sectors 2–7 (Sector 1 was not evaluated because the entire sector area is covered by concrete) using Ludlum Model 2221 scaler/rate meters connected to Ludlum Model 44-10 2 × 2 sodium iodide detectors. Areas that were not accessible included structures that remained following deactivation activities (e.g., C-403 Neutralization Pit) and areas close to the C-400 Cleaning Building structure that impacted global positioning system (GPS) surveying, etc. Surveys were conducted to define the highest count rate area/location within each sector, with the purpose of determining the area/location of biased samples within each sector. The radiological surveys were conducted as outlined in Appendix C of the C-400 Complex RI/FS Work Plan (referred to as the Survey Plan) (DOE 2020).

The logged survey data were downloaded from a Trimble GEO7X handheld data collector connected to the Ludlum Model 2221/Model 44-10 sodium iodide detector. The data was corrected and processed using Trimble® GPS Pathfinder® Office software. The downloaded data set included fields for gross count rate data in counts per minute (cpm) and State Plane coordinates (in ft), Kentucky South. The data fields also included time stamps and other fields related to the survey.

Using ArcGIS software, the data was assessed for coverage, as indicated in the Survey Plan. If the coverage was sufficient for the area surveyed in the sector and the detector fell within its two-sigma control limit, the data was accepted and surveys were continued in the sector until all accessible portions of the sector were sufficiently surveyed.

Upon completion of surveys within a sector, all data set files within that sector were merged into a single Microsoft Excel® data file. The merged file that contained the survey data set was created using net counts per minute (ncpm) (i.e., gross cpm minus background for each instrument/detector combination used) for the entire sector.

Each survey data set was analyzed in order to identify the highest count rate areas or locations within each sector.

A probability plot and inflection/break point analysis was conducted for each sector's survey data set to identify data greater than the inflection point/break point or 95% level. The probability plot for each sector survey data set was developed by the following steps.

- The survey net count rate and coordinate data for the sector was sorted using Microsoft Excel®.
- The net survey count rate (cpm) was ranked for the data set as a percentage of the data set using Microsoft Excel®.
- The probability plot was developed from the net count rate, cpm, and the percent rank (0 to 1) for the data set.

Data above the inflection point/break point or 95% level were mapped using ArcGIS to determine the location of the data within each sector. The evaluation of the plotted data indicated the following two cases from the Survey Plan were applicable at the C-400 Complex.

- Case 2—A sector may have multiple areas with a group of elevated count rate data points. The sample areas were resurveyed (e.g., confirmation) to determine the boundary of each area (e.g., count rate above the break/inflection point) and the location with the highest count rate within each area. From the areas, the area with the highest count rate were chosen for sampling at the location with the highest count rate.

— This case applied to Sectors 2, 5, 6, and 7.

- Case 5—If no inflection point was observed for the probability plot, data points above the 95th percentile were mapped and used with professional judgment to determine the location for a judgmental sample.

— This case applied to Sectors 3 and 4.

A summary of the gamma walkover survey (GWS) for each sector is provided below.

Sector 2

Most of Sector 2 was accessible for the GWS, with the exception of SWMU 40 and SWMU 480. A probability plot of the Sector 2 sodium iodide measurements (ncpm) showing the inflection point, is provided in Figure 3.2.

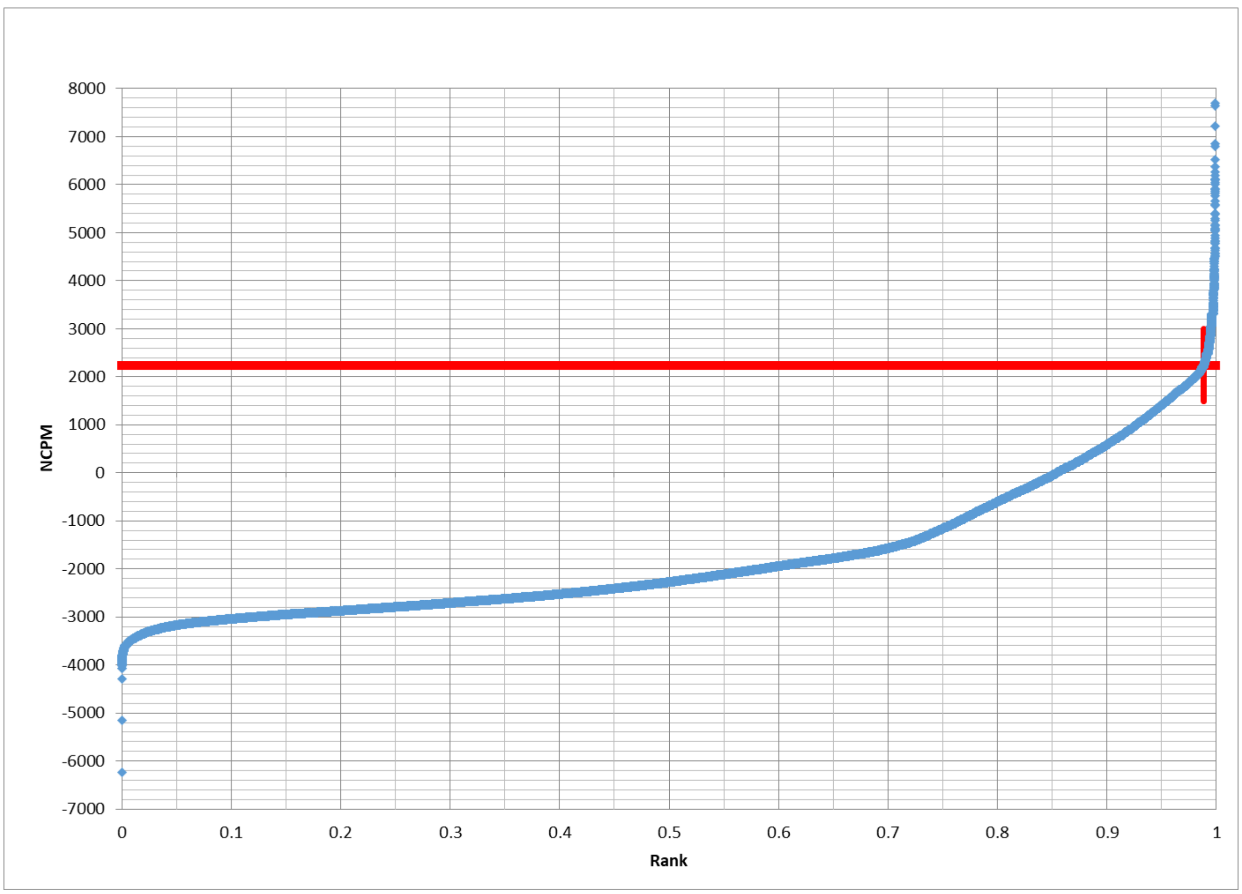


Figure 3.2. Sector 2 Gamma Walkover Probability Plot Showing the Inflection Point

There were multiple areas in Sector 2 with measurements greater than the inflection point (the five areas are noted in Figure 3.3). The location with the highest net count rate, and the location selected for biased

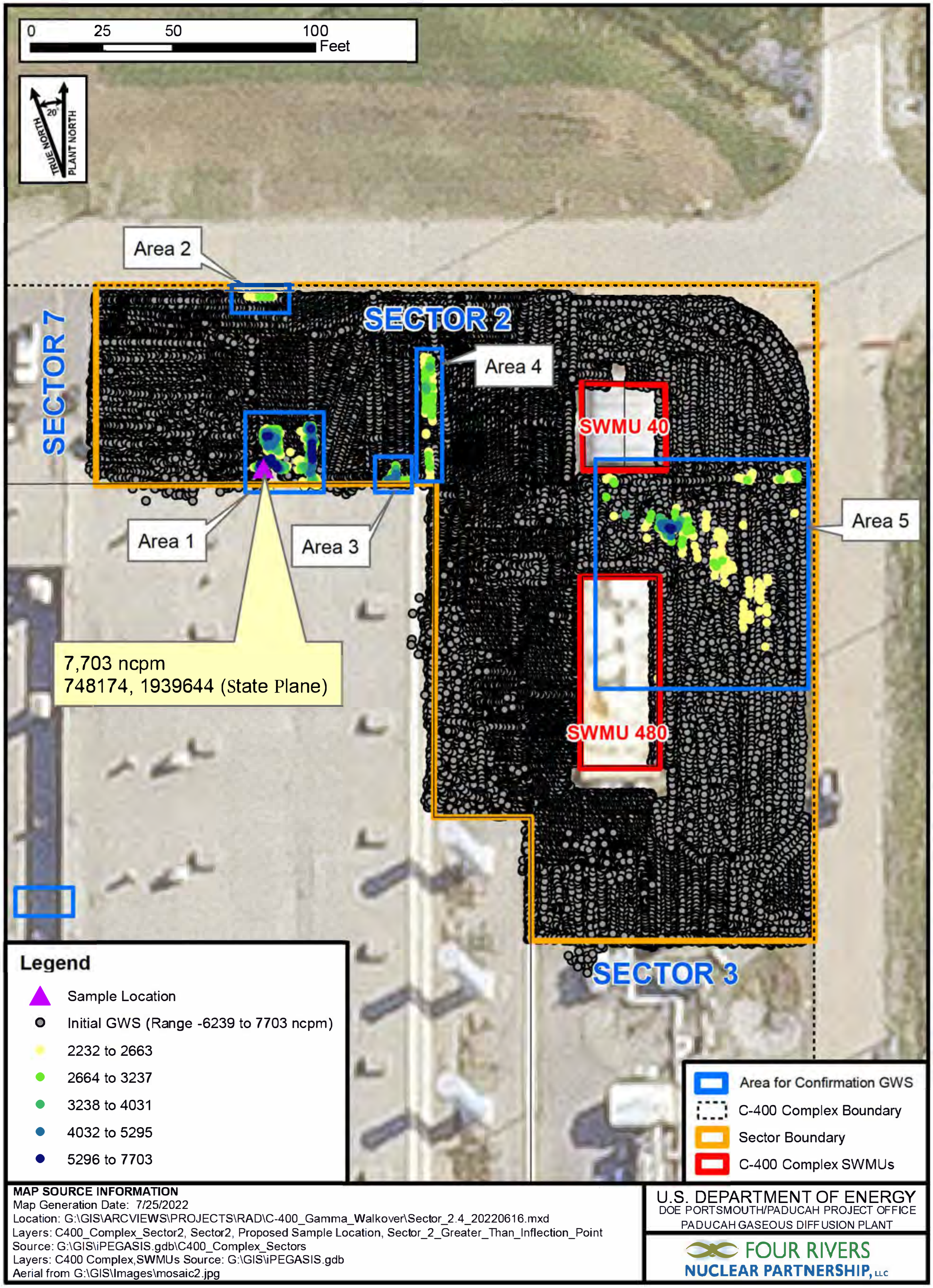


Figure 3.3. Sector 2 Gamma Walkover Survey

sampling, was located on concrete in the northwestern portion of Sector 2 and to the north of the C-400 Cleaning Building.

Sector 3

Most of Sector 3 was accessible for the GWS, with the exception of the C-400 basement access hatch. A probability plot of the Sector 3 sodium iodide measurements (ncpm) is provided in Figure 3.4, showing most of the net counts per minute were negative and indicating the background readings were greater than the gross measurements. The 95th percentile was used for plotting the elevated measurements in Sector 3.

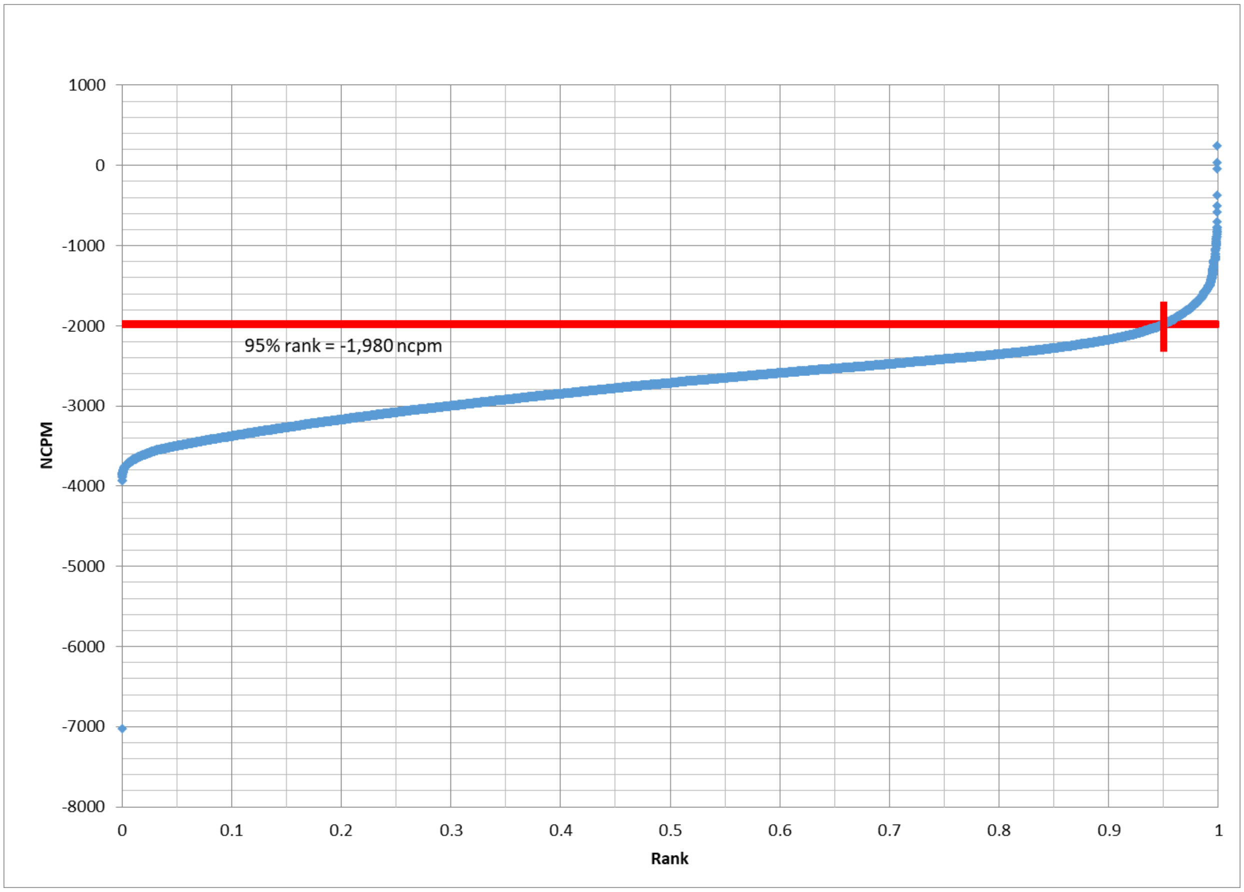


Figure 3.4. Sector 3 Gamma Walkover Probability Plot Showing the 95th Percentile Value

The location with the highest net count rate, and the location selected for biased sampling, was located in the northern portion of Sector 3 (Figure 3.5).

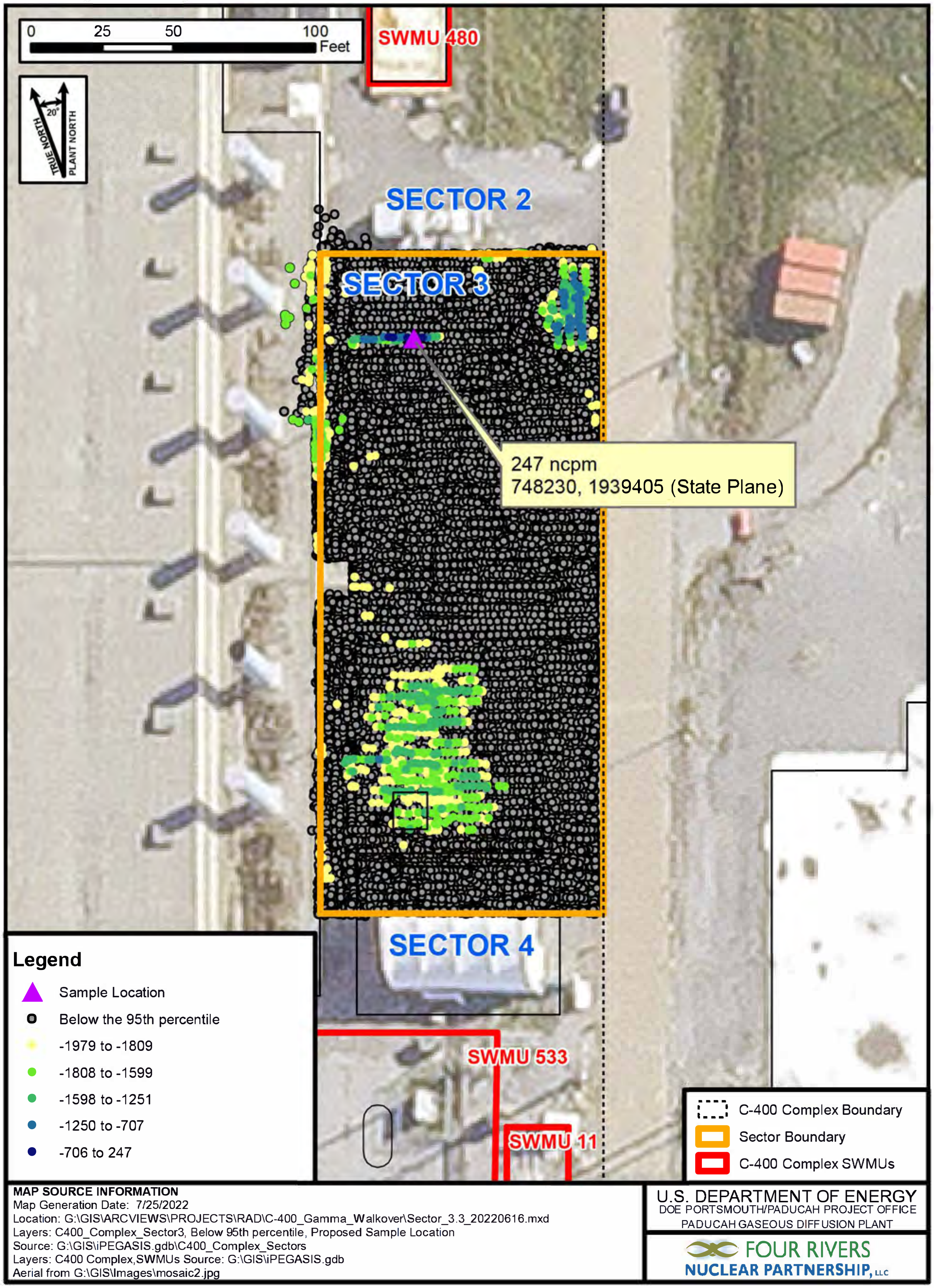


Figure 3.5. Sector 3 Gamma Walkover Survey

Sector 4

All of Sector 4 was accessible for the GWS. A probability plot of the Sector 4 sodium iodide measurements (ncpm) is provided in Figure 3.6, showing most of the net counts per minute were negative and indicating the background readings were greater than the gross measurements. The 95th percentile was used for plotting the elevated measurements in Sector 4.

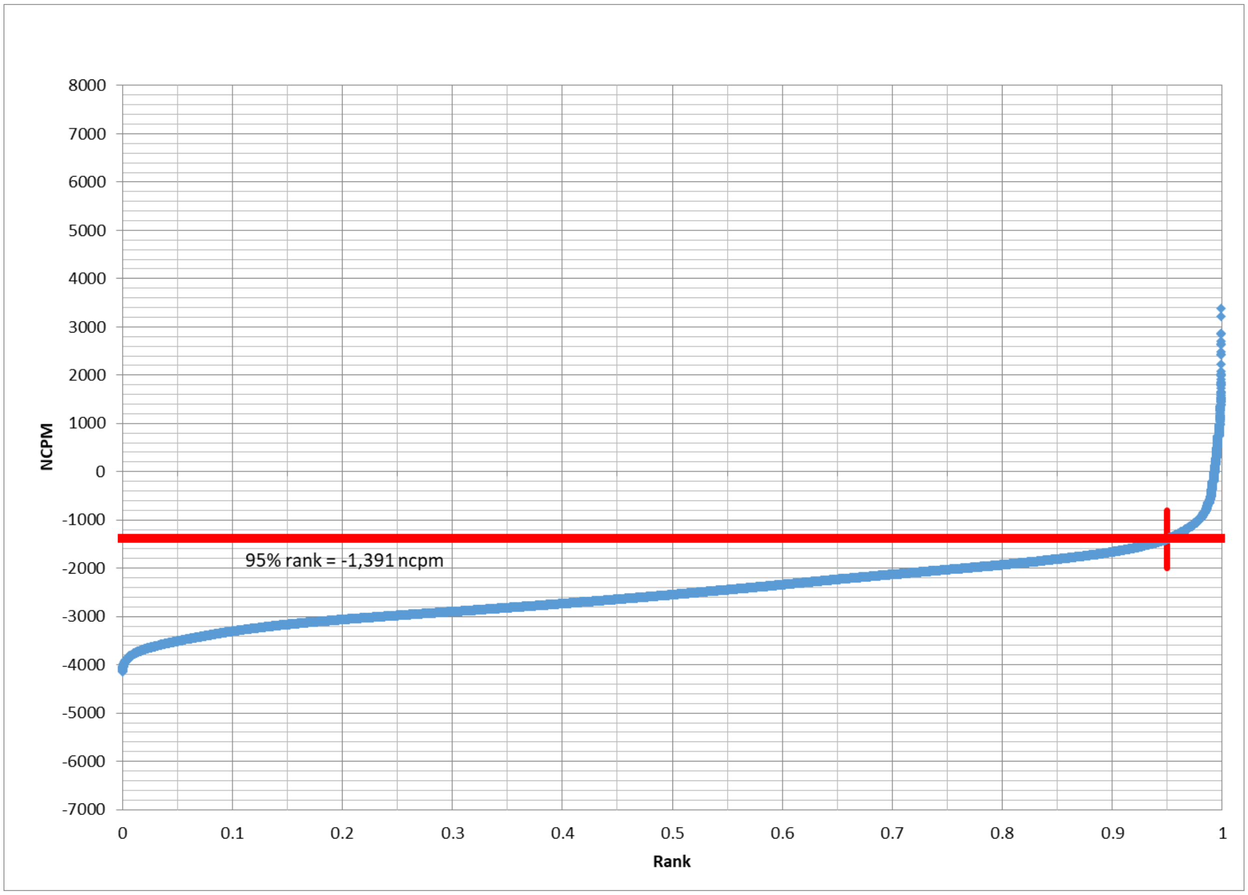


Figure 3.6. Sector 4 Gamma Walkover Probability Plot Showing the 95th Percentile Value

The location with the highest net count rate, and the location selected for biased sampling, was located in the southwestern portion of Sector 4 and south of the C-400 Cleaning Building (Figure 3.7).

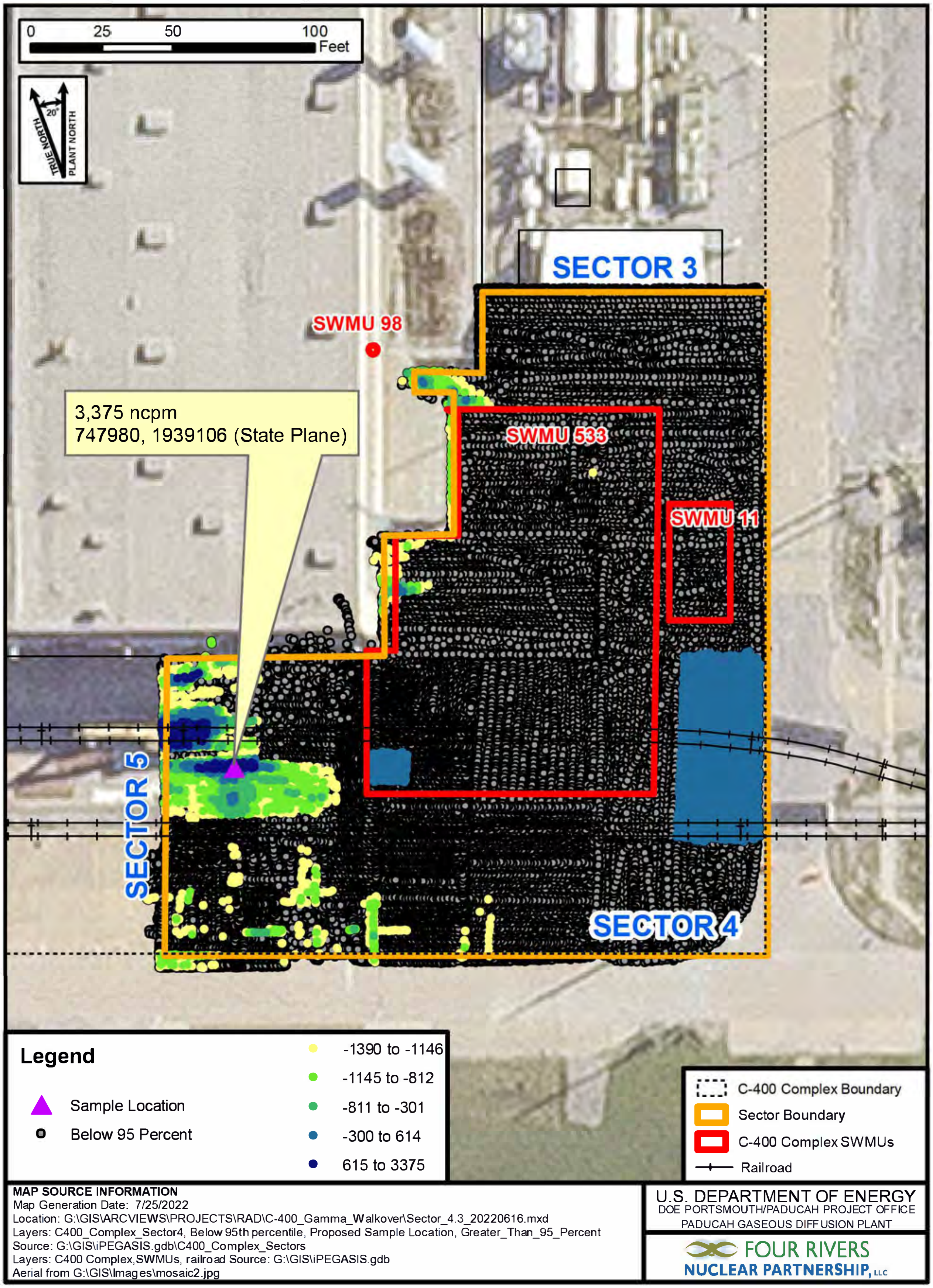


Figure 3.7. Sector 4 Gamma Walkover Survey

Sector 5

Most of Sector 5 was accessible for the GWS, with the exception of an area with waste heat recovery system equipment and areas with aboveground utilities. A probability plot of the Sector 5 sodium iodide measurements (ncpm) showing the inflection point is provided in Figure 3.8.

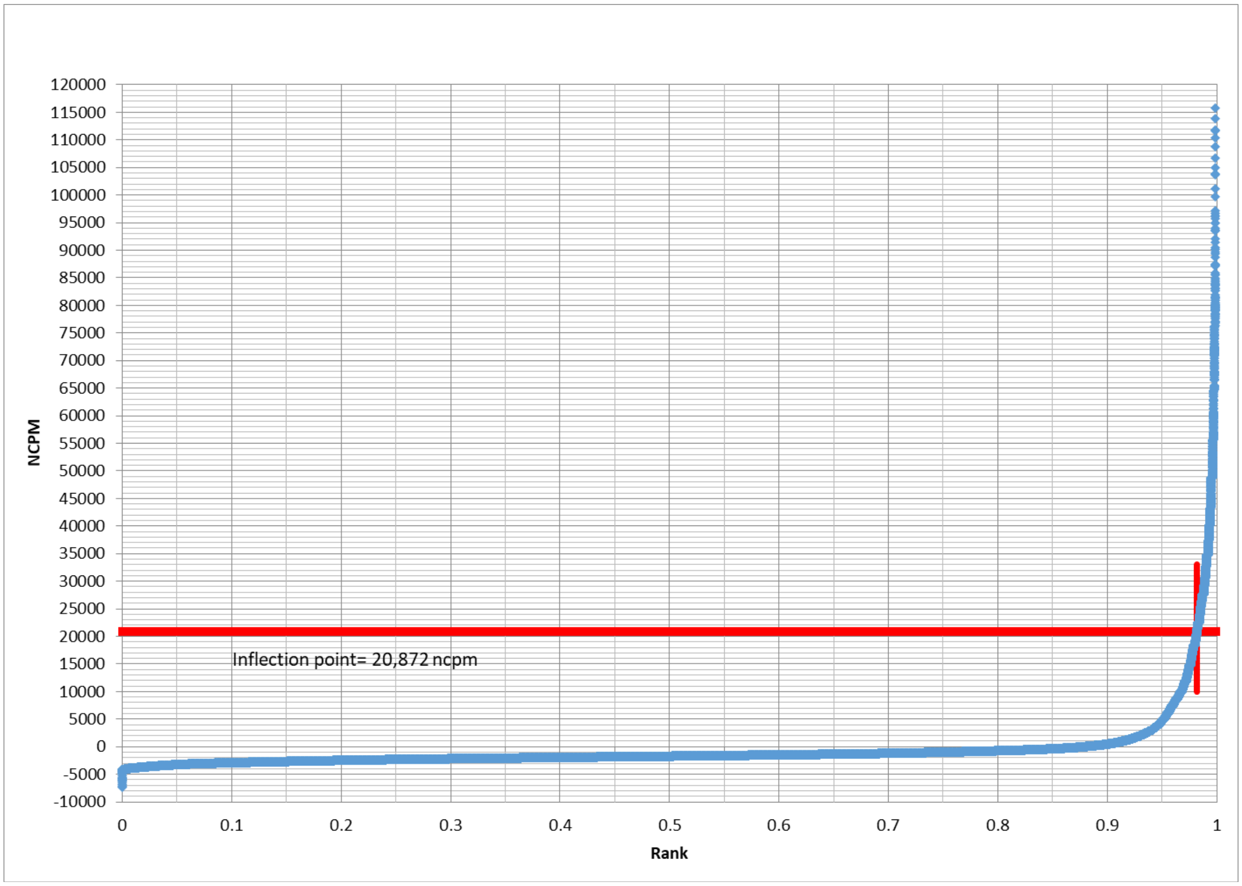


Figure 3.8. Sector 5 Gamma Walkover Probability Plot Showing Inflection Point

There were multiple areas in Sector 5 with measurements greater than the inflection point (the three areas are noted in Figure 3.9). The location with the highest net count rate, and the location selected for biased sampling, was located in the eastern portion of Sector 5—immediately west of the C-400 Cleaning Building.

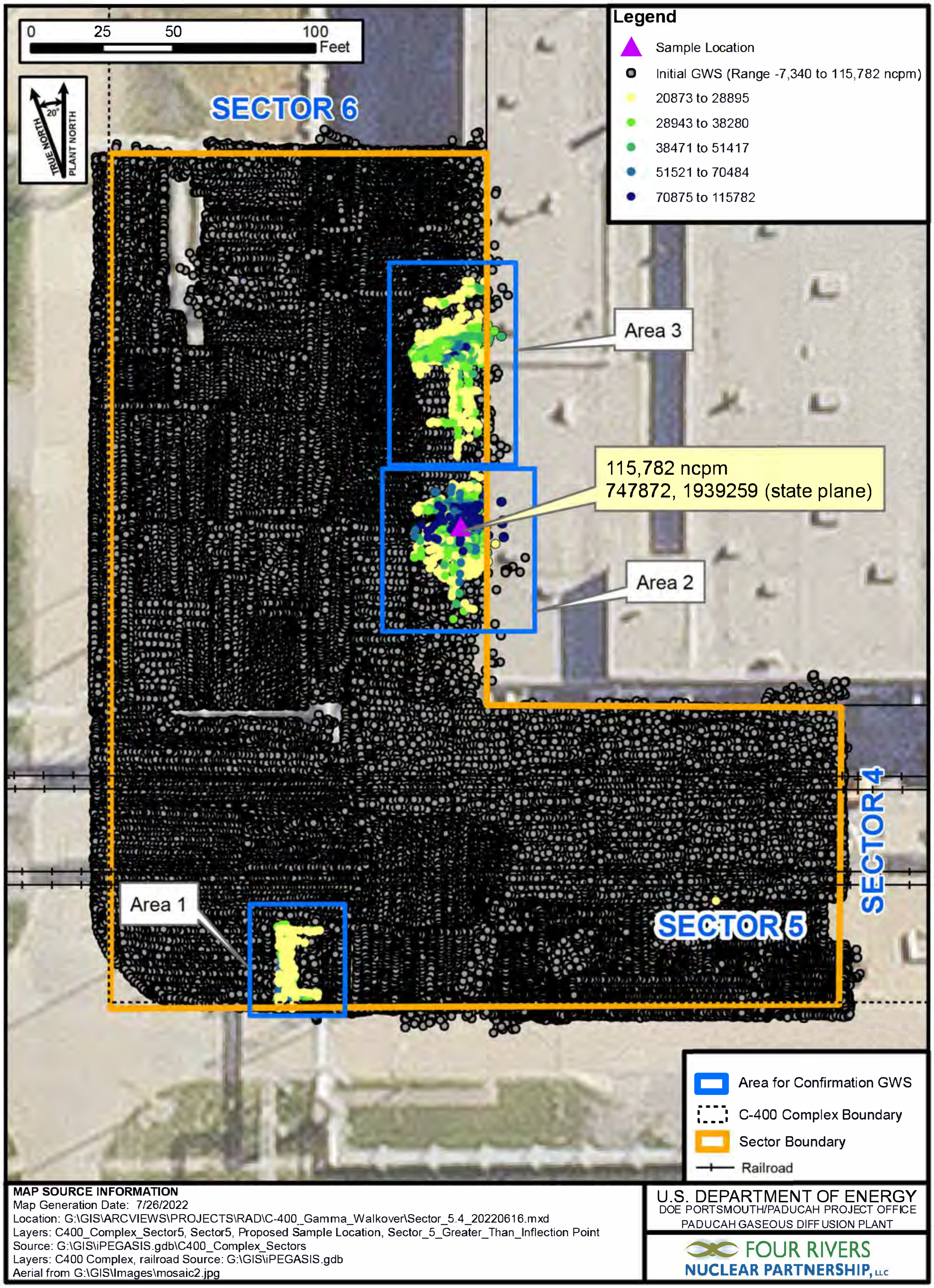


Figure 3.9. Sector 5 Gamma Walkover Survey

Sector 6

Most of Sector 6 was accessible for the GWS, with the exception of an electrical transformer station in the west central portion of the sector. A probability plot of the Sector 6 sodium iodide measurements (ncpm) showing the inflection point is provided in Figure 3.10.

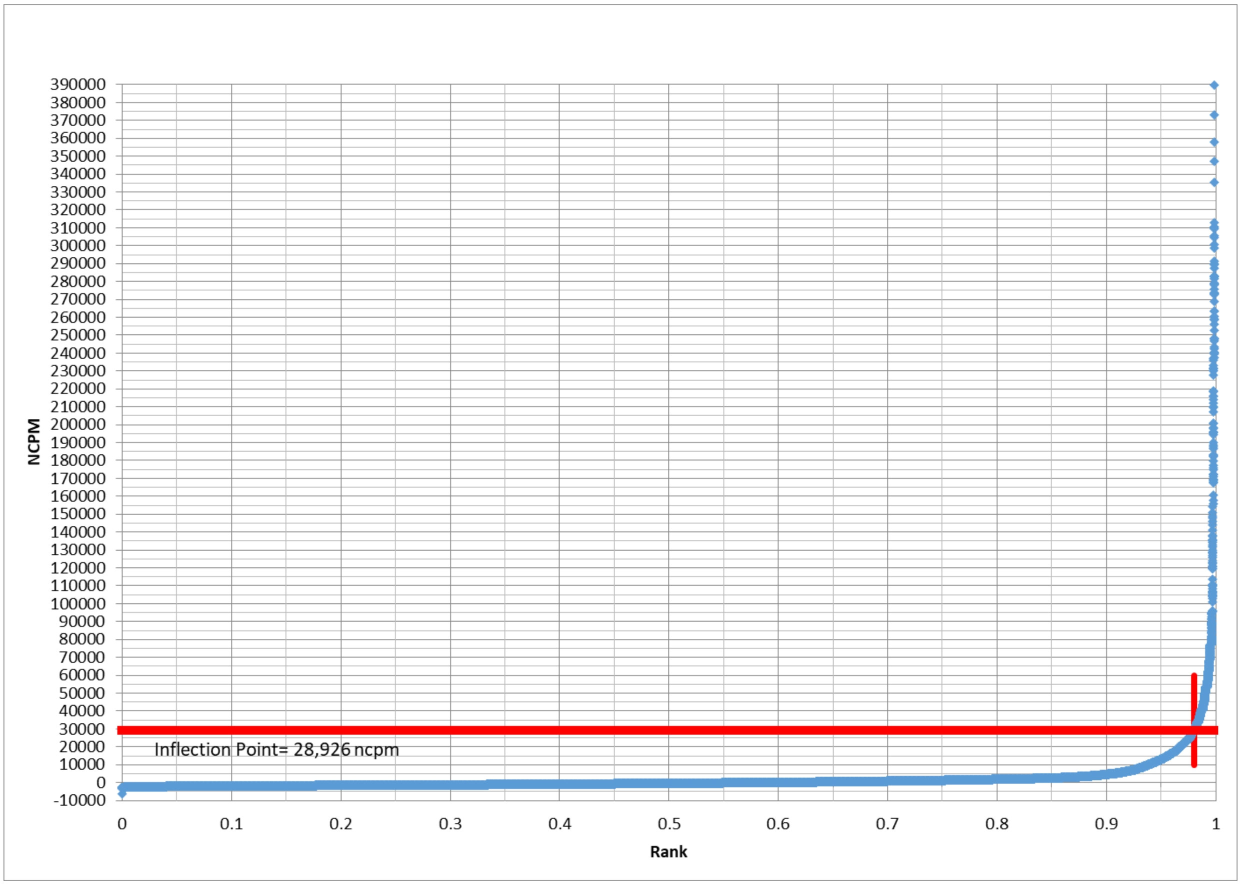


Figure 3.10. Sector 6 Gamma Walkover Probability Plot Showing Inflection Point

There were two areas in Sector 6 with measurements greater than the inflection point; these areas are noted in Figure 3.11. The location with the highest net count rate, and the location selected for biased sampling, was located in the northeastern portion of Sector 6 and adjacent to the C-400 Cleaning Building.

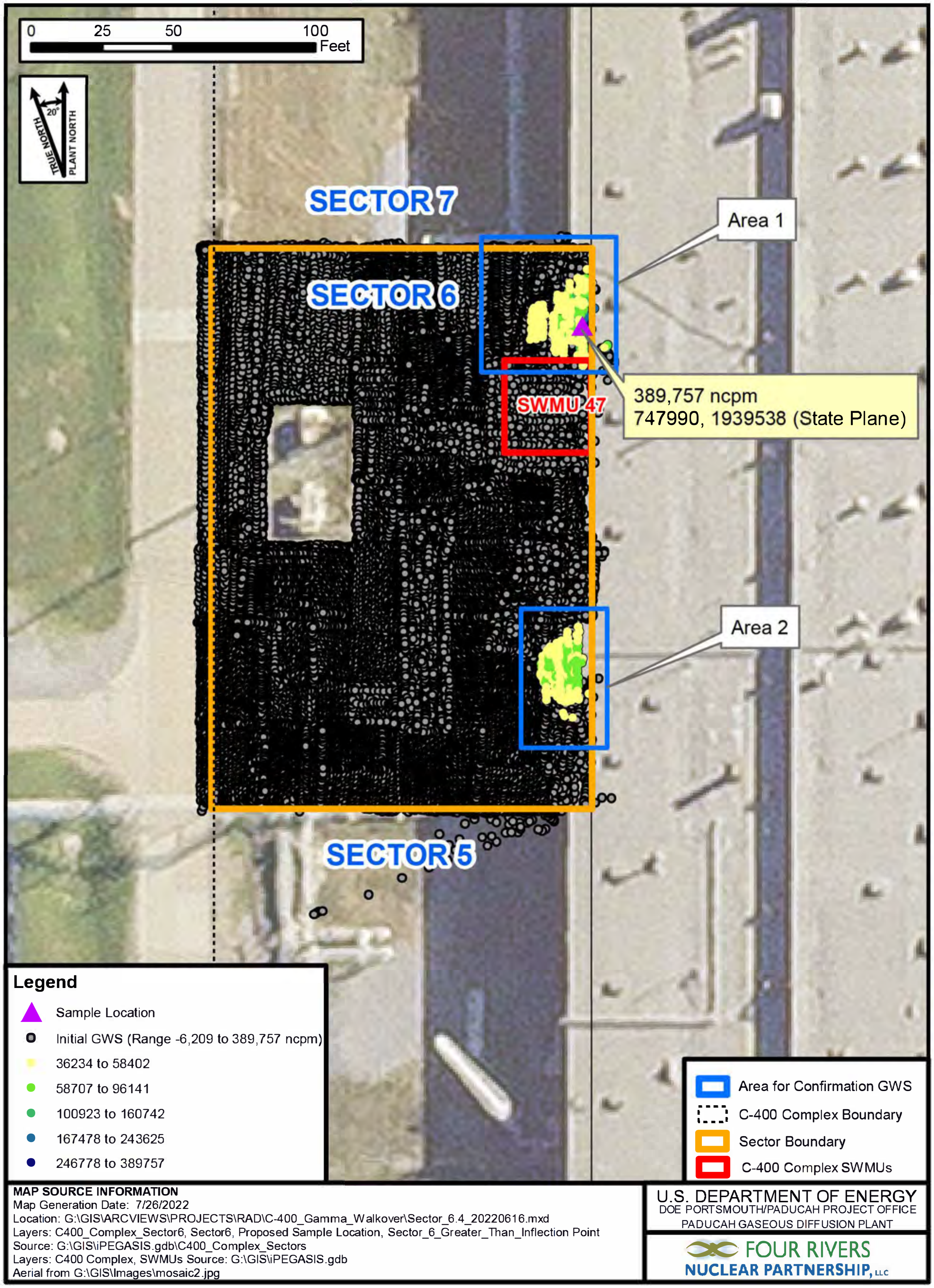


Figure 3.11. Sector 6 Gamma Walkover Survey

Sector 7

All of Sector 7 was accessible for the GWS. A probability plot of the Sector 7 sodium iodide measurements (ncpm) showing the inflection point is provided in Figure 3.12.

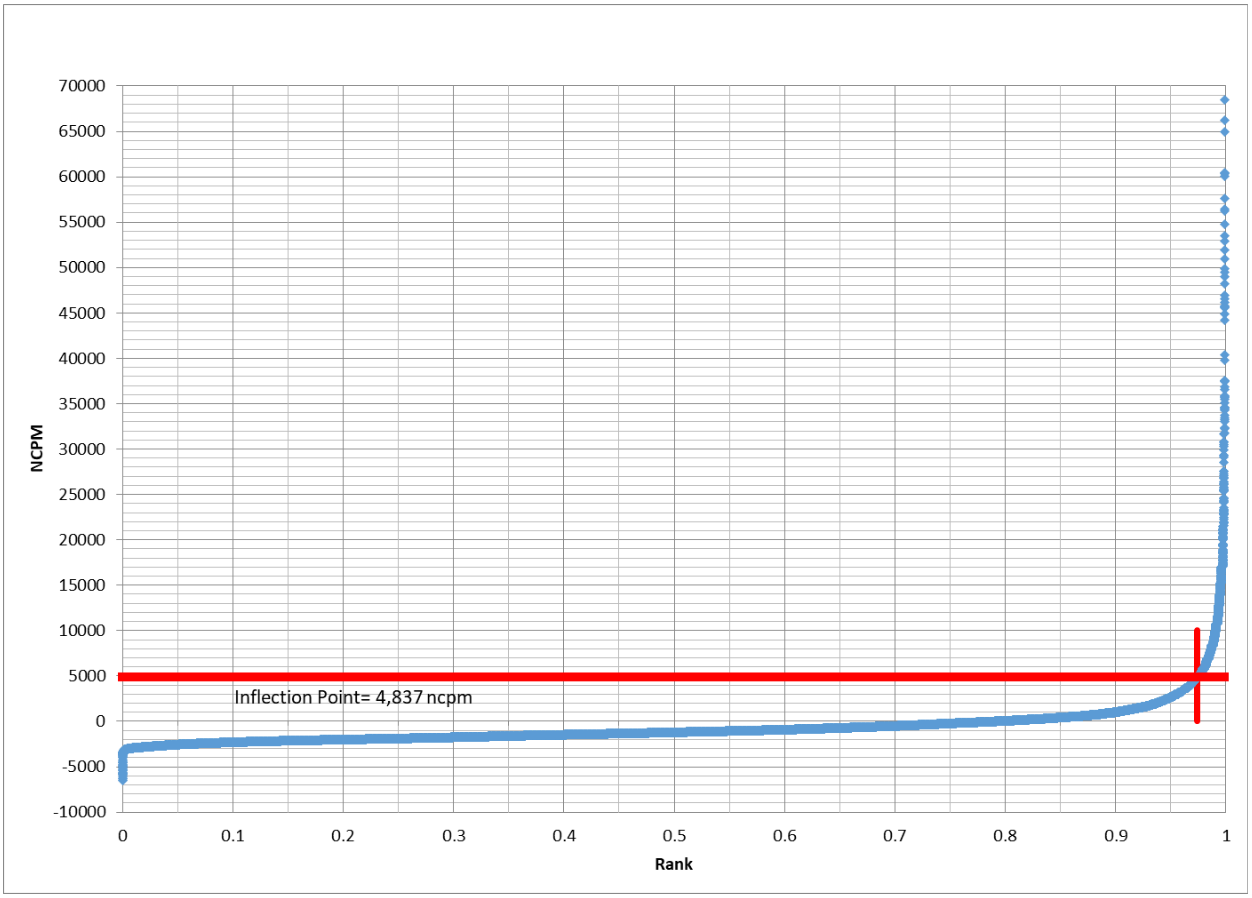


Figure 3.12. Sector 7 Gamma Walkover Probability Plot Showing Inflection Point

There were multiple areas in Sector 7 with measurements greater than the inflection point (the four areas are noted in Figure 3.13). The location with the highest net count rate, and the location selected for bias

3.2.2 Shallow Intrusive Sampling

The general approach to collecting surface soil, shallow soil, and concrete samples at the C-400 Complex is presented in this section. The specific sampling completed in each sector is discussed in Section 3.6.

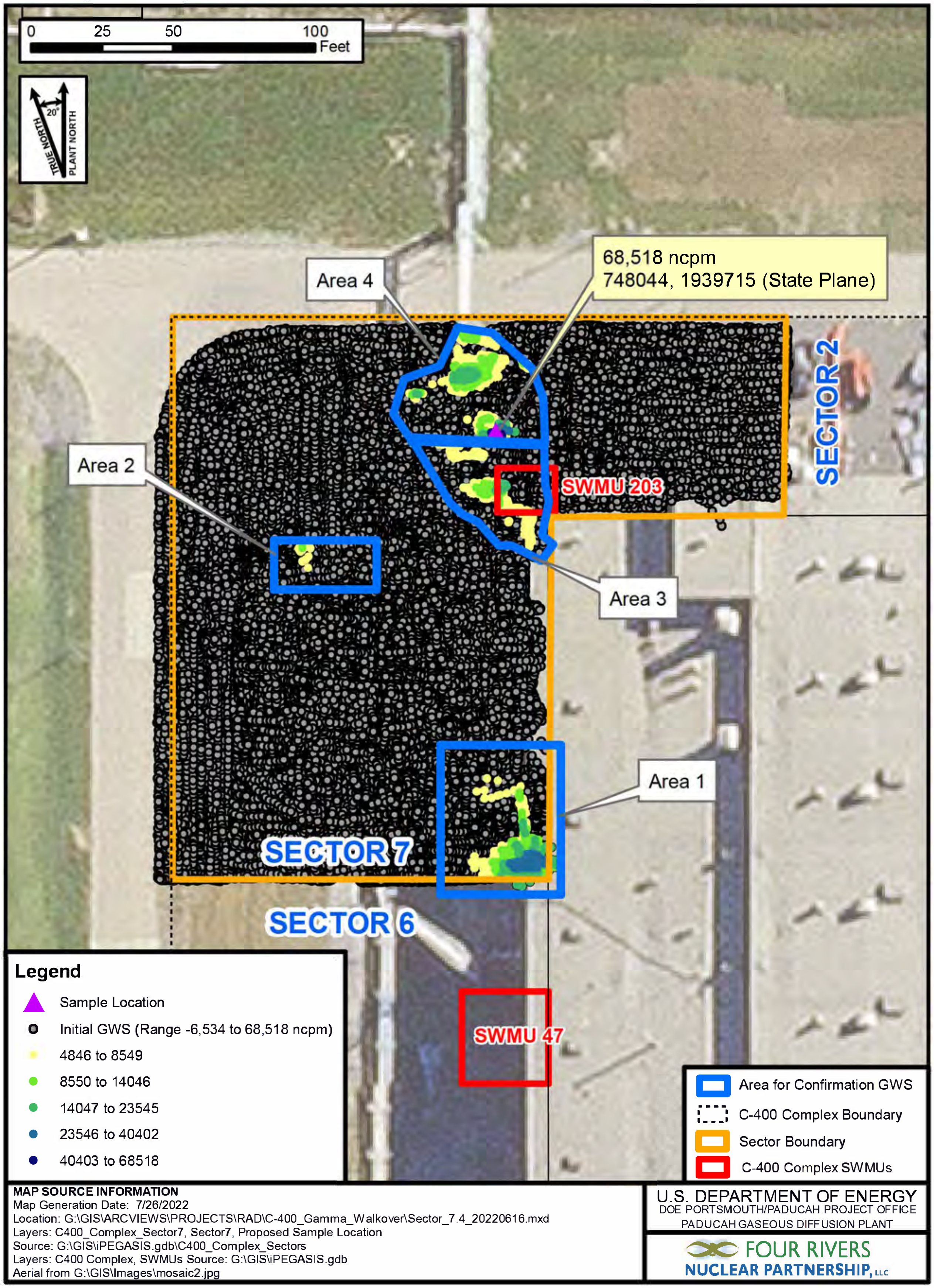


Figure 3.13. Sector 7 Gamma Walkover Survey

3.2.2.1 Gamma walkover survey biased soil sampling

Biased soil samples were collected from each sector based on the locations with the highest radioactivity measurements (Table 3.2). EPA and KDEP provided concurrence with these locations via e-mail on May 17, 2021 and May 20, 2021, respectively. The soil samples were collected from 0–0.5 ft bgs, or where concrete or asphalt were present, from the soil immediately beneath the concrete/asphalt. The samples were then analyzed for the radionuclides listed in Table 3.3. The analytical results for these samples are discussed in Section 4. A technical memorandum in Appendix A of this document provides additional details regarding the GWS, including the determination of the respective biased soil sample location.

Table 3.2. Biased Sample Locations Based on the Gamma Walkover Survey

Sector	Highest Reading in Sector (ncpm)	Coordinates (State Plane) Easting	Northing
2	7,703	748,174	1,939,644
3	247	748,230	1,939,405
4	3,375	747,980	1,939,106
5	115,782	747,872	1,939,259
6	389,757	747,990	1,939,538
7	68,518	748,044	1,939,715

Table 3.3. Analyte List for Biased Soil Samples Based on the Gamma Walkover Survey

Radionuclides	
Americium-241	Technetium-99
Cesium-137	Thorium-230
Neptunium-237	Uranium-234
Plutonium-238	Uranium-235
Plutonium-239/240	Uranium-238

3.2.2.2 Soil and shallow soil grid sampling

Surface soil and shallow soil sampling included grid-based composite sampling, where appropriate. Composite sampling provides an average of the contamination over the grid. Surface soil and shallow soil samples were collected as five-point composites from 50-ft × 50-ft grids following pattern shown in Figure 3.14. Unless otherwise noted, one grab sample was collected from the center of the grid, and four additional grab samples were collected 20 ft from the center point in each cardinal direction (north, south, east, and west). On alternating grids, grab samples were collected from the center of the grid; and four additional grab samples were collected 20 ft from the center point in each secondary direction (northeast, northwest, southeast, and southwest). Along the railroad tracks in Sectors 4 and 5, the surface soil and shallow soil samples were collected as five-point composites from 50-ft long grid areas. In these areas, the five points for each composite were collected from random locations, which were determined using Visual Sample Plan software created by Pacific Northwest National Laboratory for the development of sampling plans. In situations where the individual sample point within the grid was obstructed (e.g., by a concrete slab), the nearest possible location was substituted (PNNL 2015).

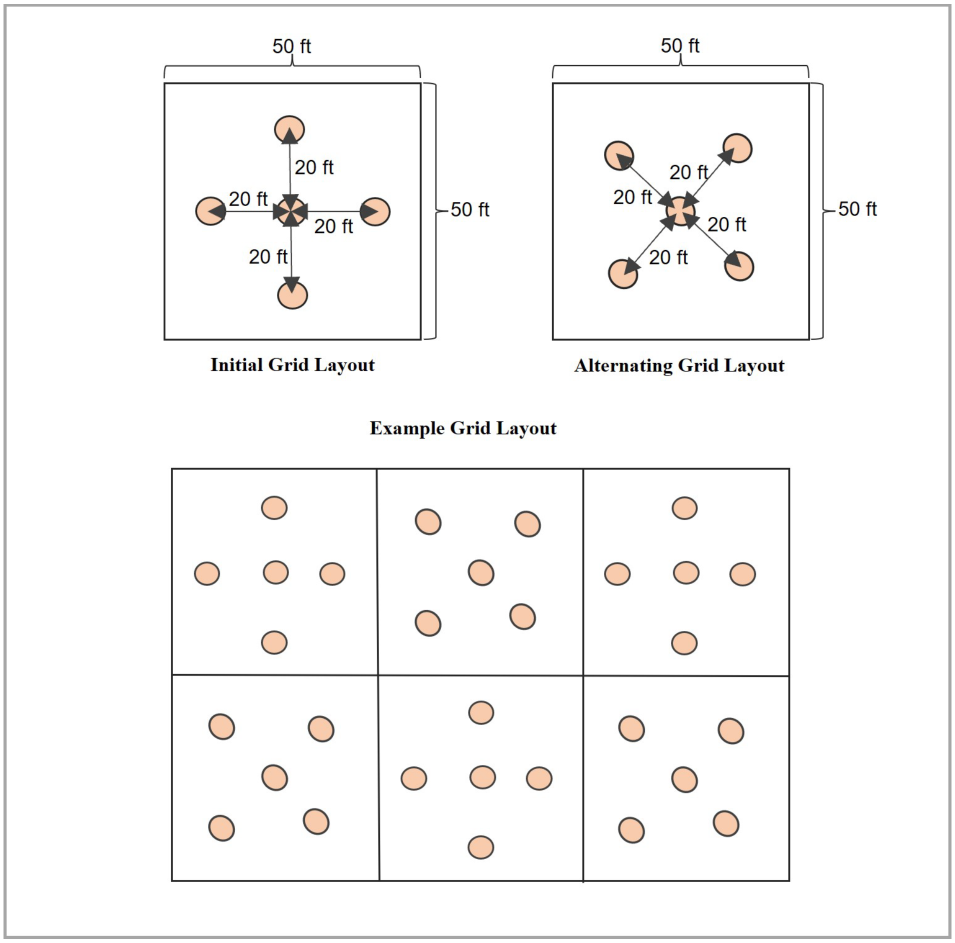


Figure 3.14. Grab Sample Locations within Each Composite Grid

Samples were collected from the surface (0–1 ft bgs) and shallow subsurface (1–4 ft bgs) and were then composited separately (i.e., one composite sample designated for surface; one composite sample was designated for the shallow subsurface for each grid). For compositing, equal volumes from each of the specified sampling locations were obtained. Samples were thoroughly homogenized, and a subsample was collected for analysis.

Each composite sample was analyzed for SVOCs, radionuclides, metals, and PCBs. Samples for VOC analysis were collected from the center location prior to homogenization. The 50-ft long grids along the railroad in Sectors 4 and 5 were additionally analyzed for dioxins/furans and pentachlorophenol.

3.2.2.3 Concrete sampling

Concrete media were sampled based on: (1) defining areas to determine the presence and level of contaminants that could potentially be present in the concrete and (2) evaluating if contamination in the slab is a potential source to the underlying subsurface media. Each concrete sample was analyzed for metals, PCBs, VOCs, SVOCs, and radionuclides.

Concrete samples (other than for PCB analysis) were collected in accordance with CP4-ES-2002, *Sampling of Structural Elements and Miscellaneous Surfaces*. For PCB sampling, concrete collocated with non-PCB concrete cores were collected—consistent with the techniques contained in PCB sampling procedure, *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs)* (EPA 2011). A core barrel sampler was used to remove a sample of the slab prior to drilling the subsurface boring. The concrete samples were size-reduced to fill sample containers. Two samples were obtained from each concrete location. One sample was obtained from the upper portion (thickness depended upon the amount of material necessary for analysis) and the second sample was collected from the lower portion (thickness depended upon the amount of material necessary for analysis) at the sampling location. The upper portion sample was collected to provide indications of the presence of contaminants that may have been released where the sample was obtained. The lower portion sample was collected to provide an indication of whether or not the released contamination could have permeated the concrete thickness and acted as a source of contamination to the soil beneath the slab. Additionally, the presence of contaminants in the lower portion sample provides data to indicate the level of contamination in the volume of the slab.

3.2.2.4 SWMU 98 and SWMU 203 sampling

As discussed in Section 1 of this report, there have been 22 SWMUs identified within the C-400 Complex area. Of the SWMUs present, 15 have been identified as requiring no further action; the remaining 7 SWMUs requiring evaluation in this report include SWMUs 11, 40, 47, 98, 203, 480, and 533. Sufficient data for evaluation is present for many of these SWMUs; however, during scoping meetings, additional characterization was planned for SWMUs 98 and 203 (C-400 Discard Waste System slab and underlying soils).

SWMU 98 is included in the C-400 Complex RI for further evaluation as a potential contributor to soil and groundwater contamination. Sampling of the concrete near the sump, as well as sampling of the sludge in the sump, previously occurred in 2018 under the *Paducah Gaseous Diffusion Plant C-400 Cleaning Building Basement Slab and Subsurface Structures Sampling and Analysis Plan* (DOE 2018c). As documented in the C-400 Complex RI/FS Work Plan, if liquid and/or sludge was present in the basement sump during this RI fieldwork, then a sample(s) would be collected. A liquid sample was collected from the sump in May 2021 and analyzed for metals, radionuclides, and VOCs. This additional sample was used for a qualitative comparison of the liquid sample results taken after initially removing the sludge material in the sump as described in Appendix D of the C-400 Complex RI/FS Work Plan (e.g., does a potential source still exist in the sump, associated piping, and/or contamination potentially infiltrating in from the outside the sump).

SWMU 203 is also included in the C-400 Complex RI for further evaluation as a potential contributor to soil and groundwater contamination. During the RI field work and based on discussions with the FFA parties, an additional sludge sample was collected in September 2021 and soil boring location 400S7-03 was drilled (adjacent to SWMU 203) to provide additional characterization data related to potential releases from the SWMU. The sludge sample was analyzed for metals, radionuclides, SVOCs, and VOCs.

Analytical results for these SWMUs are provided in Section 4 of this report.

3.3 SUBSURFACE SOIL SAMPLING

The general approach to drilling soil borings and collecting subsurface soil samples at the C-400 Complex is presented in this section. The specific sampling completed in each sector is discussed in Section 3.6.

3.3.1 Soil Borings

Subsurface soil samples were collected to represent each of the UCRS HUs (HU1 through HU3), the RGA HU4, and the upper 50 ft of the McNairy Formation. The specific type of drill rig, drill casing sizes, etc., used to collect subsurface soil samples are provided on the boring logs (provided in Appendix D). Field instruments were used to screen soil cores collected from the HUs and McNairy Formation for VOCs and radiological contamination. Samples for VOCs and SVOCs were collected from the soil core interval within the HU, with the highest VOC level as determined by field photoionization detector (PID) readings. Samples for radionuclides and metals were collected from the soil core interval with highest radiological activity. Radiological screening of the soil cores was conducted in accordance with the procedures identified in the C-400 Complex RI/FS Work Plan (DOE 2020).

For sampling in and through the RGA, the primary drill system used was a rotary sonic rig and 4-/6-/7-inch diameter drill string assembly, extruding the 4-inch diameter core in a plastic liner. Once the drill string assembly had been advanced into the Upper McNairy Formation (to a maximum depth of 5 ft), the 7-inch drill string was set to a minimum depth of 5 ft below the top of the McNairy Formation. The 7-inch drill string was used as a temporary isolation casing to prevent downward migration of any pooled DNAPL into the McNairy Formation. Field screening [visual identification, PID measurements of 300 parts per million (ppm) or greater, etc.,] was used as an indicator of TCE DNAPL.

Soil borings were typically terminated at or below the target depth, based on collaborative judgement of the project/field team and as documented in the geologist's project logbook.

Upon completion of sampling in a borehole, with the inner sample system removed, fill/sealing materials were placed in the borehole through the 6-inch drill string or direct-push technology dual-tube casing. For borings that penetrated the McNairy Formation, a sufficient volume of 30%-solids bentonite grout was placed in the bottom of the drill string to fill 110% of the calculated volume of the open borehole in the McNairy Formation. Afterward, the drill strings were retracted to the depth of the top of the McNairy Formation. The drill crew then filled the borehole with 20–30 mesh sand throughout the RGA interval and extended 2 ft up into the overlying HU3 silt/fine sand interval of the UCRS.

A 2–4-ft thick bentonite pellet seal was then placed on top of the sand column. The remainder of the borehole was sealed with a cement-bentonite slurry American Petroleum Institute Class A or B neat cement with no additives tremied through the drill string, as the drill string was recovered.

When the soil core was brought to the surface, the core was laid out in a top-to-bottom order on a table. While the soil core remained within the sample liner or the core remained in the sampling equipment, the sample liner/sampling equipment was radiologically scanned with hand-held instruments to identify any occurrences of radiological contamination that required special handling.

Upon release of the soil core by the radiological control technician, the total recovered core length was measured and recorded, then the plastic soil core liner was cut open, or the core was removed from the soil sampling equipment. The soil core was split length-wise to reveal the soil texture and provide a clean surface for radiological scans and sample collection; then one of the soil core halves was covered with aluminum foil.

Concurrent with radiological scans of the soil core, the covered soil core was scanned for offgas VOCs levels at the 0.5-ft depth intervals by piercing the aluminum foil sheeting and underlying core with an awl and using a field PID capable of detection of VOCs at parts per billion (ppb) levels. The PID readings were documented and the VOC sample area (intended as highest offgas VOC levels in the core) was identified. A VOC sample was collected immediately and stored in an iced cooler. In cases where VOC levels were consistent throughout the soil core, direct observation (discrete color, odor, or sand texture) was used to determine the sample depth.

The depth interval of each HU was assigned by observation of the soil core. VOC samples were collected from each soil core with a single VOC sample retained (based on the highest PID reading) for each HU and submitted for laboratory analysis. Other VOC samples that were collected but not submitted were disposed of with the waste soils. Samples for SVOC analysis were collected from the soil core adjacent to the depth of the VOC sample and stored in an iced cooler. Samples were collected for radionuclide analysis from the depth interval in each HU with highest alpha/beta activity (indicator of technetium-99). In cases where a hotspot of gamma activity (indicator of uranium) was observed, a second sample for radionuclide analysis was collected at that depth. Samples for metals analysis were collected from the soil core adjacent to the radionuclides sample. In cases where a gamma activity hotspot was present, the sample for metals analysis was collected at that depth. Additional samples were taken in ongoing sample borings based on observations by the project/field team and were collected using the methods described in the C-400 Complex OU RI/FS Work Plan for the same matrix types (DOE 2020). The readings from the VOC and radioactivity scans and any other criterion used to select the sample interval(s) were documented on project forms.

In the McNairy Formation, subsurface soil samples were collected for the full suite analyses at depths of 0, 10, and 20 ft below the top of the McNairy Formation in approximately half of the McNairy Formation borings. In 17 defined McNairy Formation boring locations, soil samples were collected for analysis at depths of 0, 10, 20, 35, and 50 ft below the top of the McNairy Formation. At five select locations (four locations determined during scoping and one location determined in the field), additional McNairy Formation soil samples were collected for VOC analysis at depths of 0, 1, 2, 3, 4, 6, 10, and 20 ft below the top of the McNairy Formation. The primary goal of these Upper McNairy Formation samples was to better characterize the distribution of TCE in the uppermost McNairy Formation. The core was described geologically following sampling.

To address potential data gaps, contingency boring locations, depths, and sample collection intervals were based upon the results of the defined sample borings, results of the MIP borings, results of the dye-enhanced laser induced fluorescence (DyeLIF) borings, and other data.

DOE proposed 22 contingency boring locations and the FFA parties participated in the review of the analytical results from soil and groundwater samples and provided concurrence on the proposed locations (Table 3.4). The information needed from contingency borings (contaminants to be analyzed, termination depths, etc.), as well as the rationale for the proposed boring locations, were discussed by the FFA parties. The locations of the contingency borings are discussed in the sector-by-sector sampling in Section 3.6. Contingency borings 400S1A-C09, 400S1A-C10, 400S1D-C11, 400S1D-C17, and 400S4-C22 were angled borings drilled at either 30 degrees or 45 degrees to target sampling beneath the basement in Sector 1A. The southern side of Tennessee Avenue was the southern edge of the investigation area for MIP, DyeLIF, and/or contingency borings for TCE source zone delineation.

Table 3.4. Dates of Regulatory Concurrence on Proposed Supplemental Borings

Date of Regulatory Concurrence	Contingency Borings	MIP Borings	DyeLIF Borings
6/3/2021		MIP1–MIP4, MIP6 (MIP5 delayed to later date)	
6/17/2021		MIP7–MIP9, MIP11–MIP13 (MIP10 delayed to later date)	
7/8/2021		MIP5, MIP14–MIP17	
7/23/2021		MIP18–MIP22	
8/5/2021	CB1–CB3		
8/12/2021	CB4–CB5	MIP10, MIP23–MIP30[a]	DyeLIF1–DyeLIF3
8/26/2021			DyeLIF4–DyeLIF8[b]

Table 3.4. Dates of Regulatory Concurrence on Proposed Supplemental Borings (Continued)

Date of Regulatory Concurrence	Contingency Borings	MIP Borings	DyeLIF Borings
9/16/2021	CB6–CB8	MIP31–MIP33	DyeLIF9–DyeLIF11[b]
9/30/2021	CB9–CB11	MIP34	DyeLIF12–DyeLIF13
10/14/2021	CB12–CB17	MIP35–MIP36	DyeLIF14
10/29/2021	CB18–CB19		
11/10/2021	CB20–CB22		
Total	**22**	**36**	**14**

[a] MIP30 included six separate pushes to approximately 20 ft depth.
[b] DyeLIF8 included four separate pushes to approximately 30 ft depth and DyeLIF11 included two separate pushes to approximately 60 ft depth.

3.3.2 MIP and DyeLIF Profile Borings

The RI fieldwork included downhole profile surveying using both MIP and DyeLIF tooling to provide additional characterization of VOCs in the dissolved-phase and as DNAPL. These tools offer continuous downhole profiles of dissolved TCE levels in groundwater (MIP) and residual TCE DNAPL in soil (DyeLIF). During the course of fieldwork, DOE proposed MIP and DyeLIF boring locations with rationale for the locations and the FFA parties participated in the review of analytical results from soil and groundwater samples to assist in locating the MIP and/or DyeLIF borings (Table 3.4). As with the contingency borings, the southern side of Tennessee Avenue was the southern edge of the investigation area for MIP and DyeLIF borings.

MIP and DyeLIF borings were advanced to the base of the RGA and up to 1 ft deep into the McNairy Formation without a temporary isolation casing. Where the MIP or DyeLIF tooling was advanced deeper (> 1 ft into the McNairy Formation), the MIP/DyeLIF tooling was retrieved, and a 3-inch to 5-inch rotary sonic drill string assembly was advanced over the MIP hole to the depth of the top of the McNairy Formation. Beginning at the depth of the top of the McNairy Formation, the drill crew advanced the 5-inch diameter drill string, without the addition of water and by downforce only, for a minimum of 5 ft. The 5-inch drill string was used as temporary isolation casing.

Following drilling, the drill crew cleaned out the hole to the top of the McNairy Formation with the 3-inch drill string assembly and then extracted the 3-inch tooling. The MIP tooling then was set to the depth of the top of the McNairy Formation, through the 5-inch diameter sonic drill string, and advanced to the targeted depth of investigation or depth of refusal. Upon completion of the MIP/DyeLIF profile, the MIP/DyeLIF tooling was withdrawn, and the driller sealed the borehole through the 5-inch diameter drill string using the same steps used for soil borings. The electrical conductivity log of the MIP tool and the hydraulic profiling log of the DyeLIF tool were used to identify the depth of the top of the McNairy Formation in the field.

The number and locations of additional MIP borings were determined based on the results of the soil and groundwater data and initial MIP profiles. MIP profile borings were completed at 36 locations (one location, 400-S05-MIP30, included six separate profile borings to a depth of approximately 20 ft). DyeLIF profile borings were completed at 14 locations (location 400-S05-DL08 included four separate pushes to approximately 30 ft depth and location 400-S1B-DL11 consisted of two separate pushes to approximately 60 ft depth). Locations of MIP and DyeLIF profile borings are discussed in Section 3.6.

To aid in an attempt to quantitatively correlate the MIP and DyeLIF results to laboratory data, the project characterized VOC levels in soil and groundwater in two sample borings located in Sector 4 from near land surface down to the upper 20 ft of the McNairy Formation (a depth of approximately 110 to 120 ft bgs).

Correlation boring 400S4-98 was located in the vicinity of sample location 400S4-12, and 400S4-99 was located in the vicinity of MW407, with groundwater results commonly greater than 1,000 µg/L. Forty-one soil samples (including duplicates) were collected from boring 400S4-98 (total depth of 115 ft bgs), and 42 soil samples (including duplicates) were collected from boring 400S4-99 (total depth of 114 ft bgs) to assist with the correlation. The first MIP and DyeLIF profile borings were completed in close proximity to these borings. Two borings (400S4-96 and 400S4-97) were sampled through the RGA for VOC analyses. MIP measurement correlation to TCE concentrations in soil was attempted with other soil borings located within 20 ft of the MIP boring. In addition to these borings, MIP measurement correlation to TCE concentrations in groundwater was also evaluated with soil borings where groundwater grab samples were collected located within 50 ft of the MIP profile boring.

Both Pearson and Spearman rank correlation methods were used to determine if the MIP values could be correlated to analytical data for TCE in soil and groundwater to enable the use of the MIP data quantitatively. The Pearson correlation method is the most widely used correlation method to measure the degree of the relationship between linearly related variables. The Spearman rank correlation method is a nonparametric test based on ranked values that were used to measure the degree of association between two variables. Results of the correlation efforts between all depth-discrete TCE analyses in correlation pairs of soil borings[13] and same-depth PID results in nearby MIP borings for soil and groundwater are provided in Tables 3.5 and 3.6, respectively. For both soil and groundwater, the correlation results indicate considerable variability and uncertainty in predicting quantitative soil and/or groundwater concentrations based on MIP measurements. The distance between the MIP profile boring and the paired soil boring with analytical data has no control on the correlation coefficient. Figure 3.15 shows a comparison of the MIP values to the TCE analyses from the laboratory for the closest paired borings (400-S04-MIP01 and 400S4-99). Correlation was also evaluated for soil < 30 ft depth (unsaturated) and soil > 30 ft depth (saturated) from the paired borings with mixed results (Table 3.5). Tables 3.5 and 3.6 are sorted by the distance between the MIP boring and the paired soil boring. Figure 3.16 shows the locations of the MIP borings in relation to the paired soil borings presented in Tables 3.5 and 3.6. Additional information on the correlation effort is in Appendix A. Because of this uncertainty, the MIP profiles were used qualitatively to provide additional lines of evidence for determining the extent of potential DNAPL source zones (MIP values > 7.00E+05 µV are considered a potential indicator of DNAPL and/or high concentrations of TCE, and are evaluated further).

Table 3.5. MIP Soil Correlation to TCE Analytical Data

Pair #	MIP Boring	Paired Soil Boring	Distance (ft)	Pearson's Correlation		Spearman Correlation	
				Corr. Coeff.	p Value	Corr. Coeff.	p Value
1	400-S04-MIP01	400S4-99	1.4	0.52	0.000	0.58	0.000
2	400-S04-MIP28	400S4-96	3.8	0.34	0.310	-0.22	0.510
3	400-S1A-MIP11	400S1A-23	4.7	-0.07	0.934	-0.80	0.200
4	400-S04-MIP14	400S4-12	4.9	0.98	0.000	-0.18	0.587
5	400-S04-MIP03	400S4-12	10	-0.21	0.482	-0.40	0.181
6	400-S05-MIP06	400S5-08	10.6	0.91	0.031	0.30	0.624
7	400-S02-MIP09	400S2-07	14.7	-0.24	0.696	-0.30	0.624
36	400-S04-MIP14	400S4-98	15.4	0.52	0.000	-0.06	0.690
8	400-S1B-MIP25	400S1B-09	17.3	0.33	0.257	0.37	0.193
9	400-S1A-MIP23	400S1A-23	18.3	-0.42	0.584	-0.40	0.600

13 For the correlation efforts, nondetect results were set to one-half their reporting value for the Pearson correlation, and nondetect results were set to zero for the Spearman rank correlation.

Table 3.5. MIP Soil Correlation to TCE Analytical Data (Continued)

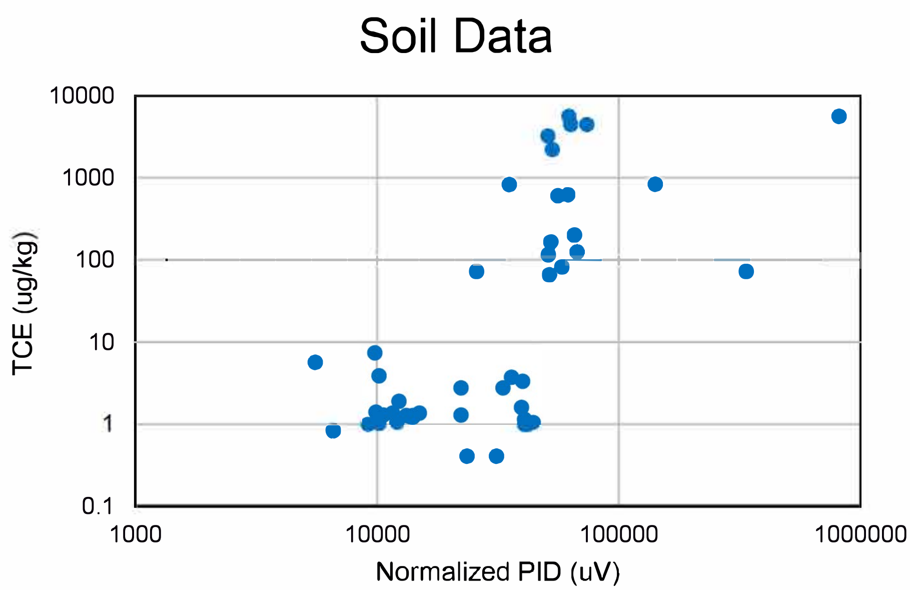
Pair #	MIP Boring	Paired Soil Boring	Distance (ft)	Pearson's Correlation		Spearman Correlation	
				Corr. Coeff.	p Value	Corr. Coeff.	p Value
10	400-S04-MIP15	400S4-12	19	0.76	0.002	0.64	0.018
11	400-S1B-MIP24	400S1B-24	19	0.83	0.005	0.71	0.031
12	400-S1B-MIP33	400S1B-04	19.6	-0.07	0.932	0.20	0.800
NA	Soil < 30 ft depth (unsaturated)			0.72	N/A	0.44	N/A
NA	Soil > 30 ft depth (saturated)			-0.004	N/A	0.29	N/A

Shading indicates correlation coefficients (Corr. Coeff.) > 0.50.

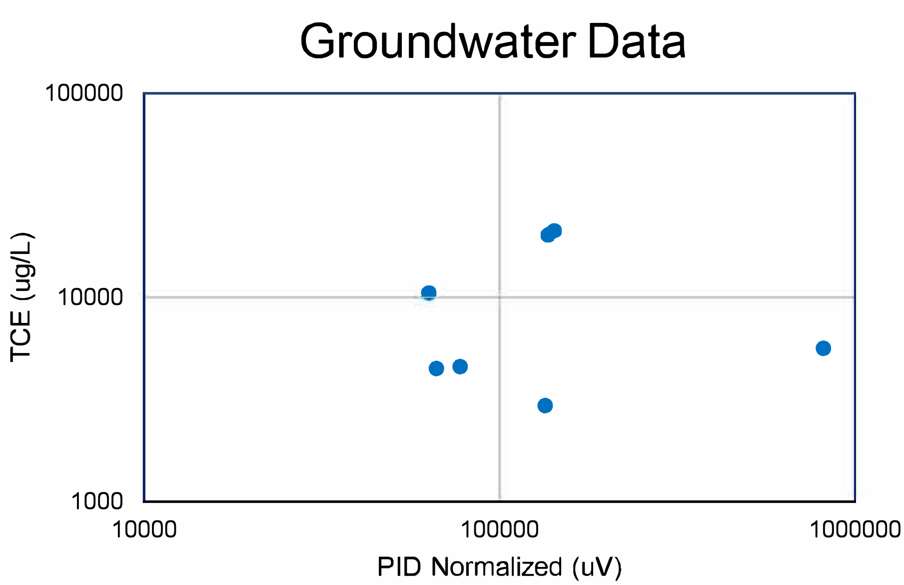
Table 3.6. MIP Groundwater Correlation to TCE Analytical Data

Pair #	MIP Boring	Paired Soil Boring	Distance (ft)	Pearson's Correlation		Spearman Correlation	
				Corr. Coeff.	p Value	Corr. Coeff.	p Value
1	400-S04-MIP01	400S4-99	1.4	-0.17	0.710	0.36	0.432
4	400-S04-MIP14	400S4-12	4.9	0.32	0.600	-0.10	0.873
5	400-S04-MIP03	400S4-12	10	-0.71	0.179	-1.00	0.000
8	400-S1B-MIP25	400S1B-09	17.3	0.89	0.044	0.90	0.037
10	400-S04-MIP15	400S4-12	19	-0.50	0.394	-0.20	0.747
14	400-S1B-MIP12	400S1B-09	22	0.80	0.104	0.70	0.188
15	400-S04-MIP26	400S1B-09	22	-0.98	0.005	-0.70	0.188
18	400-S04-MIP02	400S1B-09	26	0.99	0.001	0.90	0.037
26	400-S04-MIP29	400S4-17	32	0.18	0.767	-0.30	0.624
27	400-S04-MIP05	400S4-17	34	0.78	0.119	0.70	0.188
32	400-S04-MIP27	400S4-12	36	-0.66	0.222	-0.60	0.285
35	400-S04-MIP16	400S4-12	47	-0.05	0.935	0.30	0.624
36	400-S04-MIP14	400S4-98	15.4	0.20	0.672	0.11	0.819
38	400-S1A-MIP23	400S1A-03	25	0.12	0.842	0.60	0.285

Shading indicates correlation coefficients > 0.50.



Pearson Correlation Coefficient: 0.52
Spearman Correlation Coefficient: 0.58



Pearson Correlation Coefficient: -0.17
Spearman Correlation Coefficient: 0.36

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Figure 3.15. Correlation between 400-S04-MIP01 and Boring 400S4-99

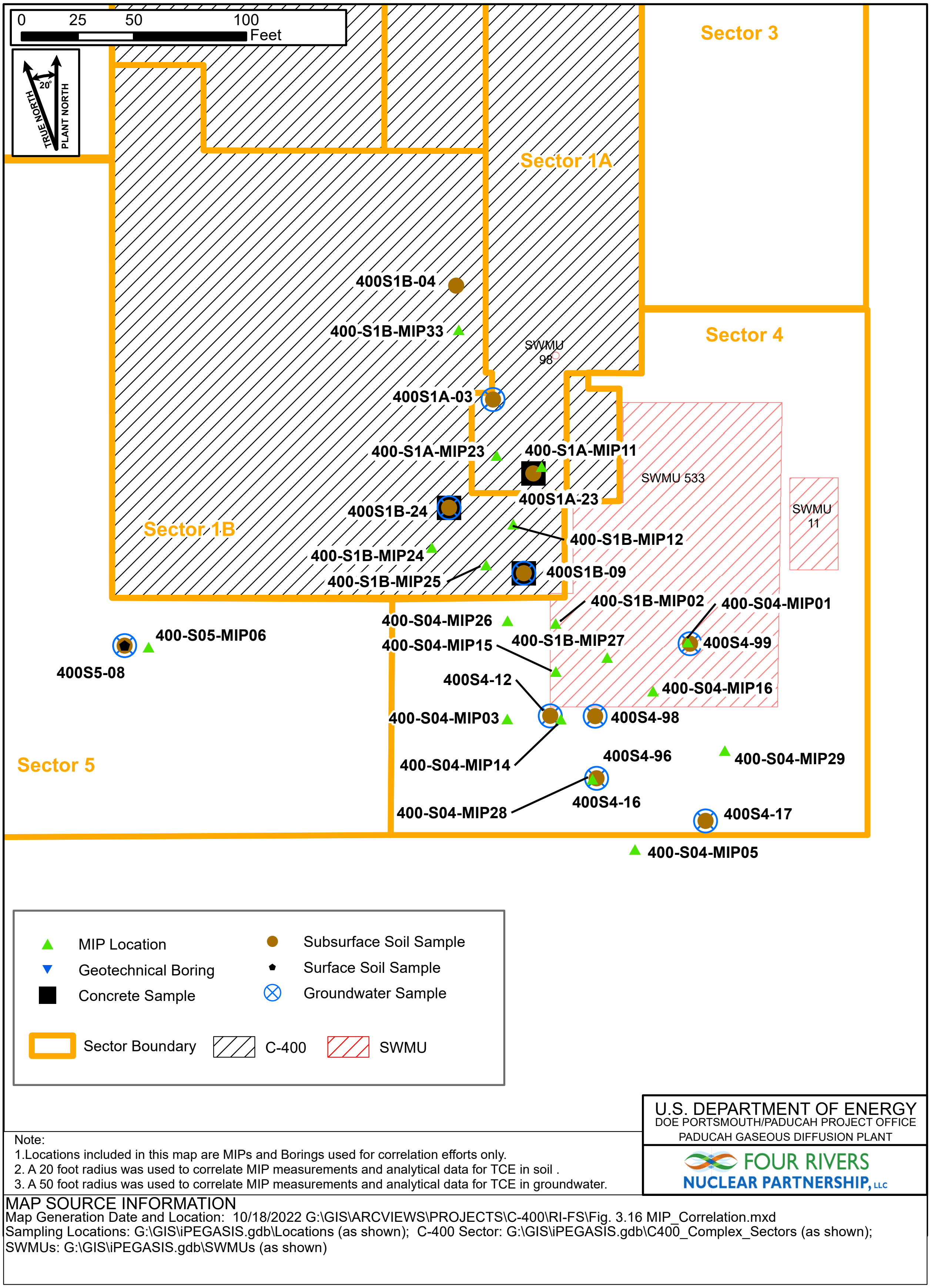


Figure 3.16. MIP Correlation Borings

Statistical DyeLIF correlation with laboratory analytical data was not attempted, and the DyeLIF results are considered to provide a semi-qualitative indicator of DNAPL in the subsurface.

Estimating a "threshold" for positive DNAPL response is difficult; however, based on past project and lab experience, any Signal % relative emittance (RE) above 10% RE generally indicates DNAPL exists with confidence. Responses between 0% and 5% RE do not provide confident indicators of DNAPL. Responses between 5% and 10% RE are suspect for potential for DNAPL, and responses > 10% RE were considered confident that DNAPL is present unless another line of evidence indicated otherwise. Additional information regarding DyeLIF data interpretation is found in Appendix A.

3.3.3 Lithologic Descriptions

Soil boring logs were prepared for each soil boring drilled for the C-400 Complex RI in accordance with CP4-ES-2303, *Borehole Logging*. The description of the physical appearance of the soils sampled including depth, color, grain size, and texture were documented to facilitate development of a three-dimensional model of the subsurface sediments. The cores of each soil boring were also documented in photographs. Soil boring logs and photo logs are provided in Appendix D.

3.4 GROUNDWATER SAMPLING

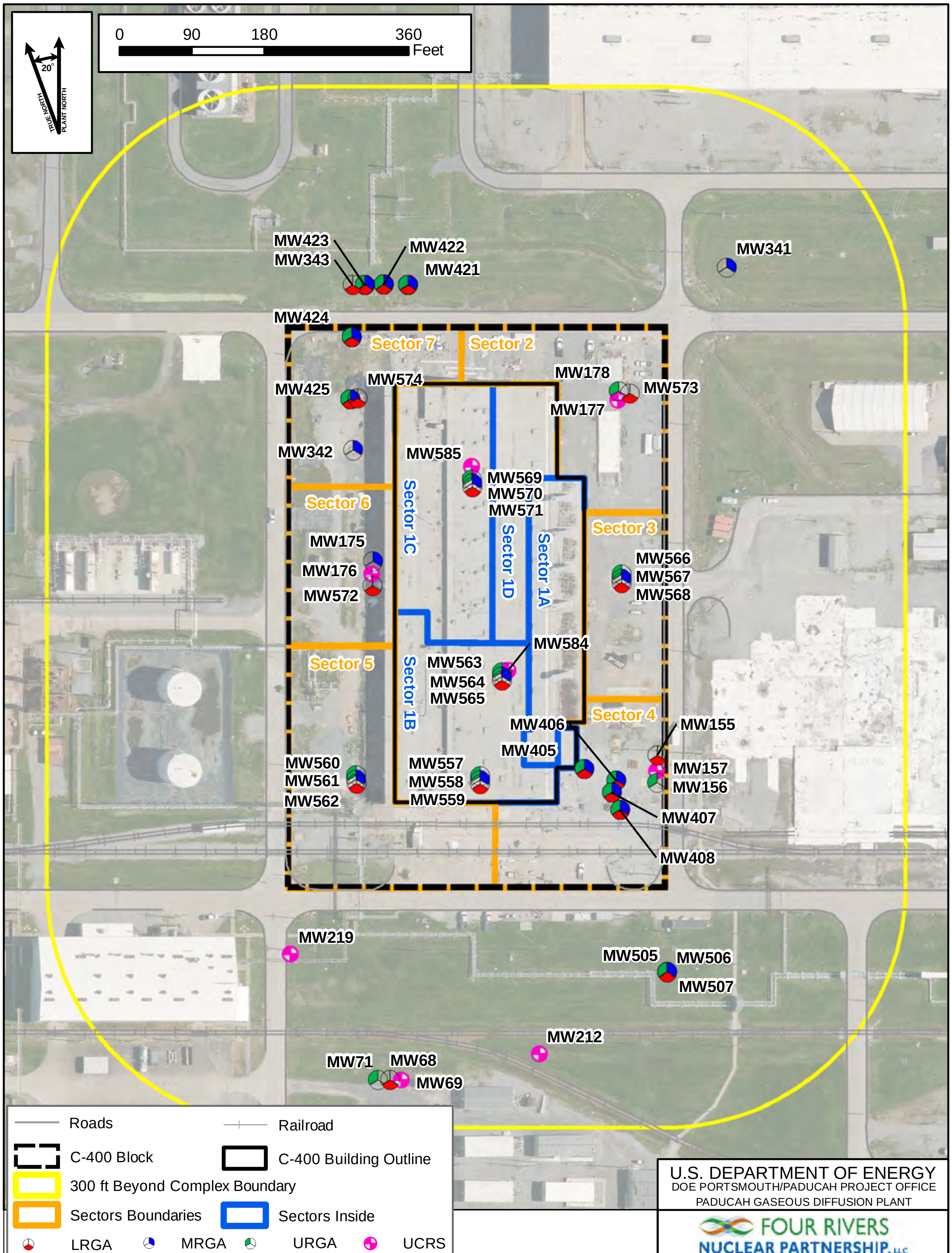
3.4.1 Collection of Groundwater Grab Samples

Soil borings were also used to collect grab groundwater samples within the RGA and/or the McNairy Formation at 62 locations. One hundred sixty-five grab samples were collected from the RGA and 53 were collected from the McNairy Formation (refer to Sections 2.5 and 2.6 for the range in depths of these HUs across the C-400 Complex). Groundwater samples were collected in accordance with CP4-ES-2101, *Groundwater Sampling*. RGA and McNairy Formation groundwater grab samples from boreholes were analyzed for TCE, TCE degradation products, technetium-99, PCBs, and PAHs. Unfiltered groundwater samples were analyzed for TCE and TCE degradation products. Both filtered and unfiltered groundwater samples were analyzed for PCBs, PAHs (both used to identify source zone delineation as a positive bias), and technetium-99 (used for source zone delineation). No metals or radionuclides, with the exception of technetium-99, were analyzed in groundwater grab samples from boreholes. Locations of soil borings where groundwater samples were collected are discussed in Section 3.6.

Discrete groundwater grab samples were collected as each water sample depth was reached. A water-level indicator was placed down the boring to determine the depth of the water level. Once the groundwater level stabilized or 15 minutes (whichever occurred first), the sampling crew purged the water column in the drill string with a pump. After the water level recovered, the sample crew purged the water column until the suspended solids content was noticeably reduced. If after five wetted drill volumes had been purged and the suspended solids content was not noticeably reduced, then it was documented. After attempting to reduce suspended solids, sampling commenced.

The UCRS is largely unsaturated beneath the C-400 Complex; therefore, no samples of UCRS groundwater were collected for this RI other than from existing UCRS MWs at the C-400 Complex that were capable of providing sufficient water.

In addition to groundwater grab samples being collected from soil borings, groundwater samples were collected from selected existing MWs located within 300 ft of the C-400 Complex boundary and newly constructed MWs in the C-400 Complex described below. Figure 3.17 shows the existing MWs within 300 ft of the C-400 Complex boundary and the newly constructed MWs in the C-400 Complex.



MAP SOURCE INFORMATION
Map Generation Date and Location: 8/30/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\C400Complex_RMonitoringWells.mxd
Roads: G:\GIS\iPEGASIS.gdb\roadrow; Facilities: G:\GIS\iPEGASIS.gdb\Facilities (as shown);
C-400 Block: G:\GIS\iPEGASIS.gdb\C400_Block; Sectors: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors;
Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown)

Figure 3.17. C-400 Complex RI Monitoring Wells

3.4.2 Rehabilitation of Existing Monitoring Wells

This report incorporates data from existing MWs located within 300 ft of the C-400 Complex boundary (Figure 3.17). Table 3.7 summarizes the construction details of the existing groundwater MWs evaluated for this project. These wells, in conjunction with the newly installed MWs, provided the opportunity to collect groundwater samples that were used quantitatively compared to the borehole grab samples that were used qualitatively. Some of the multi-port wells near the southeast corner of the C-400 Cleaning Building had experienced mechanical failure in the past and were assessed to determine which ports could be sampled as part of the RI. Many of the ports from the multi-port wells were able to be sampled for the RI; however, several experienced difficulties during sampling and no sample could be collected. Information on rehabilitation efforts and usability for sampling of the existing MWs is provided in a technical memorandum in Appendix A.

3.4.3 Installation of New Monitoring Wells

Five RGA MW clusters (with well screens in the upper, middle and lower HU5) were installed within the C-400 Complex (Table 3.8). The locations of the new wells are provided in Figure 3.17. The new MW clusters include MW557–MW559, MW560–MW562, MW563–MW565, MW566–MW568, and MW569–MW571. In addition, MW572 (LRGA) was installed adjacent to MW175 (west side of the C-400 Cleaning Building footprint), MW573 (LRGA) was installed adjacent to MW178 (northeast corner of the C-400 Complex), and MW574 (URGA) was installed adjacent to the MW425 well nest. The new wells were constructed with 4-inch diameter, stainless steel casings, and 5-ft length screens. The new MW locations were selected based on areas of higher contamination and to form a triangulated irregular network under the C-400 Cleaning Building using the existing MWs where available, with the focus on the south end of the building where TCE DNAPL is in the RGA.

Table 3.7. Previously Existing Monitoring Well Construction Information

Well ID	Screened Zone	Year Installed	Riser and Screen Material	Riser and Screen Diam[a]	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Monument Elevation[b] (ft amsl)	Datum Elevation (ft amsl)	Datum
MW68	LRGA	1986	Stainless Steele (SLS)	2	97.40	102.40	377.17	379.82	Well Wizard Plate (WWP)
MW69[c]	UCRS	1986	SLS	2	33.30	38.30	376.97	379.72	WWP
MW71	URGA	1986	SLS	2	67.10	72.10	377.11	379.84	WWP
MW155	LRGA	1990	SLS	2	87.00	92.00	379.164	381.57	Top of Casing
MW156	URGA	1990	SLS	2	63.00	70.00	379.564	382.41	Top of Casing
MW157[c]	UCRS	1990	SLS	2	30.00	35.00	379.17	382.11	Top of Casing
MW175	MRGA	1991	SLS	2	75.00	80.00	378.2	381.51	Top of Casing
MW176[c]	UCRS	1991	SLS	2	32.50	37.50	378.84	381.90	Top of Casing
MW177[c]	UCRS	1991	SLS	2	39.50	44.50	377.41	380.07	Top of Casing
MW178	URGA	1991	SLS	2	62.50	67.50	376.95	379.17	Top of Casing
MW212	UCRS	1992	Polyvinyl Chloride (PVC)	2	35.86	45.86	376.25	379.41	Top of Casing
MW219	UCRS	1992	PVC	2	36.78	46.78	377.37	379.85	Top of Casing
MW341	MRGA	1998	SLS	2	75.50	85.50	377.95	380.52	Top of Casing
MW342	MRGA	1998	SLS	2	75.40	85.10	377.53	380.18	Top of Casing
MW343	LRGA	1998	SLS	2	75.40	85.10	375.15	377.53	Top of Casing
MW405-PRT1[c]	UCRS	2002	SLS	West Bay Construction (WB)[d]	36.00	38.00	379.47	378.38	Top of Casing
MW405-PRT2	URGA	2002	SLS	WB	60.00	62.00	379.47	378.38	Top of Casing
MW405-PRT3	URGA	2002	SLS	WB	66.00	68.00	379.47	378.38	Top of Casing
MW405-PRT4	URGA	2002	SLS	WB	72.00	74.00	379.47	378.38	Top of Casing
MW405-PRT5	MRGA	2002	SLS	WB	80.00	82.00	379.47	378.38	Top of Casing
MW405-PRT6	LRGA	2002	SLS	WB	86.00	88.00	379.47	378.38	Top of Casing
MW405-PRT7[c]	McNairy	2002	SLS	WB	106.00	108.00	379.47	378.38	Top of Casing
MW406-PRT1	UCRS	2002	SLS	WB	36.00	38.00	379.24	378.24	Top of Casing
MW406-PRT2	URGA	2002	SLS	WB	60.00	62.00	379.24	378.24	Top of Casing
MW406-PRT3	URGA	2002	SLS	WB	66.00	68.00	379.24	378.24	Top of Casing
MW406-PRT4	URGA	2002	SLS	WB	72.00	74.00	379.24	378.24	Top of Casing
MW406-PRT5	MRGA	2002	SLS	WB	80.00	82.00	379.24	378.24	Top of Casing
MW406-PRT6[c]	LRGA	2002	SLS	WB	86.00	88.00	379.24	378.24	Top of Casing
MW406-PRT7	McNairy	2002	SLS	WB	106.00	108.00	379.24	378.24	Top of Casing

Table 3.7. Previously Existing Monitoring Well Construction Information (Continued)

Well ID	Screened Zone	Year Installed	Riser and Screen Material	Riser and Screen Diameter[a]	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Monument Elevation[b] (ft amsl)	Datum Elevation (ft amsl)	Datum
MW407-PRT1	UCRS	2002	SLS	WB	36.00	38.00	379.47	378.48	Top of Casing
MW407-PRT2	URGA	2002	SLS	WB	60.00	62.00	379.47	378.48	Top of Casing
MW407-PRT3	URGA	2002	SLS	WB	66.00	68.00	379.47	378.48	Top of Casing
MW407-PRT4	URGA	2002	SLS	WB	72.00	74.00	379.47	378.48	Top of Casing
MW407-PRT5	MRGA	2002	SLS	WB	80.00	82.00	379.47	378.48	Top of Casing
MW407-PRT6[c]	LRGA	2002	SLS	WB	86.00	88.00	379.47	378.48	Top of Casing
MW407-PRT7[c]	McNairy	2002	SLS	WB	106.00	108.00	379.47	378.48	Top of Casing
MW408-PRT1[c]	UCRS	2002	SLS	WB	34.00	36.00	378.99	378.08	Top of Casing
MW408-PRT2	URGA	2002	SLS	WB	58.00	60.00	378.99	378.08	Top of Casing
MW408-PRT3	URGA	2002	SLS	WB	64.00	66.00	378.99	378.08	Top of Casing
MW408-PRT4	URGA	2002	SLS	WB	70.00	72.00	378.99	378.08	Top of Casing
MW408-PRT5	MRGA	2002	SLS	WB	78.00	80.00	378.99	378.08	Top of Casing
MW408-PRT6[c]	LRGA	2002	SLS	WB	84.00	86.00	378.99	378.08	Top of Casing
MW408-PRT7[c]	McNairy	2002	SLS	WB	104.00	106.00	378.99	378.08	Top of Casing
MW421-PRT1	MRGA	2009	PVC	2	71.00	73.00	375.74	378.90	Top of Casing
MW421-PRT2	MRGA	2009	PVC	2	79.00	81.00	375.74	378.90	Top of Casing
MW421-PRT3	LRGA	2009	PVC	2	83.00	85.00	375.74	378.90	Top of Casing
MW422-PRT1	MRGA	2009	PVC	2	71.00	73.00	375.39	378.47	Top of Casing
MW422-PRT2	MRGA	2009	PVC	2	79.00	81.00	375.39	378.47	Top of Casing
MW422-PRT3	LRGA	2009	PVC	2	83.00	85.00	375.39	378.47	Top of Casing
MW423-PRT1	MRGA	2009	PVC	2	70.83	72.83	375.16	378.23	Top of Casing
MW423-PRT2	MRGA	2009	PVC	2	78.83	80.83	375.16	378.23	Top of Casing
MW423-PRT3	LRGA	2009	PVC	2	82.83	84.83	375.16	378.23	Top of Casing
MW424-PRT1	MRGA	2009	PVC	2	71.00	73.00	376.85	379.73	Top of Casing
MW424-PRT2	MRGA	2009	PVC	2	79.00	81.00	376.85	379.73	Top of Casing
MW424-PRT3	LRGA	2009	PVC	2	83.00	85.00	376.85	379.73	Top of Casing
MW425-PRT1	URGA	2009	PVC	2	71.00	73.00	377.12	380.32	Top of Casing
MW425-PRT2	MRGA	2009	PVC	2	79.00	81.00	377.12	380.32	Top of Casing
MW425-PRT3	LRGA	2009	PVC	2	83.00	85.00	377.12	380.32	Top of Casing
MW505	URGA	2011	SLS	2	65.00	70.00	378.83	381.87	Top of Casing
MW506	MRGA	2011	SLS	2	77.00	82.00	378.83	381.87	Top of Casing
MW507	LRGA	2011	SLS	2	90.00	95.00	378.86	381.87	Top of Casing

Gray shading identifies MWs located outside of the C-400 Complex but within a 300-ft buffer.
[a] Diameter in inches
[b] Monument elevation is approximate ground surface (ft amsl).
[c] Monitoring well or sample port that could not be sampled (inadequate water or inoperative pump) for the C-400 Complex RI.
[d] West Bay Construction refers to a well system with sample ports completed in sealed screen intervals.

Table 3.8. New Monitoring Well Screen Depths

Well ID	Screened Zone	Area	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)
MW557	URGA	South central C-400 Cleaning Building	65.3	70.3
MW558	MRGA		76.2	81.2
MW559	LRGA		87.8	92.8
MW560	URGA	Southwest C-400 Complex	66.5	71.5
MW561	MRGA		77.1	82.1
MW562	LRGA		88.5	93.5
MW563	URGA	Mid-central C-400 Cleaning Building	64.8	69.8
MW564	MRGA		73.8	78.8
MW565	LRGA		83.1	88.1
MW566	URGA	Mid-east C-400 Complex	59.6	64.6
MW567	MRGA		70.3	75.3
MW568	LRGA		79.8	84.8
MW569	URGA	North-central C-400 Complex	63.3	68.3
MW570	MRGA		73.2	78.2
MW571	LRGA		85.3	90.3
MW572	LRGA	Adjacent to MW175 and MW176	82.8	87.8
MW573	LRGA	Adjacent to MW177 and MW178	81.5	86.5
MW574	URGA	Adjacent to MW425	63.4	68.4

3.4.4 Piezometers Installed in Sub-Slab Gravel

Two shallow piezometers were installed to monitor water levels in the sub-slab gravel of the C-400 Cleaning Building. The two piezometers were completed in the sub-slab gravel at boring location 400S1C-33 (MW585) in the north half and boring location 400S1B-21 (MW584) in the south half of the C-400 Cleaning Building (Figure 3.17). Each piezometer was constructed with a 1-ft screen at the base of the sub-slab gravel, approximately 7.5 ft below the top of the C-400 slab. Pressure transducers equipped with data loggers monitored for the occurrence of water in the piezometers for over nine months (May 27, 2021, to March 1, 2022), with quarterly manual checks. The piezometers have remained dry since installation.

3.4.5 Quarterly Monitoring Well Sampling

Installation of the new MWs occurred early in the fieldwork to initiate quarterly groundwater and colloidal borescope data collection. The existing and new wells have been sampled quarterly during the course of the RI to use as a baseline for the RI groundwater parameters and for groundwater quality comparison to the groundwater grab samples. MW samples were analyzed for the suites identified in the C-400 Complex OU RI/FS Work Plan (DOE 2020). Appendix E contains the MW data collected for the RI.

3.4.6 Colloidal Borescope Investigation

The existing and new MWs were used to define the potentiometric conditions within the C-400 Complex. By equipping the MWs with pressure transducer/data logger assemblies, the wells were used to measure the potentiometric surface of the RGA and the hydraulic gradient during the RI. Additionally, a colloidal borescope was periodically placed within the screened intervals of select MWs to measure in-well direction of groundwater flow, which could then be compared to the area-defined gradient(s) measured with the pressure transducers. The colloidal borescope was used to evaluate colloidal transport in 22 MWs in 9 well clusters, located in the C-400 Complex. All wells were screened in either the upper, middle, or LRGA.

Measurements were taken in four quarters to compare with flow directions determined from potentiometric measurements. The quality of the colloidal borescope measurements varied among wells and time of measurement. In cases where inconclusive results were measured, multiple tests were performed on subsequent days in an attempt to obtain better results. Periods of low observed flow velocity, and bi-modal flow directions, were sometimes observed and were difficult to interpret. The results of the colloidal borescope investigation technical memorandum are included in Appendix A.

3.5 ENGINEERING AND DESIGN INFORMATION

Geotechnical borings were located in most sectors. Table 3.9 provides a list of soil borings where samples were collected for geotechnical and/or geochemical analyses. Locations are provided in figures in Section 3.6 of this report. At sampling locations designated for geotechnical sampling, a second soil boring was drilled and sampled specifically for the geotechnical and/or geochemical samples. Samples were collected based on lithology defined in the initial soil boring, which was sampled for analytical parameters. The geotechnical samples were collected whole in sample tubes.

Table 3.9. Geotechnical Boring Coordinates (State Plane)

Geotechnical Boring ID	Easting	Northing
400S1B-04GEO	748051	1939273
400S1B-24GEO	748011	1939183
400S1C-30GEO	748065	1939467
400S1C-34GEO	748062	1939646
400S2-03GEO	748265	1939595
400S3-07GEO	748226	1939245
400S4-17GEO	748062	1939007
400S5-03GEO	747773	1939343
400S6-02GEO	747887	1939572
400S7-02GEO	747962	1939752

Single soil samples were collected for each of the appropriate geotechnical and geochemical analyses from each UCRS HU and HU4, and two samples each were collected from HU5 and from the McNairy Formation. In the discussion below, the two samples from HU5 and the McNairy Formation may be referred to as “upper” and “lower.” These do not correspond to geologic strata descriptions but only to the relative depths of sample collection in each of the borings. The sample depths were selected to represent the primary range of soil textures present in each HU. All geotechnical and geochemical results are provided in Appendix D.

3.5.1 Geotechnical Analysis

Table 3.10 summarizes the applicable geotechnical analyses performed on the soil samples and provides the number of analyses provided for each HU.

Table 3.10. Type and Number of Geotechnical Analyses

Geotechnical Test	Method	Number of Analyses in Each HU					
		HU1	HU2	HU3	HU4	HU5	McNairy
Compaction—Standard Effort	American Society for Testing and Materials (ASTM) D698	9	5	0	0	0	0
Compaction—Moderate Effort	ASTM D1557	9	5	0	0	0	0
Consolidation	ASTM D2435	7	9	8	7	3	0
Density of Soil	ASTM D7263	15	17	17	11	14	28
Direct Shear	ASTM D3080	9	6	9	5	2	14
Electrical Conductivity/Resistivity	G187-12a	9	13	9	5	14	14
Grain Size (Engineering)	ASTM D6913	9	13	9	5	26	13
Grain Size (Hydrometer)	152H	10	13	9	5	13	14
Grain Size (Wet Sieve)	ASTM D1140	10	13	9	5	12	14
Hydraulic Conductivity of Unsaturated Soils	ASTM D7664	6	10	4	0	0	0
Permeameter Testing	ASTM D5084	10	10	10	8	0	15
In Situ Water Content	ASTM D2216	15	17	17	11	14	28
Index Properties	ASTM D4318	9	13	8	5	0	13
Soil Matric and Total Potential	ASTM D5298	19	14	13	7	0	18
Soil Water Characteristic Curve	ASTM D6836	9	10	10	7	1	15
Specific Gravity	ASTM D854	9	13	9	5	13	14
Standard Penetration	ASTM D1586	Measured during collection of each split-tube sample					
Unconfined Compressive Strength	ASTM D2166	8	9	9	6	8	15
Unconfined (Triaxial) Compressive Strength (laterally confined)	ASTM D2850	7	6	9	4	0	13

The geotechnical index properties (Atterberg limits) for soil samples are provided in Table 3.11. Plastic limits and liquid limits are relatively constant with depth through the UCRS and average approximately 16% and 31%, respectively. In the McNairy Formation, both plastic limits and liquid limits are greater with averages of 27% and 69%, respectively. In Figure 3.18, the index properties are plotted on a plasticity chart showing the different soil units. Also, as noted in Table 3.11, there were samples that contained an appreciable amount of sand and were classified as nonplastic. A nonplastic soil does not absorb water and, therefore, crumbles immediately during testing.

Table 3.11. Geotechnical Index Properties

Boring ID	Hydrogeological Unit	Depth Interval (ft bgs)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)	Atterberg Classification
400S1B-04GEO	HU1	13.9–15.9	18	32	14	CL
400S1B-04GEO	HU2	57.4–59.9	--	--	--	NP
400S1B-24GEO	HU1	22.5–24.2	13	47	34	CL
400S1B-24GEO	HU2	33.5–37	16	25	9	CL
400S1B-24GEO	HU3	49.1–51.2	13	27	14	CL
400S1B-24GEO	HU4	53.2–58.3	--	--	--	NP
400S1B-24GEO	McNairy	98–99.5	--	--	--	NP
400S1B-24GEO	McNairy	107.6–110.8	--	--	--	NP
400S1C-30GEO	HU1	15.5–17.5	18	33	15	CL

Table 3.11. Geotechnical Index Properties (Continued)

Boring ID	Hydrogeological Unit	Depth Interval (ft bgs)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)	Atterberg Classification
400S1C-30GEO	HU2	38.5–43.5	14	28	14	CL
400S1C-30GEO	McNairy	132–134.5	20	53	33	CH
400S1C-34GEO	HU1	17.5–20	17	35	18	CL
400S1C-34GEO	HU2	38.5–41	--	--	--	NP
400S1C-34GEO	HU3	51–54.5	17	36	19	CL
400S1C-34GEO	McNairy	90.5–92.5	30	91	61	CH
400S1C-34GEO	McNairy	105.5–107	26	61	35	CH
400S2-03GEO	HU2	30–34.5	12	29	17	CL
400S2-03GEO	HU2	37.5–41.5	--	--	--	NP
400S2-03GEO	HU3	46.5–48.5	18	35	17	CL
400S3-07GEO	HU1	14–16	18	34	16	CL
400S3-07GEO	HU2	35–39.5	13	30	17	CL
400S3-07GEO	HU3	51–53	--	--	--	NP
400S4-17GEO	HU1	13–17	16	35	19	CL
400S4-17GEO	HU2	38.5–43	12	32	20	CL
400S4-17GEO	HU3	54.5–57	15	30	15	CL
400S4-17GEO	HU4	57.5–59.5	--	--	--	NP
400S4-17GEO	McNairy	110–115.5	--	--	--	NP
400S4-17GEO	McNairy	140–143.5	22	35	13	CL
400S5-03GEO	HU1	10–13	18	29	11	CL
400S5-03GEO	HU2	25.5–29	12	26	14	CL
400S5-03GEO	HU2	34–38.5	11	32	21	CL
400S5-03GEO	HU3	48–53	16	28	12	CL
400S5-03GEO	HU4	59.4–60	--	--	--	CL
400S5-03GEO	McNairy	92–95	42	110	68	CH
400S5-03GEO	McNairy	106.5–109	16	49	33	CL
400S6-02GEO	HU1	12–14	18	33	15	CL
400S6-02GEO	HU2	30.5–35.5	16	21	5	CL-ML
400S6-02GEO	HU2	35.5–39	16	20	4	CL-ML
400S6-02GEO	HU3	47.5–49.5	18	24	6	CL-ML
400S6-02GEO	McNairy	88.5–90.5	35	106	71	CH
400S6-02GEO	McNairy	107.5–109.5	30	62	32	CH
400S7-02GEO	HU1	3.5–6	19	43	24	CL
400S7-02GEO	HU2	23–25	--	--	--	NP
400S7-02GEO	HU2	29–34	14	20	6	CL-ML
400S7-02GEO	HU3	44–47	17	37	20	CL
400S7-02GEO	HU4	56.5–59.5	--	--	--	NP
400S7-02GEO	McNairy	90.5–93.5	23	80	57	CH
400S7-02GEO	McNairy	104–108.5	23	40	17	CL

Notes:
CH = fat clay NP = nonplastic
CL-ML = clayey silt -- = not measured
CL = lean clay

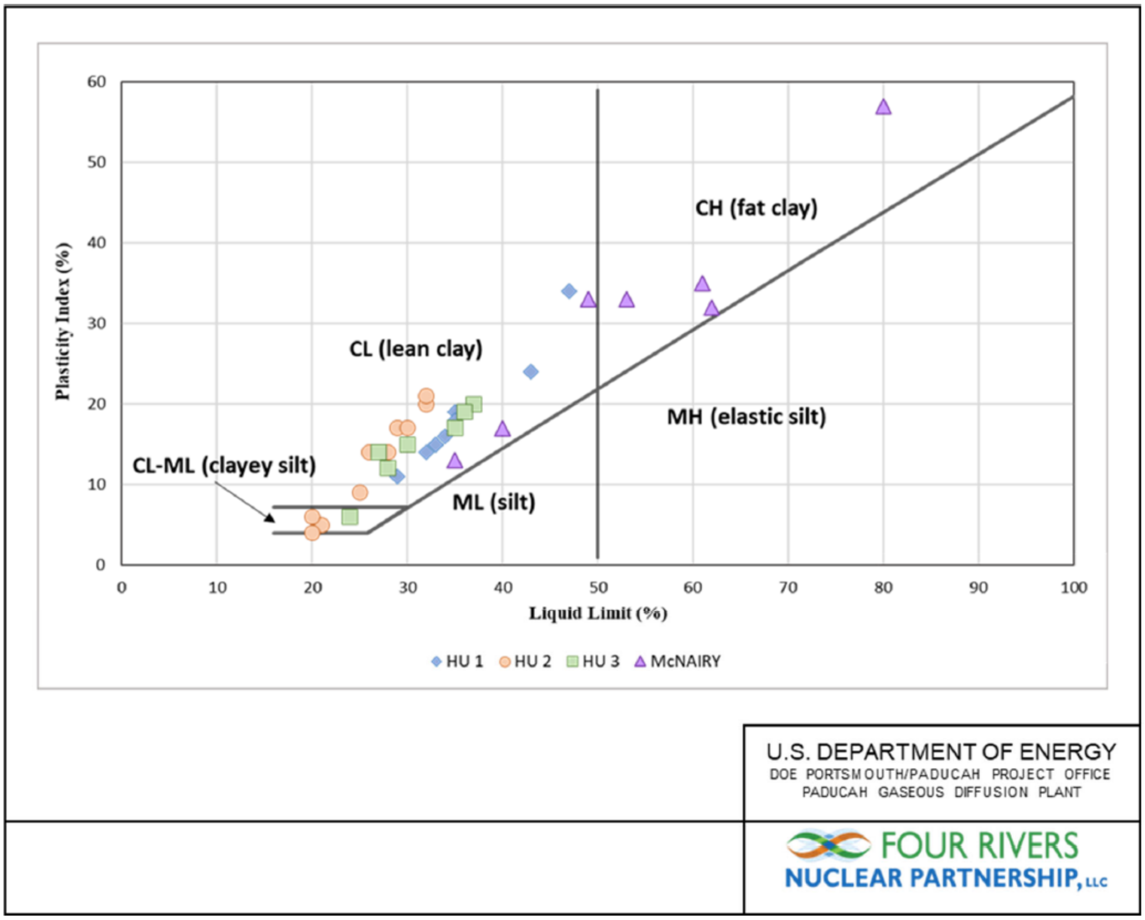


Figure 3.18. Atterberg Limits and Soils Classification

Several soil samples were collected for permeability testing. Saturated hydraulic conductivity was measured in all samples by using a constant rate of flow through a flexible wall permeameter. Table 3.12 provides a summary of the hydraulic conductivity results from the soil samples sorted by HU and soil classification. Permeameter results (Appendix D) indicate the minimum values in the UCRS are associated with the silt in HU1 and HU3. The highest mean conductivity (1.92E+00 ft/day) occurred within HU4, which typically contains significant amounts of sand. For comparison, hydraulic conductivity measurements in the McNairy Formation ranged from a minimum of 1.22E-06 ft/day for a sample of clay to 5.39E-02 ft/day for a poorly graded sand (a sample intended for the McNairy Formation in boring 400S5-03GEO from near the RGA interface contained well graded gravel from the RGA). Samples from the RGA (HU5) were not collected for permeability testing.

Table 3.12. Permeameter Testing Results

Boring ID	Hydrogeological Unit	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Hydraulic Conductivity (cm/s)	Hydraulic Conductivity (ft/day)	Soil Classification	Representative (Mean) Hydraulic Conductivity (ft/day)
400S2-03GEO	HU1	14.5	16.5	--	--	CL	NA
400S1B-24GEO	HU1	19.5	22	6.00E-09	1.70E-05	ML	2.79E-04
400S4-17GEO	HU1	10.5	13	3.20E-08	9.07E-05	ML	
400S7-02GEO	HU1	12	14.5	5.10E-08	1.45E-04	ML	

Table 3.12. Permeameter Testing Results (Continued)

Boring ID	Hydrogeological Unit	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Hydraulic Conductivity (cm/s)	Hydraulic Conductivity (ft/day)	Soil Classification	Representative (Mean) Hydraulic Conductivity (ft/day)
400S1C-34GEO	HU1	15.5	17	5.90E-08	1.67E-04	ML	
400S1B-04GEO	HU1	10.9	13.4	9.80E-08	2.78E-04	ML	
400S3-07GEO	HU1	10	12	1.20E-07	3.40E-04	ML	
400S5-03GEO	HU1	7.5	10	1.80E-07	5.10E-04	ML	
400S6-02GEO	HU1	10	12	2.40E-07	6.80E-04	ML	
400S1C-30GEO	HU1	12.5	15	1.20E-06	3.40E-03	SM	3.40E-03
400S4-17GEO	HU2	36	38.5	7.20E-06	2.04E-02	GM	2.04E-02
400S5-03GEO	HU2	23	25.5	1.50E-07	4.25E-04	ML	4.25E-04
400S7-02GEO	HU2	20.5	23	1.20E-05	3.40E-02	SP	
400S1C-30GEO	HU2	22.5	25	--	--	SP	
400S1B-04GEO	HU2	38.5	40.2	1.40E-06	3.97E-03	SP/CL	1.27E-02
400S1B-24GEO	HU2	28.5	31	4.70E-08	1.33E-04	SP/SW	
400S1C-34GEO*	HU2	36	38.5	8.80E-04	2.49E+00	SP/SW	
400S2-03GEO	HU2	26	28	3.60E-04	1.02E+00	SW	
400S3-07GEO	HU2	33	35	3.70E-08	1.05E-04	SW/GW	8.60E-01
400S6-02GEO	HU2	25	27	5.50E-04	1.56E+00	SW/SP	
400S2-03GEO	HU3	42.5	44.5	9.20E-09	2.61E-05	ML	
400S1C-34GEO	HU3	45	47.5	1.00E-08	2.83E-05	ML	
400S7-02GEO	HU3	41.5	44	1.60E-08	4.54E-05	ML	8.19E-04
400S1B-04GEO	HU3	54.3	55.9	6.40E-07	1.81E-03	ML	
400S5-03GEO	HU3	45.5	48	7.70E-07	2.18E-03	ML	
400S1B-24GEO	HU3	46.1	48.6	1.80E-07	5.10E-04	SM	
400S4-17GEO	HU3	52	54.5	1.10E-06	3.12E-03	SM	1.81E-03
400S1C-30GEO*	HU3	46	47.5	2.40E-03	6.80E+00	SM	
400S6-02GEO	HU3	45.5	47.5	3.30E-06	9.35E-03	SP	9.35E-03
400S3-07GEO	HU3	49	51	3.10E-04	8.79E-01	SW	
400S2-03GEO	HU4	56.5	58.5	--	--	SP	
400S3-07GEO	HU4	55.5	57	9.50E-04	2.69E+00	SP	
400S5-03GEO	HU4	57	59	1.90E-05	5.39E-02	SP	
400S6-02GEO	HU4	52	54	1.30E-04	3.69E-01	SP	1.92E+00
400S1B-04GEO	HU4	57.4	59.9	1.60E-03	4.54E+00	SP	
400S1B-24GEO	HU4	53.2	58.3	8.80E-06	2.49E-02	SP	
400S1C-30GEO	HU4	52.8	57.8	1.50E-07	4.25E-04	SP	
400S1C-34GEO	HU4	59.5	62	2.40E-03	6.80E+00	SP/SM	
400S5-03GEO	McNairy	104	106	3.10E-08	8.79E-05	CL	
400S6-02GEO*	McNairy	86.5	88.5	4.30E-10	1.22E-06	CL/ML	8.79E-05
400S1C-30GEO*	McNairy	129.5	132	4.50E-10	1.28E-06	CL/ML	
400S7-02GEO	McNairy	101	103.5	7.70E-06	2.18E-02	CL/SP	
400S1B-24GEO	McNairy	104.1	106.6	5.80E-09	1.64E-05	CL/SP	1.09E-02
400S5-03GEO*	McNairy	89.5	91.5	4.20E-03	1.19E+01	GW	
400S4-17GEO	McNairy	137.5	140	2.70E-08	7.65E-05	ML	
400S6-02GEO	McNairy	109.5	111.5	4.40E-07	1.25E-03	ML	3.48E-04
400S1C-34GEO	McNairy	92.5	95	1.80E-08	5.10E-05	ML	
400S7-02GEO	McNairy	87.5	90	6.50E-09	1.84E-05	ML/CL	
400S3-07GEO	McNairy	102	104	7.00E-05	1.98E-01	SP	
400S4-17GEO	McNairy	115.5	118	7.00E-05	1.98E-01	SP	
400S1B-24GEO	McNairy	100.7	102.6	1.30E-04	3.69E-01	SP	2.65E-01
400S1C-30GEO	McNairy	103.7	106.2	1.90E-04	5.39E-01	SP	
400S1C-34GEO	McNairy	99	101.5	7.60E-06	2.15E-02	SP/ML	

* Results considered "not representative" and not used to calculate mean value.

Notes:

CL = lean clay
ML = silt
SP = poorly graded sand
GM = silty gravel
SM = silty sand
SW = well graded sand
GW = well graded gravel

Results for other geotechnical tests (e.g., grain size, compaction, soil density, specific gravity) are found in Appendix D.

3.5.2 Geochemical Analysis

Table 3.13 summarizes the applicable geochemical analyses performed on the soil samples.

Table 3.13. Type and Number of Geochemical Analyses

Geotechnical Test	Method	Number of Analyses in Each HU					
		HU 1	HU 2	HU 3	HU 4	HU 5	McNairy
Anion Exchange Capacity (AEC)	MOSA, Pt 3, Ch 41	14	14	13	7	11	0
Cation Exchange Capacity (CEC)	EPA Method 9081	14	14	13	7	13	17
Fraction of Organic Carbon (f_{oc})	EPA Method 415.1	14	14	13	7	13	17
Distribution Coefficient (K_d)	ASTM D4319/ C1733	14	14	13	7	11	16
Soil pH	ASTM D4972	10	13	9	5	14	14
Clay Mineralogy	X-ray fluorescence (XRF)	14	14	13	7	11	17
Permanganate Natural Oxidant Demand (PNOD)	ASTM D7262	1	1	1	7	12	17

Table 3.14 provides the CEC and f_{oc} ranges and average for each HU for samples analyzed during this RI and Figure 3.19 shows the CEC results graphically for comparison between the HUs. The CEC dataset appears to have a lognormal distribution with a geometric mean of 8.89 meq/100g. The f_{oc} ranges from 171 mg/kg to 20,000 mg/kg with a mean of 1,818 mg/kg. The highest individual measurement (20,000 mg/kg) was found in HU1 but the highest mean result was in the deeper samples collected from the McNairy Formation. AEC, which represents the positive charge available to attract anions in solution, was also measured. The majority of the AEC values were negative. All the results for AEC values are provided in Appendix D. In most soils CEC is greater than the AEC. The CEC of a soil generally increases with soil pH due to the greater negative charge that develops on organic matter and clay minerals. The results for pH measurements of the soil are also provided in Appendix D.

Table 3.14. Cation Exchange Capacity and Fraction of Organic Carbon Test Results

Hydrogeologic Unit	CEC (meq/100g)			f_{oc} (mg/kg)		
	Minimum Result	Maximum Result	Mean Result	Minimum Result	Maximum Result	Mean Result
HU1	9.01	25	15.9	880	20,000	2,959
HU2	3.62	23.1	8.5	262	1,380	815
HU3	5.87	20.3	12.0	501	1,610	771
HU4	2.54	8.6	5.9	220	631	394
HU5 (upper)	1.91	3.93	3.1	459	1,470	791
HU5 (lower)	2.04	3.21	2.8	393	10,200	2,668
McNairy (upper)	1.63	34.5	18.0	217	6,150	2,217
McNairy (lower)	7.13	91.8	24.8	171	13,700	4,099

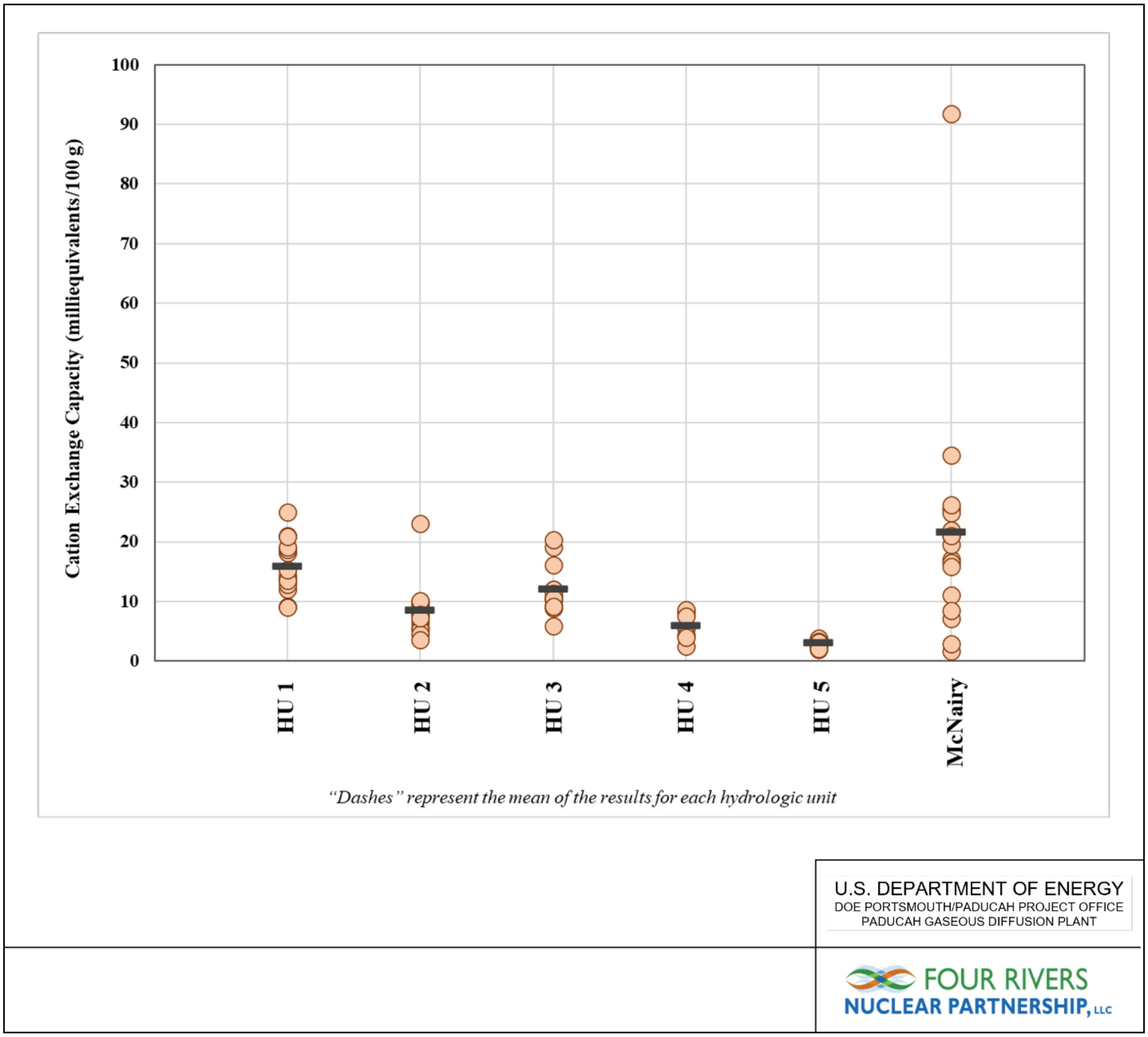


Figure 3.19. Range and Mean of Cation Exchange Capacity Measurements

The K_d values for contaminants of interest are both chemical- and site-specific. The K_d values are used for fate and transport modeling and have an indirect influence on the transport of contaminants. That is, the greater the K_d value, the more adsorption to soil, which results in reduced contaminant transport through the groundwater pathway. As documented in the C-400 Complex RI/FS Work Plan, site-specific K_d values were measured for contaminants and selected based on their physical and chemical characteristics representative of the suite of COCs at the C-400 Complex. These indicator chemicals include chromium (representative metal), aroclor 1254 (representative PCBs), phenol (representative SVOC), technetium-99, TCE, and uranium metal measured using a batch-type procedure (ASTM C1733) on samples from each HU. Because sorption phenomena can be dependent on contaminant concentration, batch attenuation tests for each indicator chemical were performed at three levels of increasing concentrations. Also, groundwater representative of the test zone was used as the contact solution for the testing. After each batch system reached equilibrium, the concentration in the solution was measured, and the mass sorbed onto the soil was inferred from the difference between the equilibrium aqueous concentration and the initial aqueous concentration.

Concentration data obtained from the batch attenuation tests were used to construct attenuation isotherms for each indicator chemical. Mathematical fitting was used to calculate K_d values for each test using both the linear isotherm and the nonlinear Freundlich isotherm (often used for data to show a deviation from a linear trend). For each test, the appropriate K_d (linear or Freundlich) was selected based on each isotherm's goodness-of-fit (i.e., R^2 coefficient of determination) to the data. The standard method used for batch attenuation testing (ASTM C1733-17a) applies to inorganic constituents, but cannot accurately characterize the sorptive behavior of organic chemicals because mass loss processes (e.g., volatilization, biodegradation) are not accounted for; therefore, K_d values for organic indicator chemicals—TCE, aroclor 1254 (i.e., PCBs), phenol—used for fate and transport modeling were calculated using K_{oc} values obtained from the Risk Assessment Information System (RAIS) database and site-specific f_{oc} measurements (Appendix B). For the inorganic indicator chemicals, statistical analysis of the batch attenuation testing data indicated that the median K_d value for each HU is most representative. Table 3.15 provides the median K_d for each inorganic indicator chemical of each HU using batch test results from all three different contaminant concentration levels. Detailed laboratory testing results are provided in Appendix D.

Table 3.15. Median Distribution Coefficients (L/kg) for Inorganic Indicator Chemicals

Constituent/Tracer		HU1	HU2	HU3	HU4	HU5	McNairy
Chromium	Min	211	1,643	809	953	432	18
	Max	20,577	43,308	41,827	32,026	17,313	79,570
	Median	1,021	11,730	18,640	3,132	5,978	9,494
Technetium-99	Min	0.75	0.08	0.84	0.77	0.61	0.92
	Max	3.39	2.56	5.32	4.38	3.00	18.20
	Median	2.40	1.65	2.30	2.41	1.92	2.70
Uranium metal	Min	128	89	158	49	87	77
	Max	3,940	3,027	4,579	21,331	17,747	4,220
	Median	317	741	1,630	7,951	1,289	385

The measurements and assessments of parameters for the C-400 Complex OU RI that are used in transport modeling differed in many cases from those that were developed for the Southwest Plume Site Investigation (DOE 2007b). These differences likely reflect improved characterization of some parameters (e.g., bulk density, porosity), spatial variability across the site (e.g., UCRS vertical hydraulic conductivity, RGA gradient), and differences in statistical methods.

Clay mineralogy was determined by X-ray diffraction of several soil samples from each HU. As shown in Table 3.16, metahalloysite, vermiculite, and mica (illite) were the predominant types of clays in the soils. Metahalloysite is in the kaolin group of minerals with a composition similar to kaolinite, and a structure produced by the dehydration of the hydrated clay mineral halloysite. CEC is typically more important for vermiculite and smectite types of clay minerals when compared to mica or metahalloysite. Based on the X-ray diffraction results, vermiculite is more common in HU1 and in the McNairy Formation clay minerals.

The PNOD was measured in several soil samples from HU4, HU5, and the McNairy Formation. PNOD is a measure of how the naturally occurring materials in soil will affect the performance of oxidants and is a key parameter for *in situ* chemical oxidation system design. PNOD was determined using ASTM D7262-10, Method B. Three potassium permanganate solutions of varying concentrations were added to the soil and allowed to react for a period of two weeks. The testing results are provided in Appendix D.

Table 3.16. Clay Mineralogy

Hydrogeological Unit	Samples Analyzed	Vermiculite (%)			Mica (Illite) (%)			Metahalloysite (%)			Vermiculite-Smectite (%)			Smectite (%)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
HU1	14	20.6	66	52.2	1.7	10	5.4	28	71.3	42.0	0	4.1	0.3	0	0	0.0
HU2	14	5	49	15.0	1.5	10	5.8	50	92	78.0	0	9.5	1.5	0	0	0.0
HU3	13	0	6.1	2.6	16.6	31.8	22.8	68.2	77.3	73.7	0	5	0.8	0	0	0.0
HU4	7	2	7.5	3.9	20.8	31	25.4	63	76	68.4	0	9.1	2.4	0	0	0.0
HU5 (upper)	6	0	6.7	2.3	25.9	31.4	29.1	65.8	71.2	68.8	0	0	0.0	0	0	0.0
HU5 (lower)	5	0	11	2.2	11.8	41.1	26.0	58.9	80.5	70.1	0	0	0.0	0	7.8	1.6
McNairy (upper)	8	23.4	65	49.0	1.9	22.3	9.8	19	65.3	40.7	0	4	0.5	0	0	0.0
McNairy (lower)	9	3.2	60.6	39.8	2.2	9.1	5.3	33	89.8	54.9	0	0	0.0	0	0	0.0

PNOD test results (14 day test) were mostly nondetect in the RGA samples (HU4, HU5 upper, and HU5 lower horizons) and were significantly greater in the McNairy Formation samples. Table 3.17 summarizes the results.

Table 3.17. Summary of Permanganate Natural Oxidant Demand Results

Test Solution	Reporting Limit (RL)	Nondetection Results (nondetections/number of analyses)				
		HU4	HU5 Upper	HU5 Lower	McNairy Upper	McNairy Lower
10K ppm $KMnO_4$	0.8 g/kg	5/7	4/7	1/5	0/8	1/9
20K ppm $KMnO_4$	1.6 g/kg	5/7	5/7	3/5	1/8	2/9
30K ppm $KMnO_4$	2.4 g/kg	6/7	5/7	3/5	4/8	1/9
		Maximum Results (g/kg)				
10K ppm $KMnO_4$		4.3	3.22	4.4	15	19.8
20K ppm $KMnO_4$		4.96	2.15	4.04	15.2	39.4
30K ppm $KMnO_4$		5.96	4.22	4.49	16.7	55.5

$KMnO_4$ = potassium permanganate

3.6 SECTOR-SPECIFIC SAMPLING

A summary of the environmental sampling completed within each sector is described below. The number of samples collected in the tables below represent a sample collected at each depth intervals where analytical data was collected (e.g., HU1, HU2, HU3, HU4, McNairy).[14] For the purposes of the tables presented in this section, samples with unique sample identification numbers are counted as separate samples except in the case where samples were collected as duplicates for QA/QC purposes. For instances where a sample was intended to be collected according to the C-400 Complex RI/FS Work Plan, but were not, the rational is presented in that sector's section (DOE 2020).

3.6.1 Sector 1A

Environmental sampling completed in Sector 1A is summarized in Table 3.18. Figure 3.20 shows the Sector 1A sampling locations.

Table 3.18. Summary of Sector 1A Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater Samples	McNairy Fm. Groundwater Samples	Total Soil Samples	Total Groundwater Samples
400S1A-03	137	0	0	3	2	2	2	20	3	3	29	6
400S1A-23	67	4	0	2	2	2	2	0	0	0	8	0
400S1A-C09*	109.3	0	0	6	4	4	1	7	3	0	22	3
400S1A-C10*	116.7	0	0	6	4	5	2	6	3	0	23	3
400S1D-C11*	113.1	0	0	0	5	2	0	6	3	0	13	3
400S1D-C17*	109.1	0	0	0	2	2	0	6	3	0	10	3
400S4-C22*	109.6	0	0	0	0	0	0	0	1	2	0	3
Total	761.8	4	0	17	19	17	7	45	16	5	105	21

*Angled borings—only samples inside the sector footprint are included in counts.

[14] The depth of the bottom groundwater sample in many soil borings exceeded the reported (drilled) depth of the soil boring. These groundwater samples were collected from a screened groundwater sample point pushed immediately beyond the depth of drilling.

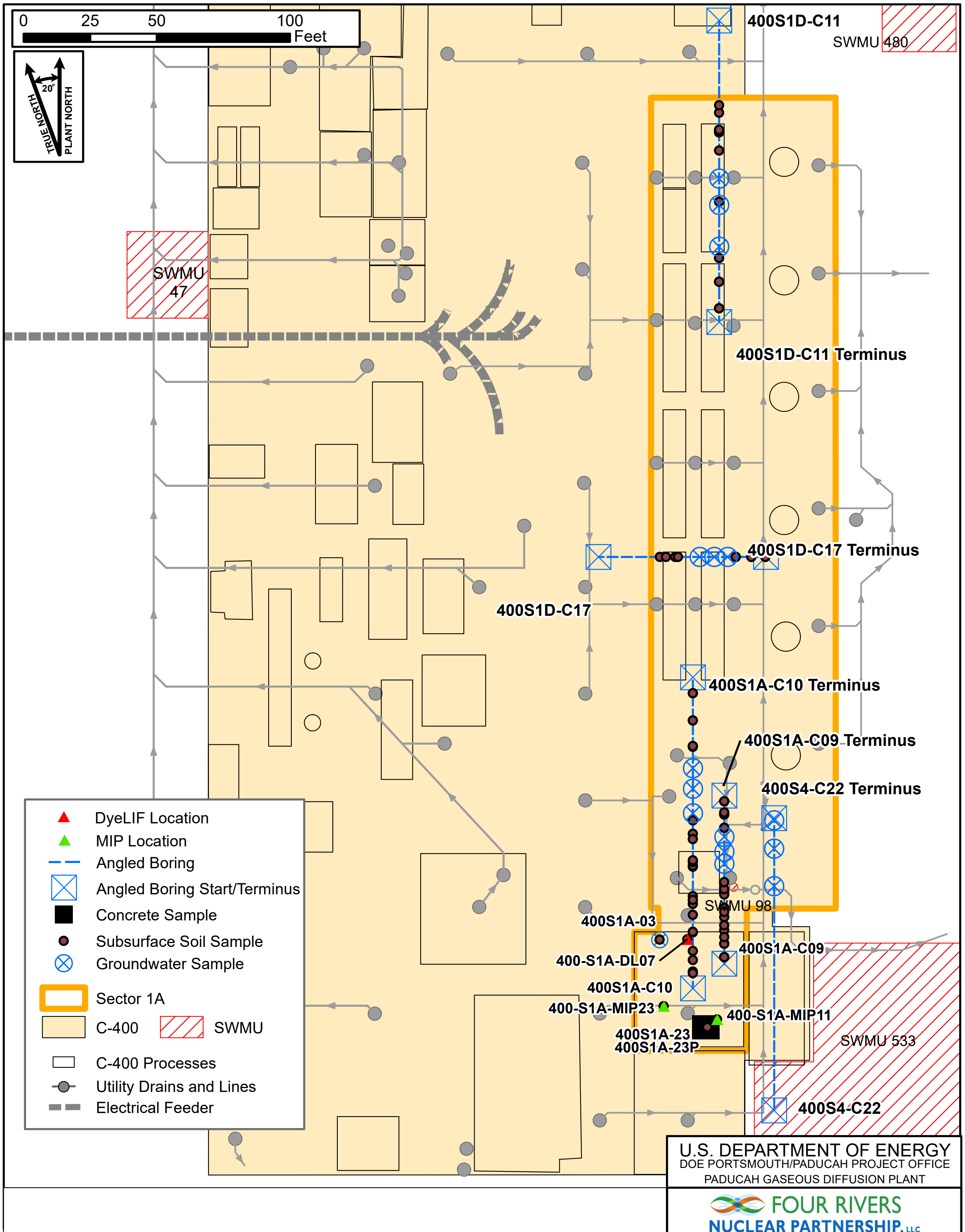


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Figure 3.20. Sector 1A Sampling Locations

Two defined soil boring locations in this sector were sited to provide information on TCE distribution in the subsurface and to provide information near the degreaser.

Two concrete intervals, 14 soil intervals, and 7 water intervals for this sector were planned according to the C-400 Complex RI/FS Work Plan (DOE 2020). A total of 4 concrete samples, 37 soil samples, and 6 water samples for this sector were collected from the planned borings. In addition, 5 contingency borings were drilled with 68 soil samples and 15 water samples collected.

Water was not present for sample collection in the gravel backfill or building footer for boring 400S1A-03. Cores at the McNairy Formation interface, 10 ft into the McNairy Formation, and 20 ft into the McNairy Formation were disposed of (inadvertently), before sampling was complete in boring 400S4-C22.

Two MIP borings and one DyeLIF profile boring were located within Sector 1A.

During comment resolution meetings, the FFA parties used the information in Appendix D of the C 400 Complex RI/FS Work Plan to agree that one additional sample from SWMU 98 was needed to finalize the work plan. If liquid and/or sludge were present in SWMU 98 during the RI fieldwork, then a sample(s) would be collected. A liquid sample was collected from the sump in May 2021 and analyzed for metals, radionuclides, and VOCs.

3.6.2 Sector 1B

Environmental sampling completed in Sector 1B is summarized in Table 3.19. Figure 3.21 shows the Sector 1B sampling locations.

Table 3.19. Summary of Sector 1B Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S1B-02	145	0	0	2	2	2	2	10	3	3	18	6
400S1B-04	67	0	0	2	2	2	2	0	0	0	8	0
400S1B-05	149	0	0	2	2	2	2	10	3	3	18	6
400S1B-09	142	4	0	2	2	2	2	20	3	3	28	6
400S1B-21	67	4	0	2	2	2	2	0	0	0	8	0
400S1B-22	67	4	0	2	2	2	2	0	0	0	8	0
400S1B-24	112	4	0	2	2	2	2	6	3	0	14	3
400S1B-25	70	4	0	2	2	2	2	0	0	0	8	0
400S1B-26	70	4	0	2	2	2	2	0	0	0	8	0
400S1B-27	67	4	0	2	2	2	2	0	0	0	8	0
400S1B-28	107	4	0	2	2	2	2	16	2	0	24	2
400S1B-41	70	4	0	2	2	2	2	0	0	0	8	0
400S1B-42	140	4	0	2	2	2	2	10	2	1	18	3
400S1B-43	70	4	0	2	2	2	2	0	0	0	8	0
400S1B-44	70	4	0	2	2	2	2	0	0	0	8	0
400S1B-45	70	0	0	2	2	2	2	0	0	0	8	0
400S1B-46	70	0	0	2	2	2	2	0	0	0	8	0

Table 3.19. Summary of Sector 1B Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S1B-C14	140	0	0	5	3	3	1	1	3	3	13	6
400S1B-C15	140	0	0	4	5	3	0	0	3	3	12	6
400S1B-C16	135	0	0	5	3	4	1	0	3	3	13	6
400S4-C22*	109.6	0	0	4	1	4	2	0	1	0	11	1
Total	2,077.6	48	0	52	46	48	38	73	26	19	257	45

*Angled boring—only samples inside the sector footprint are included in counts.

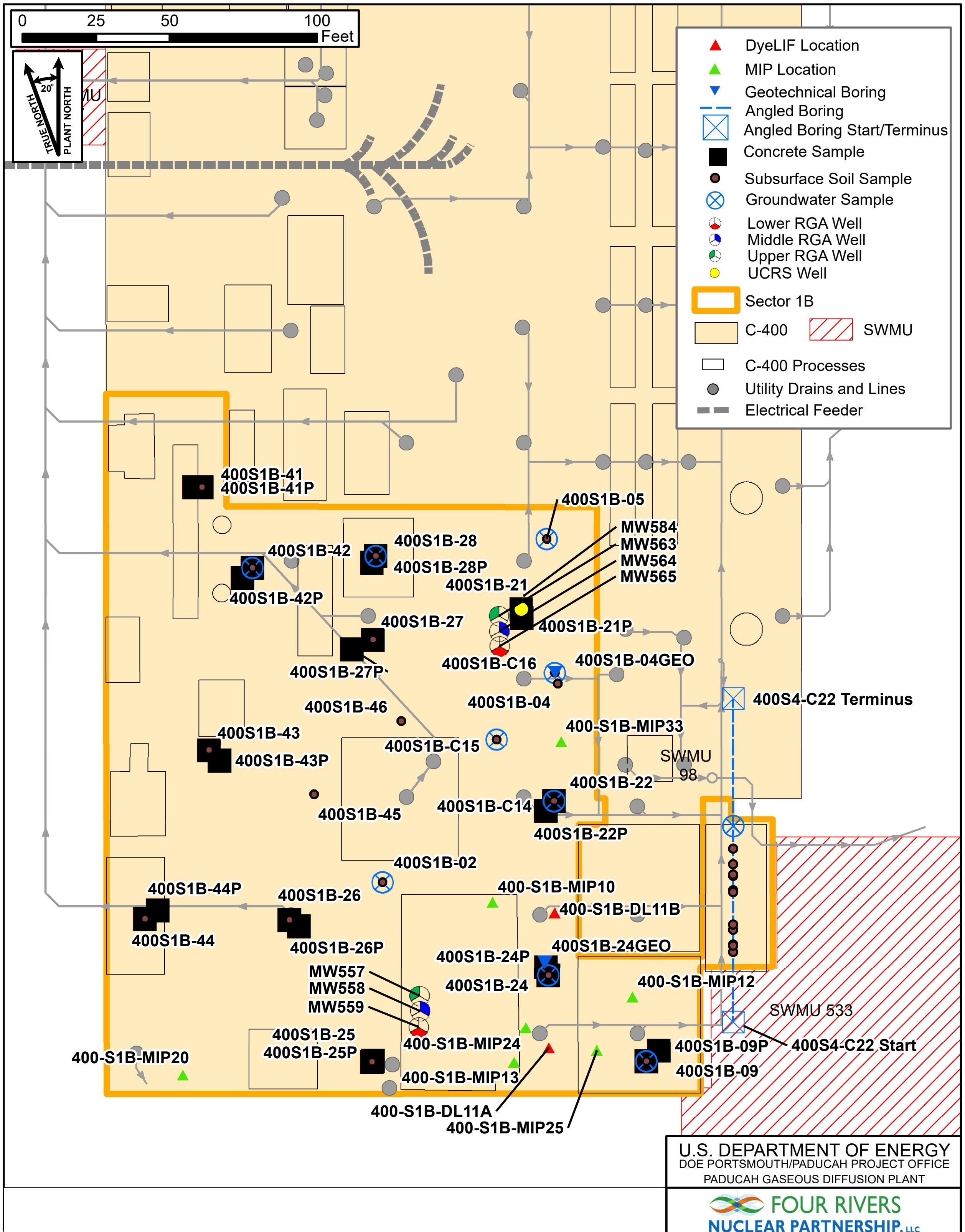

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Figure 3.21. Sector 1B Sampling Locations

Seventeen soil boring locations were sited in this sector to provide information to support TCE distribution in the subsurface, and to provide environmental data from, or near, specific equipment/features in the C-400 Cleaning Building. These features, or equipment, include the cylinder disassembly pit, seal disassembly areas, the degreasers, dip tanks, floor drains, spray booth, and discard waste lines.

Twenty-four concrete intervals, 99 soil intervals, and 28 water intervals for this sector were planned according to the C-400 Complex RI/FS Work Plan. A total of 48 concrete samples, 208 soil samples, and 26 water samples for this sector were collected from the planned borings. In addition, four contingency borings were drilled with 49 soil samples and 19 water samples collected.

Water was not present for sample collection in the gravel backfill or building footer for borings 400S1B-04 and 400S1B-22. Water was insufficient to collect samples at 10 ft into the McNairy Formation and at 50 ft into the McNairy Formation in boring 400S1B-42.

Seven MIP borings and two DyeLIF profile borings were located within Sector 1B.

During the abandonment process for sample boring 400S1B-21, a shallow piezometer (MW584) was installed to monitor water levels in the sub-slab gravel of the C-400 Cleaning Building. There have been no measureable water levels in this piezometer since installation.

Two clusters of groundwater MWs (MW557, MW558, MW559; and MW563, MW564, MW565) were installed in Section 1B to provide monitoring of the upper, middle, and LRGA.

In addition to environmental sampling, geotechnical and geochemical samples were collected from borings 400S1B-04GEO and 400S1B-24GEO in Sector 1B (Section 3.5).

3.6.3 Sector 1C

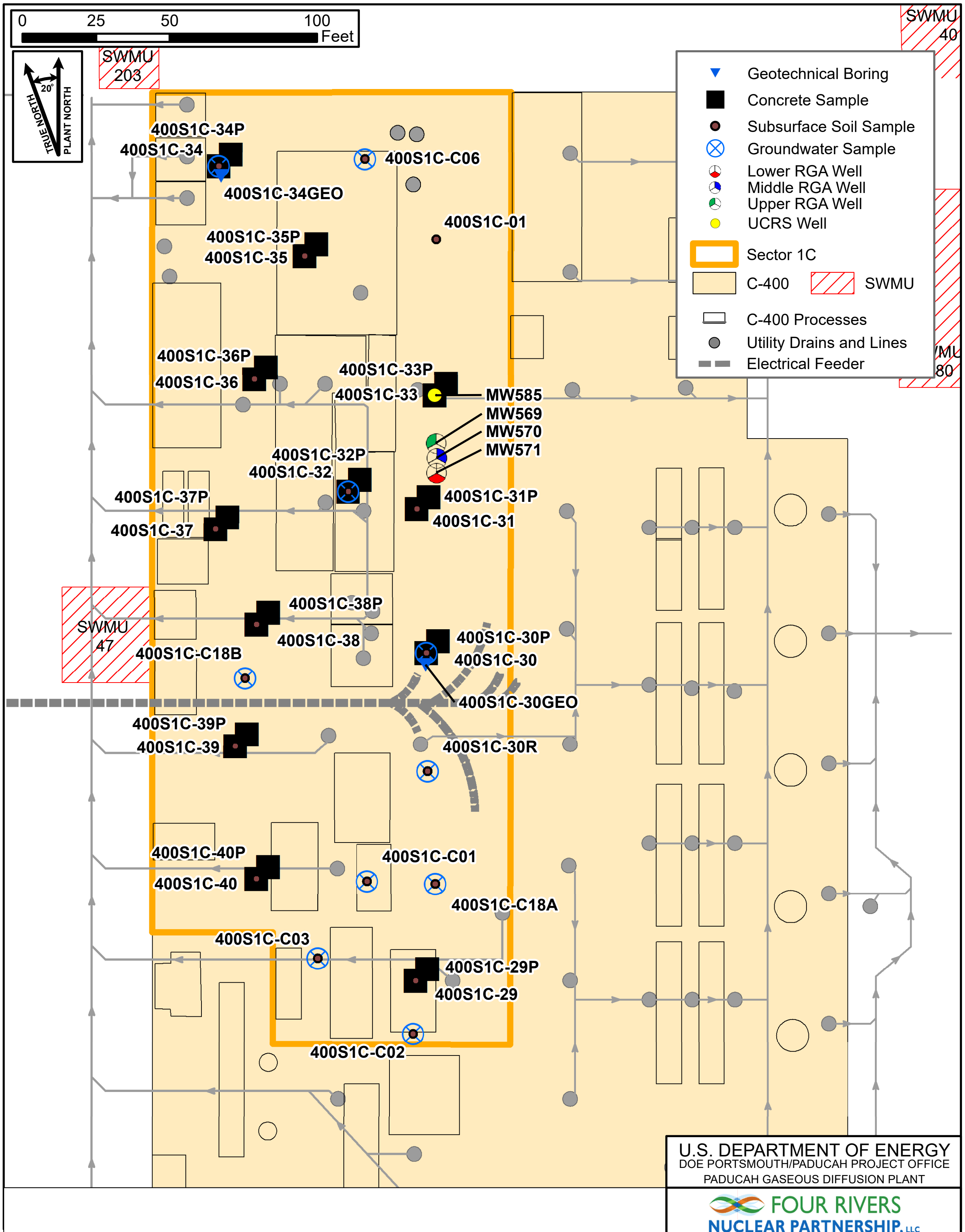
Environmental sampling completed in Sector 1C is summarized in Table 3.20. Figure 3.22 shows the Sector 1C sampling locations.

Table 3.20. Summary of Sector 1C Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S1C-01	67	0	0	2	2	2	2	0	0	0	8	0
400S1C-29	67	4	0	2	3	2	2	0	0	0	9	0
400S1C-30	142	4	0	2	3	2	2	10	2	0	19	2
400S1C-30R	95	0	0	2	2	2	2	2	2	0	10	2
400S1C-31	67	4	0	2	2	2	2	0	0	0	8	0
400S1C-32	137.5	4	0	2	2	2	2	10	2	3	18	5
400S1C-33	67	4	0	2	2	2	2	0	0	0	8	0
400S1C-34	110	4	0	2	2	2	2	6	2	0	14	2
400S1C-35	70	4	0	2	2	2	2	0	0	0	8	0
400S1C-36	70	4	0	2	2	2	2	0	0	0	8	0
400S1C-37	70	4	0	2	2	2	2	0	0	0	8	0

Table 3.20. Summary of Sector 1C Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S1C-38	70	4	0	2	2	2	2	0	0	0	8	0
400S1C-39	70	4	0	2	2	2	2	0	0	0	8	0
400S1C-40	60	4	0	2	2	2	2	0	0	0	8	0
400S1C-C01	75	0	0	3	6	2	0	0	2	0	11	2
400S1C-C02	75	0	0	2	4	2	4	0	2	0	12	2
400S1C-C03	95	0	0	4	5	1	2	2	2	0	14	2
400S1C-C06	110	0	0	5	3	4	0	6	2	0	18	2
400S1C-C18A	65	0	0	4	5	1	2	0	1	0	12	1
400S1C-C18B	65	0	0	4	5	1	2	0	1	0	12	1
Total	1,647.5	48	0	50	58	39	38	36	18	3	219	21



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…Floor_Drains3_1_Discard_Drain_LINES.dwg (6/25/2019); …Floor_Drains2_1_Storm_Drain_LINES.dwg (4/23/2018); …\Electrical Feeder.dwg (4/24/2018)

Figure 3.22. Sector 1C Sampling Locations

Thirteen soil boring locations were sited in this sector to provide environmental data from, or near, specific equipment/features in the C-400 Cleaning Building. These features, or equipment, include the dissolver tanks, discard waste lines, storage and acidifying tanks, laundry area, and the north basement furnace room. Fourteen soil borings were executed. Location 400S1C-30R was added after discussion with the FFA parties (Section 3.8 includes additional information).

Twenty-four concrete intervals, 65 soil intervals, and 9 water intervals for this sector were planned according to the C-400 Complex RI/FS Work Plan. A total of 48 concrete samples, 142 soil samples, and 11 water samples for this sector were collected from the planned borings. In addition, 5 contingency borings were drilled, and 79 soil samples and 10 water samples were collected.

Water was not present for sample collection in the gravel backfill or building footer for boring 400S1C-29.

During abandonment of sample boring 400S1C-33, a shallow piezometer (MW585) was installed to monitor water levels in the sub-slab gravel of the C-400 Cleaning Building. There have been no measureable water levels in this piezometer since installation.

A cluster of groundwater MWs (MW569, MW570, and MW571) were installed in Section 1C to provide monitoring of the upper, middle, and LRGA.

In addition to environmental sampling, geotechnical and geochemical samples were collected from borings 400S1C-30GEO and 400S1C-34GEO in Sector 1C (Section 3.5).

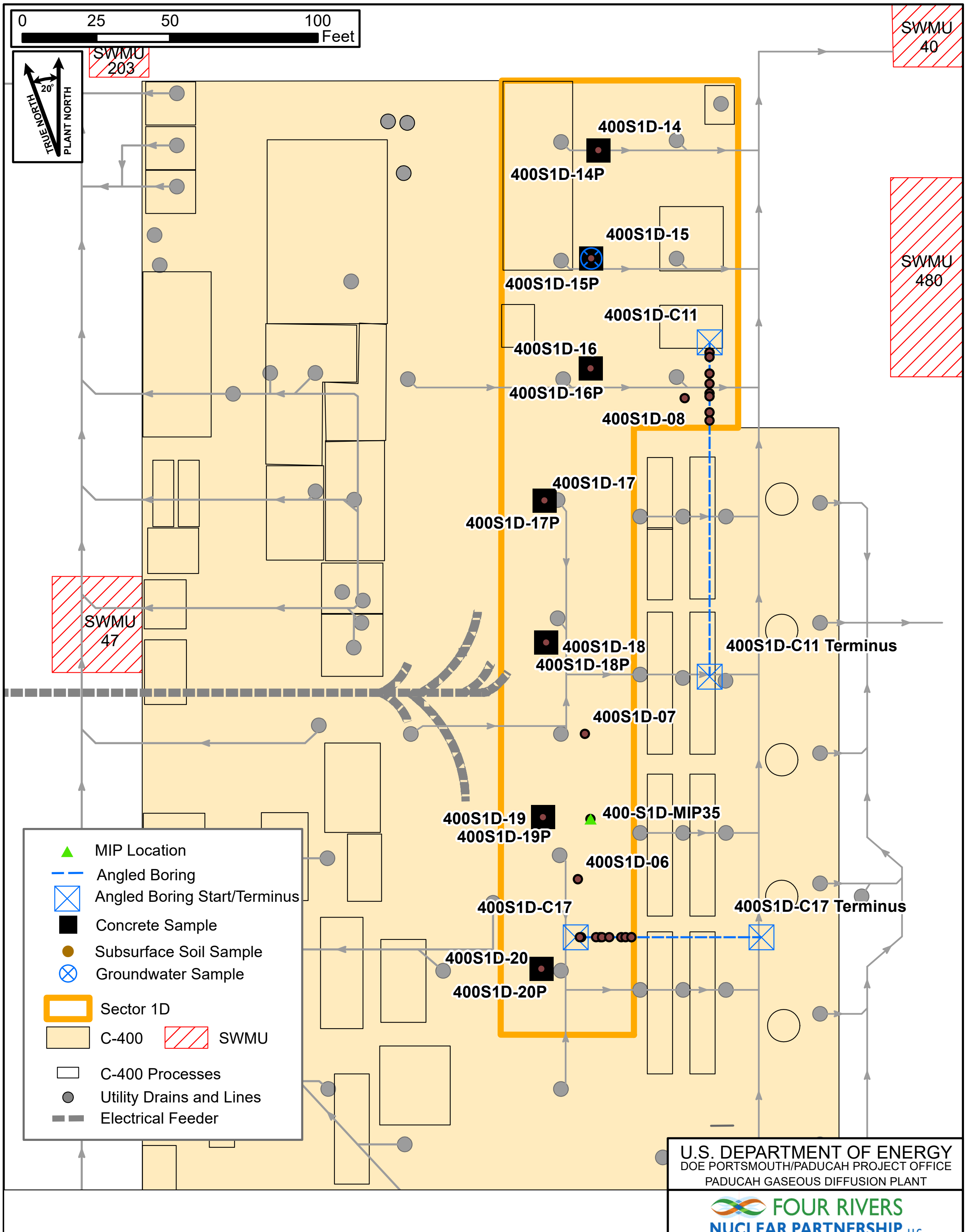
3.6.4 Sector 1D

Environmental sampling completed in Sector 1D is summarized in Table 3.21. Figure 3.23 shows the Sector 1D sampling locations.

Table 3.21. Summary of Sector 1D Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S1D-06	67	0	0	2	2	2	2	0	0	0	8	0
400S1D-07	67	0	0	2	2	2	2	0	0	0	8	0
400S1D-08	72	0	0	2	2	2	2	0	0	0	8	0
400S1D-14	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-15	137	4	0	2	2	2	2	10	2	0	18	2
400S1D-16	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-17	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-18	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-19	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-20	67	4	0	2	2	2	2	0	0	0	8	0
400S1D-C11*	113.1	0	0	7	2	0	0	0	0	0	9	0
400S1D-C17*	109.1	0	0	6	4	0	0	0	0	0	10	0
Total	900.2	28	0	33	26	20	20	10	2	0	109	2

*Angled borings—only samples inside the sector footprint are included in counts.



MAP SOURCE INFORMATION
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The following as shown: Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations; C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors; SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs;
The following as shown in C-400 RI/FS Work Plan (DOE 2020): g:\GIS\SHAPES\PROJECT-SPECIFIC\C400\
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…\Sanitary_Drains4.shp (8/5/2019); …\Processes.shp (6/6/2018); …Floor_Drains2_1_Discard_Drain_LINES.dwg (4/20/2018);
…Floor_Drains3_1_Discard_Drain_LINES.dwg (6/25/2019); …Floor_Drains2_1_Storm_Drain_LINES.dwg (4/23/2018); …\Electrical Feeder.dwg (4/24/2018)

Figure 3.23. Sector 1D Sampling Locations

Ten soil boring locations were sited in this sector to provide environmental data from, or near, specific equipment/features in the C-400 Cleaning Building. These features, or equipment, in this sector include the dip tanks, the uranium hexafluoride pulverizer, acid waste drain, and floor drains.

Fourteen concrete intervals, 45 soil intervals, and 2 water intervals for this sector were planned according to the C-400 Complex RI/FS Work Plan. A total of 28 concrete samples, 90 soil samples, and 2 water samples for this sector were collected from the planned borings. In addition, two contingency borings were drilled with 19 soil samples collected.

A single MIP boring was located within Sector 1D.

3.6.5 Sector 2

Environmental sampling completed in Sector 2 is summarized in Table 3.22. Figure 3.24 shows the Sector 2 sampling locations.

Table 3.22. Summary of Sector 2 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S2-01	67	0	2	2	2	2	2	0	0	0	10	0
400S2-02	67	0	2	2	2	2	2	0	0	0	10	0
400S2-03	62	0	2	2	2	2	2	0	0	0	10	0
400S2-04	67	0	2	2	2	2	2	0	0	0	10	0
400S2-05	67	0	2	2	2	2	2	0	0	0	10	0
400S2-06	110	0	2	2	2	2	2	6	2	0	16	2
400S2-07	67	0	2	2	2	2	2	0	0	0	10	0
400S2-08	120	0	2	2	2	2	2	6	2	0	16	2
400S2-09	67	0	2	2	2	2	2	0	0	0	10	0
400S2-10	70	0	2	2	2	2	2	0	0	0	10	0
400S2-11	67	0	2	2	2	2	2	0	0	0	10	0
400S2-12	67	0	2	2	2	2	2	0	0	0	10	0
400S2-13	67	0	2	2	2	2	2	0	0	0	10	0
400S2-14	107	0	2	2	2	2	0	6	2	0	14	2
400S2-C07	115	0	0	4	4	2	2	6	3	0	18	3
400S2-C20	115	0	0	4	2	4	2	6	3	0	18	3
400S2-G01	4	0	2	2	0	0	0	0	0	0	4	0
400S2-G02	4	0	2	2	0	0	0	0	0	0	4	0
400S2-GS1	0	1	0	0	0	0	0	0	0	0	0	0
Total	1,310	1	32	40	34	34	30	30	12	0	200	12

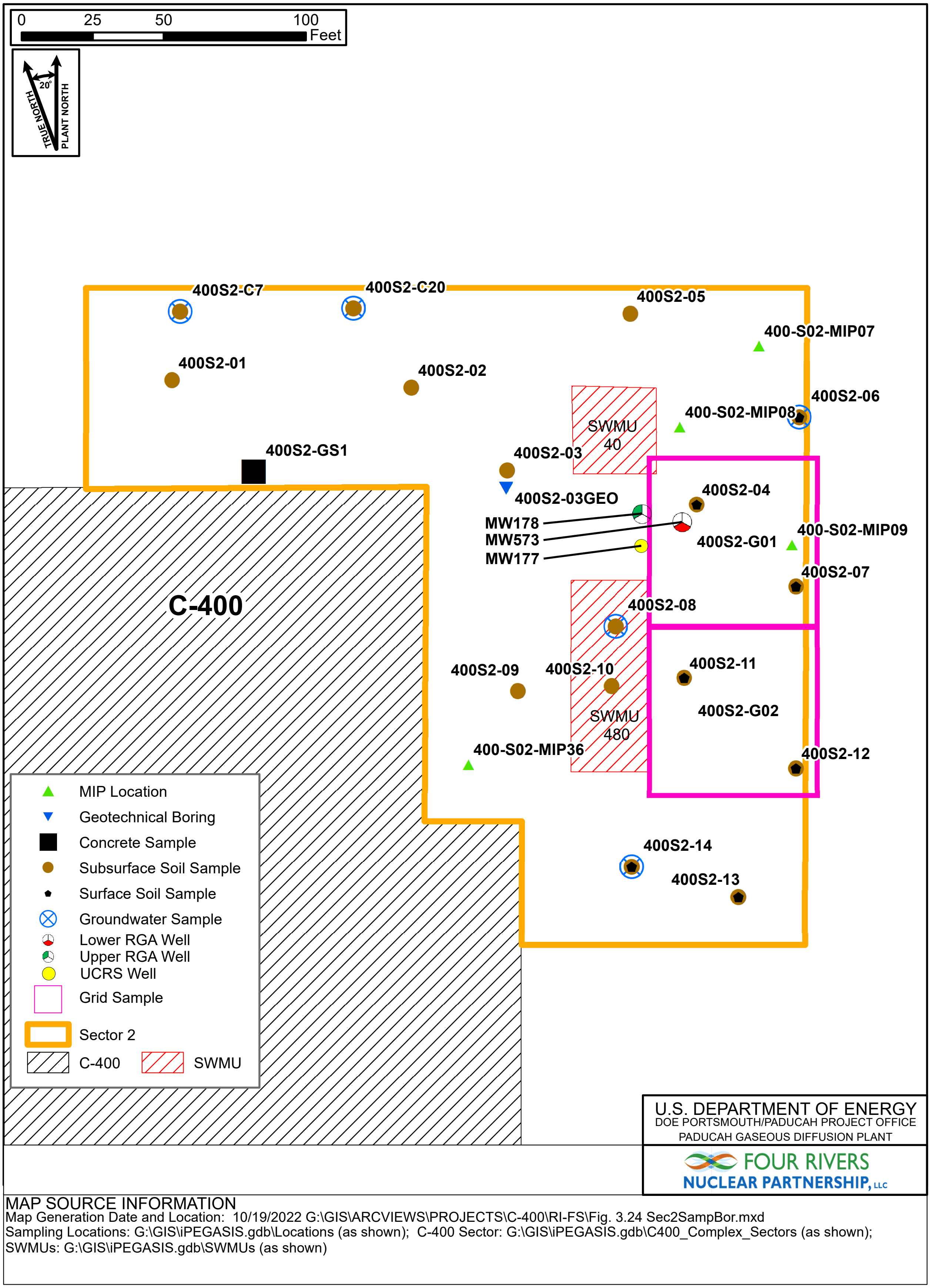


Figure 3.24. Sector 2 Sampling Locations

Fourteen soil boring locations were sited in this sector to confirm historical data from the WAG 6 investigation, bound contamination from the acid waste line to C-403, provide information on the C-403 Neutralization Tank discharge line to the C-401 Transfer Line, bound contamination related to the C-403 Neutralization Tank, and provide data on surrounding soil and storm drains.

Seventy-nine soil intervals and six water intervals were planned according to the C-400 Complex RI/FS Work Plan. A total of 156 soil samples and 6 water samples were collected from the planned borings. In addition, 2 contingency borings were drilled and 36 soil samples and 6 water samples were collected.

Four MIP borings were located within Sector 2.

A surface location was selected for biased sampling based on the GWS. This location was on concrete in the northwestern portion of Sector 2, just north of the C-400 Cleaning Building. A concrete sample was taken from this location. Additionally, 5-point composite samples were collected from grids 400S2-G01 and 400S2-G02, located east of SWMU 480, to provide data on exposed surface soil. These composite grid samples were collected from two depths, or horizons, in each grid. A total of eight soil samples were collected from composite grids in this sector.

MW573 was installed adjacent to existing MWs MW177 and MW178 to monitor the LRGA.

In addition to environmental sampling, geotechnical samples were collected from boring 400S2-03GEO in Sector 2 (Section 3.5).

No samples were collected in the HU4 soil interval for boring 400S2-14 because the HU4 was not present in the soil core.

3.6.6 Sector 3

Environmental sampling completed in Sector 3 is summarized in Table 3.23. Figure 3.25 shows the Sector 3 sampling locations.

Table 3.23. Summary of Sector 3 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S3-01	67	0	2	2	2	2	2	0	0	0	10	0
400S3-02	107	0	2	2	2	2	2	6	2	0	16	2
400S3-03	67	0	2	2	2	2	2	0	0	0	10	0
400S3-04	67	0	2	2	2	2	2	0	0	0	10	0
400S3-05	136	0	2	2	2	2	2	10	2	3	20	5
400S3-06	67	0	2	2	2	2	2	0	0	0	10	0
400S3-07	112	0	2	2	2	2	2	6	2	0	16	2
400S3-08	67	0	2	2	2	2	2	0	0	0	10	0
400S3-C13	140	0	0	6	3	1	2	0	3	2	12	5

Table 3.23. Summary of Sector 3 Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S3-C19	115	0	0	4	3	1	4	6	3	0	18	3
400S3-G01	4	0	2	2	0	0	0	0	0	0	4	0
400S3-G02	4	0	2	2	0	0	0	0	0	0	4	0
400S3-GS1	0	0	1	0	0	0	0	0	0	0	1	0
Total	953	0	21	30	22	18	22	28	12	5	141	17

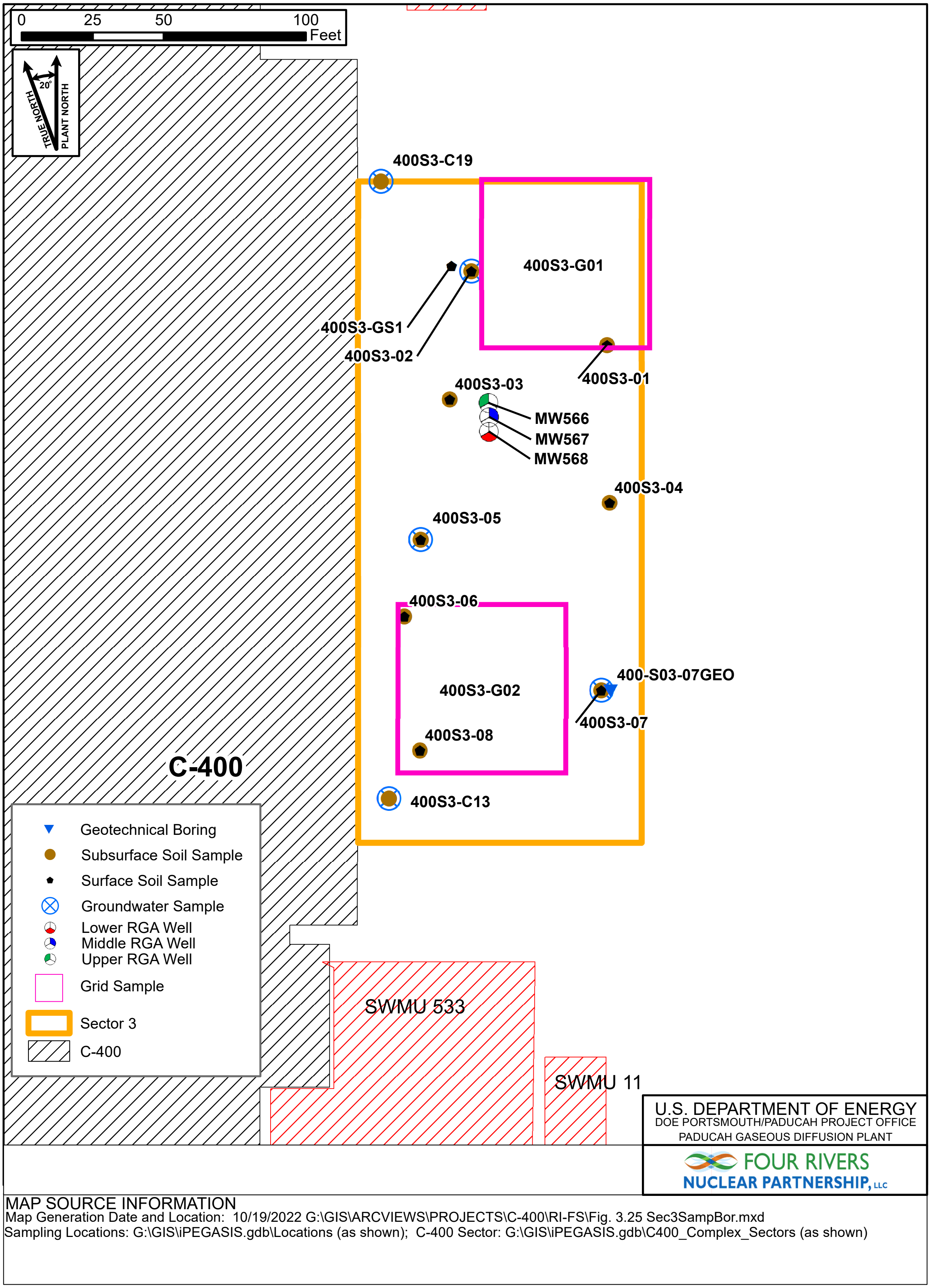


Figure 3.25. Sector 3 Sampling Locations

Eight soil boring locations were sited in this sector to confirm historical data from the WAG 6 investigation, provide information on a storm drain and a transfer line to the C-410-B Lagoon, and provide information on an acid waste line to C-403. Fifty-one soil intervals and nine water intervals were planned according to the C-400 Complex RI/FS Work Plan. A total of 102 soil samples and 9 water samples were collected from the planned borings. In addition, two contingency borings were drilled and 30 soil samples and 8 water samples were collected.

A surface location was selected for biased sampling based on the GWS. This location was in the northern portion of Sector 3 and a surface soil sample was taken from this location. Additionally, 5-point composite samples were collected from grids 400S3-G01 and 400S3-G02 to provide data on exposed surface soil. These composite grid samples were collected from two depths, or horizons, in each grid. A total of eight soil samples were collected from composite grids in this sector.

A MW cluster (MW566, MW567, and MW568) was installed in Sector 3 to monitor the upper, middle, and lower zones of the RGA.

In addition to environmental sampling, geotechnical and geochemical samples were collected from boring 400S3-07GEO in Sector 3 (Section 3.5).

3.6.7 Sector 4

Environmental sampling completed in Sector 4 is summarized in Table 3.24. Figure 3.26 shows the Sector 4 sampling locations.

Table 3.24. Summary of Sector 4 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S4-01	62	0	2	2	2	2	2	0	0	0	10	0
400S4-02	67	0	2	2	2	2	2	0	0	0	10	0
400S4-03	67	0	2	2	2	2	2	0	0	0	10	0
400S4-04	139	0	2	2	2	2	2	10	3	2	20	5
400S4-05	110	0	2	2	2	2	2	6	3	0	16	3
400S4-06	115	0	2	2	2	2	2	6	3	0	16	3
400S4-07	111	0	2	2	2	2	2	16	3	0	26	3
400S4-08	69	0	2	5	2	2	2	0	0	0	13	0
400S4-10	120	0	2	2	2	2	2	6	3	0	16	3
400S4-11	60	0	2	2	2	2	2	0	0	0	10	0
400S4-12	144	0	2	2	2	2	2	20	3	2	30	5
400S4-13	70	0	2	2	2	2	2	0	0	0	10	0
400S4-14	145	0	2	2	2	2	2	10	3	3	20	6
400S4-15	70	0	2	2	2	2	2	0	0	0	10	0
400S4-16	117	0	2	2	2	2	2	6	3	0	16	3
400S4-17	144	0	2	2	2	2	2	10	3	3	20	6
400S4-18	120	0	0	1	1	1	1	3	2	0	7	2
400S4-96	84.6	0	0	0	0	0	0	1	2	0	11[a]	2

Table 3.24. Summary of Sector 4 Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S4-97	70.9	0	0	1	9	0	0	0	0	0	16[a]	0
400S4-98	120	0	0	12	11	2	3	11	6	1	39[a]	7
400S4-99	120	0	0	14	9	3	2	11	6	1	39[a]	7
400S4-C04	115	0	0	2	2	2	2	7	3	0	15	3
400S4-C05	115	0	0	2	2	2	2	7	3	0	15	3
400S4-C12	140	0	0	4	3	3	2	0	3	3	12	6
400S4-C22[b]	155	0	0	1	4	0	0	0	1	0	5	1
400S4-G01	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G02	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G03	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G04	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G05	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G06	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G07	7	0	2	4	0	0	0	0	0	0	6	0
400S4-G08	7	0	2	4	0	0	0	0	0	0	6	0
400S4-GS1	0	0	1	0	0	0	0	0	0	0	1	0
Total	2,706.5	0	49	104	73	45	44	130	53	15	461	68

[a] Borings 400S4-96, 400S4-97, 400S4-98, and 400S4-99 included samples for VOC analyses to support MIP/DyeLIF correlation efforts.
[b] Angled boring—only samples inside the sector footprint are included in counts.

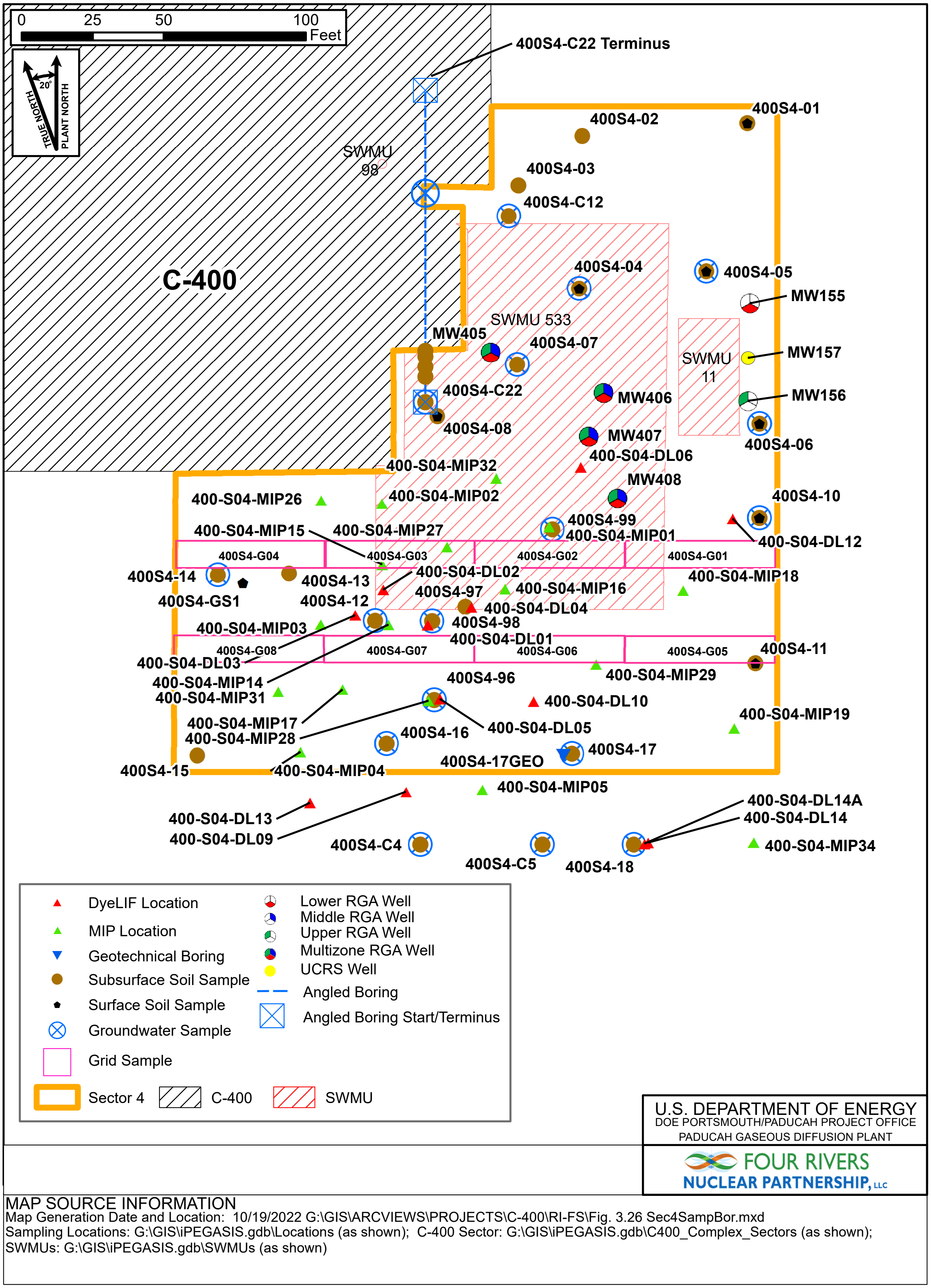


Figure 3.26. Sector 4 Sampling Locations

Seventeen soil boring locations were sited in this sector to (1) reinvestigate the contamination found at WAG 6 sample location 400-092 and to collect samples at deeper depths than the 400-092 location; (2) further investigate the anomalous TCE concentrations detected in MW505/506/507 since 2015; (3) support the validity of the CSM and determine the need for contingency samples; (4) bound contamination from potential building source(s); (5) confirm WAG 6 and/or interim remedial action data; and (6) determine whether contamination from the Phase IIb area is contained within the C-400 Complex. One hundred thirty-two soil intervals and 41 water intervals were planned in Sector 4. A total of 365 soil samples and 55 groundwater samples were collected from the planned borings. Four contingency borings were located in this sector with 47 soil samples and 13 water samples collected. The planned water samples in soil borings 400S4-04 and 400S4-12 to be taken at 50-ft depth in the McNairy Formation were not collected due to insufficient water.

To support correlation of the MIP and DyeLIF results with analytical data, VOC levels in soil and groundwater in two soil borings (400S4-98 and 400S4-99) were characterized from near land surface down into the Upper McNairy Formation. Two additional borings (400S4-96 and 400S4-97) were sampled in the UCRS and/or RGA (sand/gravel samples) to support MIP/DyeLIF correlation efforts.

Eighteen MIP borings and 12 DyeLIF profile borings were located within Sector 4.

A surface location was selected for biased sampling based on the GWS. The selected location was in the southwestern portion of Sector 4, south of the C-400 Cleaning Building and a surface soil sample was taken from this location. Additionally, 5-point composite samples were collected from eight grids (400S4-G01 through 400S4-G08) of approximately 50-ft length from along the railroad tracks within Sector 4 to provide data along the railroad corridor. These composite grid samples were collected from three depths, or horizons, in each grid. A total of 48 soil samples were collected from composite grids in this sector.

Several existing MWs (MW155, MW156, MW157, MW405, MW406, MW407, and MW408) occur in Sector 4 that were sampled for this investigation.

In addition to environmental sampling, geotechnical and geochemical samples were collected from boring 400S4-17GEO in Sector 4 (Section 3.5).

3.6.8 Sector 5

Environmental sampling completed in Sector 5 is summarized in Table 3.25. Figure 3.27 shows the Sector 5 sampling locations.

Table 3.25. Summary of Sector 5 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S5-01	67	0	2	2	2	2	2	0	0	0	10	0
400S5-02	62	0	2	2	2	2	2	0	0	0	10	0
400S5-03	109	0	2	2	2	2	2	6	2	0	16	2
400S5-04	62	0	2	2	2	2	2	0	0	0	10	0

Table 3.25. Summary of Sector 5 Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S5-05	62	0	2	2	2	2	2	0	0	0	10	0
400S5-06	62	0	2	2	2	2	2	0	0	0	10	0
400S5-07	62	0	2	2	2	2	2	0	0	0	10	0
400S5-08	150	0	2	2	2	2	2	10	3	3	20	6
400S5-09	70	0	2	2	2	2	2	0	0	0	10	0
400S5-10	57	0	2	2	2	2	2	0	0	0	10	0
400S5-11	65	0	2	2	2	2	2	0	0	0	10	0
400S5-12	70	0	2	2	2	2	2	0	0	0	10	0
400S5-13	141	0	2	2	2	2	2	10	3	3	20	6
400S5-G01	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G02	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G03	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G04	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G05	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G06	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G07	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G08	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G09	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G10	7	0	2	4	0	0	0	0	0	0	6	0
400S5-G11	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G12	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G13	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G14	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G15	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G16	4	0	2	2	0	0	0	0	0	0	4	0
400S5-G17	4	0	2	2	0	0	0	0	0	0	4	0
400S5-GS1	0	0	1	0	0	0	0	0	0	0	1	0
Total	1,137	0	61	80	26	26	26	26	8	6	245	14

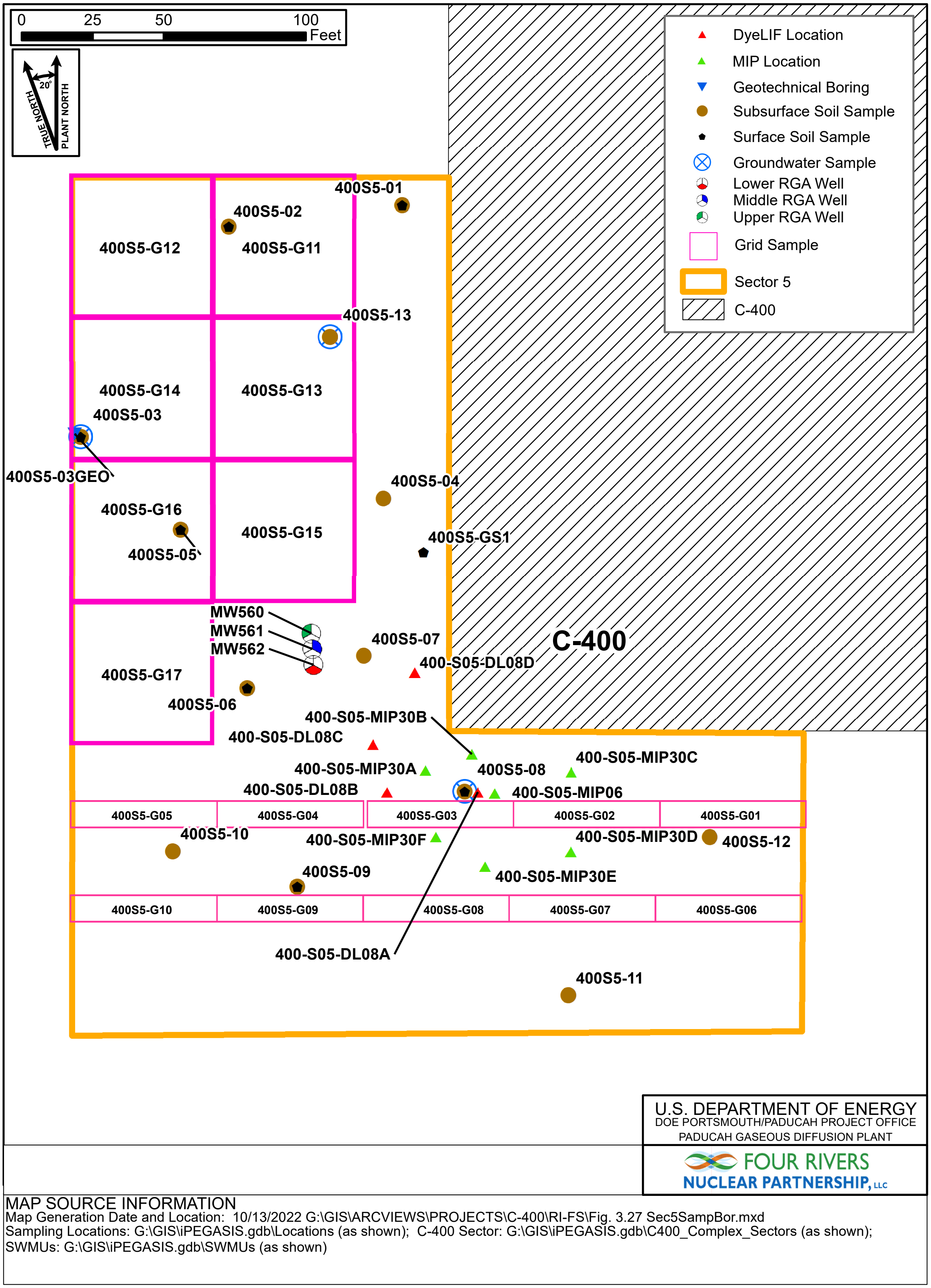


Figure 3.27. Sector 5 Sampling Locations

Thirteen soil boring locations were sited in this sector to confirm WAG 6 data, provide information on a discard waste line and along utilities, and bound contamination in the Phase I southwest area. Seventy-eight soil intervals and 15 water intervals were planned according to the C-400 Complex RI/FS Work Plan. A total of 156 soil samples and 14 water samples were collected. The URGA water interval was not sampled for 400S5-03 due to insufficient water.

Seven MIP borings and four DyeLIF profile borings were located within Sector 5.

A surface location was selected for biased sampling based on the GWS. The selected location was in the eastern portion of Sector 5, immediately west of the C-400 Cleaning Building and a surface soil sample was taken from this location. Additionally, 5-point composite samples were collected from 17 grids. Ten of the grids (400S5-G01 through 400S5-G10) were approximately 50 ft in length along the railroad tracks within Sector 5 to provide data along the railroad corridor. These composite grid samples along the railroad were collected from three depths in each grid while the remaining seven grids (400S5-G11 through 400S5-G17) located over areas of exposed soil consisted of two sample depths. A total of 88 soil samples were collected from composite grids in this sector.

A MW cluster (MW560, MW561, and MW562) was installed in Sector 5 to monitor groundwater in the upper, middle, and lower zones of the RGA.

In addition to environmental sampling, geotechnical and geochemical samples were collected from boring 400S5-03GEO in Sector 5 (Section 3.5).

3.6.9 Sector 6

Environmental sampling completed in Sector 6 is summarized in Table 3.26. Figure 3.28 shows the Sector 6 sampling locations.

Table 3.26. Summary of Sector 6 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S6-01	110	0	2	2	2	2	2	6	3	0	16	3
400S6-02	112	0	2	2	2	2	2	6	3	0	16	3
400S6-03	60	0	2	2	2	2	2	0	0	0	10	0
400S6-04	67	0	2	2	3	2	2	0	0	0	11	0
400S6-05	70	0	2	2	2	2	2	0	0	0	10	0
400S6-06	67	0	2	2	2	2	2	0	0	0	10	0
400S6-07	66	0	2	2	2	2	2	0	0	0	10	0
400S6-08	67	0	2	2	2	2	2	0	0	0	10	0
400S6-G01	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G02	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G03	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G04	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G05	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G06	4	0	2	2	0	0	0	0	0	0	4	0

Table 3.26. Summary of Sector 6 Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S6-G07	4	0	2	2	0	0	0	0	0	0	4	0
400S6-G08	4	0	2	2	0	0	0	0	0	0	4	0
400S6-GS1	0	0	1	0	0	0	0	0	0	0	1	0
Total	651	0	33	32	17	16	16	12	6	0	126	6

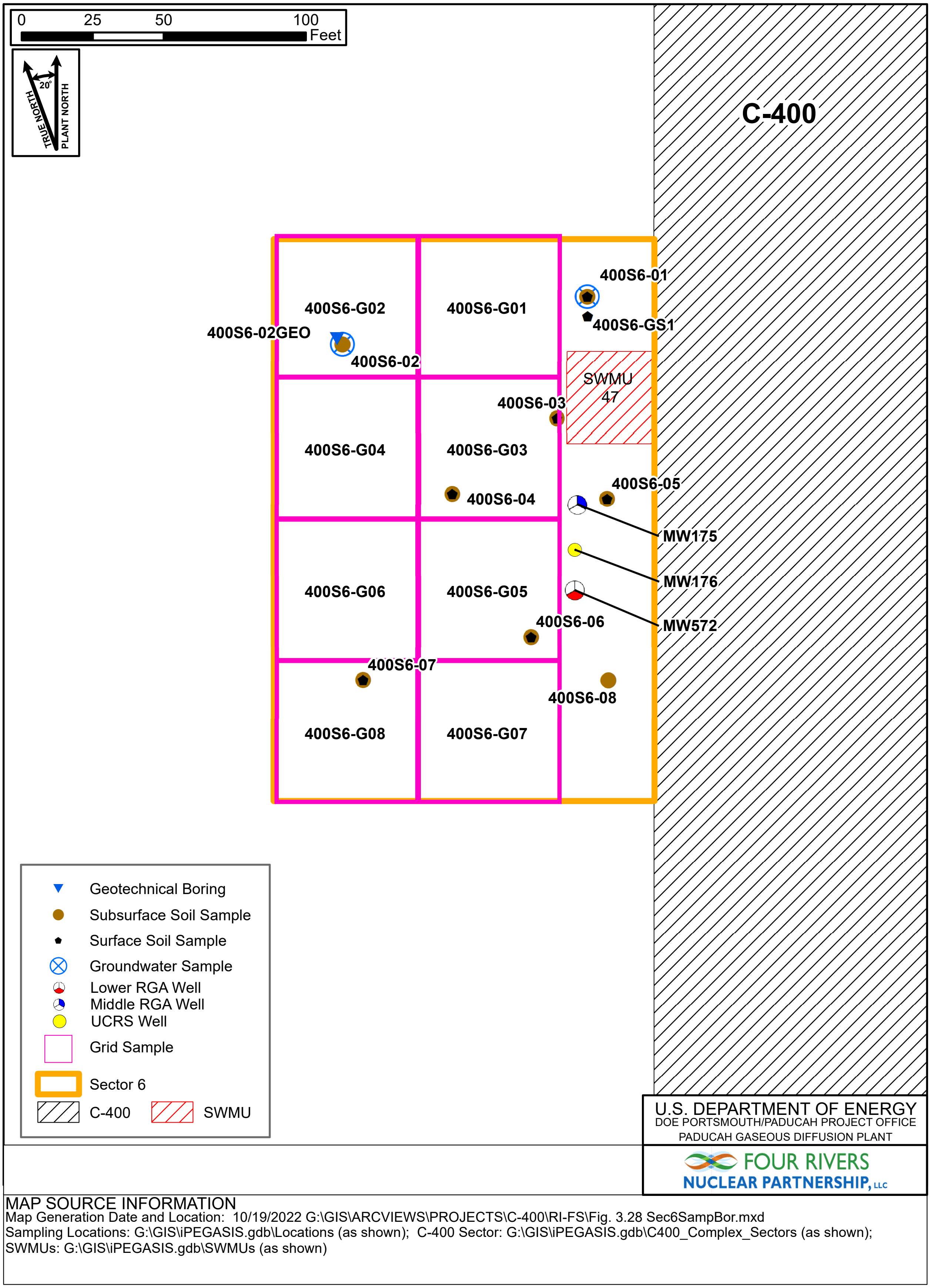


Figure 3.28. Sector 6 Sampling Locations

Eight soil boring locations were sited in this sector to verify WAG 6 data, provide information on SWMU 47, and collect data near a discard waste line and utilities. Forty-six soil intervals and six water intervals were planned according to the C-400 Complex RI/FS Work Plan. A total of 93 soil samples and six groundwater samples were collected.

A surface location was selected for biased sampling based on the GWS. This location was in the northeastern portion of Sector 6, adjacent to the C-400 Cleaning Building and a surface soil sample was taken from this location. Additionally, 5-point composite samples were collected from grids 400S6-G01 through 400S6-G08 to provide data on exposed surface soil. These composite grid samples were collected from two depths, or horizons, in each grid. A total of 32 soil samples were collected from composite grids in this sector.

MW572 was installed adjacent to MW175 and MW176 to monitor the LRGA.

In addition to environmental sampling, geotechnical and geochemical samples were collected from boring 400S6-02GEO in Sector 6 (Section 3.5).

3.6.10 Sector 7

Environmental sampling completed in Sector 7 is summarized in Table 3.27. Figure 3.29 shows the Sector 7 sampling locations.

Table 3.27. Summary of Sector 7 Sampling

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S7-01	67	0	2	2	2	2	2	0	0	0	10	0
400S7-02	112	0	2	2	2	2	2	6	2	0	16	2
400S7-03	67	0	2	2	2	2	2	0	0	0	10	0
400S7-04	67	0	2	2	2	2	2	0	0	0	10	0
400S7-05	62	0	2	2	2	2	2	0	0	0	10	0
400S7-06	67	0	2	2	2	2	2	0	0	0	10	0
400S7-07	67	0	2	2	2	2	2	0	0	0	10	0
400S7-08	67	0	2	2	2	2	2	0	0	0	10	0
400S7-09	140	0	2	2	2	2	2	10	2	0	20	2
400S7-10	139	0	2	2	2	2	2	10	2	0	20	2
400S7-C08	110	0	0	4	4	2	2	6	3	0	18	3
400S7-C21	115	0	0	5	4	1	2	6	3	0	18	3
400S7-G01	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G02	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G03	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G04	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G05	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G06	4	0	2	2	0	0	0	0	0	0	4	0

Table 3.27. Summary of Sector 7 Sampling (Continued)

Sample Point Location	Total Vertical Depth (ft bgs)	Concrete Samples	Surface Soil Samples	HU1 Soil Samples	HU2 Soil Samples	HU3 Soil Samples	HU4 Soil Samples	McNairy Soil Samples	RGA Groundwater	McNairy Fm. Groundwater	Total Soil Samples	Total Groundwater Samples
400S7-G07	4	0	2	2	0	0	0	0	0	0	4	0
400S7-G08	4	0	2	2	0	0	0	0	0	0	4	0
400S7-GS1	0	0	1	0	0	0	0	0	0	0	1	0
Total	1,112	0	37	45	28	23	24	38	12	0	195	12

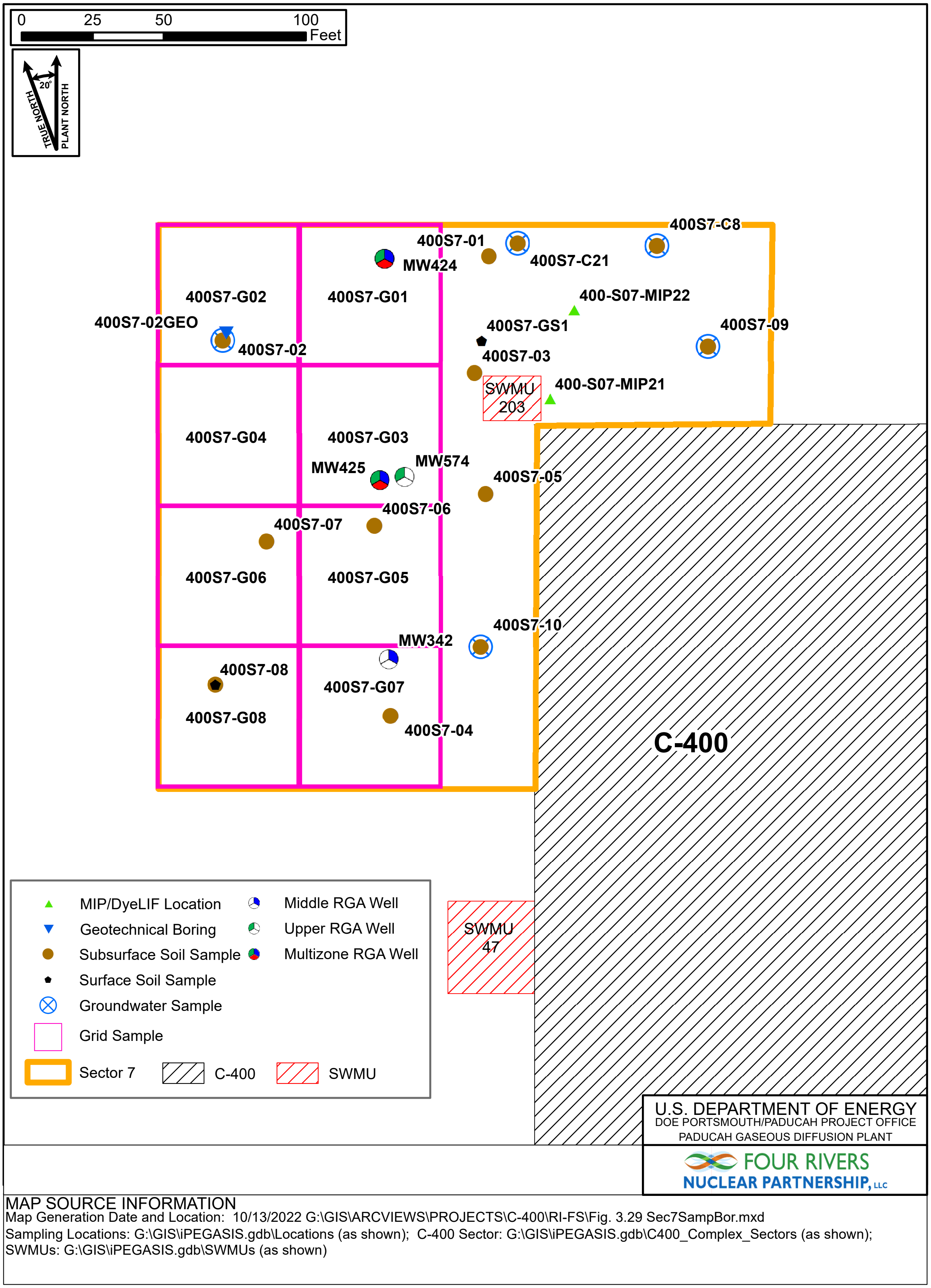


Figure 3.29. Sector 7 Sampling Locations

Ten soil boring locations were sited in this sector to confirm WAG 6 data, provide information on a discard waste line from SWMU 203, and provide information on storm drains and other utilities. Sixty-three soil sample intervals and six water sample intervals were planned to be collected according to the C-400 Complex RI/FS Work Plan. A total of 126 soil samples and 6 groundwater samples were collected in the planned borings. In addition, two contingency soil borings were drilled and 36 soil samples and 6 water samples were collected.

Two MIP borings were located within Sector 7.

A surface location was selected for biased sampling based on the GWS. This location was in the northern portion of Sector 7, northwest of the C-400 Cleaning Building and a surface soil sample was taken from this location. Additionally, 5-point composite samples were collected from grids 400S7-G01 through 400S7-G08 to provide data on exposed surface soil. These composite grid samples were collected from two depths, or horizons, in each grid. A total of 32 soil samples were collected from composite grids in this sector.

SWMU 203, located in Sector 7, was specifically targeted in the C-400 Complex RI/FS Work Plan for further evaluation as a potential contributor to soil and groundwater contamination. A sludge sample was collected and soil boring location 400S7-03 was drilled adjacent to SWMU 203 to provide additional characterization data related to the SWMU. The sludge sample was analyzed for metals, radionuclides, PCBs, SVOCs, and VOCs.

A new MW (MW574) was installed in Sector 7 adjacent to MW425 to monitor the URGA. Two additional existing MWs (MW342 and MW424) located in this sector were sampled for this investigation.

In addition to environmental sampling, geotechnical and geochemical samples were collected from boring 400S7-02GEO in Sector 7 (Section 3.5).

3.7 CIVIL SURVEYING

Upon completion of the field activities associated with the sampling points, soil borings, and groundwater MWs, a final as-built survey of each location and elevation was conducted. Site locations were surveyed on both the Kentucky State Plane Coordinate System and the PGDP Plant Coordinate System. Grid coordinates were measured to an accuracy of plus or minus 0.01 ft and tied to the USGS National Geodetic Vertical Datum of 1988 (vertical) or the North American Datum of 1983 (horizontal). Elevations were measured to a hundredth (0.01) of a foot. Surveying field activities were documented in field logbooks for archiving.

3.8 DEVIATIONS

One deviation occurred during the C-400 RI. Two defined borings (400S1C-30 and 400S1C-31) and one co-located geotechnical boring (400S1C-30) were planned to be drilled at Sector 1C locations identified in the C-400 Complex RI/FS Work Plan. The boring locations (400S1C-30 and 400S1C-31) were planned to be sited and marked using the building columns as reference points.

During the surveying activities, it was identified that the two defined borings and co-located geotechnical boring were sited and drilled approximately 40 ft north of the planned location. During field implementation, these boring locations were sited off the wrong columns (e.g., column C-9 used as reference point in lieu of column C-8). Boring 400S1C-30 and the co-located geotechnical boring were drilled in the vicinity of the originally planned 400S1C-31 location. Boring 400S1C-31 was drilled south of the MW MW569-571 cluster. Figure 3.22 provides the actual location of the soil borings.

Because of this deviation to the C-400 Complex RI/FS Work Plan, DOE proposed adding a boring at the previously planned 400S1C-30 location that met the rationale for the focused sampling in this area (i.e., "… provide information on uranium solution storage tanks, acidifying tanks, and an acid waste line and drain…") and supported the decision rules identified in the DQOs. This boring was assigned a new/unique boring number (400S1C-30R) and was not considered a contingency boring. Soil samples in the HU1, HU2, HU3, HU4, RGA/McNairy interface, and two groundwater samples in the RGA (MRGA and LRGA) were collected from this boring.

Boring 400S1C-30 was drilled in the vicinity of the originally planned 400S1C-31 location. The information provided from the 400S1C-30 location satisfied the rationale for the focused sampling planned for the 400S1C-31 location (i.e., "… provide information on the test loop and discard waste lines…") and supported the decision rules identified in the DQOs; therefore, DOE proposed to not re-drill/resample at the originally planned 400S1C-31 location.

The information provided from the 400S1C-30 geotechnical boring location was representative of the geologic conditions at the originally planned geotechnical boring location (i.e., 40 ft to the south) and supported the decision rules identified in the DQOs; therefore, DOE proposed to not redrill/resample at the planned 400S1C-30 geotechnical location.

EPA and KDEP provided concurrence with this deviation via e-mail on April 30, 2021, and April 29, 2021, respectively.

3.9 QUALITY ASSURANCE/QUALITY CONTROL

QC was monitored throughout the RI process. QC included field sampling, laboratory analysis, and data management.

3.9.1 Field Sampling QC

Field QC samples were collected to assess data quality. Table 3.28 compares the number of actual field QC samples collected during field implementation with the targeted number of field QC samples in the quality assurance project plan (QAPP) (DOE 2020). The target frequency of collection for QC samples for this project was 1 in 20 (5%) for field duplicates, field blanks, and equipment blanks. Overall, this target was met for the project. Trip blanks were collected at a frequency of one per day, or one per sample cooler containing VOC samples. Appendix E includes the data from the field QC samples in a searchable format on compact disk.

Table 3.28. Field QC Samples (Actual versus QAPP)

Analyte/ Analytical Group	Field Samples Actual[a]/QAPP	Field Duplicates Actual/QAPP	Field Blanks Actual/QAPP	Equipment Blanks Actual/QAPP	Trip Blanks[b] Actual
VOCs (Soil/concrete)	861/857	50/43	50/43	50/43	245
Metals (Soil/concrete)	852/857	51/43	49/43	49/43	Not applicable (N/A)
SVOCs (Soil/concrete)	854/857	51/43	50/43	50/43	N/A

Table 3.28. Field QC Samples (Actual versus QAPP) (Continued)

Analyte/ Analytical Group	Field Samples Actual[a]/QAPP	Field Duplicates Actual/QAPP	Field Blanks Actual/QAPP	Equipment Blanks Actual/QAPP	Trip Blanks[b] Actual
PCBs (Soil/concrete)	854/857	51/43	50/43	50/43	N/A
Radionuclides (Soil/concrete)	858/857	52/43	51/43	51/43	N/A
Dioxins (Soil/concrete)	60/63	4/4	4/4	4/4	N/A
VOCs (Groundwater)	382/313	30/17	29/17	29/17	159
Metals (Groundwater)	257/184	16/10	16/10	16/10	N/A
SVOCs (Groundwater)	489/442	42/24	28/24	28/24	N/A
PCBs (Groundwater)	489/442	42/24	28/24	28/24	N/A
Radionuclides (Groundwater)	497/442	42/24	28/24	28/24	N/A

[a] Sample counts do not include contingency borings, correlation borings, or SWMU samples.
[b] QAPP specified trip blanks at one per day or one per cooler for VOCs.

3.9.2 Laboratory QC

The analytical laboratories were contracted through the Sample Management Office (SMO) and were licensed by the Nuclear Regulatory Commission to handle samples with potential radiological contamination. The laboratories were audited annually for compliance with DOE Consolidated Audit Program requirements. EPA-approved methods were utilized, as specified in the C-400 Complex RI/FS Work Plan QAPP (DOE 2020). The analysis followed appropriate protocols and Level D data packages were provided along with electronic data deliverables (EDDs).

The following data qualifiers were used for reporting fixed-base laboratory results:

Inorganic Analysis

B This flag is used when the analyte is found in the associated blank as well as in the sample.

U Analyte analyzed for but not detected at or below the lowest concentration reported.

J Indicates an estimated value.

E The reported value is estimated because of the presence of interference.

N Spiked sample recovery was not within control limits.

N1 Matrix spike (MS)/matrix spike duplicate (MSD) relative percent difference (RPD) outside acceptance criteria.

W Post-digestion spike recovery out of control limits.

X Other specific flags may be required to properly define the results.

* Duplicate analysis was not within control limits.

Organic Analysis

U Analyte analyzed for, but not detected at or below, the lowest concentration reported.

J Indicates an estimated value.

P Difference between results from two gas chromatograph (GC) columns outside control limits.

B This flag is used when the analyte is found in the associated blank as well as in the sample.

L Laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery outside of control limits.

L1 LCS/LCSD RPD outside acceptance criteria.

H Analysis performed outside holding time requirement.

S Sample surrogate recovery outside acceptance criteria.

Y1 MS/MSD recovery outside acceptance criteria.

Y2 MS/MSD RPD outside acceptance criteria.

E This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

X Other specific flags may be required to properly define the results.

Y Indicates MS/MSD recovery and/or RPD failed to meet acceptance criteria.

Radionuclide Analysis

T Tracer recovery is outside control limits of 30–110%.

U Indicates compound was analyzed for, but result was less than the minimum detectable activity.

X Other specific flags may be required to properly define the results.

Precision, accuracy, and completeness objectives were presented in Section 11 of the C-400 Complex RI/FS Work Plan (DOE 2020) and are summarized below. Based on data verification, validation, and assessment, laboratory analytical data have been determined to be usable and to meet the DQOs. An assessment of these objectives for laboratory analytical data was performed. The results of this assessment are provided in Table 3.29.

Table 3.29. QA Assessment for Laboratory Measurements of RI Data

Parameter	Method	Precision (%)	Accuracy (%)	Completeness (%)
		Solid (Concrete) and Soil		
VOCs	SW846-8260	94	97	100
Metals	SW846-6020/6010, 7471	82	72	100
PCBs	SW846-8082	98	98	100
Americium-241, Neptunium-237, Plutonium-238, Plutonium-239/240, Thorium-228, Thorium-230, Thorium-232, Uranium-234, Uranium-235, Uranium-238	Various	100	100	100
Cesium-137, Actinium-227, Cobalt-60, Lead-210, Protactinium-231	901.1 MOD	100	100	100
Strontium-90	905.0 MOD	100	100	100
Radium-226	AN-1421	100	100	100
Technetium-99	HASL 300, Tc-02-RC M	100	100	100
SVOCs	SW846-8270	67	77	100
Dioxins and Furans	SW846-8290	100	83	100
Fluoride	SW846-9056	92	16	100
		Groundwater		
VOCs	SW846-8260	99	98	100
Metals	SW846-6020/6010, 7470	100	98	100
PCBs	SW846-8082	96	97	100
Americium-241, Neptunium-237, Plutonium-238, Plutonium-239/240, Thorium-230, Uranium-234, Uranium-235, Uranium-238	Various	100	100	100
Cesium-137	EPA-901.1	100	100	100
Technetium-99	HASL 300, Tc-02-RC M	100	100	100
SVOCs	SW846-8270	98	94	100
Fluoride	SW846-9056	100	94	100

Precision refers to the level of agreement among repeated measurements of the same characteristic, usually under a given set of conditions. To determine the precision of the laboratory analysis, a routine program of replicate analyses is performed. The absolute difference between the two values calculated is referred to as the RPD. Precision was determined for this RI by reviewing laboratory-applied qualifiers that pertain to laboratory duplicates (i.e., "*," "L1," "N1," "W1," "Y2") over all analyses.

Accuracy refers to the nearness of a measurement to an accepted reference or true value. To determine the accuracy of an analytical method and/or the laboratory analysis, a periodic program of sample spiking is conducted. Accuracy for this RI was determined by reviewing laboratory-applied qualifiers that pertain to laboratory spikes and blanks over all analyses (i.e., "B," "L," "N," "S," "T," "W," "Y1"). QA objectives for accuracy given in the C-400 Complex RI/FS Work Plan are performance based; no concentrations of target compounds are greater than the quantitation limits in method/instrument blanks, field blanks, or equipment rinseate.

Representativeness is the degree to which discrete samples accurately and precisely reflect a characteristic of a population, variations at a sampling location, or an environmental condition. Representativeness is a qualitative parameter and will be achieved through careful, informed selection of sampling sites, drilling sites, drilling depths, and analytical parameters and through the proper collection and handling of samples to avoid interference and minimize contamination and sample loss. This objective was achieved for the C-400 Complex RI by evaluating field conditions before and during the data acquisition process to ensure that the most representative sample set possible was collected.

Completeness is a measure of the percentage of valid, viable data obtained from a measurement system compared with the amount expected under normal conditions. The goal of completeness is to generate a sufficient amount of valid data to satisfy project needs. Completeness also is a measure of samples collected during the field effort with respect to those targeted for collection in the C-400 Complex RI/FS Work Plan. The completeness objective stated in the QAPP was exceeded during this investigation. While some planned samples may not have been collected for various reasons (e.g., insufficient water), there were often more samples collected than were planned for each analytical group (shown in the second column of Table 3.28).

Comparability is the extent to which comparisons among different measurements of the same quantity or quality will yield valid conclusions. Comparability was assessed in terms of field standard operating procedures, analytical methods, QC, and data reporting. In addition, data validation assesses the processes employed by the laboratory that affect data comparability.

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest. This is achieved for each analyte using the method detection limit (MDL), instrument detection limit, or by the laboratory practical quantitation limit (PQL). MDLs and PQLs are laboratory-dependent and were obtained from the analytical laboratory selected to perform work. For this data set, sensitivity was evaluated by reviewing the RLs received from the laboratory.

Historical data determined to be representative of current conditions were evaluated for precision and accuracy as described previously. This assessment was performed over all measurements for the projects associated with the C-400 Complex. Multiple laboratories analyzed samples for these projects. The comparison for the precision and accuracy of historical results encompassed the entire historical data set and did not differentiate between projects or laboratories. All historical analyses were within the criteria established by the C-400 Complex RI/FS Work Plan for RI data.

3.9.3 Data Management

The Paducah Project Environmental Measurements System (PEMS) was used to manage field-generated data; import laboratory-generated data; add data qualifiers based on data verification, validation, and assessment; and to transfer data to the Paducah Oak Ridge Environmental Information System (OREIS). PEMS identifies, tracks, and monitors each sample and associated data from point of collection through final data reporting. The system includes field measurements, chain-of-custody information, tracking laboratory data packages, and EDDs. PEMS also includes information for field planning and data evaluation.

All data packages and EDDs received from the laboratory were tracked, reviewed, and maintained in a secure environment. The following information was tracked: project ID, sample delivery group numbers, date received, receipt of EDDs, and comments.

The data verification processes for laboratory data were implemented for both laboratory data packages and EDDs. The laboratory data were reviewed to confirm that all samples had been analyzed for the requested parameters. As part of a series of internal integrity checks within PEMS, a check was run to identify which of the requested samples and analyses were not received in an EDD. Laboratory data packages were checked to confirm agreement with the associated EDD. Integrity checks in PEMS also were used to check the list of compounds generated by the laboratory to confirm that data were provided for all requested analytes.

Data verification is the process for comparing a data set against a set standard or contractual requirement. Data verification within PEMS included standardization of analytical methods, chemical names and units, and checks for holding time violations and RLs. Verification was performed for 100% of the data.

PEMS system requirements included backups, security, change control, and interfacing with other data management systems. PEMS was housed on the Paducah network. The information technology group performed system backups daily.

The security precautions and procedures implemented by the SMO are designed to minimize the vulnerability of the data to unauthorized access or corruption. Only users approved by the SMO have access to PEMS. Users have Homeland Security Presidential Directive-12 universal serial bus card readers installed on their personal computers to control access to their personal computers and the network.

A large volume of data was generated during the C-400 Complex RI. To confirm that the data set could be used in the decision making process, the RI team performed various checks and reviews during and after the fieldwork to maintain data consistency and identify problem areas. These checks and reviews included electronic verification and manual assessments, as well as independent Level IV validation of fixed-base laboratory data.

Data validation is a process performed for a data set by a qualified individual independent from sampling, laboratory, project management, and other decision-making personnel for the project. Data validation is performed in accordance with EPA guidance. In the data validation process, the laboratory adherence to analytical method requirements is evaluated. Data collected for this RI was validated at a frequency of 10%.

As part of the data review process, findings were qualified as necessary to reflect data validation results. The following qualifiers were assigned by the data validators:

U Analyte or compound considered not detected above the reported detection limit.

J Analyte or compound identified; the associated numerical value is approximated.

UJ Analyte or compound not detected above the reported detection limit, and the reported detection limit is approximated due to quality deficiency.

R Result is not usable for its intended purpose, so data are of "information only" quality and should be supplemented with additional data for decision making.

= Data were validated; however, no qualifier was added.

The majority of the data rejected by validation were VOC and SVOC analyses. Of the approximately 142,800 VOC and SVOC analyses of concrete and/or soil, 150 of the results were rejected during validation. Most of these rejected results were 1,4-dioxane analyses (98 rejected of 2,331 analyses—the samples with rejected analyses are randomly distributed by depth, location, and date of collection). In addition, validation rejected 3 of 11 protactinium-231 analyses of soil and concrete samples and 3 of 1,253 cesium-137 analyses of soil and water.

All analytical samples collected by DOE that are in the Paducah OREIS, including samples with qualified data, those not rejected during data assessment and validation, and those meeting the criteria presented in

Section 6.1.1 of the C-400 Complex RI/FS Work Plan (DOE 2020), were used in the development of this report. The following decision rules were used in the data quality analysis when determining the usability of historical data. Historical data, dated 1999 or before, were used qualitatively to inform sample selection, but were not used quantitatively. Data dated 2000 or after, were utilized after evaluation for quality and representativeness of current conditions. Additional information is included below.

- Groundwater data were used quantitatively for samples collected from 2012 to present in order to focus on current conditions. Historical data (e.g., WAG 6, remedial action work plan/remedial action completion report, post remediation data) were reviewed for qualitative use.

- Soil data were used quantitatively by analyte group for samples as follows in order to focus on current conditions:

  — Metals and Radionuclides: 2000–present

  — VOCs: 2012–present (i.e., last 5 years) for surface soil; 2000–present for deeper soils (unless coded as not representative)

  — SVOCs: 2000–present

  — PCBs: 2000–present

- Historical soil data outside sector boundaries, up to 50 ft, have been used to inform sample selection, but were not used quantitatively.

- For groundwater data, all data within the C-400 Complex boundary, up to 300 ft outside the C-400 Complex boundary were included for evaluation.

- Historical data that have been qualified as rejected by data validation or by data assessment are not included in the historical dataset.

- Historical data that contain units inconsistent with the sampled media or with the analysis are not included in the historical dataset (e.g., a soil sample with analytical units reported in mg/L or a radiological result with units reported in mg/kg).

- Historical data for radionuclide results with no minimum detectable concentration recorded are included in the historical dataset on a case-by-case basis.

- Historical data for nonradionuclide results with no reported result and no detection limit recorded are not included in the historical dataset.

- Historical data for radionuclide results with a null or zero recorded as a counting error are included in the historical dataset on a case-by case basis.

- Data assessment qualifiers previously placed on the data are noted and have been applied as appropriate.

- Data in which results are equal to the detection limit, but not qualified as nondetect, were decided as detect or nondetect on a case-by-case basis.

- A result was considered as a nondetect if it is qualified by the reporting laboratory and includes a “U” qualifier or a “<” qualifier.

- A result was considered as a nondetect if it has a "U" validation code or a "U" data assessment code, including UJ and U* validation codes and U* and U-RAD data assessment codes.

- A radiological result may be considered as a nondetect if the reported total propagated uncertainty is greater than the reported result.

- Negative radiological results were considered nondetects.

- Not representative of current conditions, as coded in the Paducah OREIS. A data field is included in the Paducah OREIS that can be used to help flag data that is not representative of the current characteristics of an area. Soil and sediment samples in the Paducah OREIS have been flagged as "RA" if they were collected in a location that has been removed (e.g., excavated) since sampling. These samples were collected *in situ* prior to removal, and are no longer representative of current conditions. Soil samples in the Paducah OREIS have been flagged as "RM" if they were collected in a location that has undergone remediation, with an additional denotation for the type of remediation (e.g., VO for volatiles). In these instances, only post-remediation or post-excavation samples (including verification samples) have been marked as representative.

- Indicator chemicals are not included in the historical data set [i.e., alpha activity, beta activity, uranium-235 (wt %), mass of uranium-235 (μg/g), total uranium (reported in pCi/g with no isotopes), and moisture].

- XRF data was collected and evaluated for quality as part of the Soils OU (DOE 2013) and is included as part of the historical data set.

- Data have been examined to ensure that the samples from which data were derived were collected using sampling methods that are adequate to determine the nature and extent of contamination for the particular unit or area being assessed. Data not from the unit or area under investigation or not useful in determining contaminant migration from the unit or area have not been used quantitatively in the assessment because these data are not representative of the unit or area for which remedial actions are being considered.

- Data have been examined to ensure that the sampling methods and analytical methods used in the laboratory are consistent with EPA-approved methods for nonradionuclides. Data for nonradionuclides not from EPA-approved methods were not used quantitatively in the risk assessment, but may be used qualitatively. Methods for radionuclides were evaluated during the DQO process to ensure that data quality requirements were achieved. Only results from unfiltered samples were used quantitatively in previous BHHRAs performed at the Paducah Site. Note: Filtered groundwater data may be used in the uncertainty section of the assessment when discussing data sources and their effects on risk estimates.

- Evaluation of radionuclide data followed rules agreed upon by the Commonwealth of Kentucky Radiation Health Branch and DOE Risk Assessment Working Group meeting minutes from 2000.

4. NATURE AND EXTENT OF CONTAMINATION

This section assesses the nature and extent of contamination at the C-400 Complex. Environmental data from each sector investigated during the C-400 Complex RI field activities, along with usable historical data, have been compiled, screened, and evaluated to assess the nature and extent of site-related contamination.

The nature and extent of contamination discussed in this section are based on the presence of site-related contaminants in all media but primarily those found in surface soils, subsurface soils, and groundwater. Samples from these media were analyzed for suites of constituents and reported in the following analytical groups: metals, VOCs, SVOCs, PCBs, dioxins/furans, and radionuclides. Summary tables containing analytical results for each of the sectors are included in this section.

4.1 DATA PROCESSING AND SCREENING

Data processing and screening for this RI focused on summarizing the representative analytical results for surface soils; surface and subsurface soils; groundwater; and other sampled media (e.g., concrete). The process for highlighting chemicals of greatest potential interest was performed consistent with the C-400 Complex RI/FS Work Plan (DOE 2020). For the C-400 Complex RI, the maximum results for each detected constituent in the newly generated data and usable historical data are screened to identify chemicals or COPCs as follows:

- Surface (0–1 ft bgs) soil data (including concrete and brick) are screened against PGDP provisional background values for surface soil and the industrial worker no action levels (NALs) from *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, *Volume* 1. *Human Health,* DOE/LX/07-0107&D2/R12/V1, (Human Health RMD) (DOE 2021). Also in this data group are samples, intended to represent surface soil that, during collection, extended to depths slightly deeper than 1 ft bgs because they were collected beneath asphalt or concrete.

- Surface and Subsurface soil (0–16 ft bgs) data are screened against PGDP provisional background values (i.e., the lowest value between surface and subsurface soil background values) and the excavation worker NALs from the Human Health RMD (DOE 2021).

- All soil data aggregates (surface soil from 0–1 ft bgs, subsurface soil from 1–16 ft bgs, deep soil > 16 ft bgs to the bottom of the RGA, and McNairy Formation) are screened for protection of groundwater using soil screening levels (SSLs) from the Human Health RMD that are derived using dilution attenuation factors (DAFs) of 1 and 20 (DOE 2021). Use of the SSLs from the Human Health RMD may result in the false identification of COPCs. In Section 5, data are further evaluated using SSLs and a DAF of 22 based on site-specific input to better identify COPCs that contribute to groundwater contamination. Deep soil and subsurface soil are also screened against PGDP provisional background values from the Human Health RMD. Data are further evaluated using a site-specific DAF of 22 in Section 5. If at least three sample results within a sector exceeded both background and the SSL screening criteria, further evaluation for possible source areas contributing to groundwater was conducted and is discussed in Section 5.

- C-400 Complex groundwater samples are screened against provisional groundwater background values (using the "Over All Observations" value), the residential use NALs, and primary maximum contaminant levels (MCLs) provided in the Human Health RMD using individual results and data aggregates for the RGA and McNairy groundwater (DOE 2021).

This data screening process was critical for determining when analytes represented site-related contaminants as opposed to laboratory contaminants or constituents that occur naturally in the soil or groundwater. Additionally, due to the volume of data, screening was used as a tool to focus the discussion of the nature and extent of contamination on those constituents that are most likely to have a potential for impact to human health and the environment. Sector data summaries included in this section indicate the detected analytes; the frequency of detection; the minimum, maximum, and average detected values for each analyte; and a comparison to the screening values discussed above. Appendix E provides a complete dataset of analytical results for all samples collected during this investigation, including usable historical data, in a searchable database.

Screening criteria are not normally used for concrete/brick or sludge (collected from pits) for a comparison to background or risk; however, in this section, soil/sediment screening values are used to evaluate data from concrete/brick or sludge. While the screening criteria are for exposure scenarios not applicable to concrete/brick, completing the evaluation using the soil/sediment screening values allows for identification of contaminants that exceed screening values by the greatest amount.

A list of potential laboratory contaminants that may be detected as part of the analysis process, but are not necessarily related to site activities, is provided in EPA guidance (EPA 1989). Potential laboratory-related organic contaminants in the C-400 dataset that were detected in more than 5% of the field and trip blank samples include acetone, 2-butanone, methylene chloride, chlorobenzene, and bis(2ethylhexyl) phthalate. Three VOCs (acetone, chlorobenzene, and methylene chloride) were detected in more than 10% of the field and trip blank samples with acetone being detected in more than 60% of the blanks. The potential for these chemicals to be COPCs and/or COCs is discussed in the SRE.

Seven analytes known to be essential nutrients and known to be toxic only at extremely high concentrations were removed from consideration as sector-related contaminants. These analytes include calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium.

4.2 SOURCES

4.2.1 Infrastructure

Surface and subsurface infrastructure left in place following deactivation are evaluated based on sample analyses and/or process knowledge to ensure risks are identified. The following are infrastructure areas and items included for assessment:

- C-400 Cleaning Building, floor slab, and foundation(s) (Sector 1)
- C-402 Former Lime House floor and foundation(s) (Sector 2)
- Pavements and ground covers (e.g., concrete, asphalt, gravel) (Sectors 2 through 7)
- C-403 Neutralization Tank (Sector 2)
- C-400 acid waste system (Sectors 1, 2, and 3)
- C-400 discard waste system (Sectors 1, 5, 6, and 7)

- Waste heat recovery system equipment (Sector 5)
- Electrical transformer station (Sector 6)
- Utilities that supply other facilities, which includes storm drains and sanitary sewers located within the C-400 Complex OU boundary, (various sectors)

Drain lines are located in and around the C-400 Complex (Figure 2.2). Lines present within the building have been isolated from their associated line portions located on the exterior of the building. A portion of these lines (approximately 10% of the total length) have been inspected with video borescope technology (see Appendix D of the C-400 Complex RI/FS Work Plan). Several chemicals/radionuclides have been identified in the samples collected from the drain lines at concentrations exceeding risk-based screening criteria (DOE 2020). While there is much uncertainty with the inaccessible portions of the drain lines, the nature of contamination in inaccessible lines is assumed to be consistent with other portions of line that were accessed and sampled (e.g., the contamination levels of an inaccessible portion of the acid drain line would be assumed to be consistent with contamination levels from the portions of the accessed acid drain lines) and the drain lines are likely sources of contamination.

As part of C-400 deactivation activities, the acid drain lines in the basement area(s) were cut flush with grade and plugs installed. Also, the acid drain lines that traverse underneath the dip tanks to C-403 Neutralization Tank were grouted from an acid drain cleanout at grade surface, located approximately 24 ft from the northeast corner of the C-400 Cleaning Building to mitigate the potential for liquid from C-403 to back feed into the acid drain lines (DOE 2020).

The locations of the subsurface utilities/infrastructure (provided in Figure 2.2) are also provided on many of the figures in this section. Contamination potentially related to the utilities are discussed on a sector-by-sector basis in Sections 4.3.1 through 4.3.7.

4.2.2 C-400 Cleaning Building—Sector 1

The C-400 Cleaning Building was one of the first buildings constructed at PGDP in the early 1950s and was operational from 1952 to 2014; the former plant laundry remained operational in the building until July 2016 before it was moved to the C-720 Complex. The building and adjacent structures have been used in a wide variety of functions to support operations at the plant. The primary functions of the C-400 Cleaning Building included cleaning (e.g., clothes laundry, machinery parts) and cleaning/maintaining equipment from the uranium enrichment process buildings. Other functions of the C-400 Cleaning Building included metal etching and plating, radioactive materials stabilization and recovery, metals recovery, uranium hexafluoride cylinder washing, uranium trioxide production, diffusion process equipment testing, treatment of radiological waste streams, and uranium tetrafluoride (green salt) pulverization. TCE was the primary degreasing solvent used in the C-400 Cleaning Building; trichloroethane was used to a lesser extent.

The presence of hazardous substances in the C-400 Cleaning Building has been determined to pose an actual or potential threat of release to the environment as the potential for building degradation continues to increase over time. The remaining portions of the C-400 Cleaning Building following deactivation contain hazardous substances that are present in the infrastructure. The *C-400 Process and Structure Review* includes a comprehensive list of hazardous substances suspected to have been associated with the C-400 Cleaning Building structure or processes (MMES 1995). The presence of contamination that is associated with the C-400 Cleaning Building includes PCBs, radionuclides, specific VOCs (e.g., TCE), and specific heavy metals (e.g., uranium, lead). The building also has ACM in its structure. The building is a known source of contamination to surrounding ditches and surface soil.

Chemical contamination—The chemical hazards that exist in the C-400 Cleaning Building include lead and/or other heavy metals, such as uranium metal, ACM in the original building construction, PCBs, and VOCs; therefore, small quantities of both Toxic Substances Control Act (TSCA) and RCRA hazardous wastes are expected to be generated during demolition of the building. Environmental media and debris contaminated with spilled TCE may carry hazardous waste codes F001, F002, and U228 under RCRA. These media and debris will be handled appropriately, in accordance with ARARs that will be defined in a future FS report. Also, TCE DNAPL, where present, might be considered RCRA toxicity characteristic waste (D040) if it fails the regulatory level of 0.5 mg/L for TCE characteristic waste.

The C-400 Cleaning Building is listed in the *Modification to the February 20, 1992, Compliance Agreement Between the United States Department of Energy and the United States Environmental Protection Agency, Washington, D.C., Toxic Substances Control Act*, approved May 30, 2017, as having gaskets impregnated with PCBs > 500 ppm. Additionally, some paints used on the building have a PCB concentration > 500 ppm. PCBs from these sources and solvents used in the building are likely to result in contaminated debris. Both PCB remediation waste and PCB bulk product waste are expected to be generated from building demolition.

Radiological contamination—Radionuclides within the building have contaminated the infrastructure such as floors, walls, and ceilings. At the time of demolition, the radiological contamination in the C-400 Cleaning Building will be comprised of surface contamination from the historical processes performed in the facility. Uranium radionuclides constitute the majority of the radiological inventory present in the facility. Various radionuclides are present as surface contamination. Some recycled uranium or reactor returns were processed at PGDP in the 1960s and 1970s, which has resulted in the potential for the presence of fission products. Beta-gamma contamination that may be present consists of uranium daughter products and technetium-99. Alpha contamination that may be present includes uranium, thorium, and transuranic elements (e.g., plutonium isotopes, americium-241, neptunium-237).

The degradation of the C-400 Cleaning Building over time could result in potential structural failure and the release and migration of contaminants. This degradation, including roof and wall deterioration, would allow rainwater to infiltrate the building. The roof drain system also is suspected to be a contributor to the infiltration of rainwater into the building. Infiltration of rainwater could wash transferable or soluble contaminants out of the building through cracks in the floors or walls, impacting underlying soil and groundwater. The near-term controlled demolition of this facility will ensure that risks to human health and the environment from actual or potential exposure to hazardous substances associated with the building structure are reduced or eliminated. Controlled demolition using engineered safety measures is safer than taking no action and reduces the probability of risks posed by the release of hazardous substances that would result from an uncontrolled collapse (i.e., building "falling in on itself"). An uncontrolled collapse would likely result in the spread of hazardous substances, including radionuclides, to site workers and the environment because contamination found in the C-400 Cleaning Building would no longer be contained by the structure.

4.2.3 SWMUs

As discussed in Section 1, SWMUs 11, 40, 47, 98, 203, 480, and 533 require CERCLA evaluation. Table 4.1 lists the SWMUs and the C-400 Complex sector in which they are located. The SWMUs are described below.

Table 4.1. C-400 Complex SWMUs and Associated Sector

SWMU No.	Sector	Description
11	4	C-400 Trichloroethylene Leak Site
40	2	C-403 Neutralization Tank slab and underlying soils
47	6	C-400 Technetium Storage Tank Area
98	1A	C-400 Basement Sump
203	7	C-400 Discard Waste System slab and underlying soils
480	2	C-402 Lime House Building slab and underlying soils
533	4	TCE Spill Site from TCE Unloading Operations at C-400

C-400 Trichloroethylene Leak Site (SWMU 11)—Sector 4

SWMU 11 is < 0.5 acres and is located near the southeast corner of the C-400 Cleaning Building, along the 11th Street storm sewer line. This SWMU consists of media contaminated by releases from a leaking storm sewer and a leaking TCE transfer pump near the C-400 Cleaning Building. Because discharge lines have been disconnected, there is no direct pathway from this SWMU to surface water. This SWMU is also part of the Groundwater OU.

A leak of TCE from the sump in the C-400 degreaser area to the storm sewer was discovered in 1986. TCE was released at various times through broken pipes and joints in a leaking underground storm sewer pipe from the C-400 Cleaning Building. It had not been known previously that the sump discharged to the sewer. After the leak was discovered, discharge lines from the sump in the basement of C-400 were disconnected from the storm sewer. TCE-contaminated soils were excavated from the area of the leak.

TCE concentrations were reported in soil samples collected adjacent to and below the storm sewer line during removal of the contaminated soil in 1986 (EDGe 1988). Approximately 9,200 ft^3 of soil and bedding material was excavated, of which 310 ft^3 of contaminated soil was drummed and disposed of. Some contaminated soil was left in place due to concerns with the structural integrity of 11th Street and the TCE Tank Pad, located between the spill site and the C-400 Cleaning Building (CH2M HILL 1992). The excavated area was backfilled with clean fill material and capped with a layer of clay after excavation activities were completed.

SWMU 11 was investigated under the Phase I and Phase II SIs (CH2M HILL 1991; CH2M HILL 1992) and the WAG 6 RI (DOE 1999). This SWMU was included in a CERCLA response action and documented in an interim C-400 ROD (DOE 2005b). The selected remedy consisted of volatilization and removal of TCE and other VOCs by application of ERH below 20 ft bgs. The C-400 ROD also incorporated land use controls (LUCs) as a component of the selected remedy. This area was previously addressed as an early action in *Removal Action Work Plan for the Interim Remedial Action for the Volatile Organic Compound Contamination at the C-400 Cleaning Building* (DOE 2009b). The early action was approved by EPA by letter dated July 28, 2008, and by the Kentucky Division of Waste Management by letter dated July 31, 2008.

Analytical data related to SWMU 11 are discussed in Section 4.3.4 as part of Sector 4.

C-403 Neutralization Tank (SWMU 40)—Sector 2

The C-403 Neutralization Tank is an in-ground concrete, open-top tank lined with two layers of acid bricks located northeast of the C-400 Cleaning Building in the central portion of the plant site. The tank is approximately 25 ft × 25 ft × 26 ft deep. This SWMU was the subject of a recent removal action at PGDP, as described in *Action Memorandum for the Soils Operable Unit Inactive Facilities at the Paducah Gaseous*

Diffusion Plant, Paducah, Kentucky (DOE 2009a). Because a 30-inch water line located adjacent to SWMU 40 required rerouting prior to removal that would have interfered with site operations, a change in schedule for the C-403 Neutralization Tank was determined to be necessary. The removal action will be implemented and addressed as part of the C-400 Complex OU final remedial action. This SWMU is not located near surface water. Because discharge lines have been disconnected, there is no direct pathway from this SWMU to surface water.

The C-403 Neutralization Tank received influent from the C-400 Cleaning Building for the storage and treatment (i.e., neutralization) of acidic, uranium-bearing waste solutions generated during cleaning operations. During treatment, lime slurry was added to the wastewater from the C-402 Lime House to raise the pH and precipitate out the uranium in the form of a low-level radioactive sludge. After the pH had been raised to the proper level (10 to 12), the effluent was discharged to the former C-404 Holding Pond where the sludge was allowed to settle out of the solution.

In 1957, discharges from the C-403 Neutralization Tank were routed to NSDD, where it flowed to the Little Bayou Creek. In the late 1970s, flow from the NSDD was routed into the C-616-F Full Flow Lagoon, after which direct discharge to Little Bayou Creek was discontinued. Although neutralization ceased at C-403 after 1957, low-level, uranium-bearing wastewater continued to be discharged to C-403 until 1990. These discharges included uranium hexafluoride-contaminated cylinder hydrostatic-test water, overflow and runoff from cleaning tanks, discharge from floor drains, and other unknown sources. After 1990, the C-403 Neutralization Tank was removed from service.

Subsurface soil samples collected adjacent to the tank backfill at a depth of 30 ft bgs as part of the WAG 6 RI were found to be impacted by several radionuclides. Based upon available data, the extent of contamination around the C-403 Neutralization Tank appeared to be limited to the area of the tank backfill. Elevated radioactivity also was detected at a few locations along the former storm sewer utility line that connects the C-403 Neutralization Tank to the C-410-B Neutralization Lagoon. High concentrations of silver and antimony, used in the plating process performed within the C-400 Cleaning Building, were also identified within the area of elevated radioactivity detected along this line.

Analytical data related to this SWMU are discussed in Section 4.3.2 as part of Sector 2.

C-400 Technetium Storage Tank Area (SWMU 47)—Sector 6

The technetium storage tank was located within a bermed area on a concrete pad outside the C-400 Cleaning Building, on the west side of the building. The tank was emptied of liquids (approximately 200 gal of solution) and removed in 1986, but the concrete pad and berms are still present. From the early 1960s to 1986, the 4,000 gal Technetium Storage Tank was used in the technetium-99 recovery process to store a waste solution of chromium and technetium-99. This SWMU is not located near surface water. No spills are known to have occurred from the technetium storage tank.

Soil borings drilled and sampled near the technetium storage tank to assess the utility corridors and C-400 area perimeter contained isolated occurrences of contaminant concentrations. SWMU 47 was also investigated as part of the Soils OU (DOE 2011b). Several metals were detected above the industrial worker NALs and the SSLs for the protection of groundwater. Several VOCs were also detected above the SSLs for the protection of groundwater including *trans*-1,2-dichloroethene and TCE. Total PAHs and a few radionuclides were detected above the industrial worker NAL. Contaminants were detected greater than background and greater than industrial worker NALs to a maximum depth of 15 ft bgs (DOE 2011b).

Analytical data related to this SWMU are discussed in Section 4.3.6 as part of Sector 6.

C-400 Basement Sump (SWMU 98)—Sector 1A

The C-400 Basement Sump was used to collect spent TCE from the C-400 degreaser where it was then pumped to the storm sewer. Because the large degreaser and its components were made of common steel and water was present, the degreaser tank eventually rusted through, and the degreaser began leaking near the base of the unit. Solvents and other contaminants leaked and flowed to a sump near the unit. From the sump the solvents discharged to the storm water drain system. A hole on the underside of this pipe may have allowed solutions within the pipe to escape to surrounding media. During the early 1970s (approximately 1973), the sump pump became inoperable and was removed from service. When sufficient liquid backed up, the liquid seeped to the drains beneath the cleaning tanks. These floor drains were connected to the C-403 Neutralization Tank. The basement sump pump and degreaser body were replaced in approximately 1978.

During RI/FS scoping meetings, the FFA parties reviewed information in Appendix D of the C-400 Complex RI/FS Work Plan and agreed that one additional sample from SWMU 98 was needed to finalize the work plan scope. A sample of the liquid in the sump was to be used for a qualitative comparison of the liquid sample results taken after initially removing the sludge material in the sump (as described in Appendix D of the C-400 Complex RI/FS Work Plan). Data from the sample provides information as to whether a potential source of contamination still exists in the sump. The concentrations of the primary analytes detected in SWMU 98 liquid are provided in Table 4.2.

Table 4.2. Selected Analytes Detected in SWMU 98 Liquid

Constituent	Result	Units	Result Qualifier	Detection Limit
Uranium metal	15.4	mg/L		0.2
Neptunium-237	2.22	pCi/L		0.816
Technetium-99	13,400	pCi/L		40.9
Uranium-233/234	2,720	pCi/L		21.7
Uranium-235/236	189	pCi/L		5.56
Uranium-238	5,610	pCi/L		14.4
1,4-Dioxane	4,520	µg/L	BJ	12,500
cis-1,2-Dichloroethene	135	µg/L	J	250
TCE	13,900	µg/L	Y1	250

Analytical data related to this SWMU are discussed in Section 4.3.1 as part of Sector 1.

C-400 Discard Waste System (SWMU 203)—Sector 7

Since construction of C-400, the Discard Waste Sump has been a convergence point for effluent from the C-400 Cleaning Building (primarily from the west side), located at the northwest corner of the building. The unit is a 6 ft wide × 11 ft deep concrete pit. The pit includes a 4 ft diameter × 4.5 ft deep sump in the floor. The concrete walls of the sump are lined with acid-proof brick. Influent to the system was discharged directly into the sump that empties into the NSDD.

A pump previously discharged wastewater through the C-401 Transfer Line (SWMU 26) prior to 1957. Beginning in 1957, a drain in the sump was opened to allow gravity fed discharge through a storm sewer line to the NSDD. In the 1950s, the Discard Waste Sump handled discharges from a variety of processes performed in the C-400 Cleaning Building. Many of these discharges were discontinued after 1957. The sump continued to collect effluent from a high-pressure waterjet system on the C-400 Spray Booth and a vacuum pump on the C-400 Lime Precipitation Unit.

The C-400 Discard Waste System slab and underlying soils were included in the C-400 Complex RI/FS for further evaluation as a potential contributor to soil and groundwater contamination. In addition, a sample of the sludge in the pit was collected in September 2021 to assess residual contamination. The concentrations of the primary analytes detected in the sludge are provided in Table 4.3. Significant levels of contaminants were present in the sludge sample.

Table 4.3. Selected Analytes Detected in SWMU 203 Sludge

Constituent	Result	Units	Result Qualifier	Detection Limit
Uranium metal	1,940	mg/kg		1.4
Americium-241	40	pCi/g		13.5
Cesium-137	4.97	pCi/g		0.368
Neptunium-237	50.2	pCi/g		7.5
Plutonium-239/240	129	pCi/g		23.6
Technetium-99	7,830	pCi/g		11.2
Thorium-230	484	pCi/g		17.4
Uranium-233/234	1,380	pCi/g		20.5
Uranium-235/236	69.4	pCi/g		13
Uranium-238	1,790	pCi/g		17.5
1,1-Dichloroethane	1,240	µg/kg	Y1	371
cis-1,2-Dichloroethene	16,300	µg/kg		371
Toluene	137	µg/kg	J	371
TCE	486	µg/kg		371
Vinyl chloride	4,230	µg/kg	Y1	371

Analytical data related to this SWMU are discussed in Section 4.3.7 as part of Sector 7.

C-402 Lime House Building (SWMU 480)—Sector 2

The C-402 Lime House was used to neutralize acids, produce magnesium fluoride pellets, and later as a storage facility, according to the SWMU assessment report. The C-402 Lime House was a 1,742 ft^2 reinforced concrete building with a ground floor and partial basement. The facility was used to supply lime slurry to the C-403 Neutralization Tank. The building also housed pelletizing units and the associated vent systems and was used for drummed chemical storage.

This facility was identified as SWMU 480 in 2001 and was placed in the D&D OU in the FY 2004 SMP (DOE 2004c). The building was radiologically contaminated, and provided storage for potential ACM. In 2006, the C-402 facility structure was demolished to the first floor concrete slab (DOE 2007a).

Analytical data related to the environmental media near this SWMU are discussed in Section 4.3.2 as part of Sector 2.

TCE Spill Site from TCE Unloading Operations at C-400 (SWMU 533)—Sector 4

The highest concentrations of TCE historically found in subsurface soil were located below the backfilled excavation at SWMU 11 (8,208,600 µg/kg), and in an area adjacent to the TCE off-loading pumps (11,055,000 µg/kg). The spill site related to the TCE unloading operations and pump station is recognized as SWMU 533. Based on the distribution and concentration of TCE in the soils, the offloading pump station is suspected to have been the primary source for TCE introduction into the subsurface within the C-400 Complex.

Analytical data related to this SWMU are discussed in Section 4.3.4 as part of Sector 4.

4.3 CONCRETE, SOILS, AND SLUDGE

To determine the nature and extent of contaminant groups found within the C-400 Complex, samples of surface and subsurface soils, and concrete from each sector were collected. One sludge sample was collected, from SWMU 203, and the results of that sample are discussed in Section 4.2.2. Samples were analyzed for suites of compounds in the chemical groups of inorganics, SVOCs, Total PCBs, VOCs, dioxins/furans, and radionuclides.

Each of the seven sectors that comprise the C-400 Complex OU area is characterized individually. The discussion of each sector begins with an introduction that provides a description of the sector. A sector base map depicting soil sample locations, facility structures, transportation pathways (e.g., roads, railroad tracks), and utility lines was provided in Section 3. The utility lines (e.g., storm water, sanitary water and sewer, recirculation water, perimeter drain waste collection) are extensive in some sectors; however, due to their potentially important role in contaminant dispersion, these utility lines are also depicted on sector maps in this section.

The nature and extent sections include summary screening tables containing analytical results for each of the sectors with discussions of COPCs identified in surface soil, subsurface soil, deep soil, and McNairy soil. Screening to identify COPCs was discussed in Section 4.1. The screening criteria do not consider concrete and other infrastructure or the migration of contaminants from concrete and other infrastructure. To allow for a risk comparison for this media, the soil/sediment screening values for the industrial worker and excavation worker were used. While the NALs and action levels (ALs) are for exposure scenarios not applicable to concrete and other infrastructure, completing the evaluation using the screening values allows for identification of the potential contaminants. Background values for surface soil also are not applicable to concrete and other infrastructure, but their use in screening data from these samples is consistent with the risk screening and should be considered as uncertainties in the risk evaluation. The written descriptions are accompanied by one or more figures that show the distribution of selected contaminants for each sector. The area or areas of concern within each sector, the constituents involved, and the potential source or sources are described.

4.3.1 Sector 1

4.3.1.1 Description and process history

Sector 1 includes the footprint of the C-400 Cleaning Building. This sector was divided into four subsectors, 1A through 1D, based on C-400 Cleaning Building historical processes. A concrete slab covers the entire area of Sector 1. Several areas within this sector were previously sampled to characterize the C-400 Cleaning Building basement slab and subsurface structures (DOE 2018c).

Sector 1A is approximately 23,000 ft^2, with approximately 21,000 ft^2 of that located in the C-400 Cleaning Building basement on the east side of the building. A concrete slab covers the entire area. The following process components are relative to Sector 1A:

- Detrex Vapor Degreaser (#1 Degreaser),
- dip tanks,
- fan room,
- equipment laydown area, and
- C-400 Basement Sump (SWMU 98).

Based on the *C-400 Process and Structure Review*, the tank bottom of the TCE degreaser rusted out, releasing TCE to the adjacent floor drain and sump (MMES 1995). The cleaning tanks historically drained through the acid lines to the C-403 Neutralization Tank.

Sector 1B is approximately 37,000 ft^2. The following process components are located in the area:

- Baron-Blakeslee degreaser,
- compressor disassembly pit,
- cylinder cleaning and testing area,
- hand table,
- spray booth,
- spray booth tanks, and
- alumina dissolver.

Based on the *C-400 Process and Structure Review* report, metals and radionuclides are the primary contaminants associated with the main processes in this subsector (MMES 1995). Acids also are of concern in the area. Trichloroethane, in addition to TCE, was used in the Baron-Blakeslee degreaser.

Sector 1C is approximately 38,000 ft^2. The following process-related equipment is located in the area:

- gold recovery systems,
- cubicle area (chemical and precious metal storage area),
- laundry room,
- test loop,
- acidifying tanks,
- technetium-99 recovery system,
- north fan basement,
- uranium solution storage tanks, and
- No. 5 dissolver solution storage tanks.

Sector 1D is approximately 19,000 ft^2 and this subsector contains the following items:

- uranium hexafluoride drum pulverizer,
- drum washer and crusher, and
- truck alley.

Based on the *C-400 Process and Structure Review* report, the uranium hexafluoride drum pulverizer was used to pulverize and segregate green salt (uranium tetrafluoride) and ash receiver waste (MMES 1995).

Appendix D of the C-400 Complex RI/FS Work Plan documents the sampling results from implementation of the *Paducah Gaseous Diffusion Plant C-400 Cleaning Building Basement Slab and Subsurface Structures Sampling and Analysis Plan* (DOE 2018c) and describes the field investigation, data evaluation, risk evaluation, and summary and conclusions for the sampling. Data collection associated with this effort was specifically for characterization of the concrete floors and walls (including stained areas), surface coatings on walls and floors, liquids/sludges in floor drains (if available), and caulk located in the sub-grade areas.

A video borescope was used on many of the pipes that penetrate and underlie the concrete foundation (approximately 10% of the total length of the drain lines were investigated). There was at least one known floor drain that was not initially accessible until building deactivation activities removed some of the equipment in the basement (e.g., TCE degreaser). There were two drain/cleanout areas found in the former degreaser area, a cleanout (identified as CO-216) and a floor drain (FD-4), that were planned to be borescoped. The CO-216 cleanout cover was removed and liquid was found beneath the cover. A sample of the liquid was collected. Upon removing the liquid, it was found that a mechanical plug was inside the piping approximately five inches below grade, precluding the use of the borescope (the plug was not removed and remains in place at that location). The liquid sample from above the plug had detections of m,p-cresol, pyridine, 2-butanone, and TCE (90.1 μg/L). Floor drain FD-4 was not covered with a cap and was visibly open. Borescoping was attempted and encountered solids approximately 1 ft below grade level inside the pipe that prevented further entry. Solid samples were retrieved from inside the piping. Several contaminants were detected in the sample from the floor drain including lead (42,900 mg/kg), nickel (71,700 mg/kg), uranium metal (2,940 mg/kg), PCBs (4.51 mg/kg), neptunium-237 [27.1 picocuries per gram (pCi/g)], plutonium-239/240 (8.03 pCi/g), technetium-99 (1,980 pCi/g), and TCE (0.191 mg/kg). Uranium-235 was also detected at 14.5 mg/kg in this sample. Results from video borescoping of the storm sewer from outside the building and the drains beneath the TCE degreaser are included in Appendix A. Analytical results associated with this effort are included in Appendix E.

The subsectors have been combined in the nature and extent discussion that follows.

4.3.1.2 Nature and extent of contamination—surface soils (concrete/brick)

All surface samples in Sector 1 are samples of concrete or brick [some samples collected during the 2018 characterization of the C-400 slab and basement were collected from a brick floor (see Appendix D of DOE 2020)]. Results from concrete/brick sampling were sufficient to characterize the nature and extent of contamination within the C-400 Cleaning Building slab and basement. A summary of the analytical results for the Sector 1 surface and the screening results are provided in Table 4.4. The results of the screening are discussed below.

Metals and Inorganics

Metals that were detected in the surface interval (i.e., concrete slab) above both background screening levels and the industrial worker NALs were chromium, cobalt, and uranium. Cobalt only exceeded the industrial worker NAL in 1 out of 96 samples. Figure 4.1 shows the distribution of samples where background and industrial worker NALs were exceeded.

Metals that were detected in the Sector 1 surface interval above both the background screening levels and the SSLs (for a DAF of 1) for the protection of groundwater include antimony, barium, cadmium, cobalt, copper, iron, lead, mercury, nickel, selenium, uranium, and zinc (all of these metals, with the exception of zinc, also exceed the SSLs for a DAF of 20).

PCBs

Total PCBs were detected in 96 of 101 samples in the Sector 1 surface interval. Total PCBs, with a maximum result of 19 mg/kg, exceeded the industrial worker NAL in 35 of the 101 samples analyzed. Samples were typically collected at two depths in the concrete (e.g., 0 to 3 inches, 7 to 10 inches). Total PCBs were greater in the shallow sample in most cases; however, in several samples the deeper sample contained higher Total PCBs. Figure 4.2 shows the locations where Total PCBs exceeded the industrial worker NAL. Total PCBs also exceeded the groundwater protection SSLs for both a DAF of 1 and 20.

In addition to concrete/brick, Figure 4.3 shows sampling locations for paint/coating materials, caulk, sludges, and liquid that correspond to Total PCB results that exceed NALs and ALs.

Table 4.4. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 1

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	2.96E+02	1.05E+04	5.58E+03	96/96	0/96	1.30E+04	0/96	1.00E+05	0/96	1.00E+05	0/96	5.99E+04	91/96	3.00E+03	9.16 - 94.7
METAL	Antimony	mg/kg	3.22E-01	1.30E+01	1.56E+00	66/96	66/96	2.10E-01	0/96	9.34E+01	0/96	2.80E+03	48/96	7.04E-01	66/96	3.52E-02	0.904 - 19.4
METAL	Arsenic	mg/kg	4.06E-01	1.15E+01	3.82E+00	95/96	0/96	1.20E+01	93/96	1.60E+00	0/96	1.60E+02	95/96	3.02E-02	95/96	1.51E-03	0.912 - 5.13
METAL	Barium	mg/kg	9.10E+00	3.87E+02	6.37E+01	96/96	1/96	2.00E+02	0/96	4.04E+04	0/96	1.00E+05	1/96	3.11E+02	94/96	1.55E+01	0.365 - 7.99
METAL	Beryllium	mg/kg	2.85E-02	4.21E-01	2.69E-01	95/96	0/96	6.70E-01	0/96	4.50E+02	0/96	1.35E+04	0/96	3.89E+01	0/96	1.95E+00	0.0912 - 0.509
METAL	Boron	mg/kg	3.07E+00	1.40E+02	1.40E+01	95/96	N/A	N/A	0/96	4.65E+04	0/96	1.00E+05	6/96	2.56E+01	95/96	1.28E+00	2.74 - 30.1
METAL	Cadmium	mg/kg	5.33E-02	2.24E+00	3.70E-01	96/96	57/96	2.10E-01	0/96	6.05E+01	0/96	1.82E+03	3/96	1.39E+00	95/96	6.93E-02	0.182 - 0.98
METAL	Chromium	mg/kg	3.32E+00	1.94E+02	1.77E+01	96/96	23/96	1.60E+01	36/96	1.23E+01	0/96	1.23E+03	0/96	3.60E+06	0/96	1.80E+05	0.547 - 3.05
METAL	Cobalt	mg/kg	1.82E+00	1.37E+02	7.88E+00	96/96	8/96	1.40E+01	1/96	6.87E+01	0/96	2.06E+03	96/96	5.43E-01	96/96	2.71E-02	0.182 - 0.207
METAL	Copper	mg/kg	2.00E+00	4.09E+02	2.28E+01	96/96	18/96	1.90E+01	0/96	9.34E+03	0/96	1.00E+05	7/96	5.62E+01	88/96	2.81E+00	0.182 - 2.07
METAL	Iron	mg/kg	1.37E+03	3.43E+04	8.52E+03	96/96	1/96	2.80E+04	0/96	1.00E+05	0/96	1.00E+05	96/96	7.04E+02	96/96	3.52E+01	18.3 - 204
METAL	Lead	mg/kg	1.77E+00	5.09E+02	2.12E+01	96/96	12/96	3.60E+01	0/96	8.00E+02	0/96	8.00E+02	1/96	2.70E+02	22/96	1.35E+01	0.365 - 0.414
METAL	Manganese	mg/kg	2.51E+01	1.34E+03	3.40E+02	96/96	0/96	1.50E+03	0/96	4.72E+03	0/96	1.00E+05	93/96	5.65E+01	96/96	2.83E+00	0.928 - 10.3
METAL	Mercury	mg/kg	3.88E-03	8.71E-01	1.03E-01	34/96	3/96	2.00E-01	0/96	7.01E+01	0/96	2.10E+03	2/96	5.91E-01	18/96	2.95E-02	0.0103 - 0.0249
METAL	Molybdenum	mg/kg	1.61E-01	8.33E+00	1.12E+00	96/96	N/A	N/A	0/96	1.16E+03	0/96	3.48E+04	5/96	4.03E+00	95/96	2.02E-01	0.182 - 0.98
METAL	Nickel	mg/kg	6.37E+00	3.32E+02	2.10E+01	96/96	22/96	2.10E+01	0/96	4.30E+03	0/96	1.00E+05	5/96	5.12E+01	96/96	2.56E+00	0.365 - 3.85
METAL	Selenium	mg/kg	3.44E-01	5.44E+00	6.00E-01	50/96	3/96	8.00E-01	0/96	1.17E+03	0/96	3.51E+04	2/96	1.04E+00	50/96	5.19E-02	0.912 - 5.13
METAL	Silver	mg/kg	1.12E-01	2.22E+00	1.13E+00	42/96	0/96	2.30E+00	0/96	1.17E+03	0/96	3.51E+04	7/96	1.60E+00	42/96	7.99E-02	0.452 - 5.27
METAL	Thallium	mg/kg	--	--	--	0/96	0/96	2.10E-01	0/96	2.34E+00	0/96	7.02E+01	0/96	2.84E-02	0/96	1.42E-03	0.365 - 0.414
METAL	Uranium[a]	mg/kg	9.46E-01	1.28E+03	1.21E+02	96/96	76/96	4.90E+00	42/96	4.66E+01	0/96	1.40E+03	84/96	3.60E+00	96/96	1.80E-01	0.0365 - 0.37
METAL	Vanadium	mg/kg	1.19E+00	2.56E+01	1.27E+01	94/96	0/96	3.80E+01	0/96	1.15E+03	0/96	3.45E+04	0/96	1.73E+02	81/96	8.64E+00	0.912 - 4.14
METAL	Zinc	mg/kg	5.07E+00	7.17E+02	7.97E+01	96/96	32/96	6.50E+01	0/96	7.01E+04	0/96	1.00E+05	0/96	7.46E+02	60/96	3.73E+01	1.82 - 20.5
ANION	Fluoride	mg/kg	3.59E-01	9.19E+01	4.30E+00	84/96	N/A	N/A	0/96	9.33E+03	0/96	1.00E+05	0/96	2.40E+02	5/96	1.20E+01	0.87 - 4.98
PPCB	Dieldrin	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.08E-02	0/26	5.08E+00	0/26	1.42E-03	0/26	7.08E-05	0.0013 - 0.133
PPCB	Total PCB[b]	mg/kg	7.16E-03	1.90E+01	8.50E-01	96/101	N/A	N/A	35/101	2.93E-01	0/101	2.93E+01	51/101	1.36E-01	96/101	6.82E-03	0.00331 - 3.42
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.00E+01	0/70	6.00E+02	0/70	1.74E-02	0/70	8.72E-04	0.329 - 13.7
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.90E+03	0/70	8.70E+04	0/70	8.04E+00	0/70	4.02E-01	0.329 - 13.7
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.90E+01	0/70	8.70E+02	0/70	2.32E-02	0/70	1.16E-03	0.329 - 13.7
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.70E+01	0/70	2.61E+03	0/70	4.52E-02	0/70	2.26E-03	0.329 - 13.7
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.80E+02	0/70	1.74E+04	0/70	8.42E-01	0/70	4.21E-02	0.329 - 13.7
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.80E+01	0/70	1.74E+03	0/70	8.72E-02	0/70	4.36E-03	0.659 - 27.5
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.57E+00	0/70	2.57E+02	0/70	6.42E-03	0/70	3.21E-04	0.329 - 13.7
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.46E-01	0/70	5.46E+01	0/70	1.33E-03	0/70	6.67E-05	0.329 - 13.7
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.84E+03	0/70	5.52E+04	0/70	7.70E+00	0/70	3.85E-01	0.0329 - 1.37
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.17E+03	0/70	3.51E+04	0/70	1.78E-01	0/70	8.91E-03	0.329 - 13.7
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.32E+00	0/70	6.96E+01	0/70	5.16E-03	0/70	2.58E-04	0.329 - 13.7
SVOC	2-Methylnaphthalene	mg/kg	1.13E-02	4.99E+00	3.31E-01	17/70	N/A	N/A	0/70	9.19E+01	0/70	2.76E+03	1/70	3.70E-01	9/70	1.85E-02	0.0329 - 1.37
SVOC	2-Methylphenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.45E+03	0/70	4.35E+04	0/70	1.51E+00	0/70	7.53E-02	0.329 - 13.7
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/94	N/A	N/A	0/94	2.87E+02	0/94	8.61E+03	0/94	1.60E-01	0/94	8.01E-03	0.329 - 13.7
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.80E+01	0/70	1.74E+03	0/70	8.72E-02	0/70	4.36E-03	0.329 - 13.7
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.80E+00	0/70	1.80E+02	0/70	1.65E-02	0/70	8.24E-04	0.329 - 13.7
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.70E+00	0/70	2.61E+02	0/70	4.90E-03	0/70	2.45E-04	0.329 - 13.7
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.41E+01	0/70	4.23E+02	0/70	6.84E-03	0/70	3.42E-04	0.329 - 13.7
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.90E+03	0/70	8.70E+04	0/70	3.42E+00	0/70	1.71E-01	0.329 - 13.7
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/70	N/A	N/A	0/70	4.06E+00	0/70	4.06E+02	0/70	3.10E-03	0/70	1.55E-04	0.329 - 13.7
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.41E+01	0/70	4.23E+02	0/70	6.84E-03	0/70	3.42E-04	0.329 - 13.7
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.80E+01	0/70	1.74E+03	0/70	8.72E-02	0/70	4.36E-03	0.329 - 13.7
SVOC	Acenaphthene	mg/kg	1.23E-02	7.36E-01	3.19E-01	4/94	N/A	N/A	0/94	1.38E+03	0/94	4.14E+04	0/94	1.10E+01	1/94	5.49E-01	0.0329 - 1.37

Table 4.4. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Acenaphthylene	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.38E+03	0/94	4.14E+04	0/94	1.10E+01	0/94	5.49E-01	0.0329 - 1.37
SVOC	Acetophenone	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.34E+04	0/70	7.02E+05	0/70	1.17E+00	0/70	5.84E-02	0.329 - 13.7
SVOC	Anthracene	mg/kg	1.12E-02	1.97E+00	5.94E-01	5/94	N/A	N/A	0/94	6.89E+03	0/94	1.00E+05	0/94	1.16E+02	0/94	5.81E+00	0.0329 - 1.37
SVOC	Atrazine	mg/kg	--	--	--	0/70	N/A	N/A	0/70	3.53E+00	0/70	3.53E+02	0/70	3.92E-03	0/70	1.96E-04	0.329 - 13.7
SVOC	Benzaldehyde	mg/kg	--	--	--	0/67	N/A	N/A	0/67	1.64E+03	0/67	1.64E+05	0/67	8.30E-02	0/67	4.15E-03	0.329 - 13.7
SVOC	Benzo(ghi)perylene	mg/kg	1.02E-01	5.08E+00	9.45E-01	9/70	N/A	N/A	0/70	6.89E+02	0/70	2.07E+04	0/70	2.63E+01	2/70	1.32E+00	0.0329 - 1.37
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.70E+01	0/70	2.61E+03	0/70	2.70E-02	0/70	1.35E-03	0.329 - 13.7
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.25E+00	0/70	1.25E+02	0/70	7.22E-05	0/70	3.61E-06	0.329 - 13.7
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.32E+01	0/70	9.32E+03	0/70	2.62E-03	0/70	1.31E-04	0.329 - 13.7
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.52E-02	3.64E+00	6.17E-01	49/70	N/A	N/A	0/70	5.80E+01	0/70	5.80E+03	0/70	2.66E+01	7/70	1.33E+00	0.0329 - 1.37
SVOC	Butyl benzyl phthalate	mg/kg	1.41E-01	2.53E+00	6.39E-01	6/70	N/A	N/A	0/70	4.27E+02	0/70	4.27E+04	0/70	4.72E+00	3/70	2.36E-01	0.0329 - 1.37
SVOC	Caprolactam	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.43E+04	0/70	4.29E+05	0/70	4.94E+00	0/70	2.47E-01	0.329 - 13.7
SVOC	Carbazole	mg/kg	1.02E-02	2.50E+00	5.27E-01	11/94	N/A	N/A	0/94	4.06E+01	0/94	4.06E+03	2/94	7.51E-01	8/94	3.76E-02	0.0329 - 1.37
SVOC	Dibenzofuran	mg/kg	1.28E-01	7.93E+00	3.09E+00	3/70	N/A	N/A	0/70	2.34E+02	0/70	7.02E+03	2/70	2.92E-01	3/70	1.46E-02	0.329 - 13.7
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.32E+04	0/70	6.96E+05	0/70	1.22E+01	0/70	6.08E-01	0.0329 - 1.37
SVOC	Dimethyl phthalate	mg/kg	2.28E-02	5.57E-02	4.00E-02	3/70	N/A	N/A	0/70	2.32E+04	0/70	6.96E+05	0/70	1.22E+01	0/70	6.08E-01	0.0329 - 1.37
SVOC	Di-n-butyl phthalate	mg/kg	1.24E-02	1.16E+01	1.02E+00	51/70	N/A	N/A	0/70	2.90E+03	0/70	8.70E+04	4/70	4.54E+00	29/70	2.27E-01	0.0329 - 1.37
SVOC	Di-n-octylphthalate	mg/kg	9.64E-02	1.75E-01	1.36E-01	2/70	N/A	N/A	0/70	2.90E+02	0/70	8.70E+03	0/70	1.13E+02	0/70	5.65E+00	0.0329 - 1.37
SVOC	Diphenylamine	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.90E+03	0/70	8.70E+04	0/70	4.66E+00	0/70	2.33E-01	0.329 - 13.7
SVOC	Fluoranthene	mg/kg	1.37E-02	2.52E+01	1.53E+00	39/94	N/A	N/A	0/94	9.19E+02	0/94	2.76E+04	0/94	1.78E+02	2/94	8.91E+00	0.0329 - 1.37
SVOC	Fluorene	mg/kg	1.42E-02	3.49E-01	1.82E-01	2/94	N/A	N/A	0/94	9.19E+02	0/94	2.76E+04	0/94	1.09E+01	0/94	5.45E-01	0.0329 - 1.37
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.26E+00	0/94	1.26E+02	0/94	2.46E-03	0/94	1.23E-04	0.329 - 13.7
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.61E+00	0/70	5.61E+02	0/70	5.34E-03	0/70	2.67E-04	0.329 - 13.7
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	7.45E-01	0/70	2.24E+01	0/70	2.56E-03	0/70	1.28E-04	0.329 - 13.7
SVOC	Hexachloroethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.46E+00	0/70	8.46E+02	0/70	4.00E-03	0/70	2.00E-04	0.329 - 13.7
SVOC	Isophorone	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.55E+02	0/70	8.55E+04	0/70	5.16E-01	0/70	2.58E-02	0.329 - 13.7
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	5.80E+02	0/70	1.74E+04	0/70	5.94E-01	0/70	2.97E-02	0.329 - 13.7
SVOC	Naphthalene	mg/kg	1.14E-02	3.08E+00	2.55E-01	16/94	N/A	N/A	0/94	4.06E+00	0/94	4.06E+02	16/94	7.70E-03	16/94	3.85E-04	0.0329 - 1.37
SVOC	Nitrobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.24E+01	0/70	2.24E+03	0/70	1.83E-03	0/70	9.17E-05	0.329 - 13.7
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.16E-01	0/94	1.16E+01	0/94	1.62E-04	0/94	8.10E-06	0.329 - 13.7
SVOC	Pentachlorophenol	mg/kg	3.32E-01	3.56E-01	3.44E-01	2/70	N/A	N/A	0/70	8.77E-01	0/70	8.77E+01	2/70	1.14E-03	2/70	5.71E-05	0.329 - 13.7
SVOC	Phenanthrene	mg/kg	1.09E-02	4.06E+01	1.59E+00	46/94	N/A	N/A	0/94	1.38E+03	0/94	4.14E+04	2/94	1.10E+01	8/94	5.49E-01	0.0329 - 1.37
SVOC	Phenol	mg/kg	--	--	--	0/70	N/A	N/A	0/70	8.70E+03	0/70	2.61E+05	0/70	6.62E+00	0/70	3.31E-01	0.329 - 13.7
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/70	N/A	N/A	0/70	4.06E+01	0/70	3.48E+03	0/70	3.16E-02	0/70	1.58E-03	0.329 - 13.7
SVOC	Pyrene	mg/kg	1.19E-02	1.85E+01	1.37E+00	33/94	N/A	N/A	0/94	6.89E+02	0/94	2.07E+04	0/94	2.63E+01	4/94	1.32E+00	0.0329 - 1.37
SVOC	Total PAH[c]	mg/kg	1.04E-05	9.35E+00	7.19E-01	25/94	N/A	N/A	3/94	6.43E-01	0/94	6.43E+01	4/94	5.89E-01	11/94	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/7	N/A	N/A	0/7	1.86E+01	0/7	1.86E+03	0/7	8.84E+00	0/7	4.42E-01	0.213 - 0.712
RADS	Americium-241	pCi/g	6.43E-01	1.96E+01	3.06E+00	10/101	N/A	N/A	1/101	6.01E+00	0/101	6.01E+02	1/101	1.92E+01	7/101	9.58E-01	0.148 - 1.5
RADS	Cesium-137	pCi/g	3.60E-02	1.89E+01	2.53E+00	31/101	13/101	4.90E-01	22/101	1.08E-01	1/101	1.08E+01	1/101	9.58E+00	13/101	4.79E-01	0.0228 - 0.116
RADS	Cobalt-60	pCi/g	--	--	--	0/7	N/A	N/A	0/7	5.67E-02	0/7	5.67E+00	0/7	3.19E-02	0/7	1.59E-03	0.0264 - 0.0708
RADS	Lead-210	pCi/g	--	--	--	0/7	N/A	N/A	0/7	7.33E+00	0/7	7.33E+02	0/7	1.78E-01	0/7	8.88E-03	0.949 - 19
RADS	Neptunium-237	pCi/g	5.10E-01	1.13E+02	8.90E+00	19/101	19/101	1.00E-01	19/101	2.49E-01	1/101	2.49E+01	14/101	1.07E+00	19/101	5.36E-02	0.32 - 1.11
RADS	Plutonium-238	pCi/g	1.22E+00	1.22E+00	1.22E+00	1/101	1/101	7.30E-02	0/101	2.65E+01	0/101	2.65E+03	0/101	4.38E+00	1/101	2.19E-01	0.196 - 1.27
RADS	Plutonium-239/240	pCi/g	3.05E-01	9.86E+01	9.56E+00	18/101	18/101	2.50E-02	1/101	2.27E+01	0/101	2.27E+03	8/101	4.26E+00	18/101	2.13E-01	0.232 - 1.25
RADS	Protactinium-231	pCi/g	--	--	--	0/5	N/A	N/A	0/5	1.49E+00	0/5	1.49E+02	0/5	1.21E+01	0/5	6.06E-01	0.387 - 0.662
RADS	Radium-226	pCi/g	5.69E-01	3.11E+00	1.81E+00	3/7	2/7	1.50E+00	3/7	2.48E-02	1/7	2.48E+00	3/7	3.26E-03	3/7	1.63E-04	0.35 - 1.47
RADS	Strontium-90	pCi/g	3.97E-01	1.24E+01	4.93E+00	3/7	1/7	4.70E+00	1/7	1.03E+01	0/7	1.03E+03	3/7	2.24E-02	3/7	1.12E-03	0.128 - 1.83
RADS	Technetium-99	pCi/g	3.41E+00	5.77E+03	2.17E+02	90/101	90/101	2.50E+00	2/101	1.27E+03	0/101	1.00E+05	90/101	1.52E-01	90/101	7.60E-03	1.74 - 5.77

Table 4.4. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Thorium-228	pCi/g	2.64E-01	3.94E-01	3.29E-01	2/7	0/7	1.60E+00	0/7	1.54E+02	0/7	1.54E+04	2/7	1.96E-04	2/7	9.80E-06	0.226 - 1.18
RADS	Thorium-230	pCi/g	5.03E-01	1.21E+02	9.11E+00	64/101	39/101	1.50E+00	5/101	3.13E+01	0/101	3.13E+03	4/101	3.66E+01	28/101	1.83E+00	0.232 - 3.94
RADS	Thorium-232	pCi/g	2.75E-01	3.89E-01	3.32E-01	2/7	0/7	1.50E+00	0/7	3.08E+01	0/7	3.08E+03	2/7	1.96E-01	2/7	9.80E-03	0.108 - 0.846
RADS	Uranium-233/234	pCi/g	6.14E-01	3.31E+02	3.62E+01	90/101	77/101	1.20E+00	13/101	5.01E+01	0/101	5.01E+03	81/101	9.90E-01	90/101	4.95E-02	0.444 - 5.14
RADS	Uranium-235/236	pCi/g	2.18E-01	1.94E+01	3.63E+00	55/101	55/101	6.00E-02	51/101	4.08E-01	0/101	4.08E+01	30/101	9.76E-01	55/101	4.88E-02	0.184 - 3.7
RADS	Uranium-238	pCi/g	5.29E-01	3.71E+02	4.27E+01	96/101	86/101	1.20E+00	81/101	1.66E+00	8/101	1.66E+02	94/101	8.05E-01	96/101	4.03E-02	0.179 - 3.85
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/94	N/A	N/A	0/94	3.58E+03	0/94	1.00E+05	0/94	5.62E+00	0/94	2.81E-01	0.000947 - 0.102
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.91E+00	0/70	2.91E+02	0/70	5.92E-04	0/70	2.96E-05	0.000947 - 0.102
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.81E+03	0/70	8.43E+04	0/70	5.13E+01	0/70	2.56E+00	0.00473 - 0.509
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/94	N/A	N/A	0/94	6.32E-01	0/94	1.90E+01	0/94	2.69E-04	0/94	1.35E-05	0.000947 - 0.102
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.58E+01	0/70	1.58E+03	0/70	1.56E-02	0/70	7.82E-04	0.000947 - 0.102
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.00E+02	0/94	3.00E+03	0/94	2.04E-01	0/94	1.02E-02	0.000947 - 0.102
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.87E+02	0/70	5.61E+03	0/70	4.18E-02	0/70	2.09E-03	0.000947 - 0.102
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.59E+01	0/70	7.77E+02	0/70	2.32E-02	0/70	1.16E-03	0.000947 - 0.102
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	6.49E-02	0/70	6.49E+00	0/70	2.88E-06	0/70	1.44E-07	0.000947 - 0.102
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.68E-01	0/70	1.68E+01	0/70	4.20E-05	0/70	2.10E-06	0.000947 - 0.102
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.76E+02	0/70	2.93E+04	0/70	5.90E-01	0/70	2.95E-02	0.000947 - 0.102
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/94	N/A	N/A	0/94	2.09E+00	0/94	2.09E+02	0/94	9.69E-04	0/94	4.84E-05	0.000947 - 0.102
VOC	1,2-Dichloroethene	mg/kg	6.30E-04	6.30E-04	6.30E-04	1/24	N/A	N/A	0/24	2.10E+03	0/24	6.30E+04	0/24	9.56E-02	0/24	4.78E-03	0.002 - 0.201
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	6.63E+00	0/70	1.99E+02	0/70	5.48E-03	0/70	2.74E-04	0.000947 - 0.102
VOC	1,2-Dimethylbenzene	mg/kg	3.72E-04	1.85E+00	3.93E-02	56/94	N/A	N/A	0/94	2.81E+02	0/94	8.43E+03	1/94	3.81E-01	7/94	1.90E-02	0.000947 - 0.102
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.76E+02	0/70	2.93E+04	0/70	5.90E-01	0/70	2.95E-02	0.000947 - 0.102
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.15E+01	0/70	1.15E+03	0/70	9.24E-03	0/70	4.62E-04	0.000947 - 0.102
VOC	1,4-Dioxane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.91E+01	0/50	3.91E+03	0/50	1.88E-03	0/50	9.42E-05	0.0473 - 5.09
VOC	2-Butanone	mg/kg	1.73E-03	4.25E-01	2.79E-02	56/70	N/A	N/A	0/70	2.24E+04	0/70	6.72E+05	0/70	2.32E+00	3/70	1.16E-01	0.00473 - 0.509
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.15E-02	0/70	9.15E+00	0/70	2.76E-05	0/70	1.38E-06	0.00473 - 0.509
VOC	2-Hexanone	mg/kg	1.77E-03	3.26E-01	2.25E-02	27/70	N/A	N/A	0/70	1.52E+02	0/70	4.56E+03	5/70	1.75E-02	27/70	8.75E-04	0.00473 - 0.509
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.17E+02	0/70	2.17E+04	0/70	6.44E-02	0/70	3.22E-03	0.000947 - 0.102
VOC	4-Methyl-2-pentanone	mg/kg	1.73E-03	2.32E-01	3.86E-02	18/70	N/A	N/A	0/70	7.97E+03	0/70	2.39E+05	0/70	5.62E-01	4/70	2.81E-02	0.00473 - 0.509
VOC	Acetone	mg/kg	4.19E-03	8.84E-01	6.76E-02	69/70	N/A	N/A	0/70	2.10E+05	0/70	6.30E+06	0/70	7.36E+00	1/70	3.68E-01	0.00473 - 0.509
VOC	Acrolein	mg/kg	--	--	--	0/70	N/A	N/A	0/70	6.05E-02	0/70	1.82E+00	0/70	1.68E-05	0/70	8.41E-07	0.00473 - 0.509
VOC	Acrylonitrile	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.24E+00	0/94	1.24E+02	0/94	2.28E-04	0/94	1.14E-05	0.00473 - 0.509
VOC	Benzene	mg/kg	3.63E-04	2.06E-03	8.29E-04	4/94	N/A	N/A	0/94	5.31E+00	0/94	5.31E+02	0/94	4.66E-03	4/94	2.33E-04	0.000947 - 0.102
VOC	Bromochloromethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	6.28E+01	0/70	1.88E+03	0/70	4.16E-02	0/70	2.08E-03	0.000947 - 0.102
VOC	Bromodichloromethane	mg/kg	--	--	--	0/94	N/A	N/A	0/94	1.30E+00	0/94	1.30E+02	0/94	7.30E-04	0/94	3.65E-05	0.000947 - 0.102
VOC	Bromoform	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.56E+01	0/70	9.56E+03	0/70	1.75E-02	0/70	8.73E-04	0.000947 - 0.102
VOC	Bromomethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	3.03E+00	0/70	9.09E+01	0/70	3.82E-03	0/70	1.91E-04	0.000947 - 0.102
VOC	Carbon disulfide	mg/kg	2.19E-03	3.86E-03	3.02E-03	3/70	N/A	N/A	0/70	3.52E+02	0/70	1.06E+04	0/70	4.80E-01	0/70	2.40E-02	0.00473 - 0.509
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/94	N/A	N/A	0/94	2.96E+00	0/94	2.96E+02	0/94	3.54E-03	0/94	1.77E-04	0.000947 - 0.102
VOC	Chlorobenzene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	1.37E+02	0/70	4.11E+03	0/70	1.06E-01	0/70	5.28E-03	0.000947 - 0.102
VOC	Chloroethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	2.27E+03	0/70	6.81E+04	0/70	4.74E+00	0/70	2.37E-01	0.000947 - 0.102
VOC	Chloroform	mg/kg	3.52E-04	1.92E-03	8.89E-04	31/94	N/A	N/A	0/94	1.39E+00	0/94	1.39E+02	7/94	1.22E-03	31/94	6.12E-05	0.000947 - 0.102
VOC	Chloromethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	4.63E+01	0/70	1.39E+03	0/70	1.05E-02	0/70	5.26E-04	0.000947 - 0.102
VOC	*cis* -1,2-Dichloroethene	mg/kg	6.30E-04	7.84E-04	7.07E-04	2/94	N/A	N/A	0/94	4.67E+02	0/94	1.40E+04	0/94	2.12E-02	0/94	1.06E-03	0.000947 - 0.102
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.34E+00	0/70	9.30E+02	0/70	3.36E-03	0/70	1.68E-04	0.000947 - 0.102
VOC	Cumene	mg/kg	3.57E-04	3.64E-03	1.65E-03	8/70	N/A	N/A	0/70	1.04E+03	0/70	3.12E+04	0/70	1.48E+00	0/70	7.38E-02	0.000947 - 0.102
VOC	Cyclohexane	mg/kg	3.62E-04	1.47E-03	8.00E-04	17/70	N/A	N/A	0/70	2.74E+03	0/70	8.22E+04	0/70	2.60E+01	0/70	1.30E+00	0.000947 - 0.102
VOC	Dibromochloromethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	7.79E+01	0/70	7.79E+03	0/70	4.64E-03	0/70	2.32E-04	0.000947 - 0.102

Table 4.4. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	3.68E+01	0/70	1.10E+03	0/70	6.08E-01	0/70	3.04E-02	0.000947 - 0.102
VOC	Ethylbenzene	mg/kg	3.22E-04	9.79E-02	8.61E-03	40/94	N/A	N/A	0/94	2.66E+01	0/94	2.66E+03	4/94	3.36E-02	9/94	1.68E-03	0.000947 - 0.102
VOC	m,p-Xylene	mg/kg	6.90E-04	3.15E+00	6.67E-02	59/94	N/A	N/A	0/94	2.50E+02	0/94	7.50E+03	1/94	3.82E-01	8/94	1.91E-02	0.00189 - 0.205
VOC	Methyl acetate	mg/kg	1.84E-03	4.02E-01	2.02E-01	2/70	N/A	N/A	0/70	2.34E+05	0/70	7.02E+06	0/70	8.22E+00	0/70	4.11E-01	0.00473 - 0.509
VOC	Methylcyclohexane	mg/kg	3.86E-04	2.74E-02	3.38E-03	51/70	N/A	N/A	0/70	1.30E+03	0/70	3.90E+04	0/70	2.80E+01	0/70	1.40E+00	0.000947 - 0.102
VOC	Methylene chloride	mg/kg	1.96E-03	3.31E-03	2.54E-03	16/70	N/A	N/A	0/70	4.08E+02	0/70	1.22E+04	0/70	5.44E-02	5/70	2.72E-03	0.00473 - 0.509
VOC	Styrene	mg/kg	3.49E-04	4.22E-04	3.81E-04	3/70	N/A	N/A	0/70	3.76E+03	0/70	1.13E+05	0/70	2.66E+00	0/70	1.33E-01	0.000947 - 0.102
VOC	Tetrachloroethene	mg/kg	5.10E-04	5.50E-04	5.30E-04	2/94	N/A	N/A	0/94	4.00E+01	0/94	1.20E+03	0/94	3.69E-02	0/94	1.84E-03	0.000947 - 0.102
VOC	Toluene	mg/kg	4.89E-04	9.60E-01	6.09E-02	92/94	N/A	N/A	0/94	6.25E+03	0/94	1.00E+05	0/94	1.52E+00	16/94	7.62E-02	0.000947 - 0.102
VOC	Total Xylene	mg/kg	1.22E-03	5.00E+00	1.10E-01	56/94	N/A	N/A	0/94	2.50E+02	0/94	7.50E+03	1/94	3.82E-01	8/94	1.91E-02	0.00284 - 0.307
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/94	N/A	N/A	0/94	4.54E+01	0/94	1.36E+03	0/94	5.83E-02	0/94	2.91E-03	0.000947 - 0.102
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/70	N/A	N/A	0/70	9.34E+00	0/70	9.30E+02	0/70	3.36E-03	0/70	1.68E-04	0.000947 - 0.102
VOC	Trichloroethene	mg/kg	3.47E-04	5.73E-01	2.39E-02	55/94	N/A	N/A	0/94	1.90E+00	0/94	5.70E+01	32/94	2.02E-03	55/94	1.01E-04	0.000947 - 0.102
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/70	N/A	N/A	0/70	3.16E+02	0/70	9.48E+03	0/70	1.46E+00	0/70	7.31E-02	0.000947 - 0.102
VOC	Vinyl chloride	mg/kg	--	--	--	0/94	N/A	N/A	0/94	2.06E+00	0/94	2.06E+02	0/94	1.29E-04	0/94	6.47E-06	0.000947 - 0.102

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

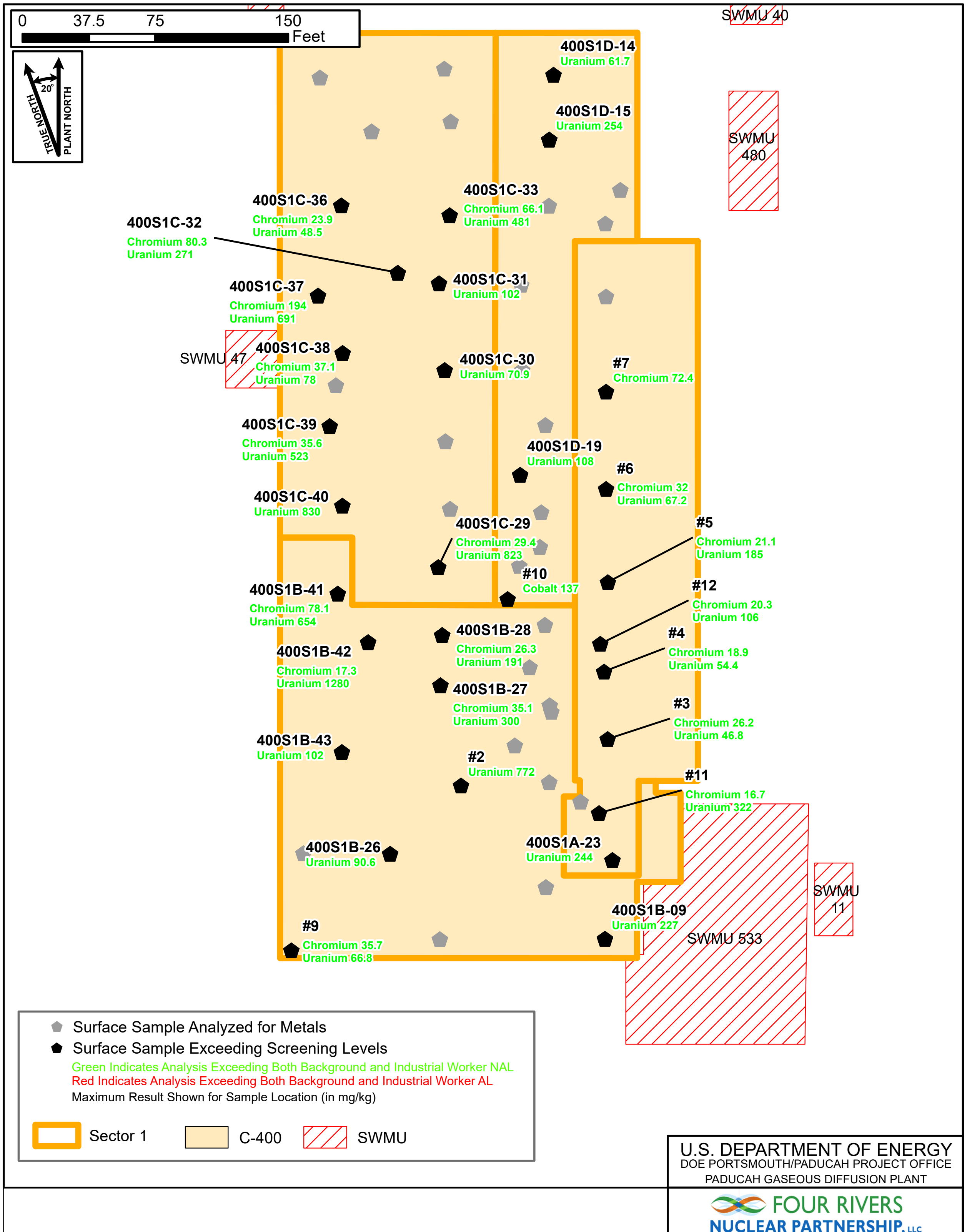
DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory and calculated using TEF values in RMD 2021 for C-400 Basement Slab and Subsurface samples.

[c] Total PAHs calculated using TEF values in RMD 2021.



MAP SOURCE INFORMATION
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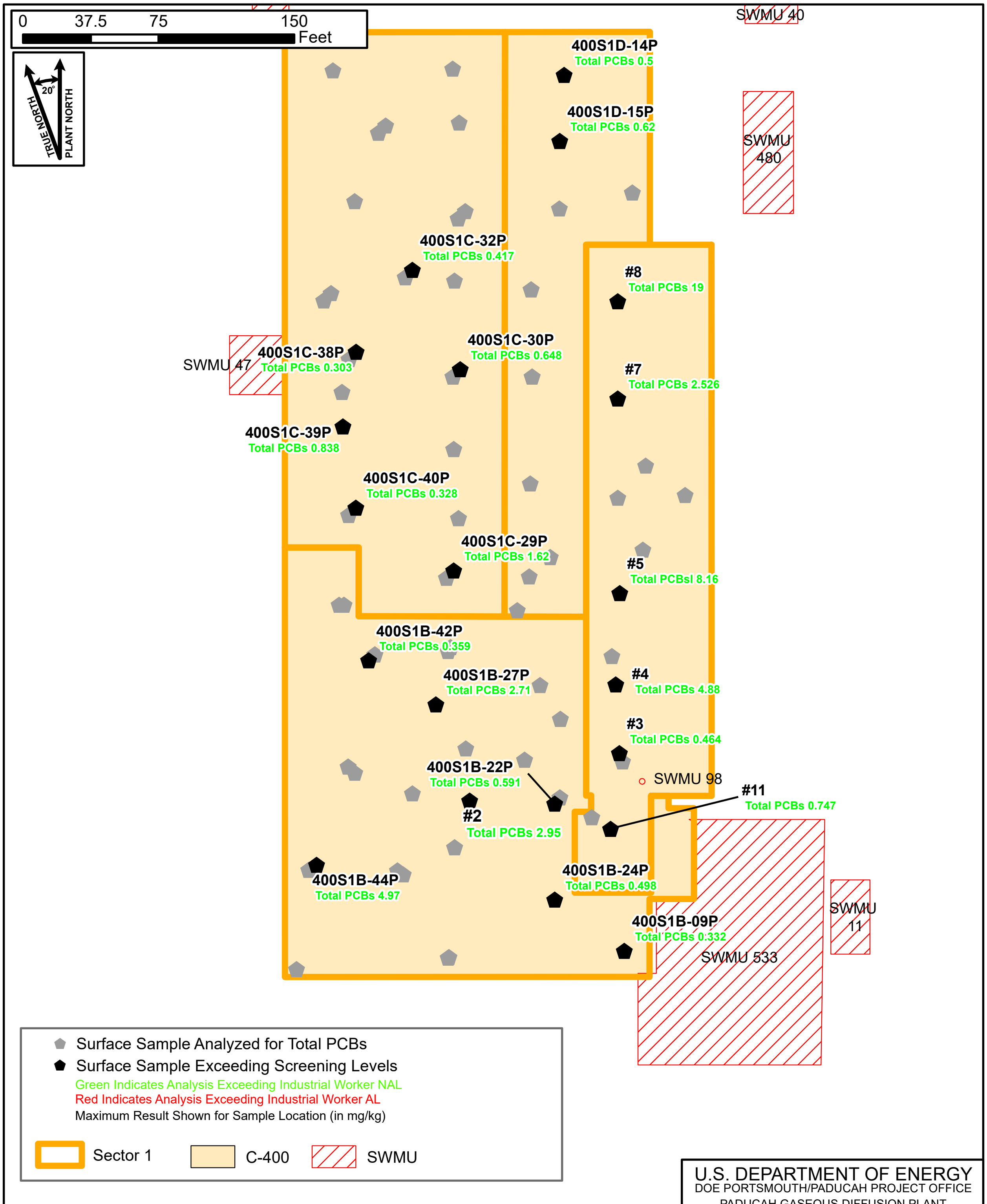
The following as shown: Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations; C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors; SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs; C-400: G:\GIS\iPEGASIS.gdb\Facilities
The following as shown in C-400 RI/FS Work Plan (DOE 2020): G:\gis\SHAPES\Project-Specific\C400\RI-FS\Basement_Loc1_20190520.shp (from Basement_Loc1.xlsx, 5/20/2019)

Figure 4.1. Sector 1 Surface Sampling Exceeding Screening Levels for Metals



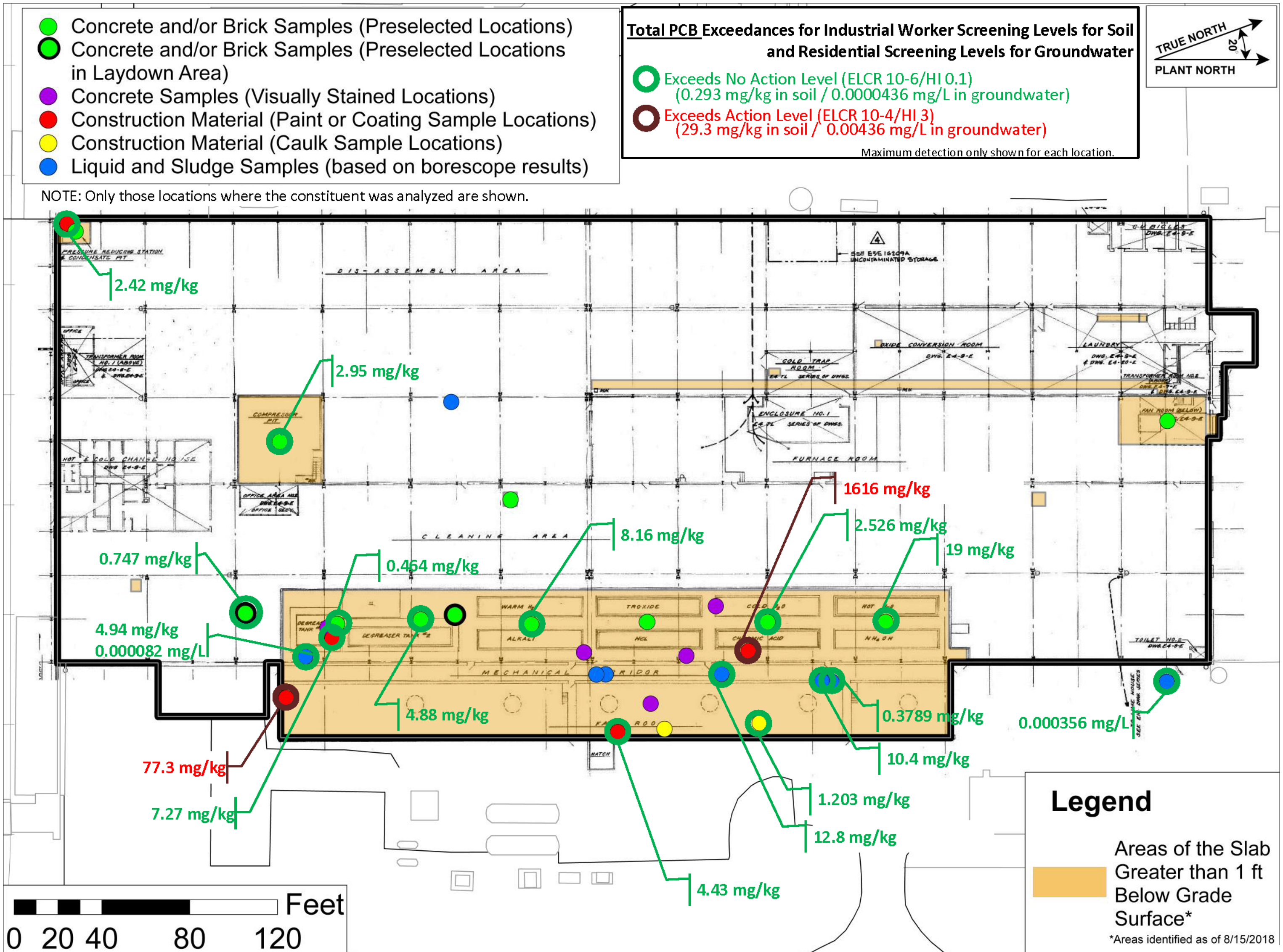
U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

MAP SOURCE INFORMATION
Map Generation Date and Location: 10/18/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.2 Sec1SurfacePCBs.mxd

The following as shown: Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations; C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors; SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs; C-400: G:\GIS\iPEGASIS.gdb\Facilities
The following as shown in C-400 RI/FS Work Plan (DOE 2020): G:\gis\SHAPES\Project-Specific\C400\RI-FS\Basement_Loc1_20190520.shp (from Basement_Loc1.xlsx, 5/20/2019)

Figure 4.2. Sector 1 Surface Sampling Exceeding Screening Levels for Total PCBs



Source: DOE 2020

Figure 4.3. Previous Screening of the C-400 Cleaning Building Basement for Total PCBs

SVOCs

Several SVOCs were detected in the surface interval, mostly PAH compounds, with Total PAHs exceeding the industrial worker NAL in 3 out of 94 samples. The maximum result for Total PAHs was 9.35 mg/kg at location 400S1B-42. Figure 4.4 shows the locations where Total PAHs exceeded the industrial worker NAL. Several SVOCs exceeded the protection of groundwater SSLs (for a DAF of 1) including 2-methylnaphthalene*, acenaphthene, benzo(ghi)perylene, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, carbazole*, dibenzofuran*, di-n-butyl phthalate*, fluoranthene, naphthalene*, pentachlorophenol*, phenanthrene*, pyrene, and Total PAHs* (SVOCs with an asterisk also exceeded the SSLs for a DAF of 20).

VOCs

Several VOCs were detected in the Sector 1 surface interval but none of the results exceeded the industrial worker NAL. Several VOCs exceeded the protection of groundwater SSLs (for a DAF of 1) including 1,2-dimethylbenzene*, 2-butanone, 2-hexanone*, 4-methyl-2-pentanone, acetone, benzene, chloroform*, ethylbenzene*, m,p-xylene*, methylene chloride, toluene, total xylene*, and TCE* (VOCs with an asterisk also exceeded the SSLs for a DAF of 20).

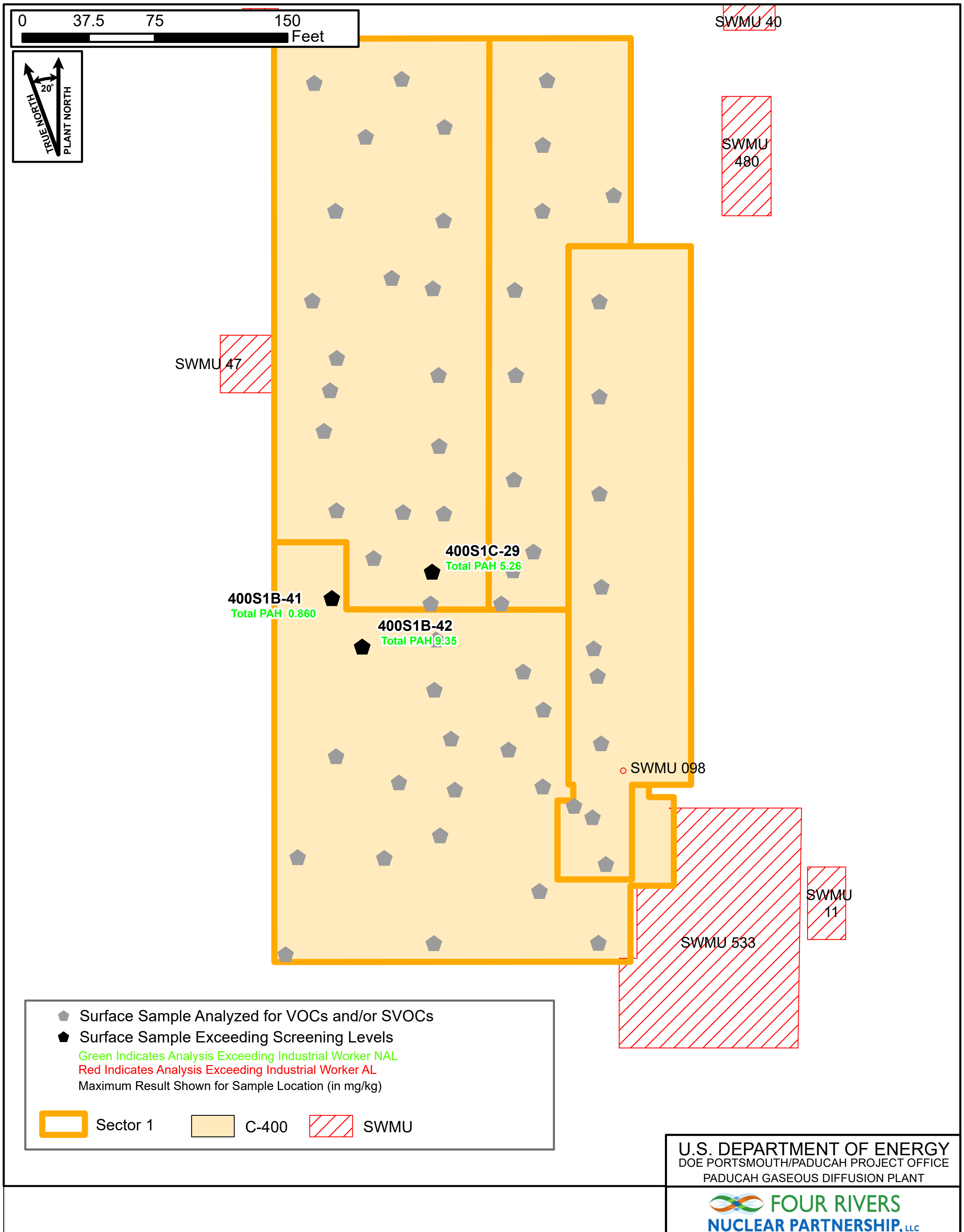
Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in the Sector 1 surface interval include cesium-137, neptunium-237, plutonium-239/240, radium-226, strontium-90, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Cesium-137, neptunium-237, and radium-226 exceeded the industrial worker AL at one location out of 101 samples, 101 samples, and 7 samples, respectively. Uranium-238, with a maximum result of 371 pCi/g, exceeded the industrial worker AL in 8 out of 101 samples. Figure 4.5 shows the distribution of samples where radionuclides exceeded background and industrial worker NALs/ALs.

Radionuclides that exceeded both background and the protection of groundwater SSLs (for a DAF of 1) include cesium-137, neptunium-237, plutonium-238, plutonium-239/240, radium-226, strontium-90, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238 (all of these radionuclides, with the exception of plutonium-238, also exceeded the SSLs for a DAF of 20). Americium-241, which does not have a site-specific background, exceeded the SSLs for both a DAF of 1 and 20.

4.3.1.3 Nature and extent of contamination—surface and subsurface concrete/brick/soils

A summary of the analytical results for Sector 1 surface and subsurface concrete/brick/soil and screening results are provided in Tables 4.5 through 4.8. The results of the screening for surface and subsurface concrete/soil are discussed below.



MAP SOURCE INFORMATION
Map Generation Date and Location: 10/18/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.4 Sec1SurfaceVOC-SVOC.mxd

The following as shown: Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations; C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors; SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs; C-400: G:\GIS\iPEGASIS.gdb\Facilities
The following as shown in C-400 RI/FS Work Plan (DOE 2020): G:\gis\SHAPES\Project-Specific\C400\RI-FS\Basement_Loc1_20190520.shp (from Basement_Loc1.xlsx, 5/20/2019)

Figure 4.4. Sector 1 Surface Sampling Exceeding Screening Levels for VOCs and SVOCs

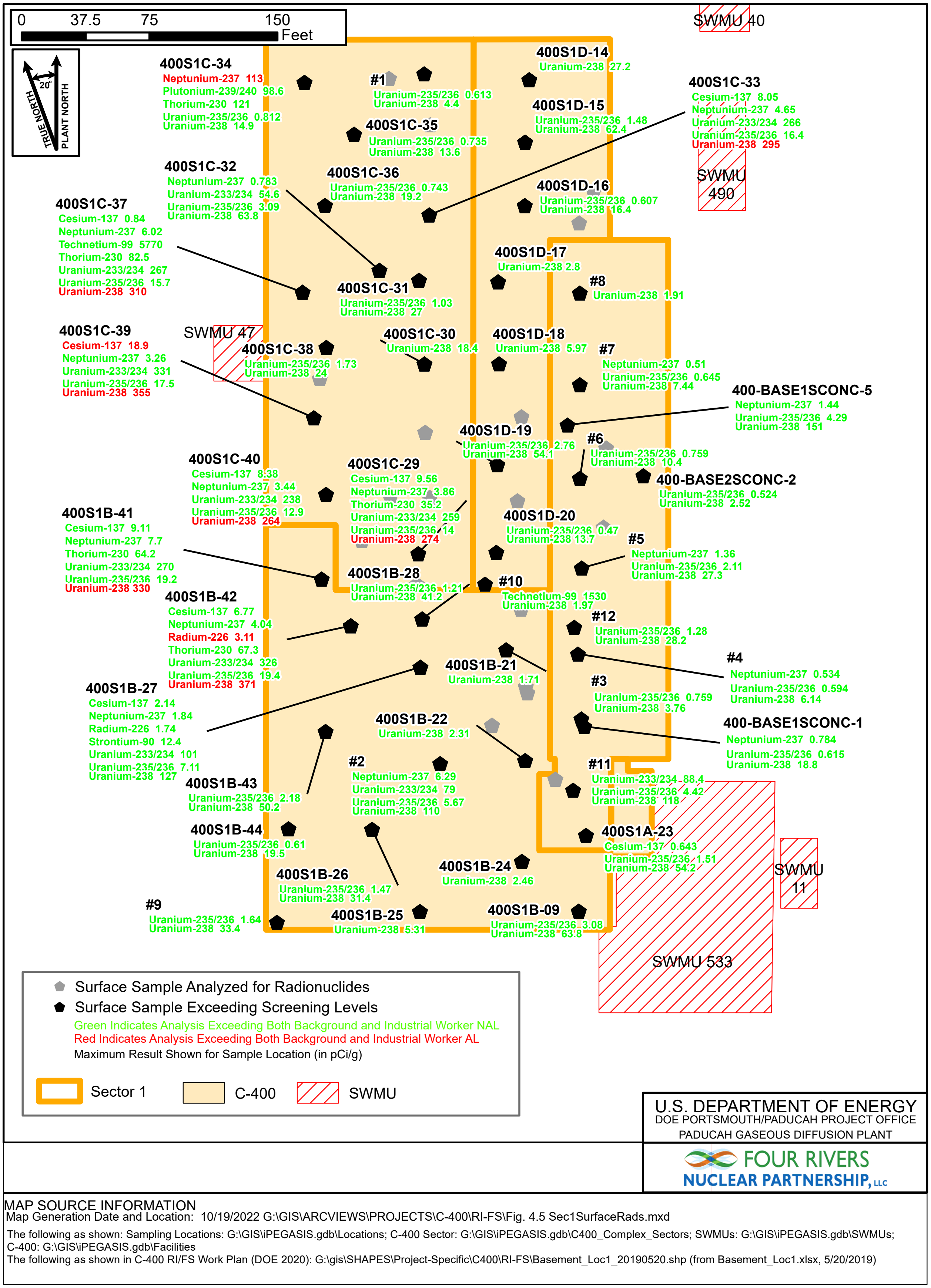


Figure 4.5. Sector 1 Surface Sampling Exceeding Screening Levels for Radionuclides

Table 4.5. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 1

			Detected Results			Freq. Of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	2.96E+02	1.91E+04	8.01E+03	147/147	34/147	1.20E+04	0/147	3.26E+04	0/147	1.00E+05	9.16 - 124
METAL	Antimony	mg/kg	3.22E-01	1.30E+01	1.44E+00	75/147	75/147	2.10E-01	0/147	1.32E+01	0/147	3.96E+02	0.904 - 22.7
METAL	Arsenic	mg/kg	4.06E-01	1.81E+01	4.45E+00	146/147	12/147	7.90E+00	74/147	3.74E+00	0/147	3.60E+02	0.912 - 5.13
METAL	Barium	mg/kg	9.10E+00	3.87E+02	8.13E+01	147/147	10/147	1.70E+02	0/147	6.47E+03	0/147	1.00E+05	0.365 - 9.64
METAL	Beryllium	mg/kg	2.85E-02	1.26E+00	3.76E-01	146/147	9/147	6.70E-01	0/147	6.55E+01	0/147	1.97E+03	0.0912 - 0.574
METAL	Boron	mg/kg	9.28E-01	1.40E+02	1.05E+01	135/147	N/A	N/A	0/147	6.57E+03	0/147	1.00E+05	2.74 - 30.1
METAL	Cadmium	mg/kg	2.13E-02	2.24E+00	2.71E-01	141/147	58/147	2.10E-01	0/147	2.53E+01	0/147	7.59E+02	0.182 - 0.98
METAL	Chromium	mg/kg	3.32E+00	1.94E+02	1.95E+01	147/147	62/147	1.60E+01	125/147	9.14E+00	0/147	9.14E+02	0.547 - 3.44
METAL	Cobalt	mg/kg	1.82E+00	1.37E+02	8.26E+00	147/147	13/147	1.30E+01	18/147	9.84E+00	0/147	2.95E+02	0.182 - 0.248
METAL	Copper	mg/kg	2.00E+00	4.09E+02	1.83E+01	147/147	19/147	1.90E+01	0/147	1.32E+03	0/147	3.96E+04	0.182 - 2.07
METAL	Iron	mg/kg	1.37E+03	3.78E+04	1.21E+04	147/147	5/147	2.80E+04	10/147	2.30E+04	0/147	1.00E+05	18.3 - 248
METAL	Lead	mg/kg	1.77E+00	5.09E+02	1.69E+01	147/147	14/147	2.30E+01	0/147	8.00E+02	0/147	8.00E+02	0.365 - 0.497
METAL	Manganese	mg/kg	2.51E+01	3.01E+03	3.73E+02	147/147	5/147	8.20E+02	6/147	7.74E+02	0/147	2.32E+04	0.928 - 114
METAL	Mercury	mg/kg	3.88E-03	8.71E-01	6.42E-02	68/147	7/147	1.30E-01	0/147	9.86E+00	0/147	2.96E+02	0.0103 - 0.0297
METAL	Molybdenum	mg/kg	1.50E-01	8.33E+00	9.15E-01	147/147	N/A	N/A	0/147	1.64E+02	0/147	4.92E+03	0.182 - 0.98
METAL	Nickel	mg/kg	3.49E+00	3.32E+02	1.97E+01	147/147	32/147	2.10E+01	0/147	6.52E+02	0/147	1.96E+04	0.365 - 3.85
METAL	Selenium	mg/kg	3.44E-01	5.44E+00	9.42E-01	96/147	42/147	7.00E-01	0/147	1.64E+02	0/147	4.92E+03	0.912 - 5.13
METAL	Silver	mg/kg	1.12E-01	2.22E+00	9.87E-01	53/147	0/147	2.30E+00	0/147	1.64E+02	0/147	4.92E+03	0.452 - 5.91
METAL	Thallium	mg/kg	1.53E-01	5.20E-01	2.18E-01	15/147	6/147	2.10E-01	1/147	3.29E-01	0/147	9.87E+00	0.365 - 0.497
METAL	Uranium[a]	mg/kg	4.73E-01	1.28E+03	8.66E+01	147/147	85/147	4.60E+00	78/147	6.58E+00	19/147	1.97E+02	0.0365 - 0.468
METAL	Vanadium	mg/kg	1.19E+00	6.76E+01	1.90E+01	145/147	11/147	3.70E+01	0/147	1.65E+02	0/147	4.95E+03	0.912 - 22.6
METAL	Zinc	mg/kg	5.07E+00	7.17E+02	6.25E+01	147/147	37/147	6.00E+01	0/147	9.86E+03	0/147	1.00E+05	1.82 - 20.5
ANION	Fluoride	mg/kg	3.59E-01	9.19E+01	7.28E+00	135/147	N/A	N/A	0/147	1.32E+03	0/147	3.96E+04	0.87 - 4.98
PPCB	Dieldrin	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.66E-01	0/26	1.66E+01	0.0013 - 0.133
PPCB	Total PCB[b]	mg/kg	3.20E-03	1.90E+01	8.00E-01	102/145	N/A	N/A	12/145	1.12E+00	0/145	1.12E+02	0.00331 - 3.42
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/114	N/A	N/A	0/114	2.69E+01	0/114	8.07E+02	0.329 - 13.7
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.90E+03	0/114	5.70E+04	0.329 - 13.7
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.90E+01	0/114	5.70E+02	0.329 - 13.7
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.69E+01	0/114	1.71E+03	0.329 - 13.7
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.79E+02	0/114	1.14E+04	0.329 - 13.7
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.79E+01	0/114	1.14E+03	0.659 - 27.5
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	8.49E+00	0/114	8.49E+02	0.329 - 13.7
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.78E+00	0/114	1.71E+02	0.329 - 13.7
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.35E+03	0/114	4.05E+04	0.0329 - 1.37
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.64E+02	0/114	4.92E+03	0.329 - 13.7
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.52E+00	0/114	4.56E+01	0.329 - 13.7
SVOC	2-Methylnaphthalene	mg/kg	1.13E-02	4.99E+00	2.99E-01	19/114	N/A	N/A	0/114	6.73E+01	0/114	2.02E+03	0.0329 - 1.37
SVOC	2-Methylphenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	9.48E+02	0/114	2.84E+04	0.329 - 13.7
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/138	N/A	N/A	0/138	1.89E+02	0/138	5.67E+03	0.329 - 13.7
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.79E+01	0/114	1.14E+03	0.329 - 13.7
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.90E+00	0/114	5.90E+02	0.329 - 13.7
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.69E+00	0/114	1.71E+02	0.329 - 13.7
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.91E+01	0/114	5.73E+02	0.329 - 13.7
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.90E+03	0/114	5.70E+04	0.329 - 13.7
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/114	N/A	N/A	0/114	9.48E+00	0/114	2.84E+02	0.329 - 13.7

Table 4.5. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			Freq. Of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.91E+01	0/114	5.73E+02	0.329 - 13.7
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.79E+01	0/114	1.14E+03	0.329 - 13.7
SVOC	Acenaphthene	mg/kg	1.23E-02	7.36E-01	2.82E-01	5/138	N/A	N/A	0/138	1.01E+03	0/138	3.03E+04	0.0329 - 1.37
SVOC	Acenaphthylene	mg/kg	--	--	--	0/138	N/A	N/A	0/138	1.01E+03	0/138	3.03E+04	0.0329 - 1.37
SVOC	Acetophenone	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.29E+03	0/114	9.87E+04	0.329 - 13.7
SVOC	Anthracene	mg/kg	1.12E-02	1.97E+00	4.05E-01	8/138	N/A	N/A	0/138	5.05E+03	0/138	1.00E+05	0.0329 - 1.37
SVOC	Atrazine	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.15E+01	0/114	1.15E+03	0.329 - 13.7
SVOC	Benzaldehyde	mg/kg	--	--	--	0/111	N/A	N/A	0/111	1.15E+03	0/111	9.87E+04	0.329 - 13.7
SVOC	Benzo(ghi)perylene	mg/kg	4.35E-02	5.08E+00	8.09E-01	11/114	N/A	N/A	0/114	5.05E+02	0/114	1.52E+04	0.0329 - 1.37
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.69E+01	0/114	1.71E+03	0.329 - 13.7
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.01E+00	0/114	3.01E+02	0.329 - 13.7
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/114	N/A	N/A	0/114	6.58E+01	0/114	6.58E+03	0.329 - 13.7
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.34E-02	3.64E+00	5.17E-01	59/114	N/A	N/A	0/114	1.90E+02	0/114	1.14E+04	0.0329 - 1.37
SVOC	Butyl benzyl phthalate	mg/kg	1.41E-01	2.53E+00	6.39E-01	6/114	N/A	N/A	0/114	1.40E+03	0/114	1.14E+05	0.0329 - 1.37
SVOC	Caprolactam	mg/kg	--	--	--	0/114	N/A	N/A	0/114	9.43E+03	0/114	2.83E+05	0.329 - 13.7
SVOC	Carbazole	mg/kg	1.02E-02	2.50E+00	4.63E-01	13/138	N/A	N/A	0/138	1.33E+02	0/138	1.33E+04	0.0329 - 1.37
SVOC	Dibenzofuran	mg/kg	1.28E-01	7.93E+00	2.36E+00	4/114	N/A	N/A	0/114	3.29E+01	0/114	9.87E+02	0.329 - 13.7
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.52E+04	0/114	4.56E+05	0.0329 - 1.37
SVOC	Dimethyl phthalate	mg/kg	2.28E-02	5.57E-02	4.00E-02	3/114	N/A	N/A	0/114	1.52E+04	0/114	4.56E+05	0.0329 - 1.37
SVOC	Di-n-butyl phthalate	mg/kg	1.24E-02	1.16E+01	8.40E-01	62/114	N/A	N/A	0/114	1.90E+03	0/114	5.70E+04	0.0329 - 1.37
SVOC	Di-n-octylphthalate	mg/kg	2.11E-02	1.75E-01	7.91E-02	4/114	N/A	N/A	0/114	1.90E+02	0/114	5.70E+03	0.0329 - 1.37
SVOC	Diphenylamine	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.90E+03	0/114	5.70E+04	0.329 - 13.7
SVOC	Fluoranthene	mg/kg	1.22E-02	2.52E+01	1.45E+00	42/138	N/A	N/A	0/138	6.73E+02	0/138	2.02E+04	0.0329 - 1.37
SVOC	Fluorene	mg/kg	1.42E-02	3.49E-01	1.51E-01	3/138	N/A	N/A	0/138	6.73E+02	0/138	2.02E+04	0.0329 - 1.37
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/138	N/A	N/A	0/138	2.33E+00	0/138	2.33E+02	0.329 - 13.7
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	2.41E+01	0/114	9.87E+02	0.329 - 13.7
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.00E+00	0/114	3.00E+01	0.329 - 13.7
SVOC	Hexachloroethane	mg/kg	--	--	--	0/114	N/A	N/A	0/114	1.98E+01	0/114	5.94E+02	0.329 - 13.7
SVOC	Isophorone	mg/kg	--	--	--	0/114	N/A	N/A	0/114	2.79E+03	0/114	1.14E+05	0.329 - 13.7
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	3.79E+02	0/114	1.14E+04	0.329 - 13.7
SVOC	Naphthalene	mg/kg	1.14E-02	3.08E+00	2.18E-01	19/138	N/A	N/A	0/138	1.67E+01	0/138	1.67E+03	0.0329 - 1.37
SVOC	Nitrobenzene	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.63E+01	0/114	1.69E+03	0.329 - 13.7
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/138	N/A	N/A	0/138	3.79E-01	0/138	3.79E+01	0.329 - 13.7
SVOC	Pentachlorophenol	mg/kg	3.32E-01	3.56E-01	3.44E-01	2/114	N/A	N/A	0/114	4.06E+00	0/114	4.06E+02	0.329 - 13.7
SVOC	Phenanthrene	mg/kg	1.09E-02	4.06E+01	1.50E+00	50/138	N/A	N/A	0/138	1.01E+03	0/138	3.03E+04	0.0329 - 1.37
SVOC	Phenol	mg/kg	--	--	--	0/114	N/A	N/A	0/114	5.69E+03	0/114	1.71E+05	0.329 - 13.7
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/114	N/A	N/A	0/114	7.58E+01	0/114	2.27E+03	0.329 - 13.7
SVOC	Pyrene	mg/kg	1.19E-02	1.85E+01	1.32E+00	35/138	N/A	N/A	0/138	5.05E+02	0/138	1.52E+04	0.0329 - 1.37
SVOC	Total PAH[c]	mg/kg	1.04E-05	9.35E+00	6.91E-01	27/138	N/A	N/A	2/138	2.35E+00	0/138	1.51E+02	-
RADS	Actinium-227	pCi/g	--	--	--	0/9	N/A	N/A	0/9	1.18E+01	0/9	1.18E+03	0.213 - 0.712
RADS	Americium-241	pCi/g	6.43E-01	1.96E+01	3.06E+00	10/152	N/A	N/A	1/152	1.64E+01	0/152	1.64E+03	0.148 - 1.5
RADS	Cesium-137	pCi/g	3.60E-02	1.89E+01	2.53E+00	31/151	18/151	2.80E-01	13/151	5.82E-01	0/151	5.82E+01	0.0228 - 0.116
RADS	Cobalt-60	pCi/g	--	--	--	0/9	N/A	N/A	0/9	1.53E-01	0/9	1.53E+01	0.0264 - 0.0708
RADS	Lead-210	pCi/g	--	--	--	0/9	N/A	N/A	0/9	4.04E+00	0/9	4.04E+02	0.949 - 19
RADS	Neptunium-237	pCi/g	5.10E-01	1.13E+02	8.44E+00	21/152	21/152	1.00E-01	14/152	1.63E+00	0/152	1.63E+02	0.292 - 1.11

Table 4.5. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			Freq. Of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Plutonium-238	pCi/g	1.22E+00	1.22E+00	1.22E+00	1/152	1/152	7.30E-02	0/152	1.94E+01	0/152	1.94E+03	0.196 - 1.27
RADS	Plutonium-239/240	pCi/g	3.05E-01	9.86E+01	9.12E+00	19/152	19/152	2.50E-02	1/152	1.83E+01	0/152	1.83E+03	0.193 - 1.25
RADS	Protactinium-231	pCi/g	--	--	--	0/7	N/A	N/A	0/7	6.23E+00	0/7	6.23E+02	0.387 - 0.662
RADS	Radium-226	pCi/g	5.69E-01	3.11E+00	1.87E+00	5/9	4/9	1.50E+00	5/9	1.64E-01	0/9	1.64E+01	0.35 - 1.47
RADS	Strontium-90	pCi/g	3.97E-01	1.24E+01	4.93E+00	3/9	1/9	4.70E+00	0/9	2.49E+01	0/9	2.49E+03	0.128 - 1.83
RADS	Technetium-99	pCi/g	3.41E+00	5.77E+03	2.11E+02	105/159	105/159	2.50E+00	1/159	1.55E+03	0/159	1.00E+05	1.73 - 5.77
RADS	Thorium-228	pCi/g	2.64E-01	8.09E-01	5.55E-01	4/9	0/9	1.60E+00	0/9	6.34E+01	0/9	6.34E+03	0.226 - 1.18
RADS	Thorium-230	pCi/g	5.03E-01	1.21E+02	6.00E+00	107/152	59/152	1.40E+00	6/152	2.82E+01	0/152	2.82E+03	0.174 - 3.94
RADS	Thorium-232	pCi/g	2.75E-01	1.43E+00	8.21E-01	4/9	0/9	1.50E+00	0/9	2.60E+01	0/9	2.60E+03	0.108 - 0.846
RADS	Uranium-233/234	pCi/g	4.68E-01	3.31E+02	2.75E+01	131/152	88/152	1.20E+00	17/152	4.30E+01	0/152	4.30E+03	0.405 - 5.14
RADS	Uranium-235/236	pCi/g	2.18E-01	1.94E+01	3.67E+00	61/152	61/152	6.00E-02	19/152	2.62E+00	0/152	2.62E+02	0.184 - 3.7
RADS	Uranium-238	pCi/g	4.88E-01	3.71E+02	3.28E+01	141/152	97/152	1.20E+00	54/152	8.98E+00	0/152	8.98E+02	0.179 - 3.85
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/144	N/A	N/A	0/144	4.54E+03	0/144	1.00E+05	0.000842 - 0.102
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	1.11E+01	0/120	1.11E+03	0.000842 - 0.102
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	3.79E+03	0/120	1.00E+05	0.00421 - 0.509
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/144	N/A	N/A	0/144	8.49E-01	0/144	2.55E+01	0.000842 - 0.102
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	9.52E+01	0/120	9.52E+03	0.000842 - 0.102
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/144	N/A	N/A	0/144	1.26E+02	0/144	3.78E+03	0.000842 - 0.102
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	2.63E+01	0/120	7.89E+02	0.000842 - 0.102
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	3.20E+01	0/120	9.60E+02	0.000842 - 0.102
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	4.10E-01	0/120	4.10E+01	0.000842 - 0.102
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	7.86E-01	0/120	7.86E+01	0.000842 - 0.102
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	9.43E+02	0/120	2.83E+04	0.000842 - 0.102
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/144	N/A	N/A	0/144	1.13E+01	0/144	5.19E+02	0.000842 - 0.102
VOC	1,2-Dichloroethene	mg/kg	6.30E-04	6.30E-04	6.30E-04	1/24	N/A	N/A	0/24	2.96E+02	0/24	8.88E+03	0.002 - 0.201
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	8.91E+00	0/120	2.67E+02	0.000842 - 0.102
VOC	1,2-Dimethylbenzene	mg/kg	3.72E-04	1.85E+00	3.74E-02	59/144	N/A	N/A	0/144	3.61E+02	0/144	1.08E+04	0.000842 - 0.102
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	9.43E+02	0/120	2.83E+04	0.000842 - 0.102
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	7.20E+01	0/120	7.20E+03	0.000842 - 0.102
VOC	1,4-Dioxane	mg/kg	--	--	--	0/98	N/A	N/A	0/98	4.30E+01	0/98	4.30E+03	0.0421 - 5.09
VOC	2-Butanone	mg/kg	1.47E-03	4.25E-01	2.50E-02	64/120	N/A	N/A	0/120	1.28E+04	0/120	3.84E+05	0.00421 - 0.509
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/120	N/A	N/A	0/120	4.80E-01	0/120	4.80E+01	0.00421 - 0.509
VOC	2-Hexanone	mg/kg	1.77E-03	3.26E-01	2.25E-02	27/120	N/A	N/A	0/120	9.69E+01	0/120	2.91E+03	0.00421 - 0.509
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	9.70E+02	0/120	9.70E+04	0.000842 - 0.102
VOC	4-Methyl-2-pentanone	mg/kg	1.73E-03	2.32E-01	4.09E-02	21/120	N/A	N/A	0/120	2.31E+03	0/120	6.93E+04	0.00421 - 0.509
VOC	Acetone	mg/kg	2.03E-03	8.84E-01	4.74E-02	104/120	N/A	N/A	0/120	2.96E+04	0/120	8.88E+05	0.00421 - 0.509
VOC	Acrolein	mg/kg	--	--	--	0/120	N/A	N/A	0/120	8.14E-02	0/120	2.44E+00	0.00421 - 0.509
VOC	Acrylonitrile	mg/kg	--	--	--	0/144	N/A	N/A	0/144	4.46E+00	0/144	2.71E+02	0.00421 - 0.509
VOC	Benzene	mg/kg	3.63E-04	2.06E-03	8.29E-04	4/144	N/A	N/A	0/144	2.59E+01	0/144	1.28E+03	0.000842 - 0.102
VOC	Bromochloromethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	8.48E+01	0/120	2.54E+03	0.000842 - 0.102
VOC	Bromodichloromethane	mg/kg	--	--	--	0/144	N/A	N/A	0/144	7.93E+00	0/144	7.93E+02	0.000842 - 0.102
VOC	Bromoform	mg/kg	--	--	--	0/120	N/A	N/A	0/120	3.24E+02	0/120	1.97E+04	0.000842 - 0.102
VOC	Bromomethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	3.80E+00	0/120	1.14E+02	0.000842 - 0.102
VOC	Carbon disulfide	mg/kg	2.19E-03	3.86E-03	3.02E-03	3/120	N/A	N/A	0/120	4.21E+02	0/120	1.26E+04	0.00421 - 0.509
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/144	N/A	N/A	0/144	1.57E+01	0/144	1.57E+03	0.000842 - 0.102

Table 4.5. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. Of Detect.	Provisional Background FOE	Bkgd	Excavation Worker FOE	NAL	Excavation Worker FOE	AL	DL Range
VOC	Chlorobenzene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	1.48E+02	0/120	4.44E+03	0.000842 - 0.102
VOC	Chloroethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	3.07E+03	0/120	9.21E+04	0.000842 - 0.102
VOC	Chloroform	mg/kg	3.52E-04	3.53E-03	9.25E-04	40/144	N/A	N/A	0/144	8.90E+00	0/144	8.90E+02	0.000842 - 0.102
VOC	Chloromethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	6.26E+01	0/120	1.88E+03	0.000842 - 0.102
VOC	*cis* -1,2-Dichloroethene	mg/kg	5.30E-04	1.77E-03	8.59E-04	5/144	N/A	N/A	0/144	6.58E+01	0/144	1.97E+03	0.000842 - 0.102
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	2.83E+01	0/120	1.21E+03	0.000842 - 0.102
VOC	Cumene	mg/kg	3.57E-04	3.64E-03	1.53E-03	9/120	N/A	N/A	0/120	1.02E+03	0/120	3.06E+04	0.000842 - 0.102
VOC	Cyclohexane	mg/kg	3.62E-04	1.47E-03	7.94E-04	19/120	N/A	N/A	0/120	3.70E+03	0/120	1.11E+05	0.000842 - 0.102
VOC	Dibromochloromethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	5.48E+01	0/120	5.48E+03	0.000842 - 0.102
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	4.94E+01	0/120	1.48E+03	0.000842 - 0.102
VOC	Ethylbenzene	mg/kg	3.22E-04	9.79E-02	8.61E-03	40/144	N/A	N/A	0/144	1.30E+02	0/144	1.30E+04	0.000842 - 0.102
VOC	m,p-Xylene	mg/kg	6.90E-04	3.15E+00	6.36E-02	62/144	N/A	N/A	0/144	3.23E+02	0/144	9.69E+03	0.00168 - 0.205
VOC	Methyl acetate	mg/kg	1.84E-03	4.02E-01	2.02E-01	2/120	N/A	N/A	0/120	3.29E+04	0/120	9.87E+05	0.00421 - 0.509
VOC	Methylcyclohexane	mg/kg	3.86E-04	2.74E-02	3.27E-03	53/120	N/A	N/A	0/120	1.76E+03	0/120	5.28E+04	0.000842 - 0.102
VOC	Methylene chloride	mg/kg	1.96E-03	4.36E-03	2.61E-03	19/120	N/A	N/A	0/120	1.57E+02	0/120	4.71E+03	0.00421 - 0.509
VOC	Styrene	mg/kg	3.49E-04	1.43E-03	6.44E-04	4/120	N/A	N/A	0/120	3.00E+03	0/120	9.00E+04	0.000842 - 0.102
VOC	Tetrachloroethene	mg/kg	5.10E-04	5.50E-04	5.30E-04	2/144	N/A	N/A	0/144	4.34E+01	0/144	1.30E+03	0.000842 - 0.102
VOC	Toluene	mg/kg	3.66E-04	9.60E-01	5.26E-02	107/144	N/A	N/A	0/144	2.18E+03	0/144	6.54E+04	0.000842 - 0.102
VOC	Total Xylene	mg/kg	1.22E-03	5.00E+00	1.04E-01	59/144	N/A	N/A	0/144	3.23E+02	0/144	9.69E+03	0.00253 - 0.307
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/144	N/A	N/A	0/144	5.67E+01	0/144	1.70E+03	0.000842 - 0.102
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/120	N/A	N/A	0/120	2.83E+01	0/120	1.21E+03	0.000842 - 0.102
VOC	Trichloroethene	mg/kg	3.47E-04	5.73E-01	1.82E-02	82/144	N/A	N/A	0/144	2.26E+00	0/144	6.78E+01	0.000842 - 0.102
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/120	N/A	N/A	0/120	4.11E+02	0/120	1.23E+04	0.000842 - 0.102
VOC	Vinyl chloride	mg/kg	--	--	--	0/144	N/A	N/A	0/144	4.72E+00	0/144	4.72E+02	0.000842 - 0.102

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

Background value is the lower of Surface or Subsurface Background levels.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory and calculated using TEF values in RMD 2021 for C-400 Basement Slab and Subsurface samples.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.6. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 1

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	5.41E+03	1.91E+04	1.26E+04	51/51	34/51	1.20E+04	0/51	5.99E+04	51/51	3.00E+03	9.7 - 124
METAL	Antimony	mg/kg	3.88E-01	8.03E-01	5.65E-01	9/51	9/51	2.10E-01	3/51	7.04E-01	9/51	3.52E-02	2.02 - 22.7
METAL	Arsenic	mg/kg	2.19E+00	1.81E+01	5.62E+00	51/51	10/51	7.90E+00	51/51	3.02E-02	51/51	1.51E-03	0.97 - 1.24
METAL	Barium	mg/kg	1.62E+01	3.58E+02	1.14E+02	51/51	8/51	1.70E+02	1/51	3.11E+02	51/51	1.55E+01	0.776 - 9.64
METAL	Beryllium	mg/kg	1.89E-01	1.26E+00	5.74E-01	51/51	9/51	6.90E-01	0/51	3.89E+01	0/51	1.95E+00	0.097 - 0.574
METAL	Boron	mg/kg	9.28E-01	4.09E+00	2.12E+00	40/51	N/A	N/A	0/51	2.56E+01	28/51	1.28E+00	2.91 - 17.2
METAL	Cadmium	mg/kg	2.13E-02	2.40E-01	5.90E-02	45/51	1/51	2.10E-01	0/51	1.39E+00	6/51	6.93E-02	0.194 - 0.248
METAL	Chromium	mg/kg	1.09E+01	1.07E+02	2.29E+01	51/51	4/51	4.30E+01	0/51	3.60E+06	0/51	1.80E+05	0.582 - 3.44
METAL	Cobalt	mg/kg	2.70E+00	1.25E+02	8.99E+00	51/51	4/51	1.30E+01	51/51	5.43E-01	51/51	2.71E-02	0.194 - 0.248
METAL	Copper	mg/kg	2.91E+00	1.92E+01	9.78E+00	51/51	0/51	2.50E+01	0/51	5.62E+01	51/51	2.81E+00	0.388 - 0.497
METAL	Iron	mg/kg	1.16E+04	3.78E+04	1.88E+04	51/51	4/51	2.80E+04	51/51	7.04E+02	51/51	3.52E+01	103 - 248
METAL	Lead	mg/kg	3.11E+00	1.82E+01	8.88E+00	51/51	0/51	2.30E+01	0/51	2.70E+02	6/51	1.35E+01	0.388 - 0.497
METAL	Manganese	mg/kg	7.72E+01	3.01E+03	4.37E+02	51/51	4/51	8.20E+02	51/51	5.65E+01	51/51	2.83E+00	1.04 - 114
METAL	Mercury	mg/kg	9.34E-03	2.24E-01	2.49E-02	34/51	1/51	1.30E-01	0/51	5.91E-01	4/51	2.95E-02	0.0234 - 0.0297
METAL	Molybdenum	mg/kg	1.50E-01	1.64E+00	5.31E-01	51/51	N/A	N/A	0/51	4.03E+00	48/51	2.02E-01	0.194 - 0.248
METAL	Nickel	mg/kg	3.49E+00	9.62E+01	1.73E+01	51/51	9/51	2.20E+01	2/51	5.12E+01	51/51	2.56E+00	0.388 - 0.497
METAL	Selenium	mg/kg	3.55E-01	2.90E+00	1.31E+00	46/51	35/51	7.00E-01	25/51	1.04E+00	46/51	5.19E-02	0.97 - 1.24
METAL	Silver	mg/kg	1.17E-01	1.36E+00	4.35E-01	11/51	0/51	2.70E+00	0/51	1.60E+00	11/51	7.99E-02	0.504 - 5.91
METAL	Thallium	mg/kg	1.53E-01	5.20E-01	2.18E-01	15/51	1/51	3.40E-01	15/51	2.84E-02	15/51	1.42E-03	0.388 - 0.497
METAL	Uranium[a]	mg/kg	4.73E-01	4.09E+02	2.16E+01	51/51	7/51	4.60E+00	7/51	3.60E+00	51/51	1.80E-01	0.0388 - 0.468
METAL	Vanadium	mg/kg	1.25E+01	6.76E+01	3.07E+01	51/51	11/51	3.70E+01	0/51	1.73E+02	51/51	8.64E+00	3.88 - 22.6
METAL	Zinc	mg/kg	8.22E+00	8.97E+01	3.01E+01	51/51	3/51	6.00E+01	0/51	7.46E+02	13/51	3.73E+01	3.88 - 9.37
ANION	Fluoride	mg/kg	4.59E+00	4.02E+01	1.22E+01	51/51	N/A	N/A	0/51	2.40E+02	21/51	1.20E+01	1.03 - 1.25
PPCB	Total PCB[b]	mg/kg	3.20E-03	3.31E-02	1.39E-02	6/44	N/A	N/A	0/44	1.36E-01	4/44	6.82E-03	0.0035 - 0.00444
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.74E-02	0/44	8.72E-04	0.347 - 1.05
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.04E+00	0/44	4.02E-01	0.347 - 1.05
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.32E-02	0/44	1.16E-03	0.347 - 1.05
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.52E-02	0/44	2.26E-03	0.347 - 1.05
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.42E-01	0/44	4.21E-02	0.347 - 1.05
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.72E-02	0/44	4.36E-03	0.695 - 2.09
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.42E-03	0/44	3.21E-04	0.347 - 1.05
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.33E-03	0/44	6.67E-05	0.347 - 1.05
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	7.70E+00	0/44	3.85E-01	0.0347 - 0.105
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.78E-01	0/44	8.91E-03	0.347 - 1.05
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.16E-03	0/44	2.58E-04	0.347 - 1.05
SVOC	2-Methylnaphthalene	mg/kg	2.60E-02	2.76E-02	2.68E-02	2/44	N/A	N/A	0/44	3.70E-01	2/44	1.85E-02	0.0347 - 0.105
SVOC	2-Methylphenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.51E+00	0/44	7.53E-02	0.347 - 1.05
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.60E-01	0/44	8.01E-03	0.347 - 1.05
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.72E-02	0/44	4.36E-03	0.347 - 1.05
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.65E-02	0/44	8.24E-04	0.347 - 1.05
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.90E-03	0/44	2.45E-04	0.347 - 1.05
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.84E-03	0/44	3.42E-04	0.347 - 1.05
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.42E+00	0/44	1.71E-01	0.347 - 1.05
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.10E-03	0/44	1.55E-04	0.347 - 1.05
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.84E-03	0/44	3.42E-04	0.347 - 1.05

Table 4.6. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.72E-02	0/44	4.36E-03	0.347 - 1.05
SVOC	Acenaphthene	mg/kg	1.32E-01	1.32E-01	1.32E-01	1/44	N/A	N/A	0/44	1.10E+01	0/44	5.49E-01	0.0347 - 0.105
SVOC	Acenaphthylene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.10E+01	0/44	5.49E-01	0.0347 - 0.105
SVOC	Acetophenone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.17E+00	0/44	5.84E-02	0.347 - 1.05
SVOC	Anthracene	mg/kg	1.51E-02	2.40E-01	9.11E-02	3/44	N/A	N/A	0/44	1.16E+02	0/44	5.81E+00	0.0347 - 0.105
SVOC	Atrazine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.92E-03	0/44	1.96E-04	0.347 - 1.05
SVOC	Benzaldehyde	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.30E-02	0/44	4.15E-03	0.347 - 1.05
SVOC	Benzo(ghi)perylene	mg/kg	4.35E-02	3.45E-01	1.94E-01	2/44	N/A	N/A	0/44	2.63E+01	0/44	1.32E+00	0.0347 - 0.105
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.70E-02	0/44	1.35E-03	0.347 - 1.05
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/44	N/A	N/A	0/44	7.22E-05	0/44	3.61E-06	0.347 - 1.05
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.62E-03	0/44	1.31E-04	0.347 - 1.05
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.34E-02	6.05E-02	2.70E-02	10/44	N/A	N/A	0/44	2.66E+01	0/44	1.33E+00	0.0347 - 0.105
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.72E+00	0/44	2.36E-01	0.0347 - 0.105
SVOC	Caprolactam	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.94E+00	0/44	2.47E-01	0.347 - 1.05
SVOC	Carbazole	mg/kg	2.09E-02	2.00E-01	1.10E-01	2/44	N/A	N/A	0/44	7.51E-01	1/44	3.76E-02	0.0347 - 0.105
SVOC	Dibenzofuran	mg/kg	1.90E-01	1.90E-01	1.90E-01	1/44	N/A	N/A	0/44	2.92E-01	1/44	1.46E-02	0.347 - 1.05
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.22E+01	0/44	6.08E-01	0.0347 - 0.105
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.22E+01	0/44	6.08E-01	0.0347 - 0.105
SVOC	Di-n-butyl phthalate	mg/kg	1.37E-02	8.02E-02	2.73E-02	11/44	N/A	N/A	0/44	4.54E+00	0/44	2.27E-01	0.0347 - 0.105
SVOC	Di-n-octylphthalate	mg/kg	2.11E-02	2.37E-02	2.24E-02	2/44	N/A	N/A	0/44	1.13E+02	0/44	5.65E+00	0.0347 - 0.105
SVOC	Diphenylamine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.66E+00	0/44	2.33E-01	0.347 - 1.05
SVOC	Fluoranthene	mg/kg	1.22E-02	1.17E+00	4.59E-01	3/44	N/A	N/A	0/44	1.78E+02	0/44	8.91E+00	0.0347 - 0.105
SVOC	Fluorene	mg/kg	9.05E-02	9.05E-02	9.05E-02	1/44	N/A	N/A	0/44	1.09E+01	0/44	5.45E-01	0.0347 - 0.105
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.46E-03	0/44	1.23E-04	0.347 - 1.05
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.34E-03	0/44	2.67E-04	0.347 - 1.05
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.56E-03	0/44	1.28E-04	0.347 - 1.05
SVOC	Hexachloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.00E-03	0/44	2.00E-04	0.347 - 1.05
SVOC	Isophorone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.16E-01	0/44	2.58E-02	0.347 - 1.05
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.94E-01	0/44	2.97E-02	0.347 - 1.05
SVOC	Naphthalene	mg/kg	1.58E-02	3.13E-02	2.11E-02	3/44	N/A	N/A	3/44	7.70E-03	3/44	3.85E-04	0.0347 - 0.105
SVOC	Nitrobenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.83E-03	0/44	9.17E-05	0.347 - 1.05
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.62E-04	0/44	8.10E-06	0.347 - 1.05
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.14E-03	0/44	5.71E-05	0.347 - 1.05
SVOC	Phenanthrene	mg/kg	1.81E-02	1.50E+00	4.33E-01	4/44	N/A	N/A	0/44	1.10E+01	1/44	5.49E-01	0.0347 - 0.105
SVOC	Phenol	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.62E+00	0/44	3.31E-01	0.347 - 1.05
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.16E-02	0/44	1.58E-03	0.347 - 1.05
SVOC	Pyrene	mg/kg	9.46E-02	1.20E+00	6.47E-01	2/44	N/A	N/A	0/44	2.63E+01	0/44	1.32E+00	0.0347 - 0.105
SVOC	Total PAH[c]	mg/kg	6.34E-02	6.27E-01	3.45E-01	2/44	N/A	N/A	1/44	5.89E-01	2/44	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/2	N/A	N/A	0/2	8.84E+00	0/2	4.42E-01	0.252 - 0.267
RADS	Americium-241	pCi/g	--	--	--	0/51	N/A	N/A	0/51	1.92E+01	0/51	9.58E-01	0.252 - 1.12
RADS	Cesium-137	pCi/g	--	--	--	0/50	0/50	2.80E-01	0/50	9.58E+00	0/50	4.79E-01	0.0284 - 0.0959
RADS	Cobalt-60	pCi/g	--	--	--	0/2	N/A	N/A	0/2	3.19E-02	0/2	1.59E-03	0.0391 - 0.0464
RADS	Lead-210	pCi/g	--	--	--	0/2	N/A	N/A	0/2	1.78E-01	0/2	8.88E-03	2.76 - 3.4
RADS	Neptunium-237	pCi/g	2.97E+00	5.09E+00	4.03E+00	2/51	N/A	N/A	2/51	1.07E+00	2/51	5.36E-02	0.292 - 0.893
RADS	Plutonium-238	pCi/g	--	--	--	0/51	N/A	N/A	0/51	4.38E+00	0/51	2.19E-01	0.219 - 1.08

Table 4.6. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Plutonium-239/240	pCi/g	1.12E+00	1.12E+00	1.12E+00	1/51	N/A	N/A	0/51	4.26E+00	1/51	2.13E-01	0.193 - 1.01
RADS	Protactinium-231	pCi/g	--	--	--	0/2	N/A	N/A	0/2	1.21E+01	0/2	6.06E-01	0.464 - 0.517
RADS	Radium-226	pCi/g	1.70E+00	2.21E+00	1.96E+00	2/2	2/2	1.50E+00	2/2	3.26E-03	2/2	1.63E-04	0.985 - 0.989
RADS	Strontium-90	pCi/g	--	--	--	0/2	N/A	N/A	0/2	2.24E-02	0/2	1.12E-03	1.15 - 1.47
RADS	Technetium-99	pCi/g	4.18E+00	1.39E+03	1.77E+02	15/58	15/58	2.80E+00	15/58	1.52E-01	15/58	7.60E-03	1.73 - 4.68
RADS	Thorium-228	pCi/g	7.52E-01	8.09E-01	7.81E-01	2/2	0/2	1.60E+00	2/2	1.96E-04	2/2	9.80E-06	0.472 - 0.487
RADS	Thorium-230	pCi/g	6.15E-01	4.47E+00	1.37E+00	43/51	17/51	1.40E+00	0/51	3.66E+01	4/51	1.83E+00	0.174 - 1.34
RADS	Thorium-232	pCi/g	1.19E+00	1.43E+00	1.31E+00	2/2	0/2	1.50E+00	2/2	1.96E-01	2/2	9.80E-03	0.222 - 0.371
RADS	Uranium-233/234	pCi/g	4.68E-01	2.05E+02	8.39E+00	41/51	11/51	1.20E+00	19/51	9.90E-01	41/51	4.95E-02	0.405 - 1.5
RADS	Uranium-235/236	pCi/g	2.69E-01	1.45E+01	4.08E+00	6/51	6/51	6.00E-02	3/51	9.76E-01	6/51	4.88E-02	0.206 - 1.36
RADS	Uranium-238	pCi/g	4.88E-01	2.63E+02	1.16E+01	45/51	11/51	1.20E+00	33/51	8.05E-01	45/51	4.03E-02	0.208 - 1.56
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.62E+00	0/50	2.81E-01	0.000842 - 0.00248
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.92E-04	0/50	2.96E-05	0.000842 - 0.00248
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.13E+01	0/50	2.56E+00	0.00421 - 0.0124
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.69E-04	0/50	1.35E-05	0.000842 - 0.00248
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.56E-02	0/50	7.82E-04	0.000842 - 0.00248
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.04E-01	0/50	1.02E-02	0.000842 - 0.00248
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.18E-02	0/50	2.09E-03	0.000842 - 0.00248
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.32E-02	0/50	1.16E-03	0.000842 - 0.00248
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.88E-06	0/50	1.44E-07	0.000842 - 0.00248
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.20E-05	0/50	2.10E-06	0.000842 - 0.00248
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.90E-01	0/50	2.95E-02	0.000842 - 0.00248
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	9.69E-04	0/50	4.84E-05	0.000842 - 0.00248
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.48E-03	0/50	2.74E-04	0.000842 - 0.00248
VOC	1,2-Dimethylbenzene	mg/kg	5.21E-04	2.85E-03	1.68E-03	3/50	N/A	N/A	0/50	3.81E-01	0/50	1.90E-02	0.000842 - 0.00248
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.90E-01	0/50	2.95E-02	0.000842 - 0.00248
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	9.24E-03	0/50	4.62E-04	0.000842 - 0.00248
VOC	1,4-Dioxane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	1.88E-03	0/48	9.42E-05	0.0421 - 0.111
VOC	2-Butanone	mg/kg	1.47E-03	1.73E-02	4.90E-03	8/50	N/A	N/A	0/50	2.32E+00	0/50	1.16E-01	0.00421 - 0.0124
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.76E-05	0/50	1.38E-06	0.00421 - 0.0124
VOC	2-Hexanone	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.75E-02	0/50	8.75E-04	0.00421 - 0.0124
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	6.44E-02	0/50	3.22E-03	0.000842 - 0.00248
VOC	4-Methyl-2-pentanone	mg/kg	3.46E-03	1.56E-01	5.48E-02	3/50	N/A	N/A	0/50	5.62E-01	1/50	2.81E-02	0.00421 - 0.0124
VOC	Acetone	mg/kg	2.03E-03	2.99E-02	7.47E-03	35/50	N/A	N/A	0/50	7.36E+00	0/50	3.68E-01	0.00421 - 0.0124
VOC	Acrolein	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.68E-05	0/50	8.41E-07	0.00421 - 0.0124
VOC	Acrylonitrile	mg/kg	--	--	--	0/50	N/A	N/A	0/50	2.28E-04	0/50	1.14E-05	0.00421 - 0.0124
VOC	Benzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.66E-03	0/50	2.33E-04	0.000842 - 0.00248
VOC	Bromochloromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.16E-02	0/50	2.08E-03	0.000842 - 0.00248
VOC	Bromodichloromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	7.30E-04	0/50	3.65E-05	0.000842 - 0.00248
VOC	Bromoform	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.75E-02	0/50	8.73E-04	0.000842 - 0.00248
VOC	Bromomethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.82E-03	0/50	1.91E-04	0.000842 - 0.00248
VOC	Carbon disulfide	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.80E-01	0/50	2.40E-02	0.00421 - 0.0124
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.54E-03	0/50	1.77E-04	0.000842 - 0.00248
VOC	Chlorobenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.06E-01	0/50	5.28E-03	0.000842 - 0.00248
VOC	Chloroethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.74E+00	0/50	2.37E-01	0.000842 - 0.00248

Table 4.6. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
VOC	Chloroform	mg/kg	3.61E-04	3.53E-03	1.05E-03	9/50	N/A	N/A	2/50	1.22E-03	9/50	6.12E-05	0.000842 - 0.00248
VOC	Chloromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.05E-02	0/50	5.26E-04	0.000842 - 0.00248
VOC	*cis* -1,2-Dichloroethene	mg/kg	5.30E-04	1.77E-03	9.61E-04	3/50	N/A	N/A	0/50	2.12E-02	1/50	1.06E-03	0.000842 - 0.00248
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.36E-03	0/50	1.68E-04	0.000842 - 0.00248
VOC	Cumene	mg/kg	4.88E-04	4.88E-04	4.88E-04	1/50	N/A	N/A	0/50	1.48E+00	0/50	7.38E-02	0.000842 - 0.00248
VOC	Cyclohexane	mg/kg	5.56E-04	9.38E-04	7.47E-04	2/50	N/A	N/A	0/50	2.60E+01	0/50	1.30E+00	0.000842 - 0.00248
VOC	Dibromochloromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	4.64E-03	0/50	2.32E-04	0.000842 - 0.00248
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	6.08E-01	0/50	3.04E-02	0.000842 - 0.00248
VOC	Ethylbenzene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.36E-02	0/50	1.68E-03	0.000842 - 0.00248
VOC	m,p-Xylene	mg/kg	8.22E-04	3.23E-03	1.89E-03	3/50	N/A	N/A	0/50	3.82E-01	0/50	1.91E-02	0.00168 - 0.00496
VOC	Methyl acetate	mg/kg	--	--	--	0/50	N/A	N/A	0/50	8.22E+00	0/50	4.11E-01	0.00421 - 0.0124
VOC	Methylcyclohexane	mg/kg	6.26E-04	7.31E-04	6.79E-04	2/50	N/A	N/A	0/50	2.80E+01	0/50	1.40E+00	0.000842 - 0.00248
VOC	Methylene chloride	mg/kg	2.15E-03	4.36E-03	3.00E-03	3/50	N/A	N/A	0/50	5.44E-02	1/50	2.72E-03	0.00421 - 0.0124
VOC	Styrene	mg/kg	1.43E-03	1.43E-03	1.43E-03	1/50	N/A	N/A	0/50	2.66E+00	0/50	1.33E-01	0.000842 - 0.00248
VOC	Tetrachloroethene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.69E-02	0/50	1.84E-03	0.000842 - 0.00248
VOC	Toluene	mg/kg	3.66E-04	3.29E-03	1.24E-03	15/50	N/A	N/A	0/50	1.52E+00	0/50	7.62E-02	0.000842 - 0.00248
VOC	Total Xylene	mg/kg	1.34E-03	6.08E-03	3.57E-03	3/50	N/A	N/A	0/50	3.82E-01	0/50	1.91E-02	0.00253 - 0.00744
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	5.83E-02	0/50	2.91E-03	0.000842 - 0.00248
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/50	N/A	N/A	0/50	3.36E-03	0/50	1.68E-04	0.000842 - 0.00248
VOC	Trichloroethene	mg/kg	3.97E-04	4.01E-02	6.62E-03	27/50	N/A	N/A	13/50	2.02E-03	27/50	1.01E-04	0.000842 - 0.00248
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.46E+00	0/50	7.31E-02	0.000842 - 0.00248
VOC	Vinyl chloride	mg/kg	--	--	--	0/50	N/A	N/A	0/50	1.29E-04	0/50	6.47E-06	0.000842 - 0.00248

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.7. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 1

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.05E+03	2.70E+04	8.96E+03	204/204	47/204	1.20E+04	0/204	5.99E+04	191/204	3.00E+03	9.59 - 123
METAL	Antimony	mg/kg	3.44E-01	1.88E+01	1.34E+00	46/204	46/204	2.10E-01	23/204	7.04E-01	46/204	3.52E-02	1.85 - 22.7
METAL	Arsenic	mg/kg	3.53E-01	1.96E+01	2.70E+00	200/204	6/204	7.90E+00	200/204	3.02E-02	200/204	1.51E-03	0.953 - 1.23
METAL	Barium	mg/kg	5.89E+00	1.30E+03	5.20E+01	204/204	7/204	1.70E+02	3/204	3.11E+02	157/204	1.55E+01	0.762 - 9.3
METAL	Beryllium	mg/kg	9.81E-02	2.62E+00	6.63E-01	204/204	74/204	6.90E-01	0/204	3.89E+01	5/204	1.95E+00	0.0959 - 0.566
METAL	Boron	mg/kg	8.69E-01	4.97E+00	1.42E+00	74/204	N/A	N/A	0/204	2.56E+01	32/204	1.28E+00	2.88 - 17
METAL	Cadmium	mg/kg	2.16E-02	1.04E+00	8.74E-02	39/204	3/204	2.10E-01	0/204	1.39E+00	12/204	6.93E-02	0.191 - 0.246
METAL	Chromium	mg/kg	3.11E+00	5.49E+01	1.45E+01	204/204	9/204	4.30E+01	0/204	3.60E+06	0/204	1.80E+05	0.575 - 3.4
METAL	Cobalt	mg/kg	3.68E-01	1.72E+02	6.39E+00	204/204	16/204	1.30E+01	202/204	5.43E-01	204/204	2.71E-02	0.192 - 0.246
METAL	Copper	mg/kg	7.20E-01	1.22E+02	5.63E+00	204/204	2/204	2.50E+01	2/204	5.62E+01	152/204	2.81E+00	0.383 - 4.71
METAL	Iron	mg/kg	1.66E+03	1.23E+05	1.72E+04	204/204	29/204	2.80E+04	204/204	7.04E+02	204/204	3.52E+01	19.5 - 2220
METAL	Lead	mg/kg	7.96E-01	3.42E+01	5.40E+00	204/204	4/204	2.30E+01	0/204	2.70E+02	10/204	1.35E+01	0.381 - 0.492
METAL	Manganese	mg/kg	5.94E+00	8.06E+03	2.40E+02	204/204	9/204	8.20E+02	102/204	5.65E+01	204/204	2.83E+00	0.959 - 116
METAL	Mercury	mg/kg	8.83E-03	3.95E-01	3.44E-02	38/204	1/204	1.30E-01	0/204	5.91E-01	9/204	2.95E-02	0.0217 - 0.0351
METAL	Molybdenum	mg/kg	8.87E-02	1.79E+00	3.16E-01	178/204	N/A	N/A	0/204	4.03E+00	119/204	2.02E-01	0.191 - 0.246
METAL	Nickel	mg/kg	9.99E-01	9.83E+01	8.10E+00	204/204	11/204	2.20E+01	2/204	5.12E+01	187/204	2.56E+00	0.383 - 0.492
METAL	Selenium	mg/kg	3.57E-01	4.35E+00	1.06E+00	151/204	103/204	7.00E-01	60/204	1.04E+00	151/204	5.19E-02	0.953 - 1.23
METAL	Silver	mg/kg	1.16E-01	6.01E+00	5.91E-01	38/204	1/204	2.70E+00	3/204	1.60E+00	38/204	7.99E-02	0.463 - 6.06
METAL	Thallium	mg/kg	1.51E-01	6.68E-01	2.32E-01	21/204	2/204	3.40E-01	21/204	2.84E-02	21/204	1.42E-03	0.381 - 0.492
METAL	Uranium[a]	mg/kg	1.64E-01	9.94E+01	2.27E+00	204/204	5/204	4.60E+00	6/204	3.60E+00	202/204	1.80E-01	0.0381 - 0.0492
METAL	Vanadium	mg/kg	1.97E+00	1.05E+02	2.27E+01	204/204	30/204	3.70E+01	0/204	1.73E+02	180/204	8.64E+00	3.83 - 20.7
METAL	Zinc	mg/kg	1.84E+00	7.03E+01	1.79E+01	204/204	2/204	6.00E+01	0/204	7.46E+02	13/204	3.73E+01	3.81 - 4.92
ANION	Fluoride	mg/kg	4.83E-01	6.20E+02	8.43E+00	200/204	N/A	N/A	1/204	2.40E+02	9/204	1.20E+01	1.02 - 24.2
PPCB	Total PCB[b]	mg/kg	2.17E-03	2.43E-02	1.26E-02	5/215	N/A	N/A	0/215	1.36E-01	3/215	6.82E-03	0.00335 - 0.0045
DI/FURA	Total Dioxin/Furans[c]	mg/kg	4.58E-06	4.92E-06	4.75E-06	2/2	N/A	N/A	2/2	1.18E-06	2/2	5.91E-08	-
SVOC	1,1-biphenyl	mg/kg	3.68E-01	3.68E-01	3.68E-01	1/215	N/A	N/A	1/215	1.74E-02	1/215	8.72E-04	0.338 - 7.68
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.04E+00	0/215	4.02E-01	0.338 - 7.68
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.32E-02	0/215	1.16E-03	0.338 - 7.68
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.52E-02	0/215	2.26E-03	0.338 - 7.68
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.42E-01	0/215	4.21E-02	0.338 - 7.68
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.72E-02	0/215	4.36E-03	0.675 - 15.4
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	6.42E-03	0/215	3.21E-04	0.338 - 7.68
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.33E-03	0/215	6.67E-05	0.338 - 7.68
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.70E+00	0/215	3.85E-01	0.0338 - 0.768
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.78E-01	0/215	8.91E-03	0.338 - 7.68
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.16E-03	0/215	2.58E-04	0.338 - 7.68
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.70E-01	0/215	1.85E-02	0.0338 - 0.768
SVOC	2-Methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.51E+00	0/215	7.53E-02	0.338 - 7.68
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.60E-01	0/215	8.01E-03	0.338 - 7.68
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.72E-02	0/215	4.36E-03	0.338 - 7.68
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/211	N/A	N/A	0/211	1.65E-02	0/211	8.24E-04	0.338 - 7.68
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.90E-03	0/215	2.45E-04	0.338 - 7.68
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	6.84E-03	0/215	3.42E-04	0.338 - 7.68
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.42E+00	0/215	1.71E-01	0.338 - 7.68
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.10E-03	0/215	1.55E-04	0.338 - 7.68

Table 4.7. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	6.84E-03	0/215	3.42E-04	0.338 - 7.68
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.72E-02	0/215	4.36E-03	0.338 - 7.68
SVOC	Acenaphthene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOC	Acenaphthylene	mg/kg	1.20E-02	1.20E-02	1.20E-02	1/215	N/A	N/A	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOC	Acetophenone	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.17E+00	0/215	5.84E-02	0.338 - 7.68
SVOC	Anthracene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.16E+02	0/215	5.81E+00	0.0338 - 0.768
SVOC	Atrazine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.92E-03	0/215	1.96E-04	0.338 - 7.68
SVOC	Benzaldehyde	mg/kg	1.16E-01	1.16E-01	1.16E-01	1/208	N/A	N/A	1/208	8.30E-02	1/208	4.15E-03	0.338 - 7.68
SVOC	Benzo(ghi)perylene	mg/kg	1.30E-02	1.79E-02	1.55E-02	2/215	N/A	N/A	0/215	2.63E+01	0/215	1.32E+00	0.0338 - 0.768
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.70E-02	0/215	1.35E-03	0.338 - 7.68
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.22E-05	0/215	3.61E-06	0.338 - 7.68
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.62E-03	0/215	1.31E-04	0.338 - 7.68
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.14E-02	8.10E-02	1.87E-02	38/215	N/A	N/A	0/215	2.66E+01	0/215	1.33E+00	0.0338 - 0.768
SVOC	Butyl benzyl phthalate	mg/kg	1.19E-02	2.48E-02	1.84E-02	2/215	N/A	N/A	0/215	4.72E+00	0/215	2.36E-01	0.0338 - 0.768
SVOC	Caprolactam	mg/kg	--	--	--	0/212	N/A	N/A	0/212	4.94E+00	0/212	2.47E-01	0.338 - 7.68
SVOC	Carbazole	mg/kg	1.23E-02	1.23E-02	1.23E-02	1/215	N/A	N/A	0/215	7.51E-01	0/215	3.76E-02	0.0338 - 0.768
SVOC	Dibenzofuran	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.92E-01	0/215	1.46E-02	0.338 - 7.68
SVOC	Diethyl phthalate	mg/kg	1.38E-02	1.39E-02	1.38E-02	3/215	N/A	N/A	0/215	1.22E+01	0/215	6.08E-01	0.0338 - 0.768
SVOC	Dimethyl phthalate	mg/kg	1.20E-02	1.20E-02	1.20E-02	1/215	N/A	N/A	0/215	1.22E+01	0/215	6.08E-01	0.0338 - 0.768
SVOC	Di-n-butyl phthalate	mg/kg	1.11E-02	5.55E-02	2.26E-02	36/215	N/A	N/A	0/215	4.54E+00	0/215	2.27E-01	0.0338 - 0.768
SVOC	Di-n-octylphthalate	mg/kg	1.18E-02	3.75E-02	2.81E-02	9/215	N/A	N/A	0/215	1.13E+02	0/215	5.65E+00	0.0338 - 0.768
SVOC	Diphenylamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.66E+00	0/215	2.33E-01	0.338 - 7.68
SVOC	Fluoranthene	mg/kg	1.12E-02	1.12E-02	1.12E-02	1/215	N/A	N/A	0/215	1.78E+02	0/215	8.91E+00	0.0338 - 0.768
SVOC	Fluorene	mg/kg	1.16E-02	1.16E-02	1.16E-02	1/215	N/A	N/A	0/215	1.09E+01	0/215	5.45E-01	0.0338 - 0.768
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.46E-03	0/215	1.23E-04	0.338 - 7.68
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.34E-03	0/215	2.67E-04	0.338 - 7.68
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.56E-03	0/215	1.28E-04	0.338 - 7.68
SVOC	Hexachloroethane	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.00E-03	0/215	2.00E-04	0.338 - 7.68
SVOC	Isophorone	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.16E-01	0/215	2.58E-02	0.338 - 7.68
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.94E-01	0/215	2.97E-02	0.338 - 7.68
SVOC	Naphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.70E-03	0/215	3.85E-04	0.0338 - 0.768
SVOC	Nitrobenzene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.83E-03	0/215	9.17E-05	0.338 - 7.68
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.62E-04	0/215	8.10E-06	0.338 - 7.68
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.14E-03	0/215	5.71E-05	0.338 - 7.68
SVOC	Phenanthrene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOC	Phenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	6.62E+00	0/215	3.31E-01	0.338 - 7.68
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.16E-02	0/215	1.58E-03	0.338 - 7.68
SVOC	Pyrene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.63E+01	0/215	1.32E+00	0.0338 - 0.768
SVOC	Total PAH[d]	mg/kg	1.31E-03	2.96E-02	1.97E-02	3/209	N/A	N/A	0/209	5.89E-01	1/209	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/204	N/A	N/A	0/204	1.92E+01	0/204	9.58E-01	0.175 - 1.27
RADS	Cesium-137	pCi/g	8.89E+00	8.89E+00	8.89E+00	1/204	1/204	2.80E-01	0/204	9.58E+00	1/204	4.79E-01	0.0206 - 0.0905
RADS	Neptunium-237	pCi/g	1.16E+00	4.78E+00	2.73E+00	8/204	N/A	N/A	8/204	1.07E+00	8/204	5.36E-02	0.283 - 1.12
RADS	Plutonium-238	pCi/g	--	--	--	0/204	N/A	N/A	0/204	4.38E+00	0/204	2.19E-01	0.158 - 0.879
RADS	Plutonium-239/240	pCi/g	--	--	--	0/204	N/A	N/A	0/204	4.26E+00	0/204	2.13E-01	0.225 - 0.959
RADS	Technetium-99	pCi/g	3.86E+00	1.02E+03	1.28E+02	55/223	55/223	2.80E+00	55/223	1.52E-01	55/223	7.60E-03	1.66 - 4.42

Table 4.7. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of Detect.	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Thorium-230	pCi/g	4.96E-01	8.51E+02	7.14E+00	140/204	24/204	1.40E+00	1/204	3.66E+01	9/204	1.83E+00	0.233 - 1.06
RADS	Uranium-233/234	pCi/g	4.11E-01	2.24E+01	1.35E+00	124/204	16/204	1.20E+00	34/204	9.90E-01	124/204	4.95E-02	0.314 - 1.25
RADS	Uranium-235/236	pCi/g	1.75E-01	1.30E+00	6.39E-01	6/204	6/204	6.00E-02	1/204	9.76E-01	6/204	4.88E-02	0.131 - 0.979
RADS	Uranium-238	pCi/g	3.06E-01	2.43E+01	1.33E+00	155/204	23/204	1.20E+00	84/204	8.05E-01	155/204	4.03E-02	0.168 - 1.23
VOC	1,1,1-Trichloroethane	mg/kg	5.72E-04	1.14E-03	8.56E-04	2/235	N/A	N/A	0/235	5.62E+00	0/235	2.81E-01	0.000859 - 0.101
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.92E-04	0/235	2.96E-05	0.000859 - 0.101
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.13E+01	0/235	2.56E+00	0.0043 - 0.503
VOC	1,1,2-Trichloroethane	mg/kg	4.62E-04	2.84E-03	8.65E-04	11/235	N/A	N/A	11/235	2.69E-04	11/235	1.35E-05	0.000859 - 0.101
VOC	1,1-Dichloroethane	mg/kg	5.88E-04	9.35E-04	7.62E-04	2/235	N/A	N/A	0/235	1.56E-02	1/235	7.82E-04	0.000859 - 0.101
VOC	1,1-Dichloroethene	mg/kg	3.48E-04	6.83E-03	1.56E-03	24/235	N/A	N/A	0/235	2.04E-01	0/235	1.02E-02	0.000859 - 0.101
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.18E-02	0/235	2.09E-03	0.000859 - 0.101
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.32E-02	0/235	1.16E-03	0.000859 - 0.101
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.88E-06	0/235	1.44E-07	0.000859 - 0.101
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.20E-05	0/235	2.10E-06	0.000859 - 0.101
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.90E-01	0/235	2.95E-02	0.000859 - 0.101
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	9.69E-04	0/235	4.84E-05	0.000859 - 0.101
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.48E-03	0/235	2.74E-04	0.000859 - 0.101
VOC	1,2-Dimethylbenzene	mg/kg	4.63E-04	4.67E-03	1.86E-03	5/235	N/A	N/A	0/235	3.81E-01	0/235	1.90E-02	0.000859 - 0.101
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.90E-01	0/235	2.95E-02	0.000859 - 0.101
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	9.24E-03	0/235	4.62E-04	0.000859 - 0.101
VOC	1,4-Dioxane	mg/kg	2.56E-02	1.33E-01	6.06E-02	4/213	N/A	N/A	4/213	1.88E-03	4/213	9.42E-05	0.043 - 5.03
VOC	2-Butanone	mg/kg	1.74E-03	3.58E-01	4.55E-02	20/235	N/A	N/A	0/235	2.32E+00	3/235	1.16E-01	0.0043 - 0.503
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.76E-05	0/235	1.38E-06	0.0043 - 0.503
VOC	2-Hexanone	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.75E-02	0/235	8.75E-04	0.0043 - 0.503
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.44E-02	0/235	3.22E-03	0.000859 - 0.101
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.62E-01	0/235	2.81E-02	0.0043 - 0.503
VOC	Acetone	mg/kg	1.74E-03	1.99E-01	9.38E-03	149/235	N/A	N/A	0/235	7.36E+00	0/235	3.68E-01	0.0043 - 0.503
VOC	Acrolein	mg/kg	3.87E-03	4.48E-03	4.18E-03	2/235	N/A	N/A	2/235	1.68E-05	2/235	8.41E-07	0.0043 - 0.503
VOC	Acrylonitrile	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.28E-04	0/235	1.14E-05	0.0043 - 0.503
VOC	Benzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.66E-03	0/235	2.33E-04	0.000859 - 0.101
VOC	Bromochloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.16E-02	0/235	2.08E-03	0.000859 - 0.101
VOC	Bromodichloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	7.30E-04	0/235	3.65E-05	0.000859 - 0.101
VOC	Bromoform	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.75E-02	0/235	8.73E-04	0.000859 - 0.101
VOC	Bromomethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.82E-03	0/235	1.91E-04	0.000859 - 0.101
VOC	Carbon disulfide	mg/kg	3.56E-03	3.56E-03	3.56E-03	1/235	N/A	N/A	0/235	4.80E-01	0/235	2.40E-02	0.0043 - 0.503
VOC	Carbon tetrachloride	mg/kg	4.09E-04	6.11E-04	5.02E-04	3/235	N/A	N/A	0/235	3.54E-03	3/235	1.77E-04	0.000859 - 0.101
VOC	Chlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.06E-01	0/235	5.28E-03	0.000859 - 0.101
VOC	Chloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.74E+00	0/235	2.37E-01	0.000859 - 0.101
VOC	Chloroform	mg/kg	3.78E-04	7.23E-03	1.56E-03	58/235	N/A	N/A	21/235	1.22E-03	58/235	6.12E-05	0.000859 - 0.101
VOC	Chloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.05E-02	0/235	5.26E-04	0.000859 - 0.101
VOC	*cis*-1,2-Dichloroethene	mg/kg	3.94E-04	8.11E-02	9.26E-03	86/235	N/A	N/A	9/235	2.12E-02	65/235	1.06E-03	0.000859 - 0.101
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.36E-03	0/235	1.68E-04	0.000859 - 0.101
VOC	Cumene	mg/kg	5.68E-04	5.68E-04	5.68E-04	1/235	N/A	N/A	0/235	1.48E+00	0/235	7.38E-02	0.000859 - 0.101
VOC	Cyclohexane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.60E+01	0/235	1.30E+00	0.000859 - 0.101
VOC	Dibromochloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.64E-03	0/235	2.32E-04	0.000859 - 0.101

Table 4.7. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.08E-01	0/235	3.04E-02	0.000859 - 0.101
VOC	Ethylbenzene	mg/kg	3.89E-04	3.89E-04	3.89E-04	1/235	N/A	N/A	0/235	3.36E-02	0/235	1.68E-03	0.000859 - 0.101
VOC	m,p-Xylene	mg/kg	1.39E-03	4.46E-03	2.64E-03	3/235	N/A	N/A	0/235	3.82E-01	0/235	1.91E-02	0.00172 - 0.201
VOC	Methyl acetate	mg/kg	--	--	--	0/235	N/A	N/A	0/235	8.22E+00	0/235	4.11E-01	0.0043 - 0.503
VOC	Methylcyclohexane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.80E+01	0/235	1.40E+00	0.000859 - 0.101
VOC	Methylene chloride	mg/kg	1.82E-03	1.67E-01	8.91E-03	28/235	N/A	N/A	1/235	5.44E-02	14/235	2.72E-03	0.0043 - 0.503
VOC	Styrene	mg/kg	7.72E-04	1.41E-03	1.07E-03	6/235	N/A	N/A	0/235	2.66E+00	0/235	1.33E-01	0.000859 - 0.101
VOC	Tetrachloroethene	mg/kg	3.79E-04	7.10E-04	5.20E-04	5/235	N/A	N/A	0/235	3.69E-02	0/235	1.84E-03	0.000859 - 0.101
VOC	Toluene	mg/kg	3.84E-04	4.88E-03	1.33E-03	30/235	N/A	N/A	0/235	1.52E+00	0/235	7.62E-02	0.000859 - 0.101
VOC	Total Xylene	mg/kg	2.80E-03	9.14E-03	5.35E-03	3/235	N/A	N/A	0/235	3.82E-01	0/235	1.91E-02	0.00258 - 0.302
VOC	*trans* -1,2-Dichloroethene	mg/kg	6.09E-04	6.09E-04	6.09E-04	1/235	N/A	N/A	0/235	5.83E-02	0/235	2.91E-03	0.000859 - 0.101
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.36E-03	0/235	1.68E-04	0.000859 - 0.101
VOC	Trichloroethene	mg/kg	4.15E-04	5.54E+00	1.94E-01	162/235	N/A	N/A	128/235	2.02E-03	162/235	1.01E-04	0.000859 - 0.212
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.46E+00	0/235	7.31E-02	0.000859 - 0.101
VOC	Vinyl chloride	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.29E-04	0/235	6.47E-06	0.000859 - 0.101

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.8. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 1

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	4.27E+02	2.05E+04	6.80E+03	77/77	55/77	3.00E+03	10.1 - 133
METAL	Antimony	mg/kg	4.15E-01	7.61E+00	1.59E+00	19/77	19/77	3.52E-02	2.1 - 30.5
METAL	Arsenic	mg/kg	6.84E-01	2.20E+02	1.14E+01	76/77	76/77	1.51E-03	1.01 - 1.55
METAL	Barium	mg/kg	2.85E+00	1.15E+03	6.06E+01	77/77	54/77	1.55E+01	0.808 - 10.2
METAL	Beryllium	mg/kg	9.47E-02	2.85E+00	7.25E-01	77/77	5/77	1.95E+00	0.101 - 0.155
METAL	Boron	mg/kg	8.75E-01	3.74E+01	8.43E+00	70/77	64/77	1.28E+00	3.03 - 4.65
METAL	Cadmium	mg/kg	2.84E-02	1.12E+00	1.73E-01	57/77	27/77	6.93E-02	0.202 - 0.31
METAL	Chromium	mg/kg	2.16E+00	1.07E+02	3.13E+01	77/77	0/77	1.80E+05	0.606 - 0.93
METAL	Cobalt	mg/kg	3.14E-01	8.71E+01	6.85E+00	77/77	77/77	2.71E-02	0.202 - 0.31
METAL	Copper	mg/kg	2.00E-01	1.24E+01	4.45E+00	76/77	49/77	2.81E+00	0.404 - 0.62
METAL	Iron	mg/kg	1.18E+03	2.96E+05	4.20E+04	77/77	77/77	3.52E+01	22.2 - 2830
METAL	Lead	mg/kg	1.12E+00	9.66E+01	8.43E+00	77/77	11/77	1.35E+01	0.404 - 0.62
METAL	Manganese	mg/kg	4.63E+00	6.71E+03	2.51E+02	77/77	77/77	2.83E+00	1.01 - 133
METAL	Mercury	mg/kg	1.10E-02	1.39E-01	3.83E-02	26/77	13/77	2.95E-02	0.0221 - 0.0384
METAL	Molybdenum	mg/kg	9.94E-02	5.47E+00	6.82E-01	54/77	41/77	2.02E-01	0.202 - 0.31
METAL	Nickel	mg/kg	6.84E-01	5.32E+01	1.13E+01	77/77	63/77	2.56E+00	0.404 - 0.62
METAL	Selenium	mg/kg	3.80E-01	8.96E+00	1.86E+00	69/77	69/77	5.19E-02	1.01 - 1.55
METAL	Silver	mg/kg	1.41E-01	3.04E+00	8.34E-01	13/77	13/77	7.99E-02	0.52 - 12
METAL	Thallium	mg/kg	1.96E-01	3.54E+00	1.34E+00	4/77	4/77	1.42E-03	0.404 - 0.62
METAL	Uranium[a]	mg/kg	6.49E-02	4.39E+00	1.15E+00	77/77	74/77	1.80E-01	0.0404 - 0.062
METAL	Vanadium	mg/kg	3.47E+00	1.73E+02	3.44E+01	77/77	69/77	8.64E+00	4.04 - 6.2
METAL	Zinc	mg/kg	3.04E+00	3.24E+02	4.69E+01	77/77	38/77	3.73E+01	4.04 - 23.6
ANION	Fluoride	mg/kg	4.65E-01	3.00E+02	7.64E+00	74/77	1/77	1.20E+01	1.08 - 13.6
PPCB	Total PCB[b]	mg/kg	--	--	--	0/79	0/79	6.82E-03	0.00361 - 0.00596
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/79	0/79	8.72E-04	0.365 - 2.25
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/79	0/79	4.02E-01	0.365 - 2.25
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/79	0/79	1.16E-03	0.365 - 2.25
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/79	0/79	2.26E-03	0.365 - 2.25
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/79	0/79	4.21E-02	0.365 - 2.25
SVOC	2,4-Dinitrophenol	mg/kg	4.39E-01	4.39E-01	4.39E-01	1/79	1/79	4.36E-03	0.647 - 4.5
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/79	0/79	3.21E-04	0.365 - 2.25
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/79	0/79	6.67E-05	0.365 - 2.25
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/79	0/79	3.85E-01	0.0365 - 0.225
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/79	0/79	8.91E-03	0.365 - 2.25
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/79	0/79	2.58E-04	0.365 - 2.25
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/79	0/79	1.85E-02	0.0365 - 0.225
SVOC	2-Methylphenol	mg/kg	--	--	--	0/79	0/79	7.53E-02	0.365 - 2.25
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/79	0/79	8.01E-03	0.365 - 2.25
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/79	0/79	4.36E-03	0.365 - 2.25
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/79	0/79	8.24E-04	0.365 - 2.25
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/79	0/79	2.45E-04	0.365 - 2.25
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/79	0/79	3.42E-04	0.365 - 2.25
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/79	0/79	1.71E-01	0.365 - 2.25
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/79	0/79	1.55E-04	0.365 - 2.25
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/79	0/79	3.42E-04	0.365 - 2.25

Table 4.8. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/79	0/79	4.36E-03	0.365 - 2.25
SVOC	Acenaphthene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOC	Acenaphthylene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOC	Acetophenone	mg/kg	--	--	--	0/79	0/79	5.84E-02	0.365 - 2.25
SVOC	Anthracene	mg/kg	--	--	--	0/79	0/79	5.81E+00	0.0365 - 0.225
SVOC	Atrazine	mg/kg	--	--	--	0/79	0/79	1.96E+04	0.365 - 2.25
SVOC	Benzaldehyde	mg/kg	--	--	--	0/79	0/79	4.15E-03	0.365 - 2.25
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/79	0/79	1.32E+00	0.0365 - 0.225
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/79	0/79	1.35E-03	0.365 - 2.25
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/79	0/79	3.61E-06	0.365 - 2.25
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/79	0/79	1.31E-04	0.365 - 2.25
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.36E-02	8.09E-02	2.64E-02	11/79	0/79	1.33E+00	0.0365 - 0.225
SVOC	Butyl benzyl phthalate	mg/kg	1.84E-02	2.48E-02	2.16E-02	2/79	0/79	2.36E-01	0.0365 - 0.225
SVOC	Caprolactam	mg/kg	--	--	--	0/79	0/79	2.47E-01	0.365 - 2.25
SVOC	Carbazole	mg/kg	1.58E-02	1.58E-02	1.58E-02	1/79	0/79	3.76E-02	0.0365 - 0.225
SVOC	Dibenzofuran	mg/kg	--	--	--	0/79	0/79	1.46E-02	0.365 - 2.25
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/79	0/79	6.08E-01	0.0365 - 0.225
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/79	0/79	6.08E-01	0.0365 - 0.225
SVOC	Di-n-butyl phthalate	mg/kg	1.34E-02	4.12E-02	1.96E-02	11/79	0/79	2.27E-01	0.0365 - 0.225
SVOC	Di-n-octylphthalate	mg/kg	2.73E-02	5.16E-02	3.95E-02	2/79	0/79	5.65E+00	0.0365 - 0.225
SVOC	Diphenylamine	mg/kg	--	--	--	0/79	0/79	2.33E-01	0.365 - 2.25
SVOC	Fluoranthene	mg/kg	1.67E-02	1.67E-02	1.67E-02	1/79	0/79	8.91E+00	0.0365 - 0.225
SVOC	Fluorene	mg/kg	--	--	--	0/79	0/79	5.45E-01	0.0365 - 0.225
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/79	0/79	1.23E-04	0.365 - 2.25
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/79	0/79	2.67E-04	0.365 - 2.25
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/79	0/79	1.28E-04	0.365 - 2.25
SVOC	Hexachloroethane	mg/kg	--	--	--	0/79	0/79	2.00E-04	0.365 - 2.25
SVOC	Isophorone	mg/kg	--	--	--	0/79	0/79	2.58E-02	0.365 - 2.25
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/79	0/79	2.97E-02	0.365 - 2.25
SVOC	Naphthalene	mg/kg	--	--	--	0/79	0/79	3.85E-04	0.0365 - 0.225
SVOC	Nitrobenzene	mg/kg	--	--	--	0/79	0/79	9.17E-05	0.365 - 2.25
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/78	0/78	8.10E-06	0.365 - 2.25
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/79	0/79	5.71E-05	0.365 - 2.25
SVOC	Phenanthrene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOC	Phenol	mg/kg	--	--	--	0/79	0/79	3.31E-01	0.365 - 2.25
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/79	0/79	1.58E-03	0.365 - 2.25
SVOC	Pyrene	mg/kg	2.22E-02	2.22E-02	2.22E-02	1/79	0/79	1.32E+00	0.0365 - 0.225
SVOC	Total PAH[c]	mg/kg	--	--	--	0/79	0/79	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/77	0/77	9.58E-01	0.174 - 1.09
RADS	Cesium-137	pCi/g	--	--	--	0/77	0/77	4.79E-01	0.0246 - 0.0793
RADS	Neptunium-237	pCi/g	--	--	--	0/77	0/77	5.36E-02	0.261 - 0.968
RADS	Plutonium-238	pCi/g	--	--	--	0/77	0/77	2.19E-01	0.202 - 1.04
RADS	Plutonium-239/240	pCi/g	--	--	--	0/77	0/77	2.13E-01	0.225 - 0.866
RADS	Technetium-99	pCi/g	--	--	--	0/81	0/81	7.60E-03	1.97 - 4.82
RADS	Thorium-230	pCi/g	4.80E-01	3.89E+00	1.24E+00	55/77	6/77	1.83E+00	0.358 - 1.58

Table 4.8. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
RADS	Thorium-232	pCi/g	4.35E-01	4.35E-01	4.35E-01	1/1	1/1	9.80E-03	0.264 - 0.264
RADS	Uranium-233/234	pCi/g	4.73E-01	2.94E+00	1.07E+00	39/77	39/77	4.95E-02	0.404 - 1.33
RADS	Uranium-235/236	pCi/g	3.53E-01	4.91E-01	4.22E-01	2/77	2/77	4.88E-02	0.198 - 1.12
RADS	Uranium-238	pCi/g	3.93E-01	2.80E+00	1.06E+00	53/77	53/77	4.03E-02	0.286 - 0.841
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/83	0/83	2.81E-01	0.000956 - 0.00296
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/83	0/83	2.96E-05	0.000956 - 0.00296
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.49E-03	1.02E-02	4.88E-03	7/83	0/83	2.56E+00	0.00478 - 0.0148
VOC	1,1,2-Trichloroethane	mg/kg	4.11E-04	3.33E-03	1.30E-03	23/83	23/83	1.35E-05	0.000956 - 0.00296
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/83	0/83	7.82E-04	0.000956 - 0.00296
VOC	1,1-Dichloroethene	mg/kg	4.54E-04	1.22E-03	8.70E-04	3/83	0/83	1.02E-02	0.000956 - 0.00296
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.09E-03	0.000956 - 0.00296
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/83	0/83	1.16E-03	0.000956 - 0.00296
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/83	0/83	1.44E-07	0.000956 - 0.00296
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/83	0/83	2.10E-06	0.000956 - 0.00296
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.95E-02	0.000956 - 0.00296
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/83	0/83	4.84E-05	0.000956 - 0.00296
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/83	0/83	2.74E-04	0.000956 - 0.00296
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/83	0/83	1.90E-02	0.000956 - 0.00296
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.95E-02	0.000956 - 0.00296
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	4.62E-04	0.000956 - 0.00296
VOC	1,4-Dioxane	mg/kg	--	--	--	0/66	0/66	9.42E-05	0.0544 - 0.148
VOC	2-Butanone	mg/kg	1.80E-03	3.56E-03	2.96E-03	8/83	0/83	1.16E-01	0.00478 - 0.0148
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/83	0/83	1.38E-06	0.00478 - 0.0148
VOC	2-Hexanone	mg/kg	--	--	--	0/83	0/83	8.75E-04	0.00478 - 0.0148
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/83	0/83	3.22E-03	0.000956 - 0.00296
VOC	4-Methyl-2-pentanone	mg/kg	3.64E-02	3.64E-02	3.64E-02	1/83	1/83	2.81E-02	0.00478 - 0.0148
VOC	Acetone	mg/kg	2.08E-03	5.15E-02	8.37E-03	60/83	0/83	3.68E-01	0.00478 - 0.0148
VOC	Acrolein	mg/kg	--	--	--	0/83	0/83	8.41E-07	0.00478 - 0.0148
VOC	Acrylonitrile	mg/kg	--	--	--	0/83	0/83	1.14E-05	0.00478 - 0.0148
VOC	Benzene	mg/kg	--	--	--	0/83	0/83	2.33E-04	0.000956 - 0.00296
VOC	Bromochloromethane	mg/kg	--	--	--	0/83	0/83	2.08E-03	0.000956 - 0.00296
VOC	Bromodichloromethane	mg/kg	7.58E-04	7.58E-04	7.58E-04	1/83	1/83	3.65E-05	0.000956 - 0.00296
VOC	Bromoform	mg/kg	--	--	--	0/83	0/83	8.73E-04	0.000956 - 0.00296
VOC	Bromomethane	mg/kg	--	--	--	0/83	0/83	1.91E-04	0.000956 - 0.00296
VOC	Carbon disulfide	mg/kg	1.16E-02	1.16E-02	1.16E-02	1/83	0/83	2.40E-02	0.00478 - 0.0148
VOC	Carbon tetrachloride	mg/kg	4.54E-04	5.93E-04	5.07E-04	3/83	3/83	1.77E-04	0.000956 - 0.00296
VOC	Chlorobenzene	mg/kg	--	--	--	0/83	0/83	5.28E-03	0.000956 - 0.00296
VOC	Chloroethane	mg/kg	--	--	--	0/83	0/83	2.37E-01	0.000956 - 0.00296
VOC	Chloroform	mg/kg	5.16E-04	2.68E-03	1.10E-03	20/83	20/83	6.12E-05	0.000956 - 0.00296
VOC	Chloromethane	mg/kg	--	--	--	0/83	0/83	5.26E-04	0.000956 - 0.00296
VOC	*cis* -1,2-Dichloroethene	mg/kg	6.16E-04	3.08E-02	4.59E-03	25/83	22/83	1.06E-03	0.000956 - 0.00296
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/83	0/83	1.68E-04	0.000956 - 0.00296
VOC	Cumene	mg/kg	--	--	--	0/83	0/83	7.38E-02	0.000956 - 0.00296
VOC	Cyclohexane	mg/kg	--	--	--	0/83	0/83	1.30E+00	0.000956 - 0.00296
VOC	Dibromochloromethane	mg/kg	--	--	--	0/83	0/83	2.32E-04	0.000956 - 0.00296

Table 4.8. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 1 (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/83	0/83	3.04E-02	0.000956 - 0.00296
VOC	Ethylbenzene	mg/kg	--	--	--	0/83	0/83	1.68E-03	0.000956 - 0.00296
VOC	m,p-Xylene	mg/kg	--	--	--	0/83	0/83	1.91E-02	0.00191 - 0.00593
VOC	Methyl acetate	mg/kg	--	--	--	0/83	0/83	4.11E-01	0.00478 - 0.0148
VOC	Methylcyclohexane	mg/kg	--	--	--	0/83	0/83	1.40E+00	0.000956 - 0.00296
VOC	Methylene chloride	mg/kg	2.19E-03	7.58E-03	4.56E-03	14/83	12/83	2.72E-03	0.00478 - 0.0125
VOC	Styrene	mg/kg	1.08E-03	1.72E-03	1.40E-03	2/83	0/83	1.33E-01	0.000956 - 0.00296
VOC	Tetrachloroethene	mg/kg	3.25E-04	5.90E-03	1.84E-03	22/83	9/83	1.84E-03	0.000956 - 0.00296
VOC	Toluene	mg/kg	5.02E-04	6.56E-03	1.70E-03	11/83	0/83	7.62E-02	0.000956 - 0.00296
VOC	Total Xylene	mg/kg	--	--	--	0/83	0/83	1.91E-02	0.00287 - 0.00889
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/83	0/83	2.91E-03	0.000956 - 0.00296
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/83	0/83	1.68E-04	0.000956 - 0.00296
VOC	Trichloroethene	mg/kg	5.48E-04	6.10E+00	1.39E+00	44/83	44/83	1.01E-04	0.00109 - 0.215
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/83	0/83	7.31E-02	0.000956 - 0.00296
VOC	Vinyl chloride	mg/kg	--	--	--	0/83	0/83	6.47E-06	0.000956 - 0.00296

(shaded) One or more samples exceed groundwater protection screening

Notes:

Field replicates, or separate samples are counted independently.

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, cobalt, iron, manganese, thallium, and uranium. Uranium metal also exceeded the excavation worker AL in 19 out of 147 samples. Locations where these metals exceeded both background and excavation worker NALs/ALs are shown in Figure 4.6.

Metals that were detected in the Sector 1 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater (for a DAF of 1) include aluminum, antimony*, arsenic*, barium*, cadmium, cobalt*, iron*, manganese*, mercury, nickel*, selenium*, thallium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the SSLs for a DAF of 20). In the deep soil interval (16 ft bgs to the bottom of the RGA), metals exceeding both the background screening levels and the SSLs (for a DAF of 1) for the protection of groundwater include aluminum, antimony*, arsenic*, barium*, beryllium, cadmium, cobalt*, copper*, iron*, lead, manganese*, mercury, nickel*, selenium*, silver*, thallium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the SSLs for a DAF of 20).

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater only (for a DAF of 1). Metals that exceeded these SSLs included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

PCBs

Total PCBs were detected in Sector 1 surface and subsurface concrete/brick/soil (0–16 ft bgs) exceeding the excavation worker NAL at 12 out of 145 locations. Locations where Total PCBs exceeded both background and excavation worker NALs are shown in Figure 4.7 (top and bottom samples of the concrete cores are considered one location and the maximum result shown in the figure). Total PCBs were detected in 6 of 44 samples in Sector 1 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs interval, 0.0331 mg/kg, did not exceed the excavation worker NAL but Total PCBs exceeded the SSL for the protection of groundwater (for a DAF of 1) in 4 out of 44 samples (a DAF of 20 was not exceeded). Total PCBs were detected in the deep soil interval (16 ft bgs to the bottom of the RGA) in 5 of 215 samples but were not detected in the 79 samples from the McNairy soil. The maximum detection in the deep soil interval was 0.0243 mg/kg.

In addition to Total PCBs, total dioxins/furans exceeded the groundwater protection SSLs in 2 of 2 samples (for both a DAF of 1 and 20) in the deep soil interval.

SVOCs

Several SVOCs were detected in Sector 1 surface and subsurface concrete/brick/soil (0–16 ft bgs), mostly PAH compounds, with Total PAHs exceeding the excavation worker NAL at 2 out of 138 locations. Total PAHs only exceeded the SSL for protection of groundwater in Sector 1 subsurface soil (1–16 ft bgs) in 2 out of 44 samples for a DAF of 1 and 1 of 44 samples for a DAF of 20. A few SVOCs exceeded the SSLs for protection of groundwater (for a DAF of 1) in the 1–16 ft bgs soil interval, including 2-methylnaphthalene, carbazole, dibenzofuran, naphthalene, phenanthrene, and Total PAHs; naphthalene and Total PAHs exceeded the DAF of 20 SSLs in the 1–16 ft bgs soil interval. 1,1-biphenyl, benzaldehyde, and Total PAHs exceeded the DAF of 1 SSLs in the deep soil interval (16 ft to the bottom of the RGA). Only 2,4-dinitrophenol exceeded the DAF of 1 SSL in the McNairy Formation soil in 1 out of 79 samples.

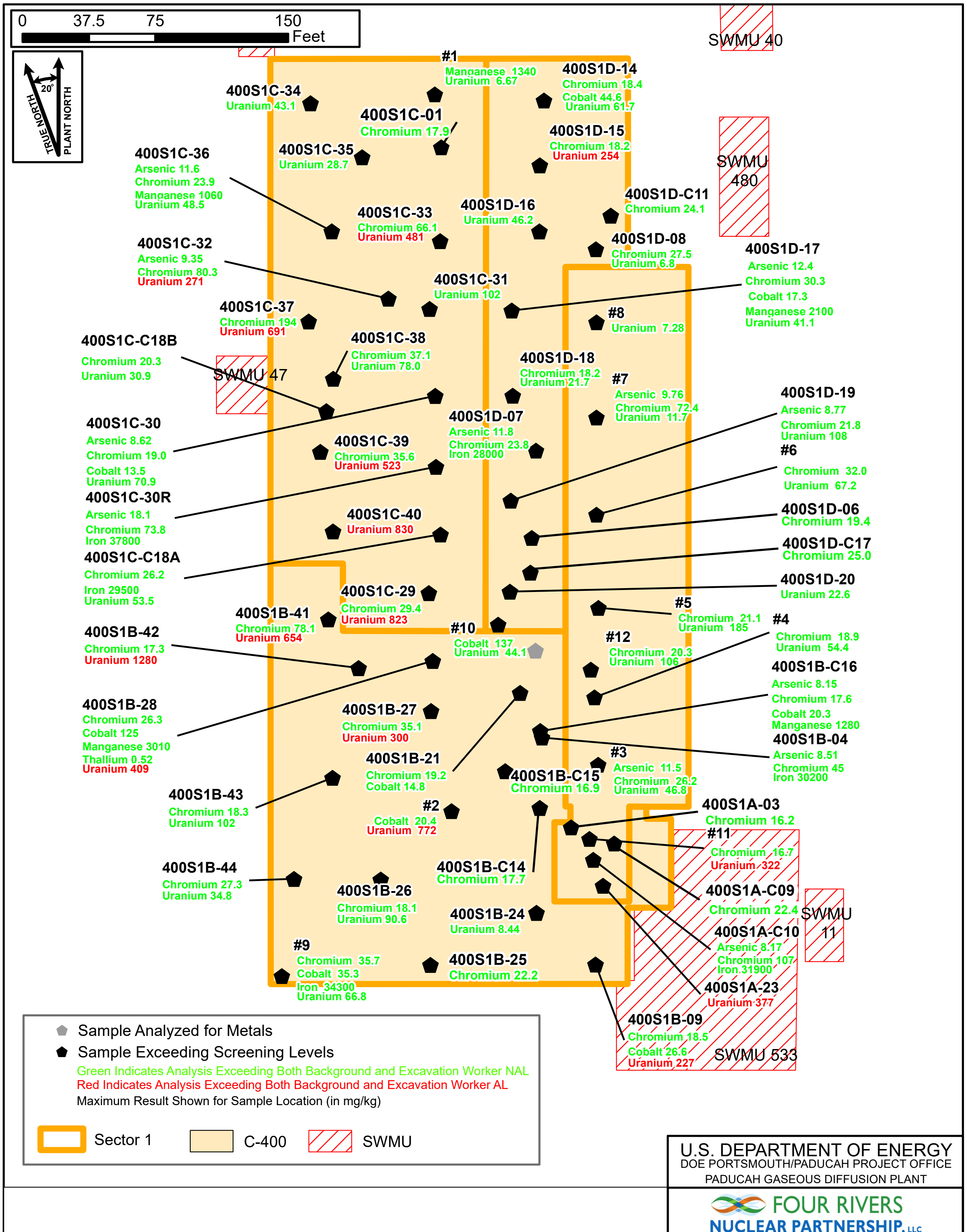


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Figure 4.6. Sector 1 Surface and Subsurface Sampling Exceeding Screening Levels for Metals

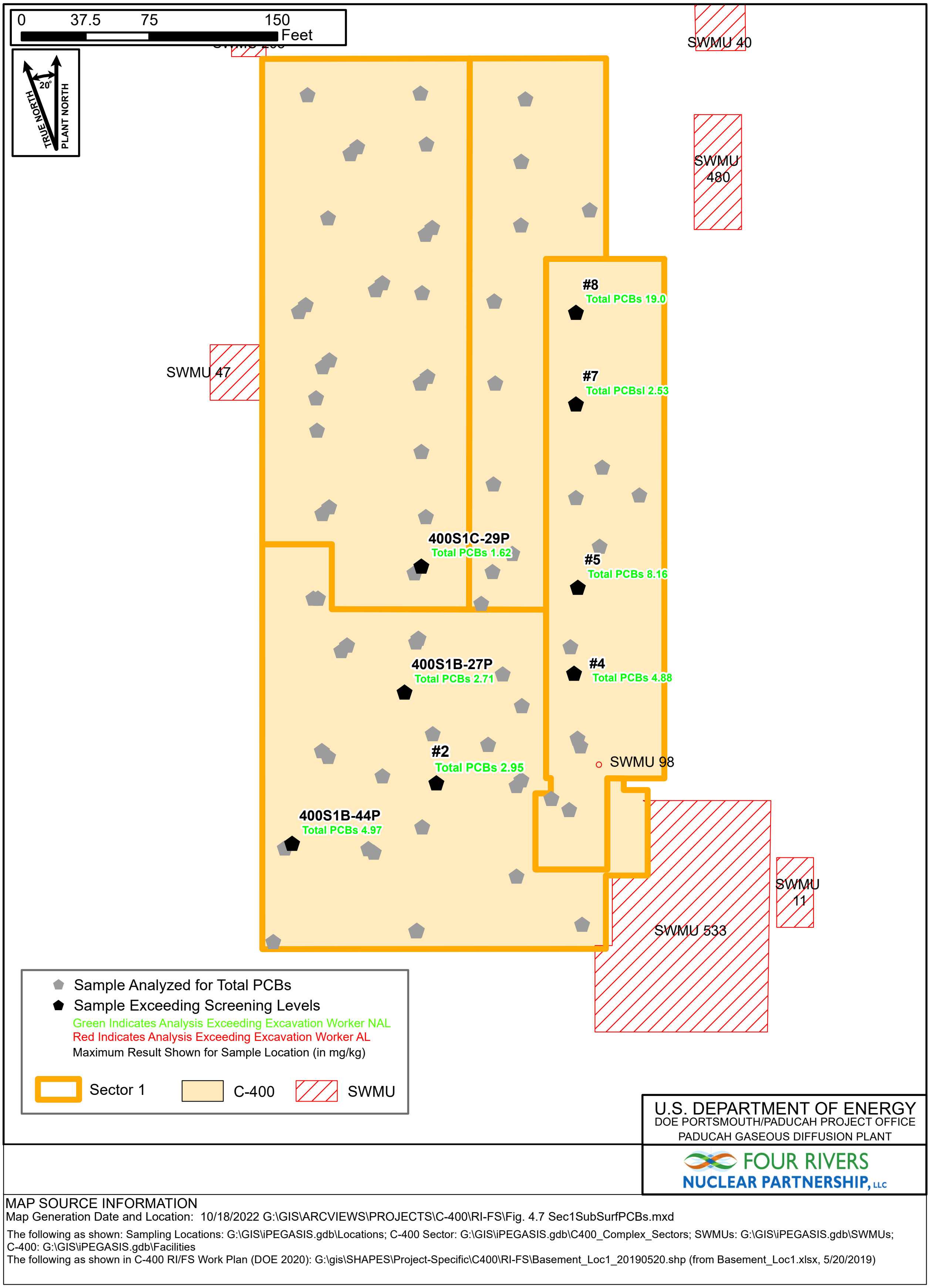


Figure 4.7. Sector 1 Surface and Subsurface Sampling Exceeding Screening Levels for Total PCBs

VOCs

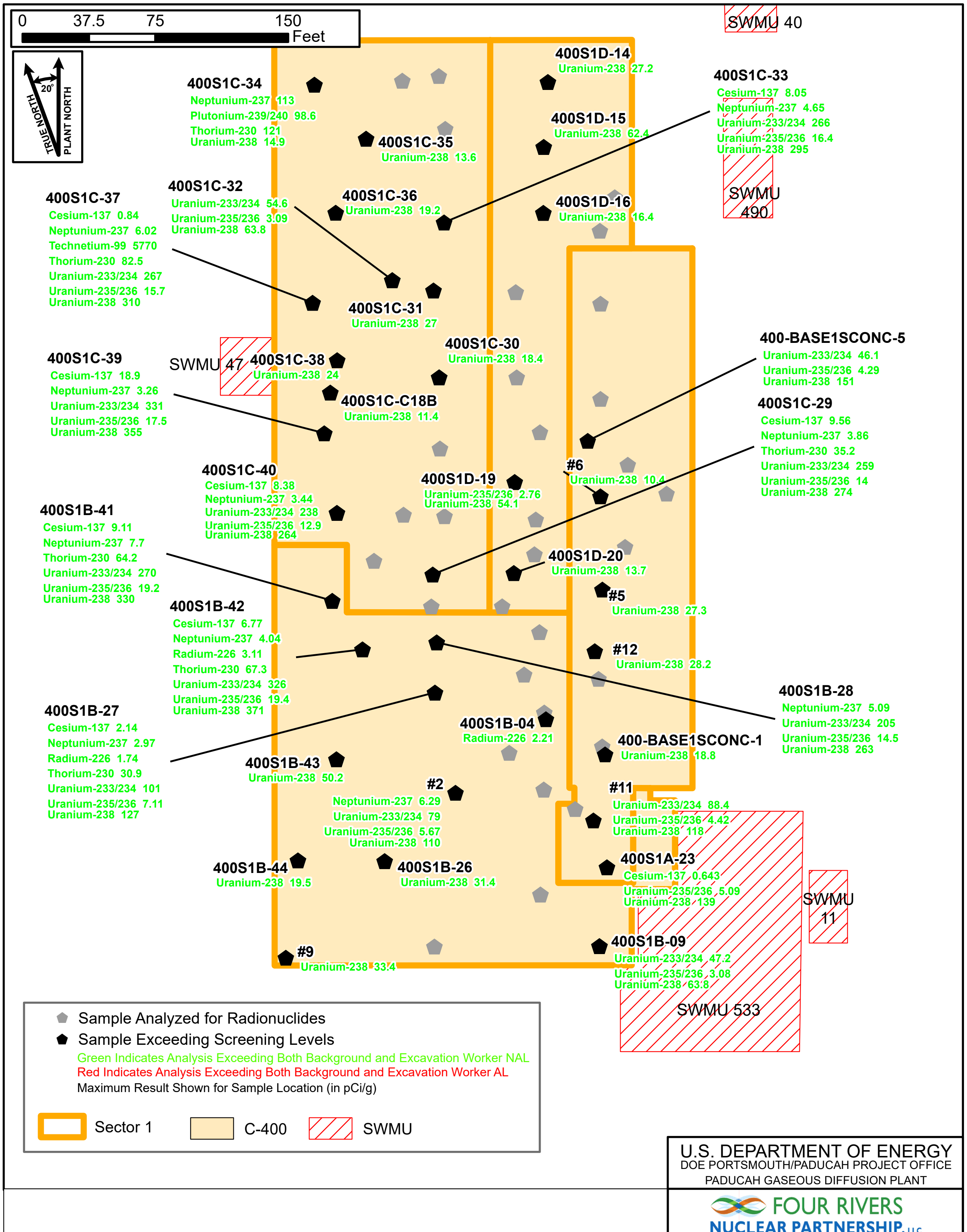
Several VOCs were detected in Sector 1 surface and subsurface concrete/brick/soil (0–16 ft bgs), but none exceeded the excavation worker NAL. VOCs in Sector 1 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs (for a DAF of 1) include 4-methyl-2-pentanone, methylene chloride (a potential lab contaminant), chloroform*, *cis*-1,2-dichloroethene, and TCE* (VOCs with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA) 1,1,2-trichloroethane*, 1,1-dichloroethane, 1,4-dioxane*, 2-butanone, acrolein*, methylene chloride* (a potential lab contaminant), carbon tetrachloride, chloroform*, *cis*-1,2-dichloroethene*, and TCE* exceeded the protection of groundwater SSLs for a DAF of 1 (an asterisk denotes VOCs exceeding the DAF of 20 SSLs). For TCE, with a maximum concentration of 5.54 mg/kg in this interval, there were 162 out of 235 samples that exceeded the DAF of 1 SSL, and 128 out of 235 samples that exceeded the DAF of 20 SSL. The maximum result of TCE in the deep soil interval (16 ft bgs to the bottom of the RGA) occurred at the base of the UCRS in boring 400S1B-24 at a depth of 58.5–59.5 ft bgs.

In the McNairy soils, VOCs that exceeded the protection of groundwater SSLs (for a DAF of 1) included 1,1,2-trichloroethane, 4-methyl-2-pentanone, bromodichloromethane, methylene chloride (a potential lab contaminant), carbon tetrachloride, chloroform, *cis*-1,2-dichloroethene, tetrachloroethene, and TCE. TCE was detected in 44 of 83 samples from the McNairy soils with a maximum concentration of 6.10 mg/kg. The maximum TCE result occurred in the top of the McNairy in boring 400S1A-03 at a depth of 88–89 ft bgs.

Radionuclides

Radionuclides that were above both the background screening levels and the excavation worker NALs in Sector 1 surface and subsurface concrete/brick/soil (0–16 ft bgs) include cesium-137, neptunium-237, plutonium-239/240, radium-226, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Locations where these radionuclides exceeded background and excavation worker NALs are provided in Figure 4.8. None of the radionuclides exceeded the excavation worker ALs.

Radionuclides that were detected in the Sector 1 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs (for a DAF of 1) for the protection of groundwater include radium-226*, technetium-99*, thorium-230, uranium-233/234*, uranium-235/236*, and uranium-238* (radionuclides with an asterisk also exceeded SSLs for a DAF of 20). Neptunium-237, which does not have a site-specific background, exceeded the DAF of 1 and the DAF of 20 SSLs; and plutonium-239/240, which also does not have a site-specific background, exceeded the DAF of 1 SSL. In the deep soil interval (16 ft bgs to the bottom of the RGA), cesium-137, neptunium-237* (which does not have a site-specific background), technetium-99*, thorium-230*, uranium-233/234*, uranium-235/236*, and uranium-238* exceeded both the background criteria and the SSLs for a DAF of 1 for protection of groundwater (radionuclides with an asterisk also exceeded SSLs for a DAF of 20). Cesium-137 only exceeded the background value in 1 out of 204 samples. In the screening of the McNairy Formation soil, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238 exceeded the groundwater protection SSLs for a DAF of 1.



MAP SOURCE INFORMATION
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The following as shown in C-400 RI/FS Work Plan (DOE 2020): G:\gis\SHAPES\Project-Specific\C400\RI-FS\Basement_Loc1_20190520.shp (from Basement_Loc1.xlsx, 5/20/2019)

Figure 4.8. Sector 1 Surface and Subsurface Sampling Exceeding Screening Levels for Radionuclides

4.3.2 Sector 2

4.3.2.1 Description and process history

Sector 2 is an L-shaped area of approximately 38,000 ft^2, located at the northeast corner of the C-400 Complex, as shown in Figure 3.1. Concrete and asphalt pavement covers much of the area at the time of the RI; there is a limited area of exposed soil. The concrete apron on the north end of the C-400 Cleaning Building is original construction. Additionally, the area contains an acid drain line.

Sector 2 includes SWMU 40 and SWMU 480. A permanent safety barrier surrounds the perimeter of the concrete slab due to the slab floor being > 4 ft above the ground level in areas. The concrete slab is posted as a fixed contamination area (DOE 2007a).

The C-403 Neutralization Tank received influent from the C-400 Cleaning Building for the storage and treatment (i.e., neutralization) of acidic, uranium-bearing waste solutions generated during cleaning operations. During treatment, lime slurry was added to the wastewater from the C-402 Lime House to raise the pH and precipitate out the uranium in the form of a low-level radioactive sludge. Once the pH was raised to the proper level (10 to 12), the effluent was discharged to the C-404 Holding Pond where the sludge was allowed to settle out of the solution.

In 1957, the discharge from the C-403 Neutralization Tank was routed to the NSDD, where it flowed to Little Bayou Creek. In the late 1970s, flow from the NSDD was routed into the C-616-F Full-Flow Lagoon, and direct discharge to Little Bayou Creek subsequently was discontinued. Although neutralization no longer was carried out at C-403 after 1957, low-level, uranium-bearing wastewater continued to be discharged to C-403 until 1990. These discharges included uranium hexafluoride cylinder hydrostatic-test water, overflow, and runoff from cleaning tanks; discharge from floor drains; and other unknown sources. Drawings for C-403 show that a 15-inch vitreous clay pipe was installed between the C-403 Neutralization Tank and the C-410-B Neutralization Lagoon (DOE 1999). The pipe was constructed utilizing part of an existing storm-water line. The intended purpose of this line is unknown (DOE 1999). After 1990, the C-403 Neutralization Tank was removed from service.

The C-402 Lime House was used to neutralize acids, produce magnesium fluoride pellets, and later as a storage facility, according to the SWMU Assessment Report. The C-402 Lime House is a 1,742 ft^2 reinforced concrete building with a ground floor and partial basement. The facility was used to supply lime slurry to the C-403 Neutralization Tank. The building also housed pelletizing units and associated vent systems and was used for drummed chemical storage. The building was radiologically contaminated, and potential ACM also was present. In 2006, the C-402 facility structure was demolished to the first floor concrete slab (DOE 2007a).

There have been no previous response actions for the C-403 Neutralization Tank; however, in 1993, nine water and three sediment samples were collected from the C-403 Neutralization Tank. Analytical results indicated that TCE concentrations in the water samples ranged from 17 to 1,300 µg/L, and TCE concentrations in the sediment samples ranged from 35 to 6,700 ppb (DOE 1999). During the WAG 6 RI, a water line located near the C-403 tank broke, and subsurface water flowed into the tank from one of the remaining fill lines. Approximately 7,000 ft^3 of water accumulated in the tank. Samples of the water from the tank were analyzed and were found to contain TCE at a concentration of 21,000 µg/L and gross beta activity of 43,750 pCi/L. Resampling in January 1998 indicated TCE concentrations in water had dropped to 5,600 µg/L (DOE 1999).

4.3.2.2 Nature and extent of contamination—concrete and surface soils

A summary of the analytical results for Sector 2 concrete and surface soil and the screening results are provided in Table 4.9. The results of the screening for concrete and surface soil are discussed below.

Metals and Inorganics

Several metals were detected in Sector 2 surface soil above background and the metals that were detected above both background screening levels and the industrial worker NALs were arsenic, chromium, and uranium. Most of these metals exceeded the background and industrial worker criteria at multiple locations (Figure 4.9), but arsenic only exceeded background at one location out of 16 samples.

Metals that were detected in the Sector 2 surface soil above both the background screening levels and the SSLs for the protection of groundwater (for a DAF of 1) include aluminum, antimony*, arsenic*, cadmium, copper*, nickel*, selenium*, thallium*, uranium*, and zinc (metals with an asterisk also exceeded SSLs for a DAF of 20).

The metals most frequently detected above their respective background values in Sector 2 surface soil are chromium, selenium, and uranium.

PCBs

Total PCBs were detected in 6 of 16 samples in Sector 2 surface soil. The maximum result, 0.0862 mg/kg, did not exceed the industrial worker NAL. Four of the 16 samples analyzed exceeded the SSL for the protection of groundwater (for a DAF of 1 only).

SVOCs

Several SVOCs were detected in surface soil, mostly PAH compounds, but none of the results exceeded the industrial worker NAL. SVOCs that exceeded the SSLs for protection of groundwater, with a DAF of 1, included carbazole, phenanthrene, and Total PAHs.

During the WAG 6 RI, a small area of surface soil between the C-402 Lime House and the C-400 Cleaning Building was found to be impacted with moderate concentrations of several common PAH compounds. The extent of contamination appears to be confined both vertically and horizontally to the surface soil surrounding near the WAG 6 boring 400-005.

VOCs

Several VOCs were detected in Sector 2 surface soil but none of the results exceeded the industrial worker NAL. The following were detected in the Sector 2 surface soil above the SSLs for the protection of groundwater at a DAF of 1: 1,2-dimethylbenzene, 1,4-dioxane, 2-butanone, benzene, chloroform, ethylbenzene, m,p-xylene, methylcyclohexane, toluene, total xylene, and TCE; 1,4-dioxane, chloroform, toluene, and TCE exceeded the SSLs for both the DAF of 1 and the DAF of 20.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 2 concrete and surface soil include neptunium-237, uranium-233/234, uranium-235/236, and uranium-238. Uranium isotopes more frequently exceeded the screening criteria than neptunium-237 which

Table 4.9. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 2

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.54E+03	1.80E+04	9.91E+03	16/16	3/16	1.30E+04	0/16	1.00E+05	0/16	1.00E+05	0/16	5.99E+04	15/16	3.00E+03	10.7 - 122
METAL	Antimony	mg/kg	3.86E-01	1.54E+00	9.94E-01	6/16	6/16	2.10E-01	0/16	9.34E+01	0/16	2.80E+03	4/16	7.04E-01	6/16	3.52E-02	1.94 - 2.36
METAL	Arsenic	mg/kg	1.84E+00	1.25E+01	6.01E+00	16/16	1/16	1.20E+01	16/16	1.60E+00	0/16	1.60E+02	16/16	3.02E-02	16/16	1.51E-03	1.06 - 5.51
METAL	Barium	mg/kg	6.97E+00	1.64E+02	7.85E+01	16/16	0/16	2.00E+02	0/16	4.04E+04	0/16	1.00E+05	0/16	3.11E+02	15/16	1.55E+01	0.851 - 0.978
METAL	Beryllium	mg/kg	9.81E-02	6.65E-01	4.10E-01	16/16	0/16	6.70E-01	0/16	4.50E+02	0/16	1.35E+04	0/16	3.89E+01	0/16	1.95E+00	0.106 - 0.122
METAL	Boron	mg/kg	1.82E+00	4.99E+00	2.91E+00	14/16	N/A	N/A	0/16	4.65E+04	0/16	1.00E+05	0/16	2.56E+01	14/16	1.28E+00	3.19 - 3.67
METAL	Cadmium	mg/kg	2.45E-02	1.12E+00	2.92E-01	12/16	4/16	2.10E-01	0/16	6.05E+01	0/16	1.82E+03	0/16	1.39E+00	8/16	6.93E-02	0.213 - 1.1
METAL	Chromium	mg/kg	5.96E+00	5.35E+01	1.91E+01	16/16	8/16	1.60E+01	14/16	1.23E+01	0/16	1.23E+03	0/16	3.60E+06	0/16	1.80E+05	0.638 - 0.733
METAL	Cobalt	mg/kg	8.34E-01	1.09E+01	6.68E+00	16/16	0/16	1.40E+01	0/16	6.87E+01	0/16	2.06E+03	16/16	5.43E-01	16/16	2.71E-02	0.213 - 0.244
METAL	Copper	mg/kg	1.86E+00	8.93E+02	6.55E+01	16/16	2/16	1.90E+01	0/16	9.34E+03	0/16	1.00E+05	1/16	5.62E+01	15/16	2.81E+00	0.425 - 4.5
METAL	Iron	mg/kg	2.72E+03	2.68E+04	1.58E+04	16/16	0/16	2.80E+04	0/16	1.00E+05	0/16	1.00E+05	16/16	7.04E+02	16/16	3.52E+01	21.4 - 244
METAL	Lead	mg/kg	1.93E+00	2.40E+01	1.10E+01	16/16	0/16	3.60E+01	0/16	8.00E+02	0/16	8.00E+02	0/16	2.70E+02	4/16	1.35E+01	0.425 - 0.489
METAL	Manganese	mg/kg	8.24E+01	1.35E+03	4.51E+02	16/16	0/16	1.50E+03	0/16	4.72E+03	0/16	1.00E+05	16/16	5.65E+01	16/16	2.83E+00	1.07 - 12.2
METAL	Mercury	mg/kg	1.51E-02	7.92E-02	2.82E-02	13/16	0/16	2.00E-01	0/16	7.01E+01	0/16	2.10E+03	0/16	5.91E-01	4/16	2.95E-02	0.0241 - 0.0298
METAL	Molybdenum	mg/kg	3.38E-01	1.28E+00	6.90E-01	16/16	N/A	N/A	0/16	1.16E+03	0/16	3.48E+04	0/16	4.03E+00	16/16	2.02E-01	0.213 - 1.1
METAL	Nickel	mg/kg	4.94E+00	1.43E+03	9.93E+01	16/16	1/16	2.10E+01	0/16	4.30E+03	0/16	1.00E+05	1/16	5.12E+01	16/16	2.56E+00	0.425 - 4.41
METAL	Selenium	mg/kg	4.00E-01	1.85E+00	9.92E-01	12/16	8/16	8.00E-01	0/16	1.17E+03	0/16	3.51E+04	5/16	1.04E+00	12/16	5.19E-02	1.06 - 5.51
METAL	Silver	mg/kg	3.99E-01	1.70E+00	9.05E-01	5/16	0/16	2.30E+00	0/16	1.17E+03	0/16	3.51E+04	1/16	1.60E+00	5/16	7.99E-02	0.485 - 5.68
METAL	Thallium	mg/kg	1.57E-01	2.47E-01	1.98E-01	8/16	3/16	2.10E-01	0/16	2.34E+00	0/16	7.02E+01	8/16	2.84E-02	8/16	1.42E-03	0.425 - 0.489
METAL	Uranium[a]	mg/kg	9.52E-01	9.10E+02	6.56E+01	16/16	7/16	4.90E+00	2/16	4.66E+01	0/16	1.40E+03	8/16	3.60E+00	16/16	1.80E-01	0.0425 - 0.221
METAL	Vanadium	mg/kg	6.18E+00	3.80E+01	2.45E+01	16/16	0/16	3.80E+01	0/16	1.15E+03	0/16	3.45E+04	0/16	1.73E+02	15/16	8.64E+00	4.25 - 4.89
METAL	Zinc	mg/kg	1.35E+01	1.44E+02	4.10E+01	16/16	2/16	6.50E+01	0/16	7.01E+04	0/16	1.00E+05	0/16	7.46E+02	7/16	3.73E+01	4.25 - 22.1
ANION	Fluoride	mg/kg	1.18E+00	2.65E+01	9.68E+00	16/16	N/A	N/A	0/16	9.33E+03	0/16	1.00E+05	0/16	2.40E+02	4/16	1.20E+01	1.09 - 1.24
PPCB	Total PCB[b]	mg/kg	1.85E-03	8.62E-02	3.90E-02	6/16	N/A	N/A	0/16	2.93E-01	0/16	2.93E+01	0/16	1.36E-01	4/16	6.82E-03	0.00361 - 0.0225
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.00E+01	0/16	6.00E+02	0/16	1.74E-02	0/16	8.72E-04	0.367 - 3.58
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.90E+03	0/16	8.70E+04	0/16	8.04E+00	0/16	4.02E-01	0.367 - 3.58
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.90E+01	0/16	8.70E+02	0/16	2.32E-02	0/16	1.16E-03	0.367 - 3.58
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.70E+01	0/16	2.61E+03	0/16	4.52E-02	0/16	2.26E-03	0.367 - 3.58
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+02	0/16	1.74E+04	0/16	8.42E-01	0/16	4.21E-02	0.367 - 3.58
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+01	0/16	1.74E+03	0/16	8.72E-02	0/16	4.36E-03	0.733 - 7.16
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.57E+00	0/16	2.57E+02	0/16	6.42E-03	0/16	3.21E-04	0.367 - 3.58
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.46E-01	0/16	5.46E+01	0/16	1.33E-03	0/16	6.67E-05	0.367 - 3.58
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.84E+03	0/16	5.52E+04	0/16	7.70E+00	0/16	3.85E-01	0.0367 - 0.358
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.17E+03	0/16	3.51E+04	0/16	1.78E-01	0/16	8.91E-03	0.367 - 3.58
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.32E+00	0/16	6.96E+01	0/16	5.16E-03	0/16	2.58E-04	0.367 - 3.58
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.19E+01	0/16	2.76E+03	0/16	3.70E-01	0/16	1.85E-02	0.0367 - 0.358
SVOC	2-Methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.45E+03	0/16	4.35E+04	0/16	1.51E+00	0/16	7.53E-02	0.367 - 3.58
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.87E+02	0/16	8.61E+03	0/16	1.60E-01	0/16	8.01E-03	0.367 - 3.58
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+01	0/16	1.74E+03	0/16	8.72E-02	0/16	4.36E-03	0.367 - 3.58
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.80E+00	0/16	1.80E+02	0/16	1.65E-02	0/16	8.24E-04	0.367 - 3.58
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.70E+00	0/16	2.61E+02	0/16	4.90E-03	0/16	2.45E-04	0.367 - 3.58
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.41E+01	0/16	4.23E+02	0/16	6.84E-03	0/16	3.42E-04	0.367 - 3.58
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.90E+03	0/16	8.70E+04	0/16	3.42E+00	0/16	1.71E-01	0.367 - 3.58
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.06E+00	0/16	4.06E+02	0/16	3.10E-03	0/16	1.55E-04	0.367 - 3.58
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.41E+01	0/16	4.23E+02	0/16	6.84E-03	0/16	3.42E-04	0.367 - 3.58
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+01	0/16	1.74E+03	0/16	8.72E-02	0/16	4.36E-03	0.367 - 3.58
SVOC	Acenaphthene	mg/kg	3.87E-02	2.82E-01	1.31E-01	3/16	N/A	N/A	0/16	1.38E+03	0/16	4.14E+04	0/16	1.10E+01	0/16	5.49E-01	0.0367 - 0.358
SVOC	Acenaphthylene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.38E+03	0/16	4.14E+04	0/16	1.10E+01	0/16	5.49E-01	0.0367 - 0.358

Table 4.9. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	Acetophenone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.34E+04	0/16	7.02E+05	0/16	1.17E+00	0/16	5.84E-02	0.367 - 3.58
SVOC	Anthracene	mg/kg	5.90E-02	5.42E-01	2.35E-01	3/16	N/A	N/A	0/16	6.89E+03	0/16	1.00E+05	0/16	1.16E+02	0/16	5.81E+00	0.0367 - 0.358
SVOC	Atrazine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.53E+00	0/16	3.53E+02	0/16	3.92E-03	0/16	1.96E-03	0.367 - 3.58
SVOC	Benzaldehyde	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.64E+03	0/16	1.64E+05	0/16	8.30E-02	0/16	4.15E-03	0.367 - 3.58
SVOC	Benzo(ghi)perylene	mg/kg	9.08E-02	2.01E-01	1.46E-01	5/16	N/A	N/A	0/16	6.89E+02	0/16	2.07E+04	0/16	2.63E+01	0/16	1.32E+00	0.0367 - 0.358
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.70E+01	0/16	2.61E+03	0/16	2.70E-02	0/16	1.35E-03	0.367 - 3.58
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.25E+00	0/16	1.25E+02	0/16	7.22E-05	0/16	3.61E-06	0.367 - 3.58
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.32E+01	0/16	9.32E+03	0/16	2.62E-03	0/16	1.31E-04	0.367 - 3.58
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+01	0/16	5.80E+03	0/16	2.66E+01	0/16	1.33E+00	0.0367 - 0.358
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.27E+02	0/16	4.27E+04	0/16	4.72E+00	0/16	2.36E-01	0.0367 - 0.358
SVOC	Caprolactam	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.43E+04	0/16	4.29E+05	0/16	4.94E+00	0/16	2.47E-01	0.367 - 3.58
SVOC	Carbazole	mg/kg	3.66E-02	1.38E-01	7.96E-02	3/16	N/A	N/A	0/16	4.06E+01	0/16	4.06E+03	0/16	7.51E-01	2/16	3.76E-02	0.0367 - 0.358
SVOC	Dibenzofuran	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.34E+02	0/16	7.02E+03	0/16	2.92E-01	0/16	1.46E-02	0.367 - 3.58
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.32E+04	0/16	6.96E+05	0/16	1.22E+01	0/16	6.08E-01	0.0367 - 0.358
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.32E+04	0/16	6.96E+05	0/16	1.22E+01	0/16	6.08E-01	0.0367 - 0.358
SVOC	Di-n-butyl phthalate	mg/kg	1.38E-02	1.78E-02	1.67E-02	4/16	N/A	N/A	0/16	2.90E+03	0/16	8.70E+04	0/16	4.54E+00	0/16	2.27E-01	0.0367 - 0.358
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.90E+02	0/16	8.70E+03	0/16	1.13E+02	0/16	5.65E+00	0.0367 - 0.358
SVOC	Diphenylamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.90E+03	0/16	8.70E+04	0/16	4.66E+00	0/16	2.33E-01	0.367 - 3.58
SVOC	Fluoranthene	mg/kg	1.50E-02	1.46E+00	4.73E-01	7/16	N/A	N/A	0/16	9.19E+02	0/16	2.76E+04	0/16	1.78E+02	0/16	8.91E+00	0.0367 - 0.358
SVOC	Fluorene	mg/kg	2.11E-02	5.18E-01	1.96E-01	3/16	N/A	N/A	0/16	9.19E+02	0/16	2.76E+04	0/16	1.09E+01	0/16	5.45E-01	0.0367 - 0.358
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.26E+00	0/16	1.26E+02	0/16	2.46E-03	0/16	1.23E-04	0.367 - 3.58
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.61E+00	0/16	5.61E+02	0/16	5.34E-03	0/16	2.67E-04	0.367 - 3.58
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.45E-01	0/16	2.24E+01	0/16	2.56E-03	0/16	1.28E-04	0.367 - 3.58
SVOC	Hexachloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.46E+00	0/16	8.46E+02	0/16	4.00E-03	0/16	2.00E-04	0.367 - 3.58
SVOC	Isophorone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.55E+02	0/16	8.55E+04	0/16	5.16E-01	0/16	2.58E-02	0.367 - 3.58
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.80E+02	0/16	1.74E+04	0/16	5.94E-01	0/16	2.97E-02	0.367 - 3.58
SVOC	Naphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.06E+00	0/16	4.06E+02	0/16	7.70E-03	0/16	3.85E-04	0.0367 - 0.358
SVOC	Nitrobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.24E+01	0/16	2.24E+03	0/16	1.83E-03	0/16	9.17E-05	0.367 - 3.58
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.16E-01	0/16	1.16E+01	0/16	1.62E-04	0/16	8.10E-06	0.367 - 3.58
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.77E-01	0/16	8.77E+01	0/16	1.14E-03	0/16	5.71E-05	0.367 - 3.58
SVOC	Phenanthrene	mg/kg	7.54E-02	1.80E+00	5.70E-01	5/16	N/A	N/A	0/16	1.38E+03	0/16	4.14E+04	0/16	1.10E+01	1/16	5.49E-01	0.0367 - 0.358
SVOC	Phenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.70E+03	0/16	2.61E+05	0/16	6.62E+00	0/16	3.31E-01	0.367 - 3.58
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.06E+01	0/16	3.48E+03	0/16	3.16E-02	0/16	1.58E-03	0.367 - 3.58
SVOC	Pyrene	mg/kg	1.35E-02	8.02E-01	2.80E-01	8/16	N/A	N/A	0/16	6.89E+02	0/16	2.07E+04	0/16	2.63E+01	0/16	1.32E+00	0.0367 - 0.358
SVOC	Total PAH[c]	mg/kg	3.11E-03	4.95E-01	2.69E-01	6/16	N/A	N/A	0/16	6.43E-01	0/16	6.43E+01	0/16	5.89E-01	5/16	2.94E-02	-
RADS	Americium-241	pCi/g	6.59E-01	6.59E-01	6.59E-01	1/17	N/A	N/A	0/17	6.01E+00	0/17	6.01E+02	0/17	1.92E+01	0/17	9.58E-01	0.238 - 0.874
RADS	Cesium-137	pCi/g	6.34E-02	6.65E-02	6.50E-02	2/17	0/17	4.90E-01	0/17	1.08E-01	0/17	1.08E+01	0/17	9.58E+00	0/17	4.79E-01	0.0255 - 0.0966
RADS	Neptunium-237	pCi/g	1.15E+00	1.15E+00	1.15E+00	1/17	1/17	1.00E-01	1/17	2.49E-01	0/17	2.49E+01	1/17	1.07E+00	1/17	5.36E-02	0.364 - 0.919
RADS	Plutonium-238	pCi/g	--	--	--	0/17	0/17	7.30E-02	0/17	2.65E+01	0/17	2.65E+03	0/17	4.38E+00	0/17	2.19E-01	0.337 - 0.897
RADS	Plutonium-239/240	pCi/g	3.33E+00	3.33E+00	3.33E+00	1/17	1/17	2.50E-02	0/17	2.27E+01	0/17	2.27E+03	0/17	4.26E+00	1/17	2.13E-01	0.323 - 0.864
RADS	Technetium-99	pCi/g	8.33E+00	2.53E+01	1.90E+01	6/17	6/17	2.50E+00	0/17	1.27E+03	0/17	1.00E+05	6/17	1.52E-01	6/17	7.60E-03	2.36 - 3.92
RADS	Thorium-230	pCi/g	6.24E-01	1.12E+01	2.09E+00	16/17	5/17	1.50E+00	0/17	3.13E+01	0/17	3.13E+03	0/17	3.66E+01	5/17	1.83E+00	0.365 - 1.15
RADS	Uranium-233/234	pCi/g	7.64E-01	5.12E+02	3.70E+01	16/17	11/17	1.20E+00	1/17	5.01E+01	0/17	5.01E+03	11/17	9.90E-01	16/17	4.95E-02	0.385 - 2.27
RADS	Uranium-235/236	pCi/g	3.16E-01	2.84E+01	5.43E+00	6/17	6/17	6.00E-02	5/17	4.08E-01	0/17	4.08E+01	3/17	9.76E-01	6/17	4.88E-02	0.134 - 0.746
RADS	Uranium-238	pCi/g	4.93E-01	5.54E+02	4.10E+01	16/17	12/17	1.20E+00	11/17	1.66E+00	1/17	1.66E+02	14/17	8.05E-01	16/17	4.03E-02	0.16 - 1.41
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.58E+03	0/16	1.00E+05	0/16	5.62E+00	0/16	2.81E-01	0.000986 - 0.053
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.91E+00	0/16	2.91E+02	0/16	5.92E-04	0/16	2.96E-05	0.000986 - 0.053
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.81E+03	0/16	8.43E+04	0/16	5.13E+01	0/16	2.56E+00	0.00493 - 0.265

Table 4.9. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 2 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.32E-01	0/16	1.90E+01	0/16	2.69E-04	0/16	1.35E-05	0.000986 - 0.053
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.58E+01	0/16	1.58E+03	0/16	1.56E-02	0/16	7.82E-04	0.000986 - 0.053
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.00E+02	0/16	3.00E+03	0/16	2.04E-01	0/16	1.02E-02	0.000986 - 0.053
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.87E+02	0/16	5.61E+03	0/16	4.18E-02	0/16	2.09E-03	0.000986 - 0.053
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.59E+01	0/16	7.77E+02	0/16	2.32E-02	0/16	1.16E-03	0.000986 - 0.053
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.49E-02	0/16	6.49E+00	0/16	2.88E-06	0/16	1.44E-07	0.000986 - 0.053
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.68E-01	0/16	1.68E+01	0/16	4.20E-05	0/16	2.10E-06	0.000986 - 0.053
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.76E+02	0/16	2.93E+04	0/16	5.90E-01	0/16	2.95E-02	0.000986 - 0.053
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.09E+00	0/16	2.09E+02	0/16	9.69E-04	0/16	4.84E-05	0.000986 - 0.053
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.63E+00	0/16	1.99E+02	0/16	5.48E-03	0/16	2.74E-04	0.000986 - 0.053
VOC	1,2-Dimethylbenzene	mg/kg	5.81E-04	2.08E-02	1.07E-02	2/16	N/A	N/A	0/16	2.81E+02	0/16	8.43E+03	0/16	3.81E-01	1/16	1.90E-02	0.000986 - 0.053
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.76E+02	0/16	2.93E+04	0/16	5.90E-01	0/16	2.95E-02	0.000986 - 0.053
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.15E+01	0/16	1.15E+03	0/16	9.24E-03	0/16	4.62E-04	0.000986 - 0.053
VOC	1,4-Dioxane	mg/kg	5.52E-02	5.52E-02	5.52E-02	1/16	N/A	N/A	0/16	3.91E+01	0/16	3.91E+03	1/16	1.88E-03	1/16	9.42E-05	0.0493 - 2.65
VOC	2-Butanone	mg/kg	3.18E-03	1.27E-01	6.51E-02	2/16	N/A	N/A	0/16	2.24E+04	0/16	6.72E+05	0/16	2.32E+00	1/16	1.16E-01	0.00493 - 0.265
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.15E-02	0/16	9.15E+00	0/16	2.76E-05	0/16	1.38E-06	0.00493 - 0.265
VOC	2-Hexanone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.52E+02	0/16	4.56E+03	0/16	1.75E-02	0/16	8.75E-04	0.00493 - 0.265
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.17E+02	0/16	2.17E+04	0/16	6.44E-02	0/16	3.22E-03	0.000986 - 0.053
VOC	4-Methyl-2-pentanone	mg/kg	2.60E-03	2.60E-03	2.60E-03	1/16	N/A	N/A	0/16	7.97E+03	0/16	2.39E+05	0/16	5.62E-01	0/16	2.81E-02	0.00493 - 0.265
VOC	Acetone	mg/kg	4.37E-03	2.03E-02	1.13E-02	6/16	N/A	N/A	0/16	2.10E+05	0/16	6.30E+06	0/16	7.36E+00	0/16	3.68E-01	0.00493 - 0.265
VOC	Acrolein	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.05E-02	0/16	1.82E+00	0/16	1.68E-05	0/16	8.41E-07	0.00493 - 0.265
VOC	Acrylonitrile	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.24E+00	0/16	1.24E+02	0/16	2.28E-04	0/16	1.14E-05	0.00493 - 0.265
VOC	Benzene	mg/kg	6.16E-04	7.59E-04	6.88E-04	2/16	N/A	N/A	0/16	5.31E+00	0/16	5.31E+02	0/16	4.66E-03	2/16	2.33E-04	0.000986 - 0.053
VOC	Bromochloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.28E+01	0/16	1.88E+03	0/16	4.16E-02	0/16	2.08E-03	0.000986 - 0.053
VOC	Bromodichloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.30E+00	0/16	1.30E+02	0/16	7.30E-04	0/16	3.65E-05	0.000986 - 0.053
VOC	Bromoform	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.56E+01	0/16	9.56E+03	0/16	1.75E-02	0/16	8.73E-04	0.000986 - 0.053
VOC	Bromomethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.03E+00	0/16	9.09E+01	0/16	3.82E-03	0/16	1.91E-04	0.000986 - 0.053
VOC	Carbon disulfide	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.52E+02	0/16	1.06E+04	0/16	4.80E-01	0/16	2.40E-02	0.00493 - 0.265
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.96E+00	0/16	2.96E+02	0/16	3.54E-03	0/16	1.77E-04	0.000986 - 0.053
VOC	Chlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.37E+02	0/16	4.11E+03	0/16	1.06E-01	0/16	5.28E-03	0.000986 - 0.053
VOC	Chloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.27E+03	0/16	6.81E+04	0/16	4.74E+00	0/16	2.37E-01	0.000986 - 0.053
VOC	Chloroform	mg/kg	5.24E-04	2.43E-03	1.22E-03	3/16	N/A	N/A	0/16	1.39E+00	0/16	1.39E+02	1/16	1.22E-03	3/16	6.12E-05	0.000986 - 0.053
VOC	Chloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.63E+01	0/16	1.39E+03	0/16	1.05E-02	0/16	5.26E-04	0.000986 - 0.053
VOC	*cis*-1,2-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.67E+02	0/16	1.40E+04	0/16	2.12E-02	0/16	1.06E-03	0.000986 - 0.053
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.34E+00	0/16	9.30E+02	0/16	3.36E-03	0/16	1.68E-04	0.000986 - 0.053
VOC	Cumene	mg/kg	4.34E-04	4.34E-04	4.34E-04	1/16	N/A	N/A	0/16	1.04E+03	0/16	3.12E+04	0/16	1.48E+00	0/16	7.38E-02	0.000986 - 0.053
VOC	Cyclohexane	mg/kg	4.68E-04	3.58E-03	1.77E-03	3/16	N/A	N/A	0/16	2.74E+03	0/16	8.22E+04	0/16	2.60E+01	0/16	1.30E+00	0.000986 - 0.053
VOC	Dibromochloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.79E+01	0/16	7.79E+03	0/16	4.64E-03	0/16	2.32E-04	0.000986 - 0.053
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.68E+01	0/16	1.10E+03	0/16	6.08E-01	0/16	3.04E-02	0.000986 - 0.053
VOC	Ethylbenzene	mg/kg	3.76E-04	1.24E-02	4.62E-03	3/16	N/A	N/A	0/16	2.66E+01	0/16	2.66E+03	0/16	3.36E-02	1/16	1.68E-03	0.000986 - 0.053
VOC	m,p-Xylene	mg/kg	7.91E-04	5.56E-02	1.47E-02	4/16	N/A	N/A	0/16	2.50E+02	0/16	7.50E+03	0/16	3.82E-01	1/16	1.91E-02	0.00197 - 0.106
VOC	Methyl acetate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.34E+05	0/16	7.02E+06	0/16	8.22E+00	0/16	4.11E-01	0.00493 - 0.265
VOC	Methylcyclohexane	mg/kg	3.81E-04	2.45E+00	3.52E-01	7/16	N/A	N/A	0/16	1.30E+03	0/16	3.90E+04	0/16	2.80E+01	1/16	1.40E+00	0.000989 - 0.108
VOC	Methylene chloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.08E+02	0/16	1.22E+04	0/16	5.44E-02	0/16	2.72E-03	0.00493 - 0.265
VOC	Styrene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.76E+03	0/16	1.13E+05	0/16	2.66E+00	0/16	1.33E-01	0.000986 - 0.053
VOC	Tetrachloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.00E+01	0/16	1.20E+03	0/16	3.69E-02	0/16	1.84E-03	0.000986 - 0.053
VOC	Toluene	mg/kg	5.04E-04	3.92E+00	6.60E-01	6/16	N/A	N/A	0/16	6.25E+03	0/16	1.00E+05	1/16	1.52E+00	1/16	7.62E-02	0.000989 - 0.108
VOC	Total Xylene	mg/kg	2.31E-03	7.64E-02	3.94E-02	2/16	N/A	N/A	0/16	2.50E+02	0/16	7.50E+03	0/16	3.82E-01	1/16	1.91E-02	0.00296 - 0.159

Table 4.9. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.54E+01	0/16	1.36E+03	0/16	5.83E-02	0/16	2.91E-03	0.000986 - 0.053
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.34E+00	0/16	9.30E+02	0/16	3.36E-03	0/16	1.68E-04	0.000986 - 0.053
VOC	Trichloroethene	mg/kg	2.57E-03	2.57E-03	2.57E-03	1/16	N/A	N/A	0/16	1.90E+00	0/16	5.70E+01	1/16	2.02E-03	1/16	1.01E-04	0.000986 - 0.053
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.16E+02	0/16	9.48E+03	0/16	1.46E+00	0/16	7.31E-02	0.000986 - 0.053
VOC	Vinyl chloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.06E+00	0/16	2.06E+02	0/16	1.29E-04	0/16	6.47E-06	0.000986 - 0.053

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

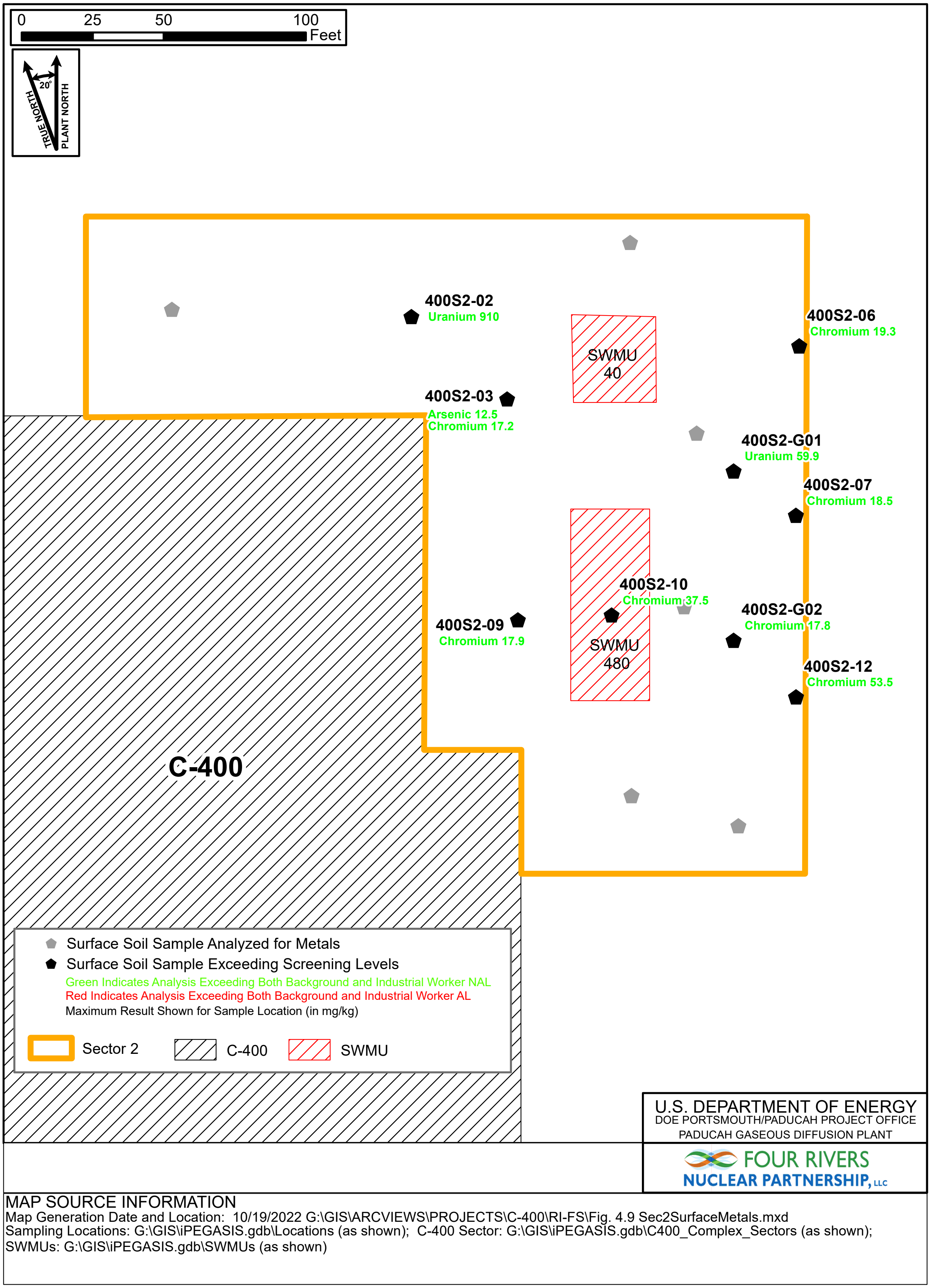


Figure 4.9. Sector 2 Surface Soil Sampling Exceeding Screening Levels for Metals

only had 1 out of 17 samples result in greater than background and NALs. Uranium-238, with a maximum result of 554 pCi/g, also exceeded the industrial worker AL at 1 out of 17 sample locations (Figure 4.10).

Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include neptunium-237*, plutonium-239/240, technetium-99*, thorium-230, uranium-233/234*, uranium-235/236*, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs).

4.3.2.3 Nature and extent of contamination—concrete and surface and subsurface soils

A summary of the analytical results for Sector 2 surface and subsurface soil and the screening results are provided in Tables 4.10 through 4.13. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Several metals were detected above background and the metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, iron, manganese, nickel, and uranium (Figure 4.11). The metals most frequently detected above its background values and excavation worker NALs in Sector 2 soil are chromium and uranium. Uranium metal exceeded the excavation worker AL at 2 out of 30 sample locations (910 mg/kg in a sample at location 400S2-02 and 281 mg/kg in a sample at location 400S2-04).

Metals that were detected in the Sector 2 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater (for a DAF of 1) include aluminum, antimony, arsenic*, barium, cadmium, copper*, iron*, lead, manganese*, nickel*, selenium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), essentially the same metals exceeded both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 with the addition of beryllium, antimony*, barium*, cobalt*, silver*, and thallium* (metals with an asterisk also exceeded the DAF of 20 SSLs); and the exclusion of copper and uranium. Based on the WAG 6 investigation, high concentrations of two metals, silver and antimony, were associated with the area of elevated radioactivity detected along a former storm sewer utility line that connected the C-403 Neutralization Tank (SWMU 40) to the C-410-B Neutralization Lagoon. Both metals were used in the plating process that was performed within the C-400 Cleaning Building. This investigation detected few occurrences of these metals above background. In both the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA), silver exceeded background in 1 of 68 samples and antimony exceeded background in 5 of 68 samples.

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater at a DAF of 1 only. Metals that exceeded these SSLs included aluminum, arsenic, barium, boron, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

PCBs

Total PCBs were detected in 3 of 10 samples in Sector 2 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs, 0.0814 mg/kg, did not exceed the excavation worker NAL but Total PCBs exceeded the SSL for the protection of groundwater (for a DAF of 1 only) at locations with the 3 detections. There was also 1 out of 58 samples with a detected result of Total PCBs (0.00897 mg/kg) in the deep soil interval (16 ft bgs to the bottom of the RGA) at a depth of 24.5–25.5 ft bgs at location 400S2-06 that exceeded the

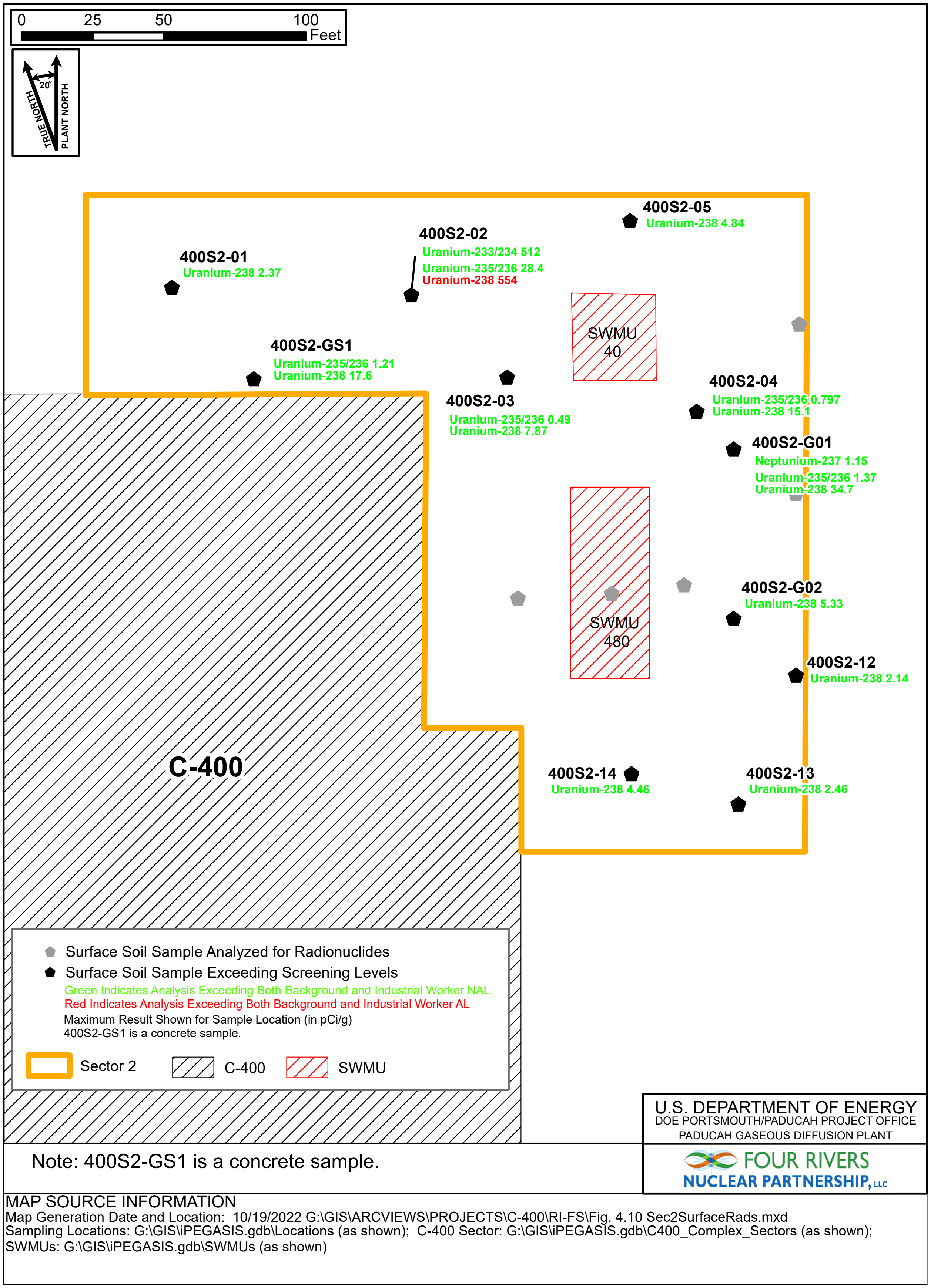


Figure 4.10. Sector 2 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

Table 4.10. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 2

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	2.54E+03	1.91E+04	1.16E+04	30/30	14/30	1.20E+04	0/30	3.26E+04	0/30	1.00E+05	10.7 - 122
METAL	Antimony	mg/kg	3.86E-01	1.54E+00	8.89E-01	8/30	8/30	2.10E-01	0/30	1.32E+01	0/30	3.96E+02	1.94 - 2.48
METAL	Arsenic	mg/kg	1.84E+00	1.25E+01	5.97E+00	30/30	5/30	7.90E+00	23/30	3.74E+00	0/30	3.60E+02	1.01 - 5.51
METAL	Barium	mg/kg	6.97E+00	2.25E+02	9.43E+01	30/30	3/30	1.70E+02	0/30	6.47E+03	0/30	1.00E+05	0.805 - 0.978
METAL	Beryllium	mg/kg	9.81E-02	7.57E-01	4.67E-01	30/30	3/30	6.70E-01	0/30	6.55E+01	0/30	1.97E+03	0.101 - 0.122
METAL	Boron	mg/kg	1.50E+00	5.57E+00	2.87E+00	27/30	N/A	N/A	0/30	6.57E+03	0/30	1.00E+05	3.02 - 3.67
METAL	Cadmium	mg/kg	2.45E-02	1.12E+00	2.12E-01	22/30	6/30	2.10E-01	0/30	2.53E+01	0/30	7.59E+02	0.201 - 1.1
METAL	Chromium	mg/kg	5.96E+00	5.69E+01	2.02E+01	30/30	18/30	1.60E+01	29/30	9.14E+00	0/30	9.14E+02	0.604 - 0.733
METAL	Cobalt	mg/kg	8.34E-01	1.22E+01	6.51E+00	30/30	0/30	1.30E+01	3/30	9.84E+00	0/30	2.95E+02	0.201 - 0.244
METAL	Copper	mg/kg	1.86E+00	8.93E+02	4.27E+01	30/30	5/30	1.90E+01	0/30	1.32E+03	0/30	3.96E+04	0.402 - 4.5
METAL	Iron	mg/kg	2.72E+03	3.03E+04	1.73E+04	30/30	1/30	2.80E+04	6/30	2.30E+04	0/30	1.00E+05	21.4 - 244
METAL	Lead	mg/kg	1.93E+00	6.27E+01	1.30E+01	30/30	2/30	2.30E+01	0/30	8.00E+02	0/30	8.00E+02	0.402 - 0.489
METAL	Manganese	mg/kg	4.57E+01	1.35E+03	4.39E+02	30/30	4/30	8.20E+02	4/30	7.74E+02	0/30	2.32E+04	1.07 - 12.2
METAL	Mercury	mg/kg	1.51E-02	9.50E-02	3.16E-02	24/30	0/30	1.30E-01	0/30	9.86E+00	0/30	2.96E+02	0.0235 - 0.0298
METAL	Molybdenum	mg/kg	2.17E-01	1.28E+00	6.40E-01	30/30	N/A	N/A	0/30	1.64E+02	0/30	4.92E+03	0.201 - 1.1
METAL	Nickel	mg/kg	4.94E+00	1.43E+03	6.48E+01	30/30	6/30	2.10E+01	1/30	6.52E+02	0/30	1.96E+04	0.402 - 4.41
METAL	Selenium	mg/kg	4.00E-01	1.85E+00	1.03E+00	25/30	17/30	7.00E-01	0/30	1.64E+02	0/30	4.92E+03	1.01 - 5.51
METAL	Silver	mg/kg	1.32E-01	1.70E+00	7.34E-01	8/30	0/30	2.30E+00	0/30	1.64E+02	0/30	4.92E+03	0.485 - 5.68
METAL	Thallium	mg/kg	1.55E-01	2.47E-01	1.94E-01	14/30	4/30	2.10E-01	0/30	3.29E-01	0/30	9.87E+00	0.402 - 0.489
METAL	Uranium[a]	mg/kg	5.08E-01	9.10E+02	5.13E+01	30/30	14/30	4.60E+00	11/30	6.58E+00	2/30	1.97E+02	0.0402 - 0.221
METAL	Vanadium	mg/kg	6.18E+00	3.98E+01	2.74E+01	30/30	3/30	3.70E+01	0/30	1.65E+02	0/30	4.95E+03	4.02 - 4.89
METAL	Zinc	mg/kg	1.15E+01	1.44E+02	4.25E+01	30/30	5/30	6.00E+01	0/30	9.86E+03	0/30	1.00E+05	4.02 - 22.1
ANION	Fluoride	mg/kg	1.18E+00	4.04E+01	1.27E+01	30/30	N/A	N/A	0/30	1.32E+03	0/30	3.96E+04	1.05 - 1.27
PPCB	Total PCB[b]	mg/kg	1.85E-03	8.62E-02	3.74E-02	9/26	N/A	N/A	0/26	1.12E+00	0/26	1.12E+02	0.00361 - 0.0225
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.69E+01	0/26	8.07E+02	0.365 - 7.53
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+03	0/26	5.70E+04	0.365 - 7.53
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+01	0/26	5.70E+02	0.365 - 7.53
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.69E+01	0/26	1.71E+03	0.365 - 7.53
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E+02	0/26	1.14E+04	0.365 - 7.53
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E+01	0/26	1.14E+03	0.731 - 15.1
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.49E+00	0/26	8.49E+02	0.365 - 7.53
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.78E+00	0/26	1.71E+02	0.365 - 7.53
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.35E+03	0/26	4.05E+04	0.0365 - 0.753
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.64E+02	0/26	4.92E+03	0.365 - 7.53
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.52E+00	0/26	4.56E+01	0.365 - 7.53
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	6.73E+01	0/26	2.02E+03	0.0365 - 0.753
SVOC	2-Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.48E+02	0/26	2.84E+04	0.365 - 7.53
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.89E+02	0/26	5.67E+03	0.365 - 7.53
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E+01	0/26	1.14E+03	0.365 - 7.53
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.90E+00	0/26	5.90E+02	0.365 - 7.53
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.69E+00	0/26	1.71E+02	0.365 - 7.53
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.91E+01	0/26	5.73E+02	0.365 - 7.53
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+03	0/26	5.70E+04	0.365 - 7.53
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.48E+00	0/26	2.84E+02	0.365 - 7.53
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.91E+01	0/26	5.73E+02	0.365 - 7.53

Table 4.10. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E+01	0/26	1.14E+03	0.365 - 7.53
SVOC	Acenaphthene	mg/kg	1.13E-02	2.82E-01	1.01E-01	4/26	N/A	N/A	0/26	1.01E+03	0/26	3.03E+04	0.0365 - 0.753
SVOC	Acenaphthylene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.01E+03	0/26	3.03E+04	0.0365 - 0.753
SVOC	Acetophenone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.29E+03	0/26	9.87E+04	0.365 - 7.53
SVOC	Anthracene	mg/kg	1.46E-02	5.42E-01	1.80E-01	4/26	N/A	N/A	0/26	5.05E+03	0/26	1.00E+05	0.0365 - 0.753
SVOC	Atrazine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.15E+01	0/26	1.15E+03	0.365 - 7.53
SVOC	Benzaldehyde	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.15E+03	0/26	9.87E+04	0.365 - 7.53
SVOC	Benzo(ghi)perylene	mg/kg	1.14E-02	2.01E-01	1.18E-01	7/26	N/A	N/A	0/26	5.05E+02	0/26	1.52E+04	0.0365 - 0.753
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.69E+01	0/26	1.71E+03	0.365 - 7.53
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.01E+00	0/26	3.01E+02	0.365 - 7.53
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	6.58E+01	0/26	6.58E+03	0.365 - 7.53
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+02	0/26	1.14E+04	0.0365 - 0.753
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.40E+03	0/26	1.14E+05	0.0365 - 0.753
SVOC	Caprolactam	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.43E+03	0/26	2.83E+05	0.365 - 7.53
SVOC	Carbazole	mg/kg	1.97E-02	1.38E-01	6.46E-02	4/26	N/A	N/A	0/26	1.33E+02	0/26	1.33E+04	0.0365 - 0.753
SVOC	Dibenzofuran	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.29E+01	0/26	9.87E+02	0.365 - 7.53
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.52E+04	0/26	4.56E+05	0.0365 - 0.753
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.52E+04	0/26	4.56E+05	0.0365 - 0.753
SVOC	Di-n-butyl phthalate	mg/kg	1.30E-02	2.41E-02	1.69E-02	8/26	N/A	N/A	0/26	1.90E+03	0/26	5.70E+04	0.0365 - 0.753
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+02	0/26	5.70E+03	0.0365 - 0.753
SVOC	Diphenylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.90E+03	0/26	5.70E+04	0.365 - 7.53
SVOC	Fluoranthene	mg/kg	1.50E-02	1.46E+00	3.65E-01	10/26	N/A	N/A	0/26	6.73E+02	0/26	2.02E+04	0.0365 - 0.753
SVOC	Fluorene	mg/kg	2.11E-02	5.18E-01	1.96E-01	3/26	N/A	N/A	0/26	6.73E+02	0/26	2.02E+04	0.0365 - 0.753
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.33E+00	0/26	2.33E+02	0.365 - 7.53
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.41E+01	0/26	9.87E+02	0.365 - 7.53
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.00E+00	0/26	3.00E+01	0.365 - 7.53
SVOC	Hexachloroethane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.98E+01	0/26	5.94E+02	0.365 - 7.53
SVOC	Isophorone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.79E+03	0/26	1.14E+05	0.365 - 7.53
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E+02	0/26	1.14E+04	0.365 - 7.53
SVOC	Naphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.67E+01	0/26	1.67E+03	0.0365 - 0.753
SVOC	Nitrobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.63E+01	0/26	1.69E+03	0.365 - 7.53
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.79E-01	0/26	3.79E+01	0.365 - 7.53
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.06E+00	0/26	4.06E+02	0.365 - 7.53
SVOC	Phenanthrene	mg/kg	1.94E-02	1.80E+00	4.30E-01	7/26	N/A	N/A	0/26	1.01E+03	0/26	3.03E+04	0.0365 - 0.753
SVOC	Phenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.69E+03	0/26	1.71E+05	0.365 - 7.53
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.58E+01	0/26	2.27E+03	0.365 - 7.53
SVOC	Pyrene	mg/kg	1.35E-02	8.02E-01	2.25E-01	11/26	N/A	N/A	0/26	5.05E+02	0/26	1.52E+04	0.0365 - 0.753
SVOC	Total PAH[c]	mg/kg	3.11E-03	4.95E-01	2.02E-01	9/26	N/A	N/A	0/26	2.35E+00	0/26	1.51E+02	-
RADS	Americium-241	pCi/g	6.59E-01	6.59E-01	6.59E-01	1/31	N/A	N/A	0/31	1.64E+01	0/31	1.64E+03	0.238 - 0.874
RADS	Cesium-137	pCi/g	6.34E-02	1.03E-01	7.76E-02	3/31	0/31	2.80E-01	0/31	5.82E-01	0/31	5.82E+01	0.0255 - 0.0966
RADS	Neptunium-237	pCi/g	1.15E+00	1.15E+00	1.15E+00	1/31	1/31	1.00E-01	0/31	1.63E+00	0/31	1.63E+02	0.364 - 0.919
RADS	Plutonium-238	pCi/g	--	--	--	0/31	0/31	7.30E-02	0/31	1.94E+01	0/31	1.94E+03	0.285 - 0.897
RADS	Plutonium-239/240	pCi/g	2.06E+00	3.33E+00	2.70E+00	2/31	2/31	2.50E-02	0/31	1.83E+01	0/31	1.83E+03	0.323 - 0.864
RADS	Technetium-99	pCi/g	8.33E+00	3.05E+01	2.02E+01	10/33	10/33	2.50E+00	0/33	1.55E+03	0/33	1.00E+05	2.36 - 4
RADS	Thorium-230	pCi/g	6.24E-01	1.12E+01	1.92E+00	29/31	9/31	1.40E+00	0/31	2.82E+01	0/31	2.82E+03	0.289 - 1.15

Table 4.10. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Uranium-233/234	pCi/g	6.53E-01	5.12E+02	2.57E+01	28/31	18/31	1.20E+00	1/31	4.30E+01	0/31	4.30E+03	0.334 - 2.27
RADS	Uranium-235/236	pCi/g	3.16E-01	2.84E+01	3.60E+00	11/31	11/31	6.00E-02	1/31	2.62E+00	0/31	2.62E+02	0.129 - 0.746
RADS	Uranium-238	pCi/g	4.93E-01	5.54E+02	2.91E+01	28/31	19/31	1.20E+00	9/31	8.98E+00	0/31	8.98E+02	0.16 - 1.41
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.54E+03	0/27	1.00E+05	0.000882 - 0.053
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	1.11E+01	0/27	1.11E+03	0.000882 - 0.053
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.79E+03	0/27	1.00E+05	0.00441 - 0.265
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	8.49E-01	0/27	2.55E+01	0.000882 - 0.053
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	9.52E+01	0/27	9.52E+03	0.000882 - 0.053
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	1.26E+02	0/27	3.78E+03	0.000882 - 0.053
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	2.63E+01	0/27	7.89E+02	0.000882 - 0.053
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.20E+01	0/27	9.60E+02	0.000882 - 0.053
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.10E-01	0/27	4.10E+01	0.000882 - 0.053
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	7.86E-01	0/27	7.86E+01	0.000882 - 0.053
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	9.43E+02	0/27	2.83E+04	0.000882 - 0.053
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	1.13E+01	0/27	5.19E+02	0.000882 - 0.053
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	8.91E+00	0/27	2.67E+02	0.000882 - 0.053
VOC	1,2-Dimethylbenzene	mg/kg	4.90E-04	2.08E-02	7.29E-03	3/27	N/A	N/A	0/27	3.61E+02	0/27	1.08E+04	0.000882 - 0.053
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	9.43E+02	0/27	2.83E+04	0.000882 - 0.053
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	7.20E+01	0/27	7.20E+03	0.000882 - 0.053
VOC	1,4-Dioxane	mg/kg	4.63E-02	5.52E-02	5.08E-02	2/27	N/A	N/A	0/27	4.30E+01	0/27	4.30E+03	0.0441 - 2.65
VOC	2-Butanone	mg/kg	1.83E-03	1.27E-01	3.40E-02	4/27	N/A	N/A	0/27	1.28E+04	0/27	3.84E+05	0.00441 - 0.265
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.80E-01	0/27	4.80E+01	0.00441 - 0.265
VOC	2-Hexanone	mg/kg	--	--	--	0/27	N/A	N/A	0/27	9.69E+01	0/27	2.91E+03	0.00441 - 0.265
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	9.70E+02	0/27	9.70E+04	0.000882 - 0.053
VOC	4-Methyl-2-pentanone	mg/kg	2.60E-03	2.60E-03	2.60E-03	1/27	N/A	N/A	0/27	2.31E+03	0/27	6.93E+04	0.00441 - 0.265
VOC	Acetone	mg/kg	3.31E-03	2.03E-02	1.14E-02	11/27	N/A	N/A	0/27	2.96E+04	0/27	8.88E+05	0.00441 - 0.265
VOC	Acrolein	mg/kg	--	--	--	0/27	N/A	N/A	0/27	8.14E-02	0/27	2.44E+00	0.00441 - 0.265
VOC	Acrylonitrile	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.46E+00	0/27	2.71E+02	0.00441 - 0.265
VOC	Benzene	mg/kg	6.16E-04	8.10E-04	7.28E-04	3/27	N/A	N/A	0/27	2.59E+01	0/27	1.28E+03	0.000882 - 0.053
VOC	Bromochloromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	8.48E+01	0/27	2.54E+03	0.000882 - 0.053
VOC	Bromodichloromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	7.93E+00	0/27	7.93E+02	0.000882 - 0.053
VOC	Bromoform	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.24E+02	0/27	1.97E+04	0.000882 - 0.053
VOC	Bromomethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.80E+00	0/27	1.14E+02	0.000882 - 0.053
VOC	Carbon disulfide	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.21E+02	0/27	1.26E+04	0.00441 - 0.265
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/27	N/A	N/A	0/27	1.57E+01	0/27	1.57E+03	0.000882 - 0.053
VOC	Chlorobenzene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	1.48E+02	0/27	4.44E+03	0.000882 - 0.053
VOC	Chloroethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.07E+03	0/27	9.21E+04	0.000882 - 0.053
VOC	Chloroform	mg/kg	5.24E-04	2.43E-03	1.22E-03	3/27	N/A	N/A	0/27	8.90E+00	0/27	8.90E+02	0.000882 - 0.053
VOC	Chloromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	6.26E+01	0/27	1.88E+03	0.000882 - 0.053
VOC	*cis* -1,2-Dichloroethene	mg/kg	8.59E-04	8.59E-04	8.59E-04	1/27	N/A	N/A	0/27	6.58E+01	0/27	1.97E+03	0.000882 - 0.053
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	2.83E+01	0/27	1.21E+03	0.000882 - 0.053
VOC	Cumene	mg/kg	4.34E-04	4.34E-04	4.34E-04	1/27	N/A	N/A	0/27	1.02E+03	0/27	3.06E+04	0.000882 - 0.053
VOC	Cyclohexane	mg/kg	4.68E-04	4.31E-03	2.05E-03	5/27	N/A	N/A	0/27	3.70E+03	0/27	1.11E+05	0.000882 - 0.053
VOC	Dibromochloromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	5.48E+01	0/27	5.48E+03	0.000882 - 0.053
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.94E+01	0/27	1.48E+03	0.000882 - 0.053

Table 4.10. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
VOC	Ethylbenzene	mg/kg	3.76E-04	1.24E-02	4.62E-03	3/27	N/A	N/A	0/27	1.30E+02	0/27	1.30E+04	0.000882 - 0.053
VOC	m,p-Xylene	mg/kg	7.91E-04	5.56E-02	1.21E-02	5/27	N/A	N/A	0/27	3.23E+02	0/27	9.69E+03	0.00176 - 0.106
VOC	Methyl acetate	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.29E+04	0/27	9.87E+05	0.00441 - 0.265
VOC	Methylcyclohexane	mg/kg	3.81E-04	2.45E+00	2.47E-01	10/27	N/A	N/A	0/27	1.76E+03	0/27	5.28E+04	0.000882 - 0.108
VOC	Methylene chloride	mg/kg	1.80E-03	1.80E-03	1.80E-03	1/27	N/A	N/A	0/27	1.57E+02	0/27	4.71E+03	0.00441 - 0.265
VOC	Styrene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	3.00E+03	0/27	9.00E+04	0.000882 - 0.053
VOC	Tetrachloroethene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.34E+01	0/27	1.30E+03	0.000882 - 0.053
VOC	Toluene	mg/kg	5.04E-04	3.92E+00	4.40E-01	9/27	N/A	N/A	0/27	2.18E+03	0/27	6.54E+04	0.000882 - 0.108
VOC	Total Xylene	mg/kg	2.21E-03	7.64E-02	2.70E-02	3/27	N/A	N/A	0/27	3.23E+02	0/27	9.69E+03	0.00265 - 0.159
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	5.67E+01	0/27	1.70E+03	0.000882 - 0.053
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/27	N/A	N/A	0/27	2.83E+01	0/27	1.21E+03	0.000882 - 0.053
VOC	Trichloroethene	mg/kg	2.57E-03	5.13E-03	3.85E-03	2/27	N/A	N/A	0/27	2.26E+00	0/27	6.78E+01	0.000882 - 0.053
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.11E+02	0/27	1.23E+04	0.000882 - 0.053
VOC	Vinyl chloride	mg/kg	--	--	--	0/27	N/A	N/A	0/27	4.72E+00	0/27	4.72E+02	0.000882 - 0.053

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

Background value is the lower of Surface or Subsurface Background levels.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts.)

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.11. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 2

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	9.50E+03	1.91E+04	1.34E+04	14/14	9/14	1.20E+04	0/14	5.99E+04	14/14	3.00E+03	10.8 - 120
METAL	Antimony	mg/kg	4.82E-01	6.67E-01	5.75E-01	2/14	2/14	2.10E-01	0/14	7.04E-01	2/14	3.52E-02	1.98 - 2.48
METAL	Arsenic	mg/kg	3.08E+00	9.89E+00	5.93E+00	14/14	2/14	7.90E+00	14/14	3.02E-02	14/14	1.51E-03	1.01 - 5.35
METAL	Barium	mg/kg	3.04E+01	2.25E+02	1.12E+02	14/14	3/14	1.70E+02	0/14	3.11E+02	14/14	1.55E+01	0.805 - 0.975
METAL	Beryllium	mg/kg	3.38E-01	7.57E-01	5.32E-01	14/14	3/14	6.90E-01	0/14	3.89E+01	0/14	1.95E+00	0.101 - 0.122
METAL	Boron	mg/kg	1.50E+00	5.57E+00	2.82E+00	13/14	N/A	N/A	0/14	2.56E+01	13/14	1.28E+00	3.02 - 3.66
METAL	Cadmium	mg/kg	3.33E-02	2.76E-01	1.17E-01	10/14	2/14	2.10E-01	0/14	1.39E+00	5/14	6.93E-02	0.201 - 0.244
METAL	Chromium	mg/kg	1.32E+01	5.69E+01	2.15E+01	14/14	1/14	4.30E+01	0/14	3.60E+06	0/14	1.80E+05	0.604 - 0.731
METAL	Cobalt	mg/kg	2.48E+00	1.22E+01	6.33E+00	14/14	0/14	1.30E+01	14/14	5.43E-01	14/14	2.71E-02	0.201 - 0.244
METAL	Copper	mg/kg	5.25E+00	5.94E+01	1.67E+01	14/14	3/14	2.50E+01	1/14	5.62E+01	14/14	2.81E+00	0.402 - 4.23
METAL	Iron	mg/kg	1.28E+04	3.03E+04	1.90E+04	14/14	1/14	2.80E+04	14/14	7.04E+02	14/14	3.52E+01	107 - 240
METAL	Lead	mg/kg	7.22E+00	6.27E+01	1.53E+01	14/14	1/14	2.30E+01	0/14	2.70E+02	5/14	1.35E+01	0.402 - 0.487
METAL	Manganese	mg/kg	4.57E+01	1.05E+03	4.25E+02	14/14	3/14	8.20E+02	13/14	5.65E+01	14/14	2.83E+00	1.07 - 12
METAL	Mercury	mg/kg	1.54E-02	9.50E-02	3.56E-02	11/14	0/14	1.30E-01	0/14	5.91E-01	4/14	2.95E-02	0.0235 - 0.0279
METAL	Molybdenum	mg/kg	2.17E-01	1.03E+00	5.83E-01	14/14	N/A	N/A	0/14	4.03E+00	14/14	2.02E-01	0.201 - 0.244
METAL	Nickel	mg/kg	5.69E+00	1.39E+02	2.54E+01	14/14	5/14	2.20E+01	1/14	5.12E+01	14/14	2.56E+00	0.402 - 0.487
METAL	Selenium	mg/kg	4.60E-01	1.69E+00	1.07E+00	13/14	9/14	7.00E-01	8/14	1.04E+00	13/14	5.19E-02	1.01 - 5.35
METAL	Silver	mg/kg	1.32E-01	6.53E-01	4.48E-01	3/14	0/14	2.70E+00	0/14	1.60E+00	3/14	7.99E-02	0.505 - 4.95
METAL	Thallium	mg/kg	1.55E-01	2.29E-01	1.89E-01	6/14	0/14	3.40E-01	6/14	2.84E-02	6/14	1.42E-03	0.402 - 0.487
METAL	Uranium[a]	mg/kg	5.08E-01	2.81E+02	3.49E+01	14/14	6/14	4.60E+00	6/14	3.60E+00	14/14	1.80E-01	0.0402 - 0.0487
METAL	Vanadium	mg/kg	2.53E+01	3.98E+01	3.07E+01	14/14	2/14	3.70E+01	0/14	1.73E+02	14/14	8.64E+00	4.02 - 4.87
METAL	Zinc	mg/kg	1.15E+01	1.11E+02	4.42E+01	14/14	3/14	6.00E+01	0/14	7.46E+02	6/14	3.73E+01	4.02 - 21.4
ANION	Fluoride	mg/kg	3.05E+00	4.04E+01	1.61E+01	14/14	N/A	N/A	0/14	2.40E+02	7/14	1.20E+01	1.05 - 1.27
PPCB	Total PCB[b]	mg/kg	7.77E-03	8.14E-02	3.42E-02	3/10	N/A	N/A	0/10	1.36E-01	3/10	6.82E-03	0.00368 - 0.0198
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.74E-02	0/10	8.72E-04	0.365 - 7.53
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.04E+00	0/10	4.02E-01	0.365 - 7.53
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.32E-02	0/10	1.16E-03	0.365 - 7.53
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.52E-02	0/10	2.26E-03	0.365 - 7.53
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.42E-01	0/10	4.21E-02	0.365 - 7.53
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.72E-02	0/10	4.36E-03	0.731 - 15.1
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	6.42E-03	0/10	3.21E-04	0.365 - 7.53
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.33E-03	0/10	6.67E-05	0.365 - 7.53
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.70E+00	0/10	3.85E-01	0.0365 - 0.753
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.78E-01	0/10	8.91E-03	0.365 - 7.53
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.16E-03	0/10	2.58E-04	0.365 - 7.53
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.70E-01	0/10	1.85E-02	0.0365 - 0.753
SVOC	2-Methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.51E+00	0/10	7.53E-02	0.365 - 7.53
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.60E-01	0/10	8.01E-03	0.365 - 7.53
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.72E-02	0/10	4.36E-03	0.365 - 7.53
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.65E-02	0/10	8.24E-04	0.365 - 7.53
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.90E-03	0/10	2.45E-04	0.365 - 7.53
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	6.84E-03	0/10	3.42E-04	0.365 - 7.53
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.42E+00	0/10	1.71E-01	0.365 - 7.53
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.10E-03	0/10	1.55E-04	0.365 - 7.53
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	6.84E-03	0/10	3.42E-04	0.365 - 7.53

Table 4.11. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.72E-02	0/10	4.36E-03	0.365 - 7.53
SVOC	Acenaphthene	mg/kg	1.13E-02	1.13E-02	1.13E-02	1/10	N/A	N/A	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOC	Acenaphthylene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOC	Acetophenone	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.17E+00	0/10	5.84E-02	0.365 - 7.53
SVOC	Anthracene	mg/kg	1.46E-02	1.46E-02	1.46E-02	1/10	N/A	N/A	0/10	1.16E+02	0/10	5.81E+00	0.0365 - 0.753
SVOC	Atrazine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.92E-03	0/10	1.96E-04	0.365 - 7.53
SVOC	Benzaldehyde	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.30E-02	0/10	4.15E-03	0.365 - 7.53
SVOC	Benzo(ghi)perylene	mg/kg	1.14E-02	8.66E-02	4.90E-02	2/10	N/A	N/A	0/10	2.63E+01	0/10	1.32E+00	0.0365 - 0.753
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.70E-02	0/10	1.35E-03	0.365 - 7.53
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.22E-05	0/10	3.61E-06	0.365 - 7.53
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.62E-03	0/10	1.31E-04	0.365 - 7.53
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.66E+01	0/10	1.33E+00	0.0365 - 0.753
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.72E+00	0/10	2.36E-01	0.0365 - 0.753
SVOC	Caprolactam	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.94E+00	0/10	2.47E-01	0.365 - 7.53
SVOC	Carbazole	mg/kg	1.97E-02	1.97E-02	1.97E-02	1/10	N/A	N/A	0/10	7.51E-01	0/10	3.76E-02	0.0365 - 0.753
SVOC	Dibenzofuran	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.92E-01	0/10	1.46E-02	0.365 - 7.53
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.22E+01	0/10	6.08E-01	0.0365 - 0.753
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.22E+01	0/10	6.08E-01	0.0365 - 0.753
SVOC	Di-n-butyl phthalate	mg/kg	1.30E-02	2.41E-02	1.72E-02	4/10	N/A	N/A	0/10	4.54E+00	0/10	2.27E-01	0.0365 - 0.753
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.13E+02	0/10	5.65E+00	0.0365 - 0.753
SVOC	Diphenylamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.66E+00	0/10	2.33E-01	0.365 - 7.53
SVOC	Fluoranthene	mg/kg	2.06E-02	3.00E-01	1.16E-01	3/10	N/A	N/A	0/10	1.78E+02	0/10	8.91E+00	0.0365 - 0.753
SVOC	Fluorene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.09E+01	0/10	5.45E-01	0.0365 - 0.753
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.46E-03	0/10	1.23E-04	0.365 - 7.53
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.34E-03	0/10	2.67E-04	0.365 - 7.53
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.56E-03	0/10	1.28E-04	0.365 - 7.53
SVOC	Hexachloroethane	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.00E-03	0/10	2.00E-04	0.365 - 7.53
SVOC	Isophorone	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.16E-01	0/10	2.58E-02	0.365 - 7.53
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.94E-01	0/10	2.97E-02	0.365 - 7.53
SVOC	Naphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.70E-03	0/10	3.85E-04	0.0365 - 0.753
SVOC	Nitrobenzene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.83E-03	0/10	9.17E-05	0.365 - 7.53
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.62E-04	0/10	8.10E-06	0.365 - 7.53
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.14E-03	0/10	5.71E-05	0.365 - 7.53
SVOC	Phenanthrene	mg/kg	1.94E-02	1.38E-01	7.87E-02	2/10	N/A	N/A	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOC	Phenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	6.62E+00	0/10	3.31E-01	0.365 - 7.53
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.16E-02	0/10	1.58E-03	0.365 - 7.53
SVOC	Pyrene	mg/kg	2.02E-02	1.88E-01	7.69E-02	3/10	N/A	N/A	0/10	2.63E+01	0/10	1.32E+00	0.0365 - 0.753
SVOC	Total PAH[c]	mg/kg	3.52E-03	1.79E-01	6.72E-02	3/10	N/A	N/A	0/10	5.89E-01	1/10	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/14	N/A	N/A	0/14	1.92E+01	0/14	9.58E-01	0.383 - 0.834
RADS	Cesium-137	pCi/g	1.03E-01	1.03E-01	1.03E-01	1/14	0/14	2.80E-01	0/14	9.58E+00	0/14	4.79E-01	0.0369 - 0.0758
RADS	Neptunium-237	pCi/g	--	--	--	0/14	N/A	N/A	0/14	1.07E+00	0/14	5.36E-02	0.45 - 0.86
RADS	Plutonium-238	pCi/g	--	--	--	0/14	N/A	N/A	0/14	4.38E+00	0/14	2.19E-01	0.285 - 0.761
RADS	Plutonium-239/240	pCi/g	2.06E+00	2.06E+00	2.06E+00	1/14	N/A	N/A	0/14	4.26E+00	1/14	2.13E-01	0.329 - 0.791
RADS	Technetium-99	pCi/g	9.17E+00	3.05E+01	2.20E+01	4/16	4/16	2.80E+00	4/16	1.52E-01	4/16	7.60E-03	2.47 - 4
RADS	Thorium-230	pCi/g	6.34E-01	6.39E+00	1.70E+00	13/14	4/14	1.40E+00	0/14	3.66E+01	3/14	1.83E+00	0.289 - 1.02

Table 4.11. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	6.53E-01	3.82E+01	1.06E+01	12/14	7/14	1.20E+00	8/14	9.90E-01	12/14	4.95E-02	0.334 - 1
RADS	Uranium-235/236	pCi/g	6.75E-01	2.45E+00	1.41E+00	5/14	5/14	6.00E-02	3/14	9.76E-01	5/14	4.88E-02	0.129 - 0.544
RADS	Uranium-238	pCi/g	7.82E-01	5.06E+01	1.33E+01	12/14	7/14	1.20E+00	11/14	8.05E-01	12/14	4.03E-02	0.245 - 0.711
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.62E+00	0/11	2.81E-01	0.000882 - 0.00121
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.92E-04	0/11	2.96E-05	0.000882 - 0.00121
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.13E+01	0/11	2.56E+00	0.00441 - 0.00607
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.69E-04	0/11	1.35E-05	0.000882 - 0.00121
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.56E-02	0/11	7.82E-04	0.000882 - 0.00121
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.04E-01	0/11	1.02E-02	0.000882 - 0.00121
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.18E-02	0/11	2.09E-03	0.000882 - 0.00121
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.32E-02	0/11	1.16E-03	0.000882 - 0.00121
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.88E-06	0/11	1.44E-07	0.000882 - 0.00121
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.20E-05	0/11	2.10E-06	0.000882 - 0.00121
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.90E-01	0/11	2.95E-02	0.000882 - 0.00121
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.69E-04	0/11	4.84E-05	0.000882 - 0.00121
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.48E-03	0/11	2.74E-04	0.000882 - 0.00121
VOC	1,2-Dimethylbenzene	mg/kg	4.90E-04	4.90E-04	4.90E-04	1/11	N/A	N/A	0/11	3.81E-01	0/11	1.90E-02	0.000882 - 0.00121
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.90E-01	0/11	2.95E-02	0.000882 - 0.00121
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.24E-03	0/11	4.62E-04	0.000882 - 0.00121
VOC	1,4-Dioxane	mg/kg	4.63E-02	4.63E-02	4.63E-02	1/11	N/A	N/A	1/11	1.88E-03	1/11	9.42E-05	0.0441 - 0.0607
VOC	2-Butanone	mg/kg	1.83E-03	3.84E-03	2.84E-03	2/11	N/A	N/A	0/11	2.32E+00	0/11	1.16E-01	0.00441 - 0.00607
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.76E-05	0/11	1.38E-06	0.00441 - 0.00607
VOC	2-Hexanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.75E-02	0/11	8.75E-04	0.00441 - 0.00607
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.44E-02	0/11	3.22E-03	0.000882 - 0.00121
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.62E-01	0/11	2.81E-02	0.00441 - 0.00607
VOC	Acetone	mg/kg	3.31E-03	2.01E-02	1.15E-02	5/11	N/A	N/A	0/11	7.36E+00	0/11	3.68E-01	0.00441 - 0.00607
VOC	Acrolein	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.68E-05	0/11	8.41E-07	0.00441 - 0.00607
VOC	Acrylonitrile	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.28E-04	0/11	1.14E-05	0.00441 - 0.00607
VOC	Benzene	mg/kg	8.10E-04	8.10E-04	8.10E-04	1/11	N/A	N/A	0/11	4.66E-03	1/11	2.33E-04	0.000882 - 0.00121
VOC	Bromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.16E-02	0/11	2.08E-03	0.000882 - 0.00121
VOC	Bromodichloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.30E-04	0/11	3.65E-05	0.000882 - 0.00121
VOC	Bromoform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.75E-02	0/11	8.73E-04	0.000882 - 0.00121
VOC	Bromomethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.82E-03	0/11	1.91E-04	0.000882 - 0.00121
VOC	Carbon disulfide	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.80E-01	0/11	2.40E-02	0.00441 - 0.00607
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.54E-03	0/11	1.77E-04	0.000882 - 0.00121
VOC	Chlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.06E-01	0/11	5.28E-03	0.000882 - 0.00121
VOC	Chloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.74E+00	0/11	2.37E-01	0.000882 - 0.00121
VOC	Chloroform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.22E-03	0/11	6.12E-05	0.000882 - 0.00121
VOC	Chloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.05E-02	0/11	5.26E-04	0.000882 - 0.00121
VOC	*cis* -1,2-Dichloroethene	mg/kg	8.59E-04	8.59E-04	8.59E-04	1/11	N/A	N/A	0/11	2.12E-02	0/11	1.06E-03	0.000882 - 0.00121
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.36E-03	0/11	1.68E-04	0.000882 - 0.00121
VOC	Cumene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.48E+00	0/11	7.38E-02	0.000882 - 0.00121
VOC	Cyclohexane	mg/kg	6.10E-04	4.31E-03	2.46E-03	2/11	N/A	N/A	0/11	2.60E+01	0/11	1.30E+00	0.000882 - 0.00121
VOC	Dibromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.64E-03	0/11	2.32E-04	0.000882 - 0.00121
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.08E-01	0/11	3.04E-02	0.000882 - 0.00121

Table 4.11. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of Detect.	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Ethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.36E-02	0/11	1.68E-03	0.000882 - 0.00121
VOC	m,p-Xylene	mg/kg	1.72E-03	1.72E-03	1.72E-03	1/11	N/A	N/A	0/11	3.82E-01	0/11	1.91E-02	0.00176 - 0.00243
VOC	Methyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.22E+00	0/11	4.11E-01	0.00441 - 0.00607
VOC	Methylcyclohexane	mg/kg	5.08E-04	5.20E-03	2.37E-03	3/11	N/A	N/A	0/11	2.80E+01	0/11	1.40E+00	0.000882 - 0.00121
VOC	Methylene chloride	mg/kg	1.80E-03	1.80E-03	1.80E-03	1/11	N/A	N/A	0/11	5.44E-02	0/11	2.72E-03	0.00441 - 0.00607
VOC	Styrene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.66E+00	0/11	1.33E-01	0.000882 - 0.00121
VOC	Tetrachloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.69E-02	0/11	1.84E-03	0.000882 - 0.00121
VOC	Toluene	mg/kg	5.10E-04	1.55E-03	9.37E-04	3/11	N/A	N/A	0/11	1.52E+00	0/11	7.62E-02	0.000882 - 0.00121
VOC	Total Xylene	mg/kg	2.21E-03	2.21E-03	2.21E-03	1/11	N/A	N/A	0/11	3.82E-01	0/11	1.91E-02	0.00265 - 0.00364
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.83E-02	0/11	2.91E-03	0.000882 - 0.00121
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.36E-03	0/11	1.68E-04	0.000882 - 0.00121
VOC	Trichloroethene	mg/kg	5.13E-03	5.13E-03	5.13E-03	1/11	N/A	N/A	1/11	2.02E-03	1/11	1.01E-04	0.000882 - 0.00121
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.46E+00	0/11	7.31E-02	0.000882 - 0.00121
VOC	Vinyl chloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.29E-04	0/11	6.47E-06	0.000882 - 0.00121

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.12. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 2

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.56E+03	1.95E+04	9.96E+03	54/54	20/54	1.20E+04	0/54	5.99E+04	53/54	3.00E+03	9.74 - 121
METAL	Antimony	mg/kg	5.40E-01	1.00E+00	7.72E-01	3/54	3/54	2.10E-01	2/54	7.04E-01	3/54	3.52E-02	2 - 22.4
METAL	Arsenic	mg/kg	4.95E-01	1.58E+01	2.43E+00	54/54	2/54	7.90E+00	54/54	3.02E-02	54/54	1.51E-03	0.974 - 1.24
METAL	Barium	mg/kg	8.15E+00	2.30E+03	1.29E+02	54/54	4/54	1.70E+02	4/54	3.11E+02	42/54	1.55E+01	0.779 - 19
METAL	Beryllium	mg/kg	2.44E-01	2.92E+00	7.38E-01	54/54	26/54	6.90E-01	0/54	3.89E+01	1/54	1.95E+00	0.0974 - 0.124
METAL	Boron	mg/kg	9.30E-01	2.79E+00	1.45E+00	26/54	N/A	N/A	0/54	2.56E+01	15/54	1.28E+00	2.92 - 3.71
METAL	Cadmium	mg/kg	2.32E-02	4.84E-01	1.00E-01	17/54	2/54	2.10E-01	0/54	1.39E+00	5/54	6.93E-02	0.195 - 0.247
METAL	Chromium	mg/kg	4.67E+00	5.28E+01	1.41E+01	54/54	2/54	4.30E+01	0/54	3.60E+06	0/54	1.80E+05	0.584 - 0.741
METAL	Cobalt	mg/kg	7.98E-01	1.32E+02	9.56E+00	54/54	5/54	1.30E+01	54/54	5.43E-01	54/54	2.71E-02	0.195 - 0.247
METAL	Copper	mg/kg	1.20E+00	1.38E+01	4.91E+00	54/54	0/54	2.50E+01	0/54	5.62E+01	42/54	2.81E+00	0.39 - 0.494
METAL	Iron	mg/kg	4.14E+03	1.43E+05	1.69E+04	54/54	2/54	2.80E+04	54/54	7.04E+02	54/54	3.52E+01	19.8 - 476
METAL	Lead	mg/kg	1.13E+00	2.43E+01	5.61E+00	54/54	1/54	2.30E+01	0/54	2.70E+02	3/54	1.35E+01	0.39 - 0.494
METAL	Manganese	mg/kg	9.41E+00	1.28E+04	6.78E+02	54/54	7/54	8.20E+02	30/54	5.65E+01	54/54	2.83E+00	0.974 - 119
METAL	Mercury	mg/kg	9.36E-03	5.88E-02	2.63E-02	16/54	0/54	1.30E-01	0/54	5.91E-01	5/54	2.95E-02	0.0224 - 0.0289
METAL	Molybdenum	mg/kg	9.86E-02	2.36E+00	3.18E-01	48/54	N/A	N/A	0/54	4.03E+00	27/54	2.02E-01	0.195 - 0.247
METAL	Nickel	mg/kg	1.93E+00	2.32E+01	7.26E+00	54/54	1/54	2.20E+01	0/54	5.12E+01	49/54	2.56E+00	0.39 - 0.494
METAL	Selenium	mg/kg	4.02E-01	2.48E+00	8.82E-01	40/54	25/54	7.00E-01	9/54	1.04E+00	40/54	5.19E-02	0.974 - 1.24
METAL	Silver	mg/kg	1.04E-01	4.17E+00	5.50E-01	21/54	1/54	2.70E+00	2/54	1.60E+00	21/54	7.99E-02	0.499 - 5.99
METAL	Thallium	mg/kg	1.56E-01	1.77E+00	3.67E-01	12/54	2/54	3.40E-01	12/54	2.84E-02	12/54	1.42E-03	0.39 - 0.494
METAL	Uranium[a]	mg/kg	1.76E-01	3.71E+00	9.06E-01	54/54	0/54	4.60E+00	1/54	3.60E+00	53/54	1.80E-01	0.039 - 0.0494
METAL	Vanadium	mg/kg	4.18E+00	3.80E+01	2.00E+01	54/54	1/54	3.70E+01	0/54	1.73E+02	51/54	8.64E+00	3.9 - 4.94
METAL	Zinc	mg/kg	3.84E+00	9.37E+01	2.30E+01	54/54	1/54	6.00E+01	0/54	7.46E+02	8/54	3.73E+01	3.9 - 4.94
ANION	Fluoride	mg/kg	7.42E-01	8.19E+01	7.08E+00	54/54	N/A	N/A	0/54	2.40E+02	6/54	1.20E+01	1.02 - 2.36
PPCB	Total PCB[b]	mg/kg	8.97E-03	8.97E-03	8.97E-03	1/58	N/A	N/A	0/58	1.36E-01	1/58	6.82E-03	0.00363 - 0.00437
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.74E-02	0/58	8.72E-04	0.365 - 0.435
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.04E+00	0/58	4.02E-01	0.365 - 0.435
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.32E-02	0/58	1.16E-03	0.365 - 0.435
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.52E-02	0/58	2.26E-03	0.365 - 0.435
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.42E-01	0/58	4.21E-02	0.365 - 0.435
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.72E-02	0/58	4.36E-03	0.731 - 0.87
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.42E-03	0/58	3.21E-04	0.365 - 0.435
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.33E-03	0/58	6.67E-05	0.365 - 0.435
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.70E+00	0/58	3.85E-01	0.0365 - 0.0435
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.78E-01	0/58	8.91E-03	0.365 - 0.435
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.16E-03	0/58	2.58E-04	0.365 - 0.435
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.70E-01	0/58	1.85E-02	0.0365 - 0.0435
SVOC	2-Methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.51E+00	0/58	7.53E-02	0.365 - 0.435
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.60E-01	0/58	8.01E-03	0.365 - 0.435
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.72E-02	0/58	4.36E-03	0.365 - 0.435
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.65E-02	0/58	8.24E-04	0.365 - 0.435
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.90E-03	0/58	2.45E-04	0.365 - 0.435
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.84E-03	0/58	3.42E-04	0.365 - 0.435
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.42E+00	0/58	1.71E-01	0.365 - 0.435
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.10E-03	0/58	1.55E-04	0.365 - 0.435
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.84E-03	0/58	3.42E-04	0.365 - 0.435

Table 4.12. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.72E-02	0/58	4.36E-03	0.365 - 0.435
SVOC	Acenaphthene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOC	Acenaphthylene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOC	Acetophenone	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.17E+00	0/58	5.84E-02	0.365 - 0.435
SVOC	Anthracene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.16E+02	0/58	5.81E+00	0.0365 - 0.0435
SVOC	Atrazine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.92E-03	0/58	1.96E-04	0.365 - 0.435
SVOC	Benzaldehyde	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.30E-02	0/58	4.15E-03	0.365 - 0.435
SVOC	Benzo(ghi)perylene	mg/kg	1.52E-02	1.52E-02	1.52E-02	1/58	N/A	N/A	0/58	2.63E+01	0/58	1.32E+00	0.0365 - 0.0435
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.70E-02	0/58	1.35E-03	0.365 - 0.435
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.22E-05	0/58	3.61E-06	0.365 - 0.435
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.62E-03	0/58	1.31E-04	0.365 - 0.435
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.69E-02	1.69E-02	1.69E-02	1/58	N/A	N/A	0/58	2.66E+01	0/58	1.33E+00	0.0365 - 0.0435
SVOC	Butyl benzyl phthalate	mg/kg	1.55E-02	1.55E-02	1.55E-02	1/58	N/A	N/A	0/58	4.72E+00	0/58	2.36E-01	0.0365 - 0.0435
SVOC	Caprolactam	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.94E+00	0/58	2.47E-01	0.365 - 0.435
SVOC	Carbazole	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.51E-01	0/58	3.76E-02	0.0365 - 0.0435
SVOC	Dibenzofuran	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.92E-01	0/58	1.46E-02	0.365 - 0.435
SVOC	Diethyl phthalate	mg/kg	3.64E-02	2.79E-01	1.58E-01	2/58	N/A	N/A	0/58	1.22E+01	0/58	6.08E-01	0.0365 - 0.0435
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.22E+01	0/58	6.08E-01	0.0365 - 0.0435
SVOC	Di-n-butyl phthalate	mg/kg	1.16E-02	3.55E-02	1.84E-02	22/58	N/A	N/A	0/58	4.54E+00	0/58	2.27E-01	0.0365 - 0.0435
SVOC	Di-n-octylphthalate	mg/kg	2.55E-02	2.72E-02	2.64E-02	2/58	N/A	N/A	0/58	1.13E+02	0/58	5.65E+00	0.0365 - 0.0435
SVOC	Diphenylamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.66E+00	0/58	2.33E-01	0.365 - 0.435
SVOC	Fluoranthene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.78E+02	0/58	8.91E+00	0.0365 - 0.0435
SVOC	Fluorene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.09E+01	0/58	5.45E-01	0.0365 - 0.0435
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.46E-03	0/58	1.23E-04	0.365 - 0.435
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.34E-03	0/58	2.67E-04	0.365 - 0.435
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.56E-03	0/58	1.28E-04	0.365 - 0.435
SVOC	Hexachloroethane	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.00E-03	0/58	2.00E-04	0.365 - 0.435
SVOC	Isophorone	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.16E-01	0/58	2.58E-02	0.365 - 0.435
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.94E-01	0/58	2.97E-02	0.365 - 0.435
SVOC	Naphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.70E-03	0/58	3.85E-04	0.0365 - 0.0435
SVOC	Nitrobenzene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.83E-03	0/58	9.17E-05	0.365 - 0.435
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.62E-04	0/58	8.10E-06	0.365 - 0.435
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.14E-03	0/58	5.71E-05	0.365 - 0.435
SVOC	Phenanthrene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOC	Phenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.62E+00	0/58	3.31E-01	0.365 - 0.435
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.16E-02	0/58	1.58E-03	0.365 - 0.435
SVOC	Pyrene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.63E+01	0/58	1.32E+00	0.0365 - 0.0435
SVOC	Total PAH[c]	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.89E-01	0/58	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/54	N/A	N/A	0/54	1.92E+01	0/54	9.58E-01	0.183 - 1.27
RADS	Cesium-137	pCi/g	--	--	--	0/54	0/54	2.80E-01	0/54	9.58E+00	0/54	4.79E-01	0.0205 - 0.1
RADS	Neptunium-237	pCi/g	--	--	--	0/54	N/A	N/A	0/54	1.07E+00	0/54	5.36E-02	0.356 - 0.872
RADS	Plutonium-238	pCi/g	--	--	--	0/54	N/A	N/A	0/54	4.38E+00	0/54	2.19E-01	0.213 - 0.702
RADS	Plutonium-239/240	pCi/g	--	--	--	0/54	N/A	N/A	0/54	4.26E+00	0/54	2.13E-01	0.315 - 0.844
RADS	Technetium-99	pCi/g	--	--	--	0/58	0/58	2.80E+00	0/58	1.52E-01	0/58	7.60E-03	2.28 - 4.13
RADS	Thorium-230	pCi/g	5.86E-01	1.51E+00	9.04E-01	27/54	1/54	1.40E+00	0/54	3.66E+01	0/54	1.83E+00	0.308 - 0.849

Table 4.12. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	4.73E-01	1.90E+00	9.16E-01	28/54	5/54	1.20E+00	8/54	9.90E-01	28/54	4.95E-02	0.337 - 0.968
RADS	Uranium-235/236	pCi/g	5.85E-01	5.85E-01	5.85E-01	1/54	1/54	6.00E-02	0/54	9.76E-01	1/54	4.88E-02	0.201 - 0.725
RADS	Uranium-238	pCi/g	4.30E-01	1.72E+00	9.08E-01	38/54	7/54	1.20E+00	21/54	8.05E-01	38/54	4.03E-02	0.161 - 0.962
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.62E+00	0/63	2.81E-01	0.000902 - 0.0574
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.92E-04	0/63	2.96E-05	0.000902 - 0.0574
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.13E+01	0/63	2.56E+00	0.00451 - 0.287
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.69E-04	0/63	1.35E-05	0.000902 - 0.0574
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.56E-02	0/63	7.82E-04	0.000902 - 0.0574
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.04E-01	0/63	1.02E-02	0.000902 - 0.0574
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.18E-02	0/63	2.09E-03	0.000902 - 0.0574
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.32E-02	0/63	1.16E-03	0.000902 - 0.0574
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.88E-06	0/63	1.44E-07	0.000902 - 0.0574
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.20E-05	0/63	2.10E-06	0.000902 - 0.0574
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.90E-01	0/63	2.95E-02	0.000902 - 0.0574
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	9.69E-04	0/63	4.84E-05	0.000902 - 0.0574
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.48E-03	0/63	2.74E-04	0.000902 - 0.0574
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.81E-01	0/63	1.90E-02	0.000902 - 0.0574
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.90E-01	0/63	2.95E-02	0.000902 - 0.0574
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	9.24E-03	0/63	4.62E-04	0.000902 - 0.0574
VOC	1,4-Dioxane	mg/kg	3.28E-02	4.73E-02	4.03E-02	4/63	N/A	N/A	4/63	1.88E-03	4/63	9.42E-05	0.0451 - 2.87
VOC	2-Butanone	mg/kg	2.12E-03	1.71E-01	1.05E-01	5/63	N/A	N/A	0/63	2.32E+00	3/63	1.16E-01	0.00451 - 0.287
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.76E-05	0/63	1.38E-06	0.00451 - 0.287
VOC	2-Hexanone	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.75E-02	0/63	8.75E-04	0.00451 - 0.287
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.44E-02	0/63	3.22E-03	0.000902 - 0.0574
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.62E-01	0/63	2.81E-02	0.00451 - 0.287
VOC	Acetone	mg/kg	2.39E-03	1.72E-02	5.38E-03	31/63	N/A	N/A	0/63	7.36E+00	0/63	3.68E-01	0.00451 - 0.287
VOC	Acrolein	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.68E-05	0/63	8.41E-07	0.00451 - 0.287
VOC	Acrylonitrile	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.28E-04	0/63	1.14E-05	0.00451 - 0.287
VOC	Benzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.66E-03	0/63	2.33E-04	0.000902 - 0.0574
VOC	Bromochloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.16E-02	0/63	2.08E-03	0.000902 - 0.0574
VOC	Bromodichloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	7.30E-04	0/63	3.65E-05	0.000902 - 0.0574
VOC	Bromoform	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.75E-02	0/63	8.73E-04	0.000902 - 0.0574
VOC	Bromomethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.82E-03	0/63	1.91E-04	0.000902 - 0.0574
VOC	Carbon disulfide	mg/kg	2.85E-03	2.85E-03	2.85E-03	1/63	N/A	N/A	0/63	4.80E-01	0/63	2.40E-02	0.00451 - 0.287
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.54E-03	0/63	1.77E-04	0.000902 - 0.0574
VOC	Chlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.06E-01	0/63	5.28E-03	0.000902 - 0.0574
VOC	Chloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.74E+00	0/63	2.37E-01	0.000902 - 0.0574
VOC	Chloroform	mg/kg	3.68E-04	1.24E-03	6.79E-04	4/63	N/A	N/A	1/63	1.22E-03	4/63	6.12E-05	0.000902 - 0.0574
VOC	Chloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.05E-02	0/63	5.26E-04	0.000902 - 0.0574
VOC	*cis*-1,2-Dichloroethene	mg/kg	5.16E-04	5.16E-04	5.16E-04	1/63	N/A	N/A	0/63	2.12E-02	0/63	1.06E-03	0.000902 - 0.0574
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.36E-03	0/63	1.68E-04	0.000902 - 0.0574
VOC	Cumene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.48E+00	0/63	7.38E-02	0.000902 - 0.0574
VOC	Cyclohexane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.60E+01	0/63	1.30E+00	0.000902 - 0.0574
VOC	Dibromochloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.64E-03	0/63	2.32E-04	0.000902 - 0.0574
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.08E-01	0/63	3.04E-02	0.000902 - 0.0574

Table 4.12. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	Ethylbenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.36E-02	0/63	1.68E-03	0.000902 - 0.0574
VOC	m,p-Xylene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.82E-01	0/63	1.91E-02	0.0018 - 0.115
VOC	Methyl acetate	mg/kg	--	--	--	0/63	N/A	N/A	0/63	8.22E+00	0/63	4.11E-01	0.00451 - 0.287
VOC	Methylcyclohexane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.80E+01	0/63	1.40E+00	0.000902 - 0.0574
VOC	Methylene chloride	mg/kg	1.77E-03	2.98E-03	2.34E-03	12/63	N/A	N/A	0/63	5.44E-02	1/63	2.72E-03	0.00451 - 0.287
VOC	Styrene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.66E+00	0/63	1.33E-01	0.000902 - 0.0574
VOC	Tetrachloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.69E-02	0/63	1.84E-03	0.000902 - 0.0574
VOC	Toluene	mg/kg	3.90E-04	1.56E-03	7.49E-04	5/63	N/A	N/A	0/63	1.52E+00	0/63	7.62E-02	0.000902 - 0.0574
VOC	Total Xylene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.82E-01	0/63	1.91E-02	0.00271 - 0.172
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.83E-02	0/63	2.91E-03	0.000902 - 0.0574
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.36E-03	0/63	1.68E-04	0.000902 - 0.0574
VOC	Trichloroethene	mg/kg	4.43E-04	1.50E-02	3.70E-03	23/63	N/A	N/A	14/63	2.02E-03	23/63	1.01E-04	0.000902 - 0.119
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.46E+00	0/63	7.31E-02	0.000902 - 0.0574
VOC	Vinyl chloride	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.29E-04	0/63	6.47E-06	0.000902 - 0.0574

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.13. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 2

Type	Analysis	Unit	Detected Results			Freq. of Detect.	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	1.22E+03	1.56E+04	7.81E+03	13/13	10/13	3.00E+03	12.1 - 126
METAL	Antimony	mg/kg	--	--	--	0/13	0/13	3.52E-02	2.37 - 26.8
METAL	Arsenic	mg/kg	1.01E+00	3.80E+01	9.58E+00	13/13	13/13	1.51E-03	1.21 - 1.39
METAL	Barium	mg/kg	6.04E+00	1.92E+02	5.29E+01	13/13	11/13	1.55E+01	0.965 - 1.11
METAL	Beryllium	mg/kg	5.61E-02	1.12E+00	4.27E-01	13/13	0/13	1.95E+00	0.121 - 0.139
METAL	Boron	mg/kg	1.14E+00	1.91E+01	5.80E+00	13/13	12/13	1.28E+00	3.62 - 4.18
METAL	Cadmium	mg/kg	4.15E-02	5.14E-01	2.45E-01	3/13	2/13	6.93E-02	0.241 - 0.279
METAL	Chromium	mg/kg	3.70E+00	7.85E+01	2.88E+01	13/13	0/13	1.80E+05	0.724 - 0.836
METAL	Cobalt	mg/kg	6.14E-01	4.84E+01	7.98E+00	13/13	13/13	2.71E-02	0.241 - 0.279
METAL	Copper	mg/kg	9.38E-01	8.51E+00	5.10E+00	12/13	10/13	2.81E+00	0.483 - 0.557
METAL	Iron	mg/kg	3.50E+03	2.51E+05	3.57E+04	13/13	13/13	3.52E+01	24.6 - 519
METAL	Lead	mg/kg	1.52E+00	1.56E+01	6.29E+00	13/13	1/13	1.35E+01	0.483 - 0.557
METAL	Manganese	mg/kg	4.90E+00	1.69E+03	1.99E+02	13/13	13/13	2.83E+00	1.21 - 26
METAL	Mercury	mg/kg	1.65E-02	1.39E-01	5.58E-02	4/13	2/13	2.95E-02	0.0264 - 0.0346
METAL	Molybdenum	mg/kg	1.01E-01	7.98E-01	2.60E-01	11/13	6/13	2.02E-01	0.241 - 0.279
METAL	Nickel	mg/kg	6.72E-01	3.27E+01	9.12E+00	13/13	9/13	2.56E+00	0.483 - 0.557
METAL	Selenium	mg/kg	5.22E-01	4.51E+00	1.62E+00	11/13	11/13	5.19E-02	1.21 - 1.39
METAL	Silver	mg/kg	5.05E+00	5.05E+00	5.05E+00	1/13	1/13	7.99E-02	0.593 - 6.71
METAL	Thallium	mg/kg	2.61E-01	2.61E-01	2.61E-01	1/13	1/13	1.42E-03	0.483 - 0.557
METAL	Uranium[a]	mg/kg	2.22E-01	3.02E+00	1.35E+00	13/13	13/13	1.80E-01	0.0483 - 0.0557
METAL	Vanadium	mg/kg	5.03E+00	1.11E+02	3.90E+01	13/13	12/13	8.64E+00	4.83 - 5.57
METAL	Zinc	mg/kg	3.68E+00	8.54E+01	3.73E+01	13/13	6/13	3.73E+01	4.83 - 5.57
ANION	Fluoride	mg/kg	4.70E-01	5.11E+00	3.31E+00	13/13	0/13	1.20E+01	1.14 - 1.44
PPCB	Total PCB[b]	mg/kg	--	--	--	0/13	0/13	6.82E-03	0.00412 - 0.00585
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/13	0/13	8.72E-04	0.418 - 0.588
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/13	0/13	4.02E-01	0.418 - 0.588
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/13	0/13	1.16E-03	0.418 - 0.588
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/13	0/13	2.26E-03	0.418 - 0.588
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/13	0/13	4.21E-02	0.418 - 0.588
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.837 - 1.18
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/13	0/13	3.21E-04	0.418 - 0.588
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/13	0/13	6.67E-05	0.418 - 0.588
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/13	0/13	3.85E-01	0.0418 - 0.0588
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/13	0/13	8.91E-03	0.418 - 0.588
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/13	0/13	2.58E-04	0.418 - 0.588
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/13	0/13	1.85E-02	0.0418 - 0.0588
SVOC	2-Methylphenol	mg/kg	--	--	--	0/13	0/13	7.53E-02	0.418 - 0.588
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/13	0/13	8.01E-03	0.418 - 0.588

Table 4.13. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. of Detect.	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.418 - 0.588
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/13	0/13	8.24E-04	0.418 - 0.588
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/13	0/13	2.45E-04	0.418 - 0.588
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/13	0/13	3.42E-04	0.418 - 0.588
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/13	0/13	1.71E-01	0.418 - 0.588
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/13	0/13	1.55E-04	0.418 - 0.588
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/13	0/13	3.42E-04	0.418 - 0.588
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.418 - 0.588
SVOC	Acenaphthene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOC	Acenaphthylene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOC	Acetophenone	mg/kg	--	--	--	0/13	0/13	5.84E-02	0.418 - 0.588
SVOC	Anthracene	mg/kg	--	--	--	0/13	0/13	5.81E+00	0.0418 - 0.0588
SVOC	Atrazine	mg/kg	--	--	--	0/13	0/13	1.96E-04	0.418 - 0.588
SVOC	Benzaldehyde	mg/kg	--	--	--	0/13	0/13	4.15E-03	0.418 - 0.588
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/13	0/13	1.32E+00	0.0418 - 0.0588
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/13	0/13	1.35E-03	0.418 - 0.588
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/13	0/13	3.61E-06	0.418 - 0.588
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/13	0/13	1.31E-04	0.418 - 0.588
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/13	0/13	1.33E+00	0.0418 - 0.0588
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/13	0/13	2.36E-01	0.0418 - 0.0588
SVOC	Caprolactam	mg/kg	--	--	--	0/13	0/13	2.47E-01	0.418 - 0.588
SVOC	Carbazole	mg/kg	--	--	--	0/13	0/13	3.76E-02	0.0418 - 0.0588
SVOC	Dibenzofuran	mg/kg	--	--	--	0/13	0/13	1.46E-02	0.418 - 0.588
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/13	0/13	6.08E-01	0.0418 - 0.0588
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/13	0/13	6.08E-01	0.0418 - 0.0588
SVOC	Di-n-butyl phthalate	mg/kg	1.50E-02	3.61E-02	2.22E-02	4/13	0/13	2.27E-01	0.0418 - 0.0588
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/13	0/13	5.65E+00	0.0418 - 0.0588
SVOC	Diphenylamine	mg/kg	--	--	--	0/13	0/13	2.33E-01	0.418 - 0.588
SVOC	Fluoranthene	mg/kg	--	--	--	0/13	0/13	8.91E+00	0.0418 - 0.0588
SVOC	Fluorene	mg/kg	--	--	--	0/13	0/13	5.45E-01	0.0418 - 0.0588
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/13	0/13	1.23E-04	0.418 - 0.588
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/13	0/13	2.67E-04	0.418 - 0.588
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/13	0/13	1.28E-04	0.418 - 0.588
SVOC	Hexachloroethane	mg/kg	--	--	--	0/13	0/13	2.00E-04	0.418 - 0.588
SVOC	Isophorone	mg/kg	--	--	--	0/13	0/13	2.58E-02	0.418 - 0.588
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/13	0/13	2.97E-02	0.418 - 0.588
SVOC	Naphthalene	mg/kg	--	--	--	0/13	0/13	3.85E-04	0.0418 - 0.0588
SVOC	Nitrobenzene	mg/kg	--	--	--	0/13	0/13	9.17E-05	0.418 - 0.588

Table 4.13. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. of Detect.	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/13	0/13	8.10E-06	0.418 - 0.588
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/13	0/13	5.71E-05	0.418 - 0.588
SVOC	Phenanthrene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOC	Phenol	mg/kg	--	--	--	0/13	0/13	3.31E-01	0.418 - 0.588
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/13	0/13	1.58E-03	0.418 - 0.588
SVOC	Pyrene	mg/kg	--	--	--	0/13	0/13	1.32E+00	0.0418 - 0.0588
SVOC	Total PAH[c]	mg/kg	--	--	--	0/13	0/13	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/13	0/13	9.58E-01	0.311 - 0.945
RADS	Cesium-137	pCi/g	--	--	--	0/13	0/13	4.79E-01	0.0309 - 0.0684
RADS	Neptunium-237	pCi/g	--	--	--	0/13	0/13	5.36E-02	0.505 - 1.42
RADS	Plutonium-238	pCi/g	--	--	--	0/13	0/13	2.19E-01	0.186 - 0.851
RADS	Plutonium-239/240	pCi/g	--	--	--	0/13	0/13	2.13E-01	0.342 - 0.821
RADS	Technetium-99	pCi/g	--	--	--	0/16	0/16	7.60E-03	3 - 4.67
RADS	Thorium-230	pCi/g	5.12E-01	2.55E+00	1.21E+00	9/13	2/13	1.83E+00	0.328 - 1.63
RADS	Uranium-233/234	pCi/g	7.51E-01	1.90E+00	1.16E+00	4/13	4/13	4.95E-02	0.376 - 0.954
RADS	Uranium-235/236	pCi/g	--	--	--	0/13	0/13	4.88E-02	0.151 - 0.743
RADS	Uranium-238	pCi/g	6.79E-01	2.36E+00	1.20E+00	8/13	8/13	4.03E-02	0.307 - 0.74
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/16	0/16	2.81E-01	0.00118 - 0.00235
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/16	0/16	2.96E-05	0.00118 - 0.00235
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.12E-03	7.27E-03	5.11E-03	5/16	0/16	2.56E+00	0.00589 - 0.0117
VOC	1,1,2-Trichloroethane	mg/kg	8.02E-04	1.04E-03	9.21E-04	2/16	2/16	1.35E-05	0.00118 - 0.00235
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/16	0/16	7.82E-04	0.00118 - 0.00235
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/16	0/16	1.02E-02	0.00118 - 0.00235
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.09E-03	0.00118 - 0.00235
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/16	0/16	1.16E-03	0.00118 - 0.00235
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/16	0/16	1.44E-07	0.00118 - 0.00235
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/16	0/16	2.10E-06	0.00118 - 0.00235
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.95E-02	0.00118 - 0.00235
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/16	0/16	4.84E-05	0.00118 - 0.00235
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/16	0/16	2.74E-04	0.00118 - 0.00235
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/16	0/16	1.90E-02	0.00118 - 0.00235
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.95E-02	0.00118 - 0.00235
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	4.62E-04	0.00118 - 0.00235
VOC	1,4-Dioxane	mg/kg	--	--	--	0/16	0/16	9.42E-05	0.0589 - 0.117
VOC	2-Butanone	mg/kg	6.24E-03	6.24E-03	6.24E-03	1/16	0/16	1.16E-01	0.00589 - 0.0117
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/16	0/16	1.38E-06	0.00589 - 0.0117
VOC	2-Hexanone	mg/kg	--	--	--	0/16	0/16	8.75E-04	0.00589 - 0.0117
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/16	0/16	3.22E-03	0.00118 - 0.00235

Table 4.13. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/16	0/16	2.81E-02	0.00589 - 0.0117
VOC	Acetone	mg/kg	3.02E-03	5.05E-02	1.42E-02	10/16	0/16	3.68E-01	0.00589 - 0.0117
VOC	Acrolein	mg/kg	--	--	--	0/16	0/16	8.41E-07	0.00589 - 0.0117
VOC	Acrylonitrile	mg/kg	--	--	--	0/16	0/16	1.14E-05	0.00589 - 0.0117
VOC	Benzene	mg/kg	--	--	--	0/16	0/16	2.33E-04	0.00118 - 0.00235
VOC	Bromochloromethane	mg/kg	--	--	--	0/16	0/16	2.08E-03	0.00118 - 0.00235
VOC	Bromodichloromethane	mg/kg	--	--	--	0/16	0/16	3.65E-05	0.00118 - 0.00235
VOC	Bromoform	mg/kg	--	--	--	0/16	0/16	8.73E-04	0.00118 - 0.00235
VOC	Bromomethane	mg/kg	--	--	--	0/16	0/16	1.91E-04	0.00118 - 0.00235
VOC	Carbon disulfide	mg/kg	--	--	--	0/16	0/16	2.40E-02	0.00589 - 0.0117
VOC	Carbon tetrachloride	mg/kg	5.33E-04	6.21E-04	5.73E-04	4/16	4/16	1.77E-04	0.00118 - 0.00235
VOC	Chlorobenzene	mg/kg	--	--	--	0/16	0/16	5.28E-03	0.00118 - 0.00235
VOC	Chloroethane	mg/kg	--	--	--	0/16	0/16	2.37E-01	0.00118 - 0.00235
VOC	Chloroform	mg/kg	4.79E-04	7.14E-04	5.75E-04	3/16	3/16	6.12E-05	0.00118 - 0.00235
VOC	Chloromethane	mg/kg	--	--	--	0/16	0/16	5.26E-04	0.00118 - 0.00235
VOC	*cis* -1,2-Dichloroethene	mg/kg	9.89E-04	1.70E-02	6.19E-03	6/16	5/16	1.06E-03	0.00118 - 0.00235
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	0/16	1.68E-04	0.00118 - 0.00235
VOC	Cumene	mg/kg	--	--	--	0/16	0/16	7.38E-02	0.00118 - 0.00235
VOC	Cyclohexane	mg/kg	--	--	--	0/16	0/16	1.30E+00	0.00118 - 0.00235
VOC	Dibromochloromethane	mg/kg	--	--	--	0/16	0/16	2.32E-04	0.00118 - 0.00235
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/16	0/16	3.04E-02	0.00118 - 0.00235
VOC	Ethylbenzene	mg/kg	--	--	--	0/16	0/16	1.68E-03	0.00118 - 0.00235
VOC	m,p-Xylene	mg/kg	--	--	--	0/16	0/16	1.91E-02	0.00236 - 0.00469
VOC	Methyl acetate	mg/kg	--	--	--	0/16	0/16	4.11E-01	0.00589 - 0.0117
VOC	Methylcyclohexane	mg/kg	--	--	--	0/16	0/16	1.40E+00	0.00118 - 0.00235
VOC	Methylene chloride	mg/kg	2.62E-03	1.63E-02	9.14E-03	3/16	2/16	2.72E-03	0.00589 - 0.0117
VOC	Styrene	mg/kg	--	--	--	0/16	0/16	1.33E-01	0.00118 - 0.00235
VOC	Tetrachloroethene	mg/kg	2.09E-03	8.69E-03	5.74E-03	6/16	6/16	1.84E-03	0.00118 - 0.00235
VOC	Toluene	mg/kg	6.50E-04	7.65E-04	7.14E-04	3/16	0/16	7.62E-02	0.00118 - 0.00235
VOC	Total Xylene	mg/kg	--	--	--	0/16	0/16	1.91E-02	0.00354 - 0.00704
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/16	0/16	2.91E-03	0.00118 - 0.00235
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	0/16	1.68E-04	0.00118 - 0.00235
VOC	Trichloroethene	mg/kg	7.03E-04	1.68E+00	6.70E-01	8/16	8/16	1.01E-04	0.00123 - 0.156
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/16	0/16	7.31E-02	0.00118 - 0.00235
VOC	Vinyl chloride	mg/kg	--	--	--	0/16	0/16	6.47E-06	0.00118 - 0.00235

[shaded] One or more samples exceed groundwater protection screening

Table 4.13. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 2 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

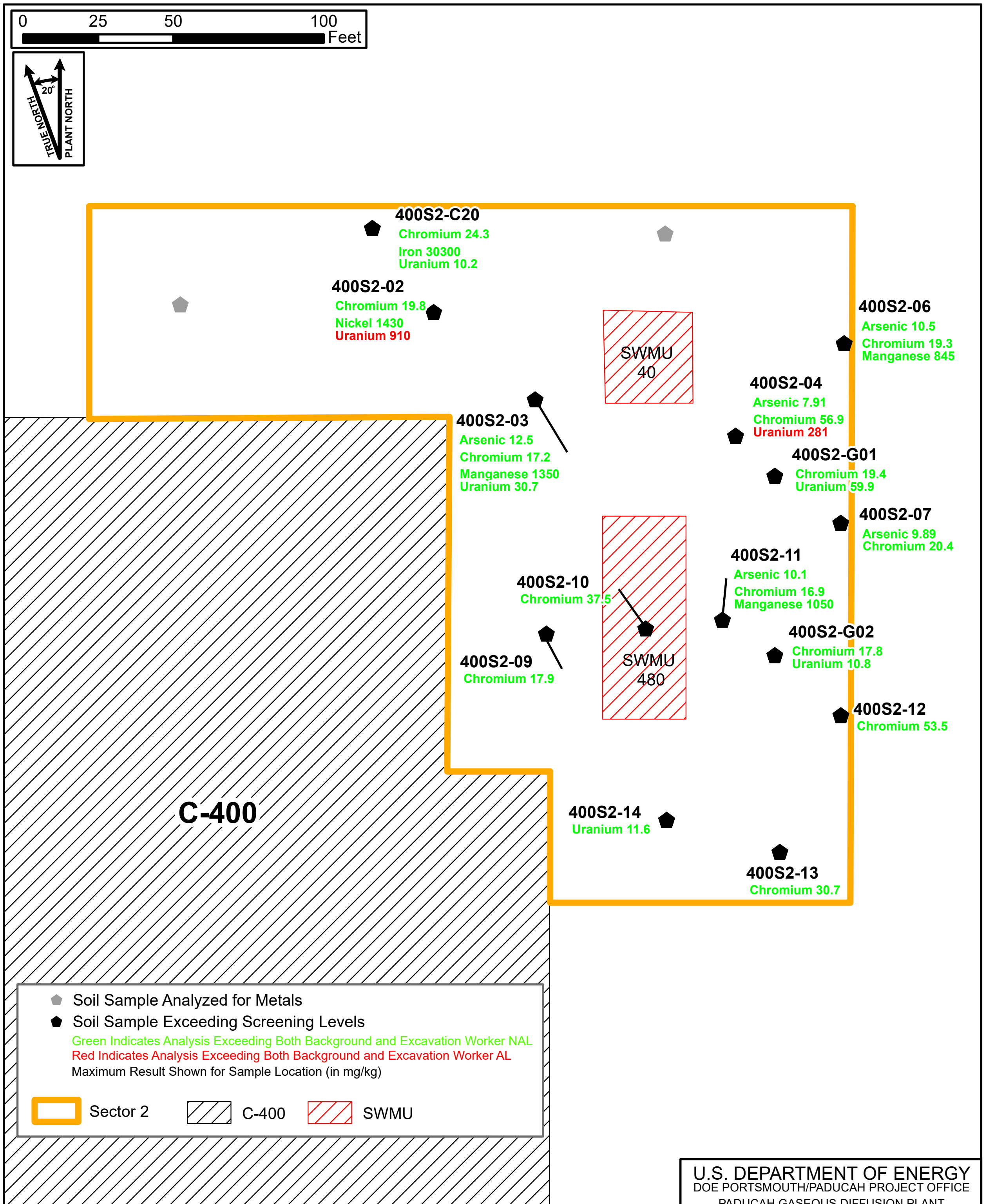
Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.



U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

MAP SOURCE INFORMATION
Map Generation Date and Location: 10/19/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.11 Sec2SubSurfMetals.mxd
Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.11. Sector 2 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals

SSL at a DAF of 1. Total PCBs in Sector 2 were primarily detected at low levels, less than 0.1 mg/kg, in the surface and shallow subsurface soils (equal to or less than 4 ft bgs).

SVOCs

Several SVOCs were detected in Sector 2 surface and subsurface soil (0–16 ft bgs), mostly PAH compounds, but none of the results exceeded the excavation worker NALs. Total PAHs exceeded the SSL for protection of groundwater at a DAF of 1 in Sector 2 subsurface soil (1–16 ft bgs) in one location out of 10 samples. SVOCs did not exceed any of the screening criteria at depths > 16 ft bgs. Like Total PCBs, Total PAHs were mostly found in the surface and shallow subsurface intervals.

VOCs

Several VOCs were detected in Sector 2 surface and subsurface soil (0–16 ft bgs) but none of the results exceeded the excavation worker NALs. VOCs in Sector 2 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs at a DAF of 1 include 1,4-dioxane, benzene, and TCE (TCE was detected in one sample with a result of 0.00513 mg/kg). Both 1,4-dioxane and TCE exceeded the DAF of 20 SSLs in this interval. In the deep soil interval (16 ft bgs to the bottom of the RGA) 1,4-dioxane, 2-butanone, methylene chloride (a potential lab contaminant), chloroform, and TCE exceeded the protection of groundwater SSLs for a DAF of 1. 1,4-dioxane, chloroform, and TCE also exceeded the DAF of 20 SSLs. For TCE, with a maximum concentration of 0.015 mg/kg, there were 23 exceedances of the DAF of 1 value and 14 exceedances of the DAF of 20 value out of 63 samples. The maximum TCE concentration in the deep soil interval occurred at a depth of 53–54 ft bgs.

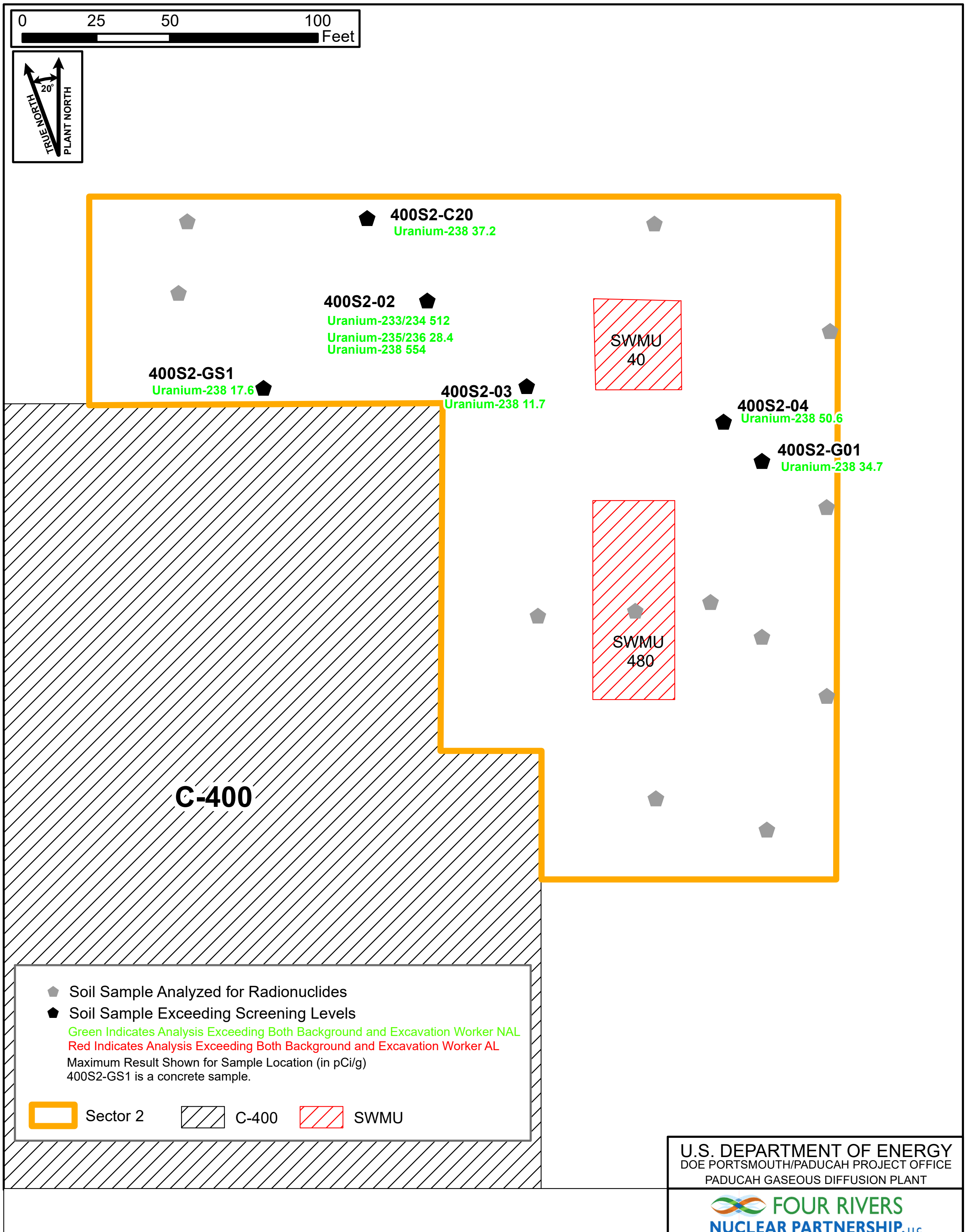
In the screening of the McNairy Formation soil, 1,1,2-trichloroethane, carbon tetrachloride, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), tetrachloroethene, and TCE exceeded the groundwater protection SSLs for a DAF of 1. The highest concentration of TCE in all subsurface soils in Sector 2, 1.68 mg/kg, occurred in the top of the McNairy at a depth of 90–91 ft bgs in boring 400S2-14.

Radionuclides

Radionuclides that were above both the background screening levels and the excavation worker NALs in Sector 2 concrete and surface and subsurface soil (0–16 ft bgs) include uranium-233/234, uranium-235/236, and uranium-238 (Figure 4.12). Uranium-238 most frequently exceeded the excavation worker NAL screening criteria.

Radionuclides that were detected in the Sector 2 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater at a DAF of 1 include technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238 (all exceeded the DAF of 20 SSLs with the exception of thorium-230). Plutonium-239/240, which does not have a site-specific background value, also exceeded the DAF of 1 SSL in 1 out of 14 samples. In the deep soil interval (16 ft bgs to the bottom of the RGA), uranium-233/234*, uranium-235/236, and uranium-238* exceeded both the background criteria and the SSLs for protection of groundwater at a DAF of 1 (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). In the screening of the McNairy Formation soil, thorium-230, uranium-233/234, and uranium-238 exceeded the groundwater protection SSLs for a DAF of 1.

Technetium-99 was not prevalent in Sector 2 soils. The maximum activity was 30.5 pCi/g at a depth of 2–3 ft bgs. The maximum activities for the uranium isotopes were all found in boring 400S2-02 at a depth of 1–2 ft bgs.



MAP SOURCE INFORMATION
Map Generation Date and Location: 10/19/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.12 Sec2SubSurfRads.mxd
Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.12. Sector 2 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

An area of contamination identified during WAG 6 was associated with the C-403 Neutralization Tank and the former storm sewer (DOE 1999). Subsurface soil collected adjacent to the tank backfill at a depth of 30 ft bgs was found to be impacted by several radionuclides. Based upon available data, the extent of radionuclide contamination around the C-403 Neutralization Tank appears to be limited mostly to the area of the tank backfill. Elevated radioactivity was also detected at a few locations along the former storm sewer utility line that connects the C-403 Neutralization Tank to the C-410-B Neutralization Lagoon. Sporadic occurrences of contamination along the utility corridors suggest that leaking joints or cracks provided isolated locations for contaminant introduction into the subsurface.

4.3.3 Sector 3

4.3.3.1 Description and process history

Sector 3 is an area of approximately 23,000 ft^2, located east of the C-400 Cleaning Building, as shown in Figure 3.1. Asphalt pavement and gravel cover much of current area with limited area of exposed soil. Sector 3 does not contain a SWMU. There are several buried utility lines in the sector but no significant historical C-400 Cleaning Building processes have been identified in Sector 3.

4.3.3.2 Nature and extent of contamination—surface soils

A summary of the analytical results for Sector 3 surface soil and the screening results are provided in Table 4.14. The results of the screening for surface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface soil above both background screening levels and the industrial worker NALs were arsenic and chromium. These two metals exceeded the background and industrial worker criteria at multiple locations, but arsenic only exceeded background at one location out of 12 samples. Locations where these metals exceeded background and industrial worker NALs are shown in Figure 4.13.

Metals that were detected in the Sector 3 surface soil above both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 include aluminum, antimony*, arsenic*, cadmium, selenium*, thallium*, uranium*, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs).

The metals most frequently detected above its background values in Sector 3 surface soil are chromium, selenium, and uranium.

PCBs

Total PCBs were detected in 10 of 11 samples in Sector 3 surface soil. The maximum result, 0.198 mg/kg, did not exceed the industrial worker NAL. Total PCBs exceeded the SSL for the protection of groundwater for a DAF of 1 at 8 locations and a DAF of 20 at 2 out of 11 sample locations. Most of the PCB detections in Sector 3 occurred in the surface soil interval (ranging from 0.00169 to 0.198 mg/kg).

SVOCs

Several SVOCs were detected in surface soil with Total PAHs exceeding the industrial worker NAL at 2 out of 11 sample locations (Figure 4.14). SVOCs that exceeded the SSLs for protection of groundwater, with a DAF of 1, included carbazole, phenanthrene, pyrene, and Total PAHs. Total PAHs also exceeded the DAF of 20 SSL.

Table 4.14. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 3

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	4.44E+03	1.73E+04	1.11E+04	12/12	5/12	1.30E+04	0/12	1.00E+05	0/12	1.00E+05	0/12	5.99E+04	12/12	3.00E+03	10.2 - 114
METAL	Antimony	mg/kg	6.86E-01	2.10E+00	1.22E+00	6/12	6/12	2.10E-01	0/12	9.34E+01	0/12	2.80E+03	5/12	7.04E-01	6/12	3.52E-02	1.96 - 2.4
METAL	Arsenic	mg/kg	2.82E+00	1.31E+01	6.34E+00	12/12	1/12	1.20E+01	12/12	1.60E+00	0/12	1.60E+02	12/12	3.02E-02	12/12	1.51E-03	1.01 - 1.2
METAL	Barium	mg/kg	2.92E+01	1.29E+02	8.44E+01	12/12	0/12	2.00E+02	0/12	4.04E+04	0/12	1.00E+05	0/12	3.11E+02	12/12	1.55E+01	0.806 - 0.958
METAL	Beryllium	mg/kg	1.83E-01	6.10E-01	4.03E-01	12/12	0/12	6.70E-01	0/12	4.50E+02	0/12	1.35E+04	0/12	3.89E+01	0/12	1.95E+00	0.101 - 0.12
METAL	Boron	mg/kg	1.11E+00	5.93E+00	3.87E+00	12/12	N/A	N/A	0/12	4.65E+04	0/12	1.00E+05	0/12	2.56E+01	11/12	1.28E+00	3.02 - 3.59
METAL	Cadmium	mg/kg	3.04E-02	3.49E-01	1.43E-01	10/12	2/12	2.10E-01	0/12	6.05E+01	0/12	1.82E+03	0/12	1.39E+00	6/12	6.93E-02	0.202 - 0.24
METAL	Chromium	mg/kg	1.03E+01	2.08E+01	1.64E+01	12/12	7/12	1.60E+01	10/12	1.23E+01	0/12	1.23E+03	0/12	3.60E+06	0/12	1.80E+05	0.605 - 0.719
METAL	Cobalt	mg/kg	2.26E+00	8.99E+00	5.60E+00	12/12	0/12	1.40E+01	0/12	6.87E+01	0/12	2.06E+03	12/12	5.43E-01	12/12	2.71E-02	0.202 - 0.24
METAL	Copper	mg/kg	3.49E+00	1.70E+01	1.11E+01	12/12	0/12	1.90E+01	0/12	9.34E+03	0/12	1.00E+05	0/12	5.62E+01	12/12	2.81E+00	0.403 - 0.479
METAL	Iron	mg/kg	5.71E+03	2.42E+04	1.60E+04	12/12	0/12	2.80E+04	0/12	1.00E+05	0/12	1.00E+05	12/12	7.04E+02	12/12	3.52E+01	20.3 - 228
METAL	Lead	mg/kg	5.33E+00	1.61E+01	1.11E+01	12/12	0/12	3.60E+01	0/12	8.00E+02	0/12	8.00E+02	0/12	2.70E+02	3/12	1.35E+01	0.403 - 0.479
METAL	Manganese	mg/kg	1.75E+02	5.97E+02	3.65E+02	12/12	0/12	1.50E+03	0/12	4.72E+03	0/12	1.00E+05	12/12	5.65E+01	12/12	2.83E+00	1.02 - 11.4
METAL	Mercury	mg/kg	1.04E-02	5.02E-02	2.64E-02	11/12	0/12	2.00E-01	0/12	7.01E+01	0/12	2.10E+03	0/12	5.91E-01	5/12	2.95E-02	0.0225 - 0.0281
METAL	Molybdenum	mg/kg	3.00E-01	8.65E-01	5.96E-01	12/12	N/A	N/A	0/12	1.16E+03	0/12	3.48E+04	0/12	4.03E+00	12/12	2.02E-01	0.202 - 0.24
METAL	Nickel	mg/kg	4.10E+00	1.83E+01	1.17E+01	12/12	0/12	2.10E+01	0/12	4.30E+03	0/12	1.00E+05	0/12	5.12E+01	12/12	2.56E+00	0.403 - 0.479
METAL	Selenium	mg/kg	5.76E-01	1.65E+00	9.65E-01	12/12	8/12	8.00E-01	0/12	1.17E+03	0/12	3.51E+04	4/12	1.04E+00	12/12	5.19E-02	1.01 - 1.2
METAL	Silver	mg/kg	3.43E-01	4.43E-01	3.93E-01	2/12	0/12	2.30E+00	0/12	1.17E+03	0/12	3.51E+04	0/12	1.60E+00	2/12	7.99E-02	0.531 - 5.45
METAL	Thallium	mg/kg	1.70E-01	2.42E-01	2.01E-01	7/12	3/12	2.10E-01	0/12	2.34E+00	0/12	7.02E+01	7/12	2.84E-02	7/12	1.42E-03	0.403 - 0.479
METAL	Uranium[a]	mg/kg	1.08E+00	2.97E+01	9.31E+00	12/12	9/12	4.90E+00	0/12	4.66E+01	0/12	1.40E+03	9/12	3.60E+00	12/12	1.80E-01	0.0403 - 0.0479
METAL	Vanadium	mg/kg	1.27E+01	3.69E+01	2.59E+01	12/12	0/12	3.80E+01	0/12	1.15E+03	0/12	3.45E+04	0/12	1.73E+02	12/12	8.64E+00	4.03 - 4.79
METAL	Zinc	mg/kg	1.27E+01	2.39E+02	6.78E+01	12/12	3/12	6.50E+01	0/12	7.01E+04	0/12	1.00E+05	0/12	7.46E+02	8/12	3.73E+01	4.03 - 4.79
ANION	Fluoride	mg/kg	3.15E+00	5.24E+01	2.03E+01	12/12	N/A	N/A	0/12	9.33E+03	0/12	1.00E+05	0/12	2.40E+02	6/12	1.20E+01	1.06 - 1.21
DI/FURA	Total Dioxin/Furans[b]	mg/kg	3.33E-06	3.33E-06	3.33E-06	1/1	N/A	N/A	0/1	1.57E-05	0/1	1.57E-03	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	1.69E-03	1.98E-01	5.94E-02	10/11	N/A	N/A	0/11	2.93E-01	0/11	2.93E+01	2/11	1.36E-01	8/11	6.82E-03	0.00364 - 0.0364
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.00E+01	0/11	6.00E+02	0/11	1.74E-02	0/11	8.72E-04	0.36 - 7.36
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.90E+03	0/11	8.70E+04	0/11	8.04E+00	0/11	4.02E-01	0.36 - 7.36
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.90E+01	0/11	8.70E+02	0/11	2.32E-02	0/11	1.16E-03	0.36 - 7.36
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.70E+01	0/11	2.61E+03	0/11	4.52E-02	0/11	2.26E-03	0.36 - 7.36
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+02	0/11	1.74E+04	0/11	8.42E-01	0/11	4.21E-02	0.36 - 7.36
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+01	0/11	1.74E+03	0/11	8.72E-02	0/11	4.36E-03	0.72 - 14.7
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.57E+00	0/11	2.57E+02	0/11	6.42E-03	0/11	3.21E-04	0.36 - 7.36
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.46E-01	0/11	5.46E+01	0/11	1.33E-03	0/11	6.67E-05	0.36 - 7.36
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.84E+03	0/11	5.52E+04	0/11	7.70E+00	0/11	3.85E-01	0.036 - 0.736
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.17E+03	0/11	3.51E+04	0/11	1.78E-01	0/11	8.91E-03	0.36 - 7.36
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.32E+00	0/11	6.96E+01	0/11	5.16E-03	0/11	2.58E-04	0.36 - 7.36
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.19E+01	0/11	2.76E+03	0/11	3.70E-01	0/11	1.85E-02	0.036 - 0.736
SVOC	2-Methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.45E+03	0/11	4.35E+04	0/11	1.51E+00	0/11	7.53E-02	0.36 - 7.36
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.87E+02	0/11	8.61E+03	0/11	1.60E-01	0/11	8.01E-03	0.36 - 7.36
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+01	0/11	1.74E+03	0/11	8.72E-02	0/11	4.36E-03	0.36 - 7.36
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.80E+00	0/11	1.80E+02	0/11	1.65E-02	0/11	8.24E-04	0.36 - 7.36
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.70E+00	0/11	2.61E+02	0/11	4.90E-03	0/11	2.45E-04	0.36 - 7.36
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.41E+01	0/11	4.23E+02	0/11	6.84E-03	0/11	3.42E-04	0.36 - 7.36
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.90E+03	0/11	8.70E+04	0/11	3.42E+00	0/11	1.71E-01	0.36 - 7.36
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.06E+00	0/11	4.06E+02	0/11	3.10E-03	0/11	1.55E-04	0.36 - 7.36
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.41E+01	0/11	4.23E+02	0/11	6.84E-03	0/11	3.42E-04	0.36 - 7.36
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+01	0/11	1.74E+03	0/11	8.72E-02	0/11	4.36E-03	0.36 - 7.36
SVOC	Acenaphthene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.38E+03	0/11	4.14E+04	0/11	1.10E+01	0/11	5.49E-01	0.036 - 0.736

Table 4.14. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	Acenaphthylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.38E+03	0/11	4.14E+04	0/11	1.10E+01	0/11	5.49E-01	0.036 - 0.736
SVOC	Acetophenone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.34E+04	0/11	7.02E+05	0/11	1.17E+00	0/11	5.84E-02	0.36 - 7.36
SVOC	Anthracene	mg/kg	9.28E-02	9.39E-02	9.34E-02	2/11	N/A	N/A	0/11	6.89E+03	0/11	1.00E+05	0/11	1.16E+02	0/11	5.81E+00	0.036 - 0.736
SVOC	Atrazine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.53E+00	0/11	3.53E+02	0/11	3.92E-03	0/11	1.96E-04	0.36 - 7.36
SVOC	Benzaldehyde	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.64E+03	0/11	1.64E+05	0/11	8.30E-02	0/11	4.15E-03	0.36 - 7.36
SVOC	Benzo(ghi)perylene	mg/kg	1.66E-02	2.75E-01	8.20E-02	6/11	N/A	N/A	0/11	6.89E+02	0/11	2.07E+04	0/11	2.63E+01	0/11	1.32E+00	0.036 - 0.736
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.70E+01	0/11	2.61E+03	0/11	2.70E-02	0/11	1.35E-03	0.36 - 7.36
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.25E+00	0/11	1.25E+02	0/11	7.22E-05	0/11	3.61E-06	0.36 - 7.36
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.32E+01	0/11	9.32E+03	0/11	2.62E-03	0/11	1.31E-04	0.36 - 7.36
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+01	0/11	5.80E+03	0/11	2.66E+01	0/11	1.33E+00	0.036 - 0.736
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.27E+02	0/11	4.27E+04	0/11	4.72E+00	0/11	2.36E-01	0.036 - 0.736
SVOC	Caprolactam	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.43E+04	0/11	4.29E+05	0/11	4.94E+00	0/11	2.47E-01	0.36 - 7.36
SVOC	Carbazole	mg/kg	7.77E-02	7.77E-02	7.77E-02	1/11	N/A	N/A	0/11	4.06E+01	0/11	4.06E+03	0/11	7.51E-01	1/11	3.76E-02	0.036 - 0.736
SVOC	Dibenzofuran	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.34E+02	0/11	7.02E+03	0/11	2.92E-01	0/11	1.46E-02	0.36 - 7.36
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.32E+04	0/11	6.96E+05	0/11	1.22E+01	0/11	6.08E-01	0.036 - 0.736
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.32E+04	0/11	6.96E+05	0/11	1.22E+01	0/11	6.08E-01	0.036 - 0.736
SVOC	Di-n-butyl phthalate	mg/kg	1.43E-02	1.80E-02	1.62E-02	2/11	N/A	N/A	0/11	2.90E+03	0/11	8.70E+04	0/11	4.54E+00	0/11	2.27E-01	0.036 - 0.736
SVOC	Di-n-octylphthalate	mg/kg	1.28E-02	5.96E-02	3.62E-02	2/11	N/A	N/A	0/11	2.90E+02	0/11	8.70E+03	0/11	1.13E+02	0/11	5.65E+00	0.036 - 0.736
SVOC	Diphenylamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.90E+03	0/11	8.70E+04	0/11	4.66E+00	0/11	2.33E-01	0.36 - 7.36
SVOC	Fluoranthene	mg/kg	1.22E-02	3.99E+00	5.68E-01	11/11	N/A	N/A	0/11	9.19E+02	0/11	2.76E+04	0/11	1.78E+02	0/11	8.91E+00	0.036 - 0.736
SVOC	Fluorene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.19E+02	0/11	2.76E+04	0/11	1.09E+01	0/11	5.45E-01	0.036 - 0.736
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.26E+00	0/11	1.26E+02	0/11	2.46E-03	0/11	1.23E-04	0.36 - 7.36
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.61E+00	0/11	5.61E+02	0/11	5.34E-03	0/11	2.67E-04	0.36 - 7.36
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.45E-01	0/11	2.24E+01	0/11	2.56E-03	0/11	1.28E-04	0.36 - 7.36
SVOC	Hexachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.46E+00	0/11	8.46E+02	0/11	4.00E-03	0/11	2.00E-04	0.36 - 7.36
SVOC	Isophorone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.55E+02	0/11	8.55E+04	0/11	5.16E-01	0/11	2.58E-02	0.36 - 7.36
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.80E+02	0/11	1.74E+04	0/11	5.94E-01	0/11	2.97E-02	0.36 - 7.36
SVOC	Naphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.06E+00	0/11	4.06E+02	0/11	7.70E-03	0/11	3.85E-04	0.036 - 0.736
SVOC	Nitrobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.24E+01	0/11	2.24E+03	0/11	1.83E-03	0/11	9.17E-05	0.36 - 7.36
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.16E-01	0/11	1.16E+01	0/11	1.62E-04	0/11	8.10E-06	0.36 - 7.36
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.77E-01	0/11	8.77E+01	0/11	1.14E-03	0/11	5.71E-05	0.36 - 7.36
SVOC	Phenanthrene	mg/kg	1.25E-02	1.69E+00	2.85E-01	10/11	N/A	N/A	0/11	1.38E+03	0/11	4.14E+04	0/11	1.10E+01	1/11	5.49E-01	0.036 - 0.736
SVOC	Phenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.70E+03	0/11	2.61E+05	0/11	6.62E+00	0/11	3.31E-01	0.36 - 7.36
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.06E+01	0/11	3.48E+03	0/11	3.16E-02	0/11	1.58E-03	0.36 - 7.36
SVOC	Pyrene	mg/kg	1.77E-02	3.62E+00	5.41E-01	10/11	N/A	N/A	0/11	6.89E+02	0/11	2.07E+04	0/11	2.63E+01	1/11	1.32E+00	0.036 - 0.736
SVOC	Total PAH[d]	mg/kg	1.95E-02	1.09E+00	2.43E-01	10/11	N/A	N/A	2/11	6.43E-01	0/11	6.43E+01	2/11	5.89E-01	6/11	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/13	N/A	N/A	0/13	6.01E+00	0/13	6.01E+02	0/13	1.92E+01	0/13	9.58E-01	0.277 - 0.936
RADS	Cesium-137	pCi/g	5.37E-02	1.57E-01	1.00E-01	6/13	0/13	4.90E-01	3/13	1.08E-01	0/13	1.08E+01	0/13	9.58E+00	0/13	4.79E-01	0.0369 - 0.0859
RADS	Neptunium-237	pCi/g	--	--	--	0/13	0/13	1.00E-01	0/13	2.49E-01	0/13	2.49E+01	0/13	1.07E+00	0/13	5.36E-02	0.432 - 1.01
RADS	Plutonium-238	pCi/g	--	--	--	0/13	0/13	7.30E-02	0/13	2.65E+01	0/13	2.65E+03	0/13	4.38E+00	0/13	2.19E-01	0.245 - 0.788
RADS	Plutonium-239/240	pCi/g	1.05E+00	1.05E+00	1.05E+00	1/13	1/13	2.50E-02	0/13	2.27E+01	0/13	2.27E+03	0/13	4.26E+00	1/13	2.13E-01	0.367 - 0.815
RADS	Technetium-99	pCi/g	3.92E+00	1.96E+01	9.91E+00	3/13	3/13	2.50E+00	0/13	1.27E+03	0/13	1.00E+05	3/13	1.52E-01	3/13	7.60E-03	2.28 - 3.97
RADS	Thorium-230	pCi/g	5.50E-01	2.24E+00	1.39E+00	12/13	3/13	1.50E+00	0/13	3.13E+01	0/13	3.13E+03	0/13	3.66E+01	3/13	1.83E+00	0.51 - 1.33
RADS	Uranium-233/234	pCi/g	1.28E+00	3.58E+01	6.56E+00	13/13	13/13	1.20E+00	0/13	5.01E+01	0/13	5.01E+03	13/13	9.90E-01	13/13	4.95E-02	0.502 - 1.02
RADS	Uranium-235/236	pCi/g	1.06E+00	1.57E+00	1.32E+00	2/13	2/13	6.00E-02	2/13	4.08E-01	0/13	4.08E+01	2/13	9.76E-01	2/13	4.88E-02	0.33 - 0.578
RADS	Uranium-238	pCi/g	1.60E+00	3.86E+01	7.49E+00	13/13	13/13	1.20E+00	12/13	1.66E+00	0/13	1.66E+02	13/13	8.05E-01	13/13	4.03E-02	0.274 - 0.733
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.58E+03	0/11	1.00E+05	0/11	5.62E+00	0/11	2.81E-01	0.000933 - 0.107
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.91E+00	0/11	2.91E+02	0/11	5.92E-04	0/11	2.96E-05	0.000933 - 0.107

Table 4.14. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 3 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.81E+03	0/11	8.43E+04	0/11	5.13E+01	0/11	2.56E+00	0.00466 - 0.535
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.32E-01	0/11	1.90E+01	0/11	2.69E-04	0/11	1.35E-05	0.000933 - 0.107
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.58E+01	0/11	1.58E+03	0/11	1.56E-02	0/11	7.82E-04	0.000933 - 0.107
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.00E+02	0/11	3.00E+03	0/11	2.04E-01	0/11	1.02E-02	0.000933 - 0.107
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.87E+02	0/11	5.61E+03	0/11	4.18E-02	0/11	2.09E-03	0.000933 - 0.107
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.59E+01	0/11	7.77E+02	0/11	2.32E-02	0/11	1.16E-03	0.000933 - 0.107
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.49E-02	0/11	6.49E+00	0/11	2.88E-06	0/11	1.44E-07	0.000933 - 0.107
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.68E-01	0/11	1.68E+01	0/11	4.20E-05	0/11	2.10E-06	0.000933 - 0.107
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.76E+02	0/11	2.93E+04	0/11	5.90E-01	0/11	2.95E-02	0.000933 - 0.107
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.09E+00	0/11	2.09E+02	0/11	9.69E-04	0/11	4.84E-05	0.000933 - 0.107
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.63E+00	0/11	1.99E+02	0/11	5.48E-03	0/11	2.74E-04	0.000933 - 0.107
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.81E+02	0/11	8.43E+03	0/11	3.81E-01	0/11	1.90E-02	0.000933 - 0.107
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.76E+02	0/11	2.93E+04	0/11	5.90E-01	0/11	2.95E-02	0.000933 - 0.107
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.15E+01	0/11	1.15E+03	0/11	9.24E-03	0/11	4.62E-04	0.000933 - 0.107
VOC	1,4-Dioxane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.91E+01	0/11	3.91E+03	0/11	1.88E-03	0/11	9.42E-05	0.0466 - 5.35
VOC	2-Butanone	mg/kg	7.33E-03	1.53E-02	1.13E-02	2/11	N/A	N/A	0/11	2.24E+04	0/11	6.72E+05	0/11	2.32E+00	0/11	1.16E-01	0.00466 - 0.535
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.15E-02	0/11	9.15E+00	0/11	2.76E-05	0/11	1.38E-06	0.00466 - 0.535
VOC	2-Hexanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.52E+02	0/11	4.56E+03	0/11	1.75E-02	0/11	8.75E-04	0.00466 - 0.535
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.17E+02	0/11	2.17E+04	0/11	6.44E-02	0/11	3.22E-03	0.000933 - 0.107
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.97E+03	0/11	2.39E+05	0/11	5.62E-01	0/11	2.81E-02	0.00466 - 0.535
VOC	Acetone	mg/kg	1.77E-03	7.41E-02	1.89E-02	7/11	N/A	N/A	0/11	2.10E+05	0/11	6.30E+06	0/11	7.36E+00	0/11	3.68E-01	0.00466 - 0.535
VOC	Acrolein	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.05E-02	0/11	1.82E+00	0/11	1.68E-05	0/11	8.41E-07	0.00466 - 0.535
VOC	Acrylonitrile	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.24E+00	0/11	1.24E+02	0/11	2.28E-04	0/11	1.14E-05	0.00466 - 0.535
VOC	Benzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.31E+00	0/11	5.31E+02	0/11	4.66E-03	0/11	2.33E-04	0.000933 - 0.107
VOC	Bromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.28E+01	0/11	1.88E+03	0/11	4.16E-02	0/11	2.08E-03	0.000933 - 0.107
VOC	Bromodichloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.30E+00	0/11	1.30E+02	0/11	7.30E-04	0/11	3.65E-05	0.000933 - 0.107
VOC	Bromoform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.56E+01	0/11	9.56E+03	0/11	1.75E-02	0/11	8.73E-04	0.000933 - 0.107
VOC	Bromomethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.03E+00	0/11	9.09E+01	0/11	3.82E-03	0/11	1.91E-04	0.000933 - 0.107
VOC	Carbon disulfide	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.52E+02	0/11	1.06E+04	0/11	4.80E-01	0/11	2.40E-02	0.00466 - 0.535
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.96E+00	0/11	2.96E+02	0/11	3.54E-03	0/11	1.77E-04	0.000933 - 0.107
VOC	Chlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.37E+02	0/11	4.11E+03	0/11	1.06E-01	0/11	5.28E-03	0.000933 - 0.107
VOC	Chloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.27E+03	0/11	6.81E+04	0/11	4.74E+00	0/11	2.37E-01	0.000933 - 0.107
VOC	Chloroform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.39E+00	0/11	1.39E+02	0/11	1.22E-03	0/11	6.12E-05	0.000933 - 0.107
VOC	Chloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.63E+01	0/11	1.39E+03	0/11	1.05E-02	0/11	5.26E-04	0.000933 - 0.107
VOC	*cis* -1,2-Dichloroethene	mg/kg	5.02E-04	7.66E-02	3.86E-02	2/11	N/A	N/A	0/11	4.67E+02	0/11	1.40E+04	1/11	2.12E-02	1/11	1.06E-03	0.000933 - 0.107
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.34E+00	0/11	9.30E+02	0/11	3.36E-03	0/11	1.68E-04	0.000933 - 0.107
VOC	Cumene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.04E+03	0/11	3.12E+04	0/11	1.48E+00	0/11	7.38E-02	0.000933 - 0.107
VOC	Cyclohexane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.74E+03	0/11	8.22E+04	0/11	2.60E+01	0/11	1.30E+00	0.000933 - 0.107
VOC	Dibromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.79E+01	0/11	7.79E+03	0/11	4.64E-03	0/11	2.32E-04	0.000933 - 0.107
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.68E+01	0/11	1.10E+03	0/11	6.08E-01	0/11	3.04E-02	0.000933 - 0.107
VOC	Ethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.66E+01	0/11	2.66E+03	0/11	3.36E-02	0/11	1.68E-03	0.000933 - 0.107
VOC	m,p-Xylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.50E+02	0/11	7.50E+03	0/11	3.82E-01	0/11	1.91E-02	0.00187 - 0.214
VOC	Methyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.34E+05	0/11	7.02E+06	0/11	8.22E+00	0/11	4.11E-01	0.00466 - 0.535
VOC	Methylcyclohexane	mg/kg	4.17E-04	4.17E-04	4.17E-04	1/11	N/A	N/A	0/11	1.30E+03	0/11	3.90E+04	0/11	2.80E+01	0/11	1.40E+00	0.000933 - 0.107
VOC	Methylene chloride	mg/kg	2.00E-03	2.60E-03	2.21E-03	3/11	N/A	N/A	0/11	4.08E+02	0/11	1.22E+04	0/11	5.44E-02	0/11	2.72E-03	0.00466 - 0.535
VOC	Styrene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.76E+03	0/11	1.13E+05	0/11	2.66E+00	0/11	1.33E-01	0.000933 - 0.107
VOC	Tetrachloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.00E+01	0/11	1.20E+03	0/11	3.69E-02	0/11	1.84E-03	0.000933 - 0.107
VOC	Toluene	mg/kg	3.71E-04	8.23E-04	6.11E-04	5/11	N/A	N/A	0/11	6.25E+03	0/11	1.00E+05	0/11	1.52E+00	0/11	7.62E-02	0.000933 - 0.107

Table 4.14. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Total Xylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.50E+02	0/11	7.50E+03	0/11	3.82E-01	0/11	1.91E-02	0.0028 - 0.321
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.50E-04	5.50E-04	5.50E-04	1/11	N/A	N/A	0/11	4.54E+01	0/11	1.36E+03	0/11	5.83E-02	0/11	2.91E-03	0.000933 - 0.107
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.34E+00	0/11	9.30E+02	0/11	3.36E-03	0/11	1.68E-04	0.000933 - 0.107
VOC	Trichloroethene	mg/kg	5.93E-04	3.01E+00	4.32E-01	7/11	N/A	N/A	1/11	1.90E+00	0/11	5.70E+01	4/11	2.02E-03	7/11	1.01E-04	0.000933 - 0.112
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.16E+02	0/11	9.48E+03	0/11	1.46E+00	0/11	7.31E-02	0.000933 - 0.107
VOC	Vinyl chloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.06E+00	0/11	2.06E+02	0/11	1.29E-04	0/11	6.47E-06	0.000933 - 0.107

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

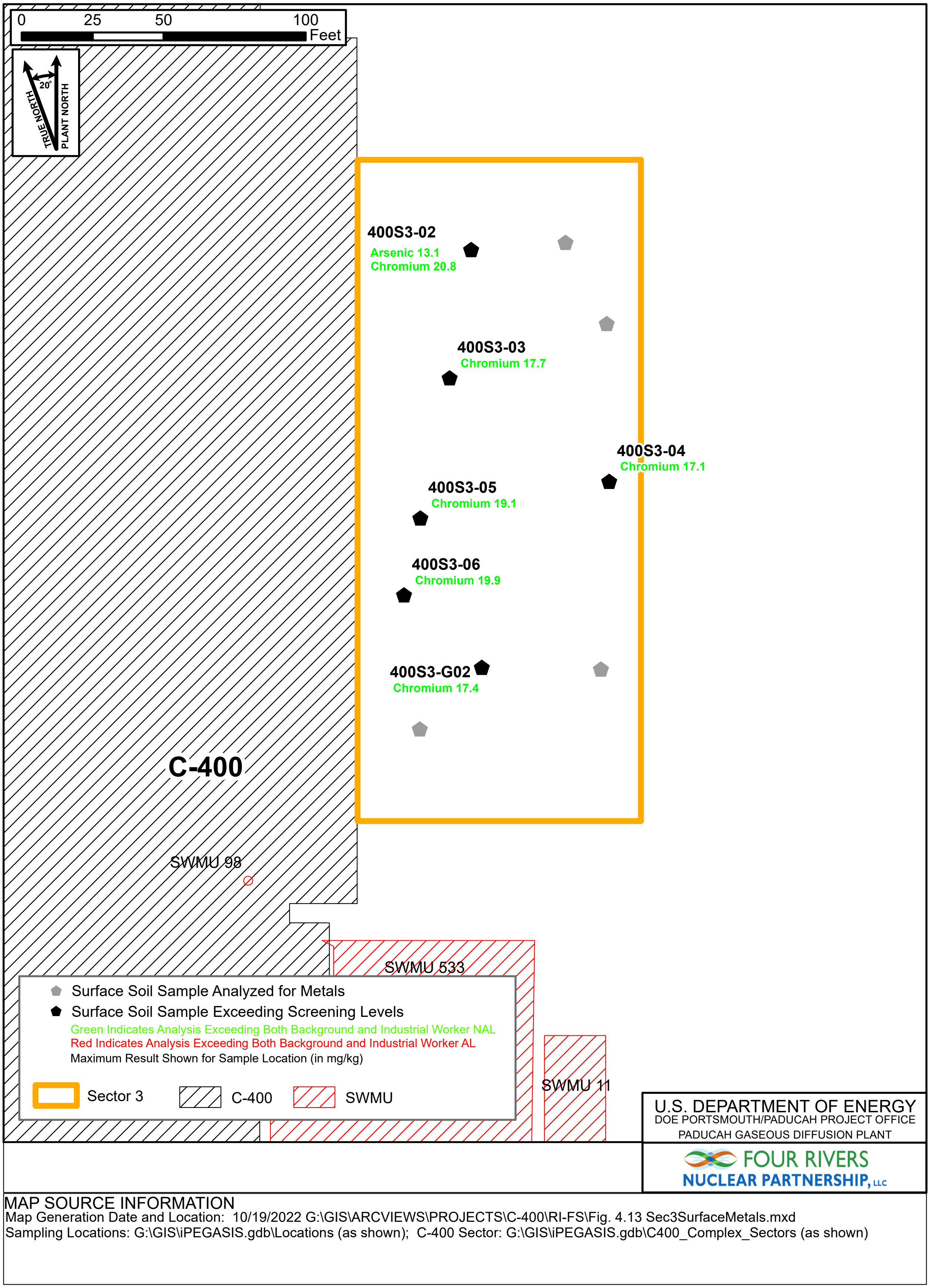


Figure 4.13. Sector 3 Surface Soil Sampling Exceeding Screening Levels for Metals

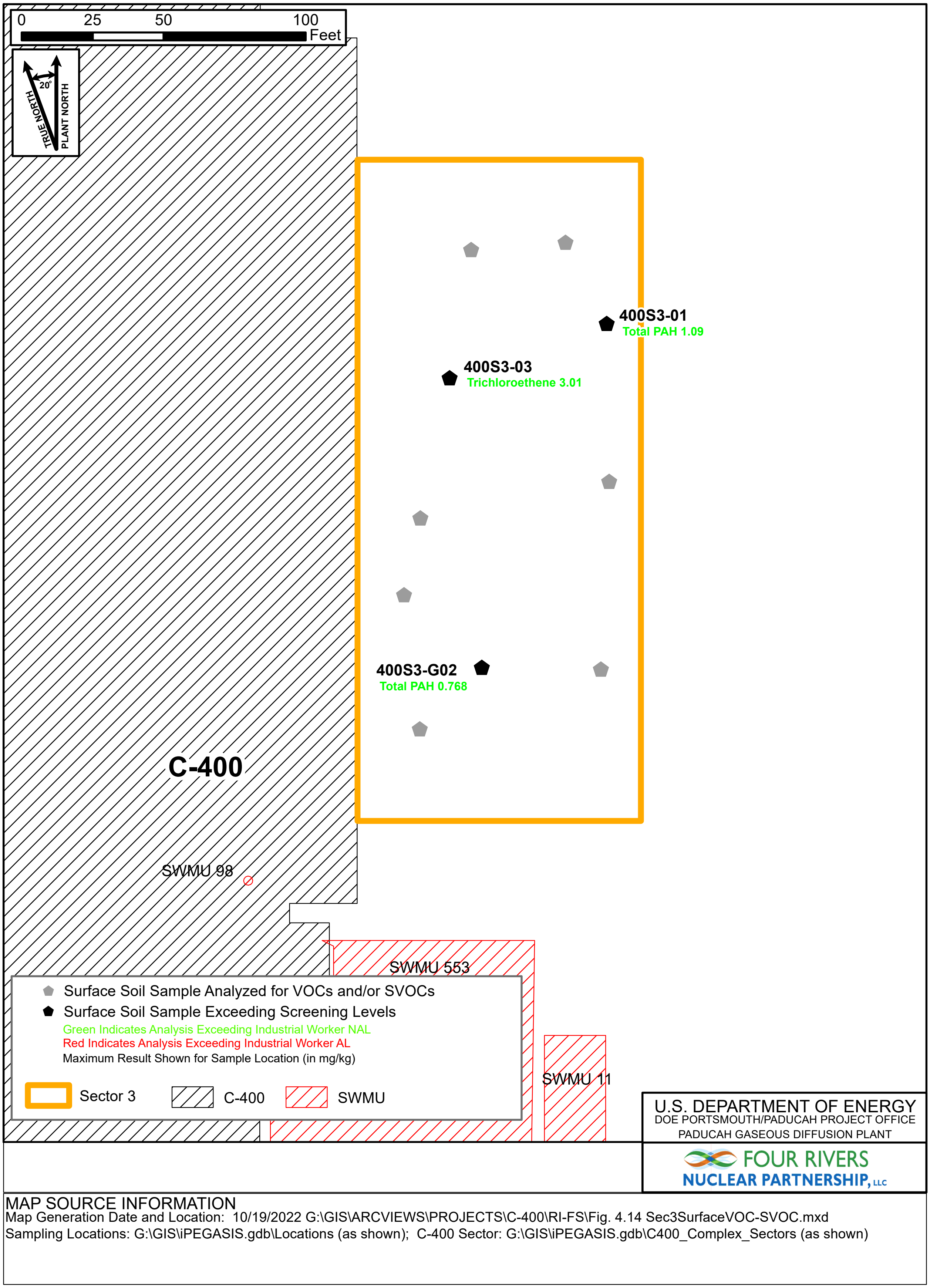


Figure 4.14. Sector 3 Surface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

VOCs

A few VOCs were detected in Sector 3 surface soil with TCE at 1 out of 11 sample locations (3.01 mg/kg) exceeding the industrial worker NAL. Figure 4.14 shows the location where TCE exceeded the industrial worker NAL. *cis*-1,2-dichloroethene and TCE were detected in Sector 3 surface soil at concentrations above the SSLs for the protection of groundwater for both the DAF of 1 and the DAF of 20.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 3 surface soil include uranium-235/236 and uranium-238 (Figure 4.15). Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include plutonium-239/240, technetium-99*, thorium-230, uranium-233/234*, uranium-235/236*, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs).

4.3.3.3 Nature and extent of contamination—surface and subsurface soils

A summary of the analytical results for Sector 3 surface and subsurface soil including the screening results are provided in Tables 4.15 through 4.18. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, cobalt, manganese, thallium, and uranium. The metals most frequently detected above its background values and excavation worker NALs in Sector 3 soil are chromium and uranium. Figure 4.16 shows the areal distribution of locations where metals exceeded both background and the excavation worker NALs.

Metals that were detected in the Sector 3 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 include aluminum, antimony*, arsenic*, barium, cobalt*, manganese*, nickel, selenium*, thallium*, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA) the metals exceeding both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 are aluminum, antimony*, arsenic*, barium*, beryllium, cobalt*, iron*, manganese*, selenium*, silver*, and vanadium (metals with an asterisk also exceeded the DAF of 20 SSLs).

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater for a DAF of 1 only. Metals that exceeded these SSLs included aluminum, antimony, arsenic, barium, boron, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, uranium, vanadium, and zinc.

PCBs

Total PCBs were detected in 2 of 9 samples in Sector 3 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs horizon, 0.00569 mg/kg, did not exceed the excavation worker NAL nor the SSL for the protection of groundwater for a DAF of 1. There were 2 out of 40 samples with detected results of Total PCBs (with a maximum of 0.00465 mg/kg) in the deep soil interval (16 ft bgs to the bottom of the RGA) but the results did not exceed any of the screening criteria.

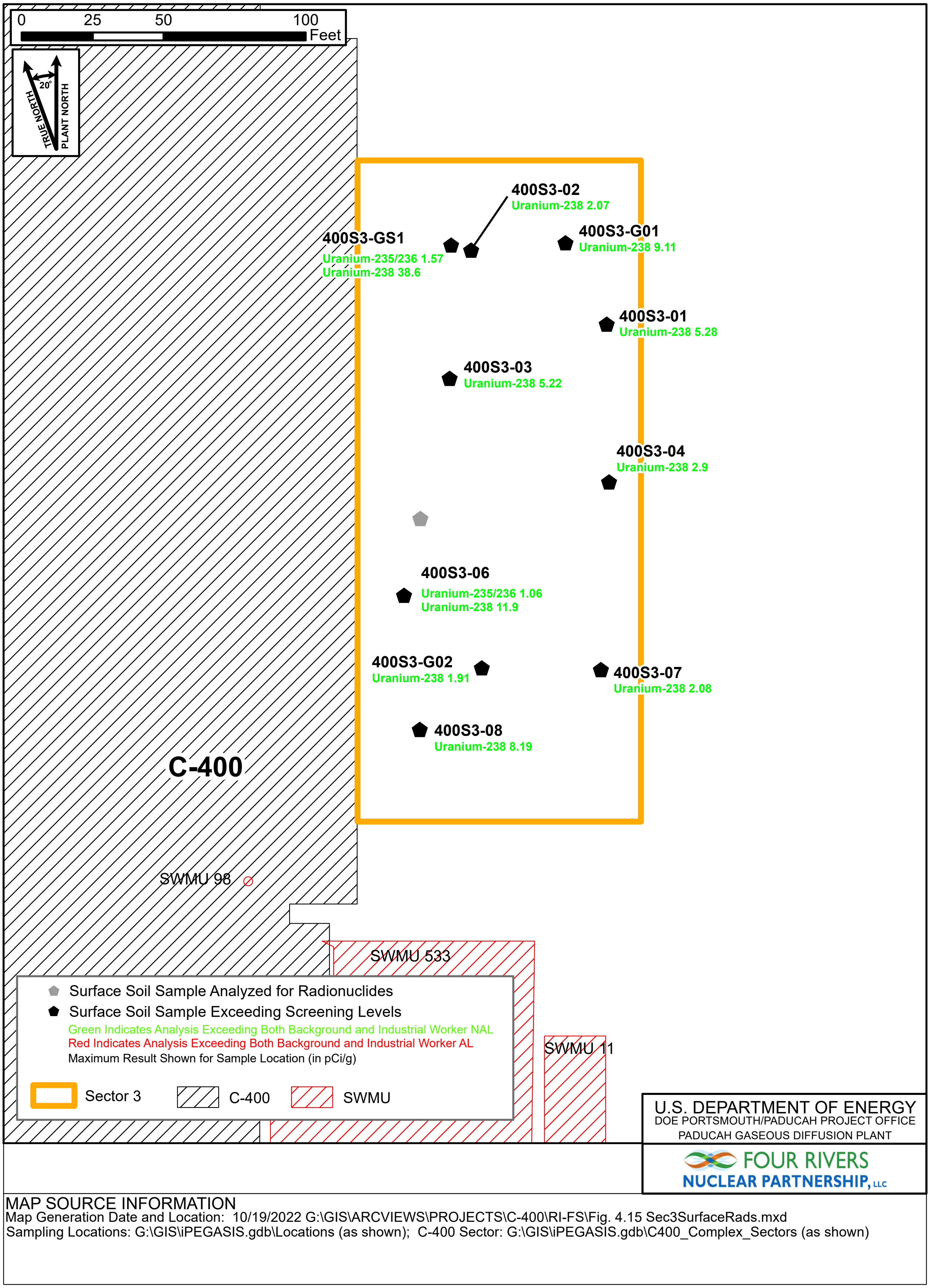


Figure 4.15. Sector 3 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

Table 4.15. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 3

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	4.44E+03	1.97E+04	1.27E+04	24/24	15/24	1.20E+04	0/24	3.26E+04	0/24	1.00E+05	10.2 - 1130
METAL	Antimony	mg/kg	6.86E-01	2.10E+00	1.21E+00	8/24	8/24	2.10E-01	0/24	1.32E+01	0/24	3.96E+02	1.96 - 2.41
METAL	Arsenic	mg/kg	2.47E+00	1.31E+01	6.09E+00	24/24	7/24	7.90E+00	19/24	3.74E+00	0/24	3.60E+02	1.01 - 1.28
METAL	Barium	mg/kg	2.92E+01	2.64E+02	1.13E+02	24/24	5/24	1.70E+02	0/24	6.47E+03	0/24	1.00E+05	0.806 - 90.8
METAL	Beryllium	mg/kg	1.83E-01	9.95E-01	4.82E-01	24/24	4/24	6.70E-01	0/24	6.55E+01	0/24	1.97E+03	0.101 - 0.128
METAL	Boron	mg/kg	1.11E+00	5.93E+00	3.22E+00	24/24	N/A	N/A	0/24	6.57E+03	0/24	1.00E+05	3.02 - 3.84
METAL	Cadmium	mg/kg	2.62E-02	3.49E-01	9.97E-02	19/24	2/24	2.10E-01	0/24	2.53E+01	0/24	7.59E+02	0.202 - 0.256
METAL	Chromium	mg/kg	1.03E+01	2.46E+01	1.74E+01	24/24	17/24	1.60E+01	24/24	9.14E+00	0/24	9.14E+02	0.605 - 0.768
METAL	Cobalt	mg/kg	2.26E+00	2.71E+01	8.12E+00	24/24	3/24	1.30E+01	4/24	9.84E+00	0/24	2.95E+02	0.202 - 0.256
METAL	Copper	mg/kg	3.49E+00	1.78E+01	1.11E+01	24/24	0/24	1.90E+01	0/24	1.32E+03	0/24	3.96E+04	0.403 - 0.512
METAL	Iron	mg/kg	5.71E+03	2.51E+04	1.69E+04	24/24	0/24	2.80E+04	3/24	2.30E+04	0/24	1.00E+05	20.3 - 2270
METAL	Lead	mg/kg	5.33E+00	1.61E+01	1.06E+01	24/24	0/24	2.30E+01	0/24	8.00E+02	0/24	8.00E+02	0.403 - 0.512
METAL	Manganese	mg/kg	9.83E+01	3.11E+03	5.69E+02	24/24	4/24	8.20E+02	4/24	7.74E+02	0/24	2.32E+04	1.02 - 113
METAL	Mercury	mg/kg	1.04E-02	1.06E-01	2.97E-02	19/24	0/24	1.30E-01	0/24	9.86E+00	0/24	2.96E+02	0.0225 - 0.0304
METAL	Molybdenum	mg/kg	1.95E-01	8.65E-01	5.53E-01	24/24	N/A	N/A	0/24	1.64E+02	0/24	4.92E+03	0.202 - 0.256
METAL	Nickel	mg/kg	4.10E+00	2.60E+01	1.32E+01	24/24	4/24	2.10E+01	0/24	6.52E+02	0/24	1.96E+04	0.403 - 0.512
METAL	Selenium	mg/kg	5.76E-01	3.02E+00	1.30E+00	24/24	21/24	7.00E-01	0/24	1.64E+02	0/24	4.92E+03	1.01 - 1.28
METAL	Silver	mg/kg	3.43E-01	4.43E-01	3.88E-01	3/24	0/24	2.30E+00	0/24	1.64E+02	0/24	4.92E+03	0.531 - 5.54
METAL	Thallium	mg/kg	1.70E-01	4.00E-01	2.18E-01	15/24	6/24	2.10E-01	1/24	3.29E-01	0/24	9.87E+00	0.403 - 0.512
METAL	Uranium[a]	mg/kg	5.57E-01	2.97E+01	5.28E+00	24/24	9/24	4.60E+00	8/24	6.58E+00	0/24	1.97E+02	0.0403 - 0.0512
METAL	Vanadium	mg/kg	1.27E+01	3.69E+01	2.72E+01	24/24	0/24	3.70E+01	0/24	1.65E+02	0/24	4.95E+03	4.03 - 5.12
METAL	Zinc	mg/kg	1.27E+01	2.39E+02	5.33E+01	24/24	6/24	6.00E+01	0/24	9.86E+03	0/24	1.00E+05	4.03 - 5.12
ANION	Fluoride	mg/kg	2.34E+00	5.24E+01	1.52E+01	24/24	N/A	N/A	0/24	1.32E+03	0/24	3.96E+04	1.06 - 1.27
DI/FURA	Total Dioxin/Furans[b]	mg/kg	2.42E-06	3.33E-06	2.88E-06	2/2	N/A	N/A	0/2	1.89E-05	0/2	5.67E-04	-
PPCB	Total PCB[c]	mg/kg	1.69E-03	1.98E-01	5.02E-02	12/20	N/A	N/A	0/20	1.12E+00	0/20	1.12E+02	0.00364 - 0.0364
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.69E+01	0/20	8.07E+02	0.36 - 7.36
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.90E+03	0/20	5.70E+04	0.36 - 7.36
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.90E+01	0/20	5.70E+02	0.36 - 7.36
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.69E+01	0/20	1.71E+03	0.36 - 7.36
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+02	0/20	1.14E+04	0.36 - 7.36
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+01	0/20	1.14E+03	0.72 - 14.7
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	8.49E+00	0/20	8.49E+02	0.36 - 7.36
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.78E+00	0/20	1.71E+02	0.36 - 7.36
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.35E+03	0/20	4.05E+04	0.036 - 0.736
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.64E+02	0/20	4.92E+03	0.36 - 7.36
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.52E+00	0/20	4.56E+01	0.36 - 7.36
SVOC	2-Methylnaphthalene	mg/kg	7.00E-02	7.13E-02	7.07E-02	2/20	N/A	N/A	0/20	6.73E+01	0/20	2.02E+03	0.036 - 0.736
SVOC	2-Methylphenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.48E+02	0/20	2.84E+04	0.36 - 7.36
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.89E+02	0/20	5.67E+03	0.36 - 7.36
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+01	0/20	1.14E+03	0.36 - 7.36
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.90E+00	0/20	5.90E+02	0.36 - 7.36
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.69E+00	0/20	1.71E+02	0.36 - 7.36
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.91E+01	0/20	5.73E+02	0.36 - 7.36
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.90E+03	0/20	5.70E+04	0.36 - 7.36
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.48E+00	0/20	2.84E+02	0.36 - 7.36

Table 4.15. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.91E+01	0/20	5.73E+02	0.36 - 7.36
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+01	0/20	1.14E+03	0.36 - 7.36
SVOC	Acenaphthene	mg/kg	2.33E-02	3.40E-01	1.82E-01	2/20	N/A	N/A	0/20	1.01E+03	0/20	3.03E+04	0.036 - 0.736
SVOC	Acenaphthylene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.01E+03	0/20	3.03E+04	0.036 - 0.736
SVOC	Acetophenone	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.29E+03	0/20	9.87E+04	0.36 - 7.36
SVOC	Anthracene	mg/kg	4.17E-02	5.05E-01	1.83E-01	4/20	N/A	N/A	0/20	5.05E+03	0/20	1.00E+05	0.036 - 0.736
SVOC	Atrazine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.15E+01	0/20	1.15E+03	0.36 - 7.36
SVOC	Benzaldehyde	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.15E+03	0/20	9.87E+04	0.36 - 7.36
SVOC	Benzo(ghi)perylene	mg/kg	1.66E-02	3.79E-01	1.22E-01	8/20	N/A	N/A	0/20	5.05E+02	0/20	1.52E+04	0.036 - 0.736
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.69E+01	0/20	1.71E+03	0.36 - 7.36
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.01E+00	0/20	3.01E+02	0.36 - 7.36
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/20	N/A	N/A	0/20	6.58E+01	0/20	6.58E+03	0.36 - 7.36
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.23E-02	1.23E-02	1.23E-02	1/20	N/A	N/A	0/20	1.90E+02	0/20	1.14E+04	0.036 - 0.736
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.40E+03	0/20	1.14E+05	0.036 - 0.736
SVOC	Caprolactam	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.43E+03	0/20	2.83E+05	0.36 - 7.36
SVOC	Carbazole	mg/kg	2.41E-02	2.49E-01	1.17E-01	3/20	N/A	N/A	0/20	1.33E+02	0/20	1.33E+04	0.036 - 0.736
SVOC	Dibenzofuran	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.29E+01	0/20	9.87E+02	0.36 - 7.36
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.52E+04	0/20	4.56E+05	0.036 - 0.736
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.52E+04	0/20	4.56E+05	0.036 - 0.736
SVOC	Di-n-butyl phthalate	mg/kg	1.43E-02	1.89E-02	1.71E-02	3/20	N/A	N/A	0/20	1.90E+03	0/20	5.70E+04	0.036 - 0.736
SVOC	Di-n-octylphthalate	mg/kg	1.28E-02	5.96E-02	3.62E-02	2/20	N/A	N/A	0/20	1.90E+02	0/20	5.70E+03	0.036 - 0.736
SVOC	Diphenylamine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.90E+03	0/20	5.70E+04	0.36 - 7.36
SVOC	Fluoranthene	mg/kg	1.22E-02	3.99E+00	6.29E-01	15/20	N/A	N/A	0/20	6.73E+02	0/20	2.02E+04	0.036 - 0.736
SVOC	Fluorene	mg/kg	1.80E-02	2.80E-01	1.49E-01	2/20	N/A	N/A	0/20	6.73E+02	0/20	2.02E+04	0.036 - 0.736
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.33E+00	0/20	2.33E+02	0.36 - 7.36
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.41E+01	0/20	9.87E+02	0.36 - 7.36
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.00E+00	0/20	3.00E+01	0.36 - 7.36
SVOC	Hexachloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.98E+01	0/20	5.94E+02	0.36 - 7.36
SVOC	Isophorone	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.79E+03	0/20	1.14E+05	0.36 - 7.36
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+02	0/20	1.14E+04	0.36 - 7.36
SVOC	Naphthalene	mg/kg	1.66E-02	2.78E-01	1.47E-01	2/20	N/A	N/A	0/20	1.67E+01	0/20	1.67E+03	0.036 - 0.736
SVOC	Nitrobenzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.63E+01	0/20	1.69E+03	0.36 - 7.36
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E-01	0/20	3.79E+01	0.36 - 7.36
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.06E+00	0/20	4.06E+02	0.36 - 7.36
SVOC	Phenanthrene	mg/kg	1.25E-02	2.13E+00	3.71E-01	14/20	N/A	N/A	0/20	1.01E+03	0/20	3.03E+04	0.036 - 0.736
SVOC	Phenol	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.69E+03	0/20	1.71E+05	0.36 - 7.36
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/20	N/A	N/A	0/20	7.58E+01	0/20	2.27E+03	0.36 - 7.36
SVOC	Pyrene	mg/kg	1.77E-02	3.62E+00	5.44E-01	14/20	N/A	N/A	0/20	5.05E+02	0/20	1.52E+04	0.036 - 0.736
SVOC	Total PAH[d]	mg/kg	1.95E-02	1.21E+00	2.81E-01	14/20	N/A	N/A	0/20	2.35E+00	0/20	1.51E+02	-
RADS	Americium-241	pCi/g	--	--	--	0/25	N/A	N/A	0/25	1.64E+01	0/25	1.64E+03	0.277 - 0.936
RADS	Cesium-137	pCi/g	5.37E-02	1.57E-01	1.00E-01	6/25	0/25	2.80E-01	0/25	5.82E-01	0/25	5.82E+01	0.0349 - 0.0946
RADS	Neptunium-237	pCi/g	--	--	--	0/25	0/25	1.00E-01	0/25	1.63E+00	0/25	1.63E+02	0.432 - 1.01
RADS	Plutonium-238	pCi/g	--	--	--	0/25	0/25	7.30E-02	0/25	1.94E+01	0/25	1.94E+03	0.228 - 0.991
RADS	Plutonium-239/240	pCi/g	1.05E+00	1.05E+00	1.05E+00	1/25	1/25	2.50E-02	0/25	1.83E+01	0/25	1.83E+03	0.317 - 0.894
RADS	Technetium-99	pCi/g	3.92E+00	1.96E+01	9.91E+00	3/25	3/25	2.50E+00	0/25	1.55E+03	0/25	1.00E+05	2.28 - 3.97

Table 4.15. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 3 (Continued)

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
RADS	Thorium-230	pCi/g	5.50E-01	2.24E+00	1.24E+00	23/25	6/25	1.40E+00	0/25	2.82E+01	0/25	2.82E+03	0.51 - 1.33
RADS	Uranium-233/234	pCi/g	6.54E-01	3.58E+01	4.48E+00	21/25	15/25	1.20E+00	0/25	4.30E+01	0/25	4.30E+03	0.425 - 1.02
RADS	Uranium-235/236	pCi/g	1.06E+00	1.57E+00	1.32E+00	2/25	2/25	6.00E-02	0/25	2.62E+00	0/25	2.62E+02	0.292 - 0.699
RADS	Uranium-238	pCi/g	6.77E-01	3.86E+01	4.75E+00	23/25	17/25	1.20E+00	3/25	8.98E+00	0/25	8.98E+02	0.264 - 0.777
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.54E+03	0/20	1.00E+05	0.000933 - 0.107
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.11E+01	0/20	1.11E+03	0.000933 - 0.107
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.79E+03	0/20	1.00E+05	0.00466 - 0.535
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	8.49E-01	0/20	2.55E+01	0.000933 - 0.107
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.52E+01	0/20	9.52E+03	0.000933 - 0.107
VOC	1,1-Dichloroethene	mg/kg	1.45E-03	1.45E-03	1.45E-03	1/20	N/A	N/A	0/20	1.26E+02	0/20	3.78E+03	0.000933 - 0.107
VOC	1,2,3-Trichlorobenzene	mg/kg	1.63E-03	1.63E-03	1.63E-03	1/20	N/A	N/A	0/20	2.63E+01	0/20	7.89E+02	0.000933 - 0.107
VOC	1,2,4-Trichlorobenzene	mg/kg	1.17E-03	1.17E-03	1.17E-03	1/20	N/A	N/A	0/20	3.20E+01	0/20	9.60E+02	0.000933 - 0.107
VOC	1,2-Dibromo-3-chloropropane	mg/kg	6.61E-04	6.61E-04	6.61E-04	1/20	N/A	N/A	0/20	4.10E-01	0/20	4.10E+01	0.000933 - 0.107
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	7.86E-01	0/20	7.86E+01	0.000933 - 0.107
VOC	1,2-Dichlorobenzene	mg/kg	6.07E-04	6.07E-04	6.07E-04	1/20	N/A	N/A	0/20	9.43E+02	0/20	2.83E+04	0.000933 - 0.107
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.13E+01	0/20	5.19E+02	0.000933 - 0.107
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	8.91E+00	0/20	2.67E+02	0.000933 - 0.107
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.61E+02	0/20	1.08E+04	0.000933 - 0.107
VOC	1,3-Dichlorobenzene	mg/kg	4.66E-04	4.66E-04	4.66E-04	1/20	N/A	N/A	0/20	9.43E+02	0/20	2.83E+04	0.000933 - 0.107
VOC	1,4-Dichlorobenzene	mg/kg	5.96E-04	5.96E-04	5.96E-04	1/20	N/A	N/A	0/20	7.20E+01	0/20	7.20E+03	0.000933 - 0.107
VOC	1,4-Dioxane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.30E+01	0/20	4.30E+03	0.0466 - 5.35
VOC	2-Butanone	mg/kg	4.62E-03	1.99E-01	4.79E-02	5/20	N/A	N/A	0/20	1.28E+04	0/20	3.84E+05	0.00466 - 0.535
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.80E-01	0/20	4.80E+01	0.00466 - 0.535
VOC	2-Hexanone	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.69E+01	0/20	2.91E+03	0.00466 - 0.535
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	9.70E+02	0/20	9.70E+04	0.000933 - 0.107
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.31E+03	0/20	6.93E+04	0.00466 - 0.535
VOC	Acetone	mg/kg	1.77E-03	7.41E-02	1.82E-02	13/20	N/A	N/A	0/20	2.96E+04	0/20	8.88E+05	0.00466 - 0.535
VOC	Acrolein	mg/kg	--	--	--	0/20	N/A	N/A	0/20	8.14E-02	0/20	2.44E+00	0.00466 - 0.535
VOC	Acrylonitrile	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.46E+00	0/20	2.71E+02	0.00466 - 0.535
VOC	Benzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.59E+01	0/20	1.28E+03	0.000933 - 0.107
VOC	Bromochloromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	8.48E+01	0/20	2.54E+03	0.000933 - 0.107
VOC	Bromodichloromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	7.93E+00	0/20	7.93E+02	0.000933 - 0.107
VOC	Bromoform	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.24E+02	0/20	1.97E+04	0.000933 - 0.107
VOC	Bromomethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.80E+00	0/20	1.14E+02	0.000933 - 0.107
VOC	Carbon disulfide	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.21E+02	0/20	1.26E+04	0.00466 - 0.535
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.57E+01	0/20	1.57E+03	0.000933 - 0.107
VOC	Chlorobenzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.48E+02	0/20	4.44E+03	0.000933 - 0.107
VOC	Chloroethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.07E+03	0/20	9.21E+04	0.000933 - 0.107
VOC	Chloroform	mg/kg	5.14E-04	5.14E-04	5.14E-04	1/20	N/A	N/A	0/20	8.90E+00	0/20	8.90E+02	0.000933 - 0.107
VOC	Chloromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	6.26E+01	0/20	1.88E+03	0.000933 - 0.107
VOC	*cis* -1,2-Dichloroethene	mg/kg	5.02E-04	7.66E-02	2.04E-02	7/20	N/A	N/A	0/20	6.58E+01	0/20	1.97E+03	0.000933 - 0.107
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.83E+01	0/20	1.21E+03	0.000933 - 0.107
VOC	Cumene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.02E+03	0/20	3.06E+04	0.000933 - 0.107
VOC	Cyclohexane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.70E+03	0/20	1.11E+05	0.000933 - 0.107
VOC	Dibromochloromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	5.48E+01	0/20	5.48E+03	0.000933 - 0.107

Table 4.15. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.94E+01	0/20	1.48E+03	0.000933 - 0.107
VOC	Ethylbenzene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	1.30E+02	0/20	1.30E+04	0.000933 - 0.107
VOC	m,p-Xylene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.23E+02	0/20	9.69E+03	0.00187 - 0.214
VOC	Methyl acetate	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.29E+04	0/20	9.87E+05	0.00466 - 0.535
VOC	Methylcyclohexane	mg/kg	4.17E-04	4.17E-04	4.17E-04	1/20	N/A	N/A	0/20	1.76E+03	0/20	5.28E+04	0.000933 - 0.107
VOC	Methylene chloride	mg/kg	2.00E-03	3.73E-03	2.65E-03	6/20	N/A	N/A	0/20	1.57E+02	0/20	4.71E+03	0.00466 - 0.535
VOC	Styrene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.00E+03	0/20	9.00E+04	0.000933 - 0.107
VOC	Tetrachloroethene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.34E+01	0/20	1.30E+03	0.000933 - 0.107
VOC	Toluene	mg/kg	3.71E-04	8.23E-04	6.11E-04	5/20	N/A	N/A	0/20	2.18E+03	0/20	6.54E+04	0.000933 - 0.107
VOC	Total Xylene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	3.23E+02	0/20	9.69E+03	0.0028 - 0.321
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.50E-04	2.56E-03	1.36E-03	3/20	N/A	N/A	0/20	5.67E+01	0/20	1.70E+03	0.000933 - 0.107
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	N/A	N/A	0/20	2.83E+01	0/20	1.21E+03	0.000933 - 0.107
VOC	Trichloroethene	mg/kg	5.93E-04	3.01E+00	2.93E-01	12/20	N/A	N/A	1/20	2.26E+00	0/20	6.78E+01	0.000933 - 0.112
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.11E+02	0/20	1.23E+04	0.000933 - 0.107
VOC	Vinyl chloride	mg/kg	--	--	--	0/20	N/A	N/A	0/20	4.72E+00	0/20	4.72E+02	0.000933 - 0.107

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.16. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 3

Type	Analysis	Unit	Detected Results			Freq. of Detect.	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	1.04E+04	1.97E+04	1.44E+04	12/12	10/12	1.20E+04	0/12	5.99E+04	12/12	3.00E+03	11.3 - 1130
METAL	Antimony	mg/kg	7.00E-01	1.67E+00	1.19E+00	2/12	2/12	2.10E-01	1/12	7.04E-01	2/12	3.52E-02	2.16 - 2.41
METAL	Arsenic	mg/kg	2.47E+00	8.82E+00	5.84E+00	12/12	4/12	7.90E+00	12/12	3.02E-02	12/12	1.51E-03	1.09 - 1.28
METAL	Barium	mg/kg	6.50E+01	2.64E+02	1.42E+02	12/12	5/12	1.70E+02	0/12	3.11E+02	12/12	1.55E+01	0.872 - 90.8
METAL	Beryllium	mg/kg	2.21E-01	9.95E-01	5.61E-01	12/12	4/12	6.90E-01	0/12	3.89E+01	0/12	1.95E+00	0.109 - 0.128
METAL	Boron	mg/kg	1.26E+00	5.05E+00	2.56E+00	12/12	N/A	N/A	0/12	2.56E+01	10/12	1.28E+00	3.27 - 3.84
METAL	Cadmium	mg/kg	2.62E-02	8.90E-02	5.15E-02	9/12	0/12	2.10E-01	0/12	1.39E+00	2/12	6.93E-02	0.218 - 0.256
METAL	Chromium	mg/kg	1.15E+01	2.46E+01	1.84E+01	12/12	0/12	4.30E+01	0/12	3.60E+06	0/12	1.80E+05	0.654 - 0.768
METAL	Cobalt	mg/kg	2.32E+00	2.71E+01	1.06E+01	12/12	3/12	1.30E+01	12/12	5.43E-01	12/12	2.71E-02	0.218 - 0.256
METAL	Copper	mg/kg	6.02E+00	1.78E+01	1.10E+01	12/12	0/12	2.50E+01	0/12	5.62E+01	12/12	2.81E+00	0.436 - 0.512
METAL	Iron	mg/kg	1.20E+04	2.51E+04	1.78E+04	12/12	0/12	2.80E+04	12/12	7.04E+02	12/12	3.52E+01	24.1 - 2270
METAL	Lead	mg/kg	6.06E+00	1.42E+01	1.01E+01	12/12	0/12	2.30E+01	0/12	2.70E+02	1/12	1.35E+01	0.436 - 0.512
METAL	Manganese	mg/kg	9.83E+01	3.11E+03	7.73E+02	12/12	4/12	8.20E+02	12/12	5.65E+01	12/12	2.83E+00	1.2 - 113
METAL	Mercury	mg/kg	1.06E-02	1.06E-01	3.43E-02	8/12	0/12	1.30E-01	0/12	5.91E-01	3/12	2.95E-02	0.0233 - 0.0304
METAL	Molybdenum	mg/kg	1.95E-01	7.76E-01	5.11E-01	12/12	N/A	N/A	0/12	4.03E+00	11/12	2.02E-01	0.218 - 0.256
METAL	Nickel	mg/kg	6.76E+00	2.60E+01	1.48E+01	12/12	3/12	2.20E+01	0/12	5.12E+01	12/12	2.56E+00	0.436 - 0.512
METAL	Selenium	mg/kg	5.97E-01	3.02E+00	1.64E+00	12/12	11/12	7.00E-01	9/12	1.04E+00	12/12	5.19E-02	1.09 - 1.28
METAL	Silver	mg/kg	3.79E-01	3.79E-01	3.79E-01	1/12	0/12	2.70E+00	0/12	1.60E+00	1/12	7.99E-02	0.54 - 5.54
METAL	Thallium	mg/kg	1.70E-01	4.00E-01	2.33E-01	8/12	1/12	3.40E-01	8/12	2.84E-02	8/12	1.42E-03	0.436 - 0.512
METAL	Uranium[a]	mg/kg	5.57E-01	3.58E+00	1.25E+00	12/12	0/12	4.60E+00	0/12	3.60E+00	12/12	1.80E-01	0.0436 - 0.0512
METAL	Vanadium	mg/kg	2.12E+01	3.49E+01	2.84E+01	12/12	0/12	3.70E+01	0/12	1.73E+02	12/12	8.64E+00	4.36 - 5.12
METAL	Zinc	mg/kg	1.60E+01	7.31E+01	3.87E+01	12/12	3/12	6.00E+01	0/12	7.46E+02	5/12	3.73E+01	4.36 - 5.12
ANION	Fluoride	mg/kg	2.34E+00	1.71E+01	1.00E+01	12/12	N/A	N/A	0/12	2.40E+02	6/12	1.20E+01	1.14 - 1.27
DI/FURA	Total Dioxin/Furans[b]	mg/kg	2.42E-06	2.42E-06	2.42E-06	1/1	N/A	N/A	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	2.32E-03	5.69E-03	4.01E-03	2/9	N/A	N/A	0/9	1.36E-01	0/9	6.82E-03	0.00377 - 0.00413
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.74E-02	0/9	8.72E-04	0.381 - 2.06
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.04E+00	0/9	4.02E-01	0.381 - 2.06
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.32E-02	0/9	1.16E-03	0.381 - 2.06
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.52E-02	0/9	2.26E-03	0.381 - 2.06
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.42E-01	0/9	4.21E-02	0.381 - 2.06
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.72E-02	0/9	4.36E-03	0.761 - 4.12
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.42E-03	0/9	3.21E-04	0.381 - 2.06
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.33E-03	0/9	6.67E-05	0.381 - 2.06
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.70E+00	0/9	3.85E-01	0.0381 - 0.206
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.78E-01	0/9	8.91E-03	0.381 - 2.06
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.16E-03	0/9	2.58E-04	0.381 - 2.06
SVOC	2-Methylnaphthalene	mg/kg	7.00E-02	7.13E-02	7.07E-02	2/9	N/A	N/A	0/9	3.70E-01	2/9	1.85E-02	0.0381 - 0.206
SVOC	2-Methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.51E+00	0/9	7.53E-02	0.381 - 2.06
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.60E-01	0/9	8.01E-03	0.381 - 2.06
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.72E-02	0/9	4.36E-03	0.381 - 2.06
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.65E-02	0/9	8.24E-04	0.381 - 2.06
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.90E-03	0/9	2.45E-04	0.381 - 2.06
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.84E-03	0/9	3.42E-04	0.381 - 2.06
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.42E+00	0/9	1.71E-01	0.381 - 2.06
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.10E-03	0/9	1.55E-04	0.381 - 2.06

Table 4.16. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.84E-03	0/9	3.42E-04	0.381 - 2.06
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.72E-02	0/9	4.36E-03	0.381 - 2.06
SVOC	Acenaphthene	mg/kg	2.33E-02	3.40E-01	1.82E-01	2/9	N/A	N/A	0/9	1.10E+01	0/9	5.49E-01	0.0381 - 0.206
SVOC	Acenaphthylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.10E+01	0/9	5.49E-01	0.0381 - 0.206
SVOC	Acetophenone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.17E+00	0/9	5.84E-02	0.381 - 2.06
SVOC	Anthracene	mg/kg	4.17E-02	5.05E-01	2.73E-01	2/9	N/A	N/A	0/9	1.16E+02	0/9	5.81E+00	0.0381 - 0.206
SVOC	Atrazine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.92E-03	0/9	1.96E-04	0.381 - 2.06
SVOC	Benzaldehyde	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.30E-02	0/9	4.15E-03	0.381 - 2.06
SVOC	Benzo(ghi)perylene	mg/kg	1.05E-01	3.79E-01	2.42E-01	2/9	N/A	N/A	0/9	2.63E+01	0/9	1.32E+00	0.0381 - 0.206
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.70E-02	0/9	1.35E-03	0.381 - 2.06
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.22E-05	0/9	3.61E-06	0.381 - 2.06
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.62E-03	0/9	1.31E-04	0.381 - 2.06
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.23E-02	1.23E-02	1.23E-02	1/9	N/A	N/A	0/9	2.66E+01	0/9	1.33E+00	0.0381 - 0.206
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.72E+00	0/9	2.36E-01	0.0381 - 0.206
SVOC	Caprolactam	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.94E+00	0/9	2.47E-01	0.381 - 2.06
SVOC	Carbazole	mg/kg	2.41E-02	2.49E-01	1.37E-01	2/9	N/A	N/A	0/9	7.51E-01	1/9	3.76E-02	0.0381 - 0.206
SVOC	Dibenzofuran	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.92E-01	0/9	1.46E-02	0.381 - 2.06
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.22E+01	0/9	6.08E-01	0.0381 - 0.206
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.22E+01	0/9	6.08E-01	0.0381 - 0.206
SVOC	Di-n-butyl phthalate	mg/kg	1.89E-02	1.89E-02	1.89E-02	1/9	N/A	N/A	0/9	4.54E+00	0/9	2.27E-01	0.0381 - 0.206
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.13E+02	0/9	5.65E+00	0.0381 - 0.206
SVOC	Diphenylamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.66E+00	0/9	2.33E-01	0.381 - 2.06
SVOC	Fluoranthene	mg/kg	3.01E-02	2.84E+00	7.95E-01	4/9	N/A	N/A	0/9	1.78E+02	0/9	8.91E+00	0.0381 - 0.206
SVOC	Fluorene	mg/kg	1.80E-02	2.80E-01	1.49E-01	2/9	N/A	N/A	0/9	1.09E+01	0/9	5.45E-01	0.0381 - 0.206
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.46E-03	0/9	1.23E-04	0.381 - 2.06
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.34E-03	0/9	2.67E-04	0.381 - 2.06
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.56E-03	0/9	1.28E-04	0.381 - 2.06
SVOC	Hexachloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.00E-03	0/9	2.00E-04	0.381 - 2.06
SVOC	Isophorone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.16E-01	0/9	2.58E-02	0.381 - 2.06
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.94E-01	0/9	2.97E-02	0.381 - 2.06
SVOC	Naphthalene	mg/kg	1.66E-02	2.78E-01	1.47E-01	2/9	N/A	N/A	2/9	7.70E-03	2/9	3.85E-04	0.0381 - 0.206
SVOC	Nitrobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.83E-03	0/9	9.17E-05	0.381 - 2.06
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.62E-04	0/9	8.10E-06	0.381 - 2.06
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.14E-03	0/9	5.71E-05	0.381 - 2.06
SVOC	Phenanthrene	mg/kg	1.33E-02	2.13E+00	5.86E-01	4/9	N/A	N/A	0/9	1.10E+01	1/9	5.49E-01	0.0381 - 0.206
SVOC	Phenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.62E+00	0/9	3.31E-01	0.381 - 2.06
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.16E-02	0/9	1.58E-03	0.381 - 2.06
SVOC	Pyrene	mg/kg	2.74E-02	1.87E+00	5.50E-01	4/9	N/A	N/A	0/9	2.63E+01	1/9	1.32E+00	0.0381 - 0.206
SVOC	Total PAH[d]	mg/kg	2.09E-02	1.21E+00	3.74E-01	4/9	N/A	N/A	1/9	5.89E-01	2/9	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/12	N/A	N/A	0/12	1.92E+01	0/12	9.58E-01	0.341 - 0.676
RADS	Cesium-137	pCi/g	--	--	--	0/12	0/12	2.80E-01	0/12	9.58E+00	0/12	4.79E-01	0.0349 - 0.0946
RADS	Neptunium-237	pCi/g	--	--	--	0/12	N/A	N/A	0/12	1.07E+00	0/12	5.36E-02	0.486 - 0.84
RADS	Plutonium-238	pCi/g	--	--	--	0/12	N/A	N/A	0/12	4.38E+00	0/12	2.19E-01	0.228 - 0.991
RADS	Plutonium-239/240	pCi/g	--	--	--	0/12	N/A	N/A	0/12	4.26E+00	0/12	2.13E-01	0.317 - 0.894
RADS	Technetium-99	pCi/g	--	--	--	0/12	0/12	2.80E+00	0/12	1.52E-01	0/12	7.60E-03	2.48 - 3.97

Table 4.16. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Thorium-230	pCi/g	6.44E-01	1.90E+00	1.09E+00	11/12	2/12	1.40E+00	0/12	3.66E+01	1/12	1.83E+00	0.518 - 0.878
RADS	Uranium-233/234	pCi/g	6.54E-01	2.45E+00	1.11E+00	8/12	2/12	1.20E+00	3/12	9.90E-01	8/12	4.95E-02	0.425 - 0.957
RADS	Uranium-235/236	pCi/g	--	--	--	0/12	0/12	6.00E-02	0/12	9.76E-01	0/12	4.88E-02	0.292 - 0.699
RADS	Uranium-238	pCi/g	6.77E-01	1.70E+00	1.19E+00	10/12	4/12	1.20E+00	9/12	8.05E-01	10/12	4.03E-02	0.264 - 0.777
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.62E+00	0/9	2.81E-01	0.00108 - 0.103
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.92E-04	0/9	2.96E-05	0.00108 - 0.103
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.13E+01	0/9	2.56E+00	0.0054 - 0.514
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.69E-04	0/9	1.35E-05	0.00108 - 0.103
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.56E-02	0/9	7.82E-04	0.00108 - 0.103
VOC	1,1-Dichloroethene	mg/kg	1.45E-03	1.45E-03	1.45E-03	1/9	N/A	N/A	0/9	2.04E-01	0/9	1.02E-02	0.00108 - 0.103
VOC	1,2,3-Trichlorobenzene	mg/kg	1.63E-03	1.63E-03	1.63E-03	1/9	N/A	N/A	0/9	4.18E-02	0/9	2.09E-03	0.00108 - 0.103
VOC	1,2,4-Trichlorobenzene	mg/kg	1.17E-03	1.17E-03	1.17E-03	1/9	N/A	N/A	0/9	2.32E-02	1/9	1.16E-03	0.00108 - 0.103
VOC	1,2-Dibromo-3-chloropropane	mg/kg	6.61E-04	6.61E-04	6.61E-04	1/9	N/A	N/A	1/9	2.88E-06	1/9	1.44E-07	0.00108 - 0.103
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.20E-05	0/9	2.10E-06	0.00108 - 0.103
VOC	1,2-Dichlorobenzene	mg/kg	6.07E-04	6.07E-04	6.07E-04	1/9	N/A	N/A	0/9	5.90E-01	0/9	2.95E-02	0.00108 - 0.103
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.69E-04	0/9	4.84E-05	0.00108 - 0.103
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.48E-03	0/9	2.74E-04	0.00108 - 0.103
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.81E-01	0/9	1.90E-02	0.00108 - 0.103
VOC	1,3-Dichlorobenzene	mg/kg	4.66E-04	4.66E-04	4.66E-04	1/9	N/A	N/A	0/9	5.90E-01	0/9	2.95E-02	0.00108 - 0.103
VOC	1,4-Dichlorobenzene	mg/kg	5.96E-04	5.96E-04	5.96E-04	1/9	N/A	N/A	0/9	9.24E-03	1/9	4.62E-04	0.00108 - 0.103
VOC	1,4-Dioxane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.88E-03	0/9	9.42E-05	0.054 - 5.14
VOC	2-Butanone	mg/kg	4.62E-03	1.99E-01	7.23E-02	3/9	N/A	N/A	0/9	2.32E+00	1/9	1.16E-01	0.0054 - 0.514
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.76E-05	0/9	1.38E-06	0.0054 - 0.514
VOC	2-Hexanone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.75E-02	0/9	8.75E-04	0.0054 - 0.514
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.44E-02	0/9	3.22E-03	0.00108 - 0.103
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.62E-01	0/9	2.81E-02	0.0054 - 0.514
VOC	Acetone	mg/kg	2.60E-03	6.17E-02	1.74E-02	6/9	N/A	N/A	0/9	7.36E+00	0/9	3.68E-01	0.0054 - 0.514
VOC	Acrolein	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.68E-05	0/9	8.41E-07	0.0054 - 0.514
VOC	Acrylonitrile	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.28E-04	0/9	1.14E-05	0.0054 - 0.514
VOC	Benzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.66E-03	0/9	2.33E-04	0.00108 - 0.103
VOC	Bromochloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.16E-02	0/9	2.08E-03	0.00108 - 0.103
VOC	Bromodichloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.30E-04	0/9	3.65E-05	0.00108 - 0.103
VOC	Bromoform	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.75E-02	0/9	8.73E-04	0.00108 - 0.103
VOC	Bromomethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.82E-03	0/9	1.91E-04	0.00108 - 0.103
VOC	Carbon disulfide	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.80E-01	0/9	2.40E-02	0.0054 - 0.514
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.54E-03	0/9	1.77E-04	0.00108 - 0.103
VOC	Chlorobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.06E-01	0/9	5.28E-03	0.00108 - 0.103
VOC	Chloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.74E+00	0/9	2.37E-01	0.00108 - 0.103
VOC	Chloroform	mg/kg	5.14E-04	5.14E-04	5.14E-04	1/9	N/A	N/A	0/9	1.22E-03	1/9	6.12E-05	0.00108 - 0.103
VOC	Chloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.05E-02	0/9	5.26E-04	0.00108 - 0.103
VOC	*cis* -1,2-Dichloroethene	mg/kg	6.59E-04	3.43E-02	1.31E-02	5/9	N/A	N/A	1/9	2.12E-02	4/9	1.06E-03	0.00108 - 0.103
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.36E-03	0/9	1.68E-04	0.00108 - 0.103
VOC	Cumene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.48E+00	0/9	7.38E-02	0.00108 - 0.103
VOC	Cyclohexane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.60E+01	0/9	1.30E+00	0.00108 - 0.103
VOC	Dibromochloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.64E-03	0/9	2.32E-04	0.00108 - 0.103

Table 4.16. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.08E-01	0/9	3.04E-02	0.00108 - 0.103
VOC	Ethylbenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.36E-02	0/9	1.68E-03	0.00108 - 0.103
VOC	m,p-Xylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.82E-01	0/9	1.91E-02	0.00216 - 0.206
VOC	Methyl acetate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.22E+00	0/9	4.11E-01	0.0054 - 0.514
VOC	Methylcyclohexane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.80E+01	0/9	1.40E+00	0.00108 - 0.103
VOC	Methylene chloride	mg/kg	2.58E-03	3.73E-03	3.10E-03	3/9	N/A	N/A	0/9	5.44E-02	2/9	2.72E-03	0.0054 - 0.514
VOC	Styrene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.66E+00	0/9	1.33E-01	0.00108 - 0.103
VOC	Tetrachloroethene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.69E-02	0/9	1.84E-03	0.00108 - 0.103
VOC	Toluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.52E+00	0/9	7.62E-02	0.00108 - 0.103
VOC	Total Xylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.82E-01	0/9	1.91E-02	0.00324 - 0.308
VOC	*trans* -1,2-Dichloroethene	mg/kg	9.70E-04	2.56E-03	1.77E-03	2/9	N/A	N/A	0/9	5.83E-02	0/9	2.91E-03	0.00108 - 0.103
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.36E-03	0/9	1.68E-04	0.00108 - 0.103
VOC	Trichloroethene	mg/kg	1.78E-03	2.96E-01	9.73E-02	5/9	N/A	N/A	4/9	2.02E-03	5/9	1.01E-04	0.00108 - 0.11
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.46E+00	0/9	7.31E-02	0.00108 - 0.103
VOC	Vinyl chloride	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.29E-04	0/9	6.47E-06	0.00108 - 0.103

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.17. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 3

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	1.96E+03	2.13E+04	8.83E+03	36/36	8/36	1.20E+04	0/36	5.99E+04	33/36	3.00E+03	10 - 115
METAL	Antimony	mg/kg	4.02E-01	1.10E+00	6.42E-01	7/36	7/36	2.10E-01	2/36	7.04E-01	7/36	3.52E-02	1.96 - 21.1
METAL	Arsenic	mg/kg	7.25E-01	5.88E+01	4.82E+00	36/36	6/36	7.90E+00	36/36	3.02E-02	36/36	1.51E-03	1 - 1.19
METAL	Barium	mg/kg	1.21E+01	6.52E+02	9.49E+01	36/36	5/36	1.70E+02	4/36	3.11E+02	33/36	1.55E+01	0.803 - 9.31
METAL	Beryllium	mg/kg	2.63E-01	1.96E+00	7.56E-01	36/36	16/36	6.90E-01	0/36	3.89E+01	1/36	1.95E+00	0.1 - 0.119
METAL	Boron	mg/kg	8.95E-01	1.96E+00	1.31E+00	12/36	N/A	N/A	0/36	2.56E+01	4/36	1.28E+00	3.01 - 3.56
METAL	Cadmium	mg/kg	2.40E-02	7.19E-02	4.65E-02	9/36	0/36	2.10E-01	0/36	1.39E+00	1/36	6.93E-02	0.201 - 0.237
METAL	Chromium	mg/kg	3.73E+00	6.48E+01	1.24E+01	36/36	1/36	4.30E+01	0/36	3.60E+06	0/36	1.80E+05	0.602 - 0.712
METAL	Cobalt	mg/kg	6.76E-01	6.58E+01	9.03E+00	36/36	8/36	1.30E+01	36/36	5.43E-01	36/36	2.71E-02	0.201 - 0.237
METAL	Copper	mg/kg	1.50E+00	8.34E+00	4.09E+00	36/36	0/36	2.50E+01	0/36	5.62E+01	25/36	2.81E+00	0.402 - 0.475
METAL	Iron	mg/kg	5.07E+03	1.46E+05	2.39E+04	36/36	8/36	2.80E+04	36/36	7.04E+02	36/36	3.52E+01	20.2 - 2200
METAL	Lead	mg/kg	1.48E+00	1.97E+01	4.74E+00	36/36	0/36	2.30E+01	0/36	2.70E+02	1/36	1.35E+01	0.402 - 0.475
METAL	Manganese	mg/kg	1.32E+01	4.67E+03	5.38E+02	36/36	6/36	8.20E+02	20/36	5.65E+01	36/36	2.83E+00	1 - 116
METAL	Mercury	mg/kg	8.37E-03	7.01E-02	2.09E-02	20/36	0/36	1.30E-01	0/36	5.91E-01	3/36	2.95E-02	0.0223 - 0.0282
METAL	Molybdenum	mg/kg	9.90E-02	2.26E+00	4.24E-01	31/36	N/A	N/A	0/36	4.03E+00	19/36	2.02E-01	0.201 - 0.237
METAL	Nickel	mg/kg	2.35E+00	1.68E+01	6.68E+00	36/36	0/36	2.20E+01	0/36	5.12E+01	33/36	2.56E+00	0.402 - 0.475
METAL	Selenium	mg/kg	3.96E-01	2.62E+00	9.25E-01	30/36	19/36	7.00E-01	9/36	1.04E+00	30/36	5.19E-02	1 - 1.19
METAL	Silver	mg/kg	1.41E-01	9.44E+00	2.07E+00	7/36	2/36	2.70E+00	2/36	1.60E+00	7/36	7.99E-02	0.489 - 5.26
METAL	Thallium	mg/kg	2.16E-01	3.28E-01	2.81E-01	5/36	0/36	3.40E-01	5/36	2.84E-02	5/36	1.42E-03	0.402 - 0.475
METAL	Uranium[a]	mg/kg	3.40E-01	1.95E+00	8.72E-01	36/36	0/36	4.60E+00	0/36	3.60E+00	36/36	1.80E-01	0.0402 - 0.0475
METAL	Vanadium	mg/kg	4.93E+00	8.59E+01	2.00E+01	36/36	2/36	3.70E+01	0/36	1.73E+02	28/36	8.64E+00	4.02 - 4.75
METAL	Zinc	mg/kg	5.36E+00	5.66E+01	1.89E+01	36/36	0/36	6.00E+01	0/36	7.46E+02	4/36	3.73E+01	4.02 - 4.75
ANION	Fluoride	mg/kg	9.45E-01	1.22E+01	3.26E+00	36/36	N/A	N/A	0/36	2.40E+02	1/36	1.20E+01	1.03 - 1.22
PPCB	Total PCB[b]	mg/kg	2.02E-03	4.65E-03	3.34E-03	2/40	N/A	N/A	0/40	1.36E-01	0/40	6.82E-03	0.00358 - 0.123
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.74E-02	0/40	8.72E-04	0.363 - 0.442
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.04E+00	0/40	4.02E-01	0.363 - 0.442
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.32E-02	0/40	1.16E-03	0.363 - 0.442
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.52E-02	0/40	2.26E-03	0.363 - 0.442
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.42E-01	0/40	4.21E-02	0.363 - 0.442
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.726 - 0.885
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.42E-03	0/40	3.21E-04	0.363 - 0.442
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.33E-03	0/40	6.67E-05	0.363 - 0.442
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.70E+00	0/40	3.85E-01	0.0363 - 0.0442
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.78E-01	0/40	8.91E-03	0.363 - 0.442
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.16E-03	0/40	2.58E-04	0.363 - 0.442
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-01	0/40	1.85E-02	0.0363 - 0.0442
SVOC	2-Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.51E+00	0/40	7.53E-02	0.363 - 0.442
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.60E-01	0/40	8.01E-03	0.363 - 0.442
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.363 - 0.442
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.65E-02	0/40	8.24E-04	0.363 - 0.442
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.90E-03	0/40	2.45E-04	0.363 - 0.442
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.84E-03	0/40	3.42E-04	0.363 - 0.442
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.42E+00	0/40	1.71E-01	0.363 - 0.442
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.10E-03	0/40	1.55E-04	0.363 - 0.442
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.84E-03	0/40	3.42E-04	0.363 - 0.442
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.363 - 0.442
SVOC	Acenaphthene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442

Table 4.17. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	Acenaphthylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442
SVOC	Acetophenone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.17E+00	0/40	5.84E-02	0.363 - 0.442
SVOC	Anthracene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.16E+02	0/40	5.81E+00	0.0363 - 0.0442
SVOC	Atrazine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.92E-03	0/40	1.96E-04	0.363 - 0.442
SVOC	Benzaldehyde	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.30E-02	0/40	4.15E-03	0.363 - 0.442
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.63E+01	0/40	1.32E+00	0.0363 - 0.0442
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.70E-02	0/40	1.35E-03	0.363 - 0.442
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.22E-05	0/40	3.61E-06	0.363 - 0.442
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.62E-03	0/40	1.31E-04	0.363 - 0.442
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.69E-02	1.69E-02	1.69E-02	1/40	N/A	N/A	0/40	2.66E+01	0/40	1.33E+00	0.0363 - 0.0442
SVOC	Butyl benzyl phthalate	mg/kg	1.25E-02	1.25E-02	1.25E-02	1/40	N/A	N/A	0/40	4.72E+00	0/40	2.36E-01	0.0363 - 0.0442
SVOC	Caprolactam	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.94E+00	0/40	2.47E-01	0.363 - 0.442
SVOC	Carbazole	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.51E-01	0/40	3.76E-02	0.0363 - 0.0442
SVOC	Dibenzofuran	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.92E-01	0/40	1.46E-02	0.363 - 0.442
SVOC	Diethyl phthalate	mg/kg	1.33E-02	1.33E-02	1.33E-02	1/40	N/A	N/A	0/40	1.22E+01	0/40	6.08E-01	0.0363 - 0.0442
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.22E+01	0/40	6.08E-01	0.0363 - 0.0442
SVOC	Di-n-butyl phthalate	mg/kg	1.25E-02	4.12E-02	1.90E-02	10/40	N/A	N/A	0/40	4.54E+00	0/40	2.27E-01	0.0363 - 0.0442
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.13E+02	0/40	5.65E+00	0.0363 - 0.0442
SVOC	Diphenylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.66E+00	0/40	2.33E-01	0.363 - 0.442
SVOC	Fluoranthene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.78E+02	0/40	8.91E+00	0.0363 - 0.0442
SVOC	Fluorene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.09E+01	0/40	5.45E-01	0.0363 - 0.0442
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.46E-03	0/40	1.23E-04	0.363 - 0.442
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.34E-03	0/40	2.67E-04	0.363 - 0.442
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.56E-03	0/40	1.28E-04	0.363 - 0.442
SVOC	Hexachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.00E-03	0/40	2.00E-04	0.363 - 0.442
SVOC	Isophorone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.16E-01	0/40	2.58E-02	0.363 - 0.442
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.94E-01	0/40	2.97E-02	0.363 - 0.442
SVOC	Naphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.70E-03	0/40	3.85E-04	0.0363 - 0.0442
SVOC	Nitrobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.83E-03	0/40	9.17E-05	0.363 - 0.442
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.62E-04	0/40	8.10E-06	0.363 - 0.442
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.14E-03	0/40	5.71E-05	0.363 - 0.442
SVOC	Phenanthrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442
SVOC	Phenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.62E+00	0/40	3.31E-01	0.363 - 0.442
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.16E-02	0/40	1.58E-03	0.363 - 0.442
SVOC	Pyrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.63E+01	0/40	1.32E+00	0.0363 - 0.0442
SVOC	Total PAH[c]	mg/kg	1.25E-03	1.25E-03	1.25E-03	1/40	N/A	N/A	0/40	5.89E-01	0/40	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/36	N/A	N/A	0/36	1.92E+01	0/36	9.58E-01	0.259 - 0.877
RADS	Cesium-137	pCi/g	--	--	--	0/36	0/36	2.80E-01	0/36	9.58E+00	0/36	4.79E-01	0.0274 - 0.0716
RADS	Neptunium-237	pCi/g	--	--	--	0/36	N/A	N/A	0/36	1.07E+00	0/36	5.36E-02	0.361 - 1.11
RADS	Plutonium-238	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.38E+00	0/36	2.19E-01	0.171 - 1.06
RADS	Plutonium-239/240	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.26E+00	0/36	2.13E-01	0.301 - 0.89
RADS	Technetium-99	pCi/g	--	--	--	0/36	0/36	2.80E+00	0/36	1.52E-01	0/36	7.60E-03	2.14 - 4.15
RADS	Thorium-230	pCi/g	5.47E-01	1.48E+00	9.08E-01	23/36	1/36	1.40E+00	0/36	3.66E+01	0/36	1.83E+00	0.301 - 0.995
RADS	Uranium-233/234	pCi/g	5.21E-01	1.02E+00	7.64E-01	14/36	0/36	1.20E+00	1/36	9.90E-01	14/36	4.95E-02	0.441 - 1.08
RADS	Uranium-235/236	pCi/g	--	--	--	0/36	0/36	6.00E-02	0/36	9.76E-01	0/36	4.88E-02	0.197 - 0.868
RADS	Uranium-238	pCi/g	4.39E-01	1.03E+00	6.81E-01	27/36	0/36	1.20E+00	4/36	8.05E-01	27/36	4.03E-02	0.269 - 0.956
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.62E+00	0/40	2.81E-01	0.000921 - 0.00137

Table 4.17. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.92E-04	0/40	2.96E-05	0.000921 - 0.00137
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.13E+01	0/40	2.56E+00	0.00461 - 0.00683
VOC	1,1,2-Trichloroethane	mg/kg	4.31E-04	1.99E-03	9.72E-04	4/40	N/A	N/A	4/40	2.69E-04	4/40	1.35E-05	0.000921 - 0.00137
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.56E-02	0/40	7.82E-04	0.000921 - 0.00137
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.04E-01	0/40	1.02E-02	0.000921 - 0.00137
VOC	1,2,3-Trichlorobenzene	mg/kg	4.49E-04	4.49E-04	4.49E-04	1/40	N/A	N/A	0/40	4.18E-02	0/40	2.09E-03	0.000921 - 0.00137
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.32E-02	0/40	1.16E-03	0.000921 - 0.00137
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.88E-06	0/40	1.44E-07	0.000921 - 0.00137
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-05	0/40	2.10E-06	0.000921 - 0.00137
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.90E-01	0/40	2.95E-02	0.000921 - 0.00137
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.69E-04	0/40	4.84E-05	0.000921 - 0.00137
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.48E-03	0/40	2.74E-04	0.000921 - 0.00137
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.81E-01	0/40	1.90E-02	0.000921 - 0.00137
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.90E-01	0/40	2.95E-02	0.000921 - 0.00137
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.24E-03	0/40	4.62E-04	0.000921 - 0.00137
VOC	1,4-Dioxane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.88E-03	0/40	9.42E-05	0.0461 - 0.0683
VOC	2-Butanone	mg/kg	4.17E-03	4.17E-03	4.17E-03	1/40	N/A	N/A	0/40	2.32E+00	0/40	1.16E-01	0.00461 - 0.00683
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.76E-05	0/40	1.38E-06	0.00461 - 0.00688
VOC	2-Hexanone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.75E-02	0/40	8.75E-04	0.00461 - 0.00683
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.44E-02	0/40	3.22E-03	0.000921 - 0.00137
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.62E-01	0/40	2.81E-02	0.00461 - 0.00683
VOC	Acetone	mg/kg	1.59E-03	2.31E-02	4.45E-03	30/40	N/A	N/A	0/40	7.36E+00	0/40	3.68E-01	0.00461 - 0.00683
VOC	Acrolein	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.68E-05	0/40	8.41E-07	0.00461 - 0.00683
VOC	Acrylonitrile	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.28E-04	0/40	1.14E-05	0.00461 - 0.00683
VOC	Benzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.66E-03	0/40	2.33E-04	0.000921 - 0.00137
VOC	Bromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.16E-02	0/40	2.08E-03	0.000921 - 0.00137
VOC	Bromodichloromethane	mg/kg	4.63E-04	4.63E-04	4.63E-04	1/40	N/A	N/A	0/40	7.30E-04	1/40	3.65E-05	0.000921 - 0.00137
VOC	Bromoform	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.75E-02	0/40	8.73E-04	0.000921 - 0.00137
VOC	Bromomethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.82E-03	0/40	1.91E-04	0.000921 - 0.00137
VOC	Carbon disulfide	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.80E-01	0/40	2.40E-02	0.00461 - 0.00683
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.54E-03	0/40	1.77E-04	0.000921 - 0.00137
VOC	Chlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.06E-01	0/40	5.28E-03	0.000921 - 0.00137
VOC	Chloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.74E+00	0/40	2.37E-01	0.000921 - 0.00137
VOC	Chloroform	mg/kg	5.67E-04	1.78E-03	1.07E-03	3/40	N/A	N/A	1/40	1.22E-03	3/40	6.12E-05	0.000921 - 0.00137
VOC	Chloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.05E-02	0/40	5.26E-04	0.000921 - 0.00137
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.66E-04	7.78E-02	1.09E-02	15/40	N/A	N/A	2/40	2.12E-02	12/40	1.06E-03	0.000921 - 0.00137
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.36E-03	0/40	1.68E-04	0.000921 - 0.00137
VOC	Cumene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.48E+00	0/40	7.38E-02	0.000921 - 0.00137
VOC	Cyclohexane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.60E+01	0/40	1.30E+00	0.000921 - 0.00137
VOC	Dibromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.64E-03	0/40	2.32E-04	0.000921 - 0.00137
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.08E-01	0/40	3.04E-02	0.000921 - 0.00137
VOC	Ethylbenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.36E-02	0/40	1.68E-03	0.000921 - 0.00137
VOC	m,p-Xylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.82E-01	0/40	1.91E-02	0.00184 - 0.00273
VOC	Methyl acetate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.22E+00	0/40	4.11E-01	0.00461 - 0.00683
VOC	Methylcyclohexane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.80E+01	0/40	1.40E+00	0.000921 - 0.00137
VOC	Methylene chloride	mg/kg	1.96E-03	2.08E-03	2.02E-03	2/40	N/A	N/A	0/40	5.44E-02	0/40	2.72E-03	0.00461 - 0.00683
VOC	Styrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.66E+00	0/40	1.33E-01	0.000921 - 0.00137

Table 4.17. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Tetrachloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.69E-02	0/40	1.84E-03	0.000921 - 0.00137
VOC	Toluene	mg/kg	6.34E-04	4.72E-03	1.49E-03	6/40	N/A	N/A	0/40	1.52E+00	0/40	7.62E-02	0.000921 - 0.00137
VOC	Total Xylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.82E-01	0/40	1.91E-02	0.00276 - 0.0041
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.83E-02	0/40	2.91E-03	0.000921 - 0.00137
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.36E-03	0/40	1.68E-04	0.000921 - 0.00137
VOC	Trichloroethene	mg/kg	4.07E-04	1.23E+00	9.12E-02	34/40	N/A	N/A	24/40	2.02E-03	34/40	1.01E-04	0.000921 - 0.123
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.46E+00	0/40	7.31E-02	0.000921 - 0.00137
VOC	Vinyl chloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.29E-04	0/40	6.47E-06	0.000921 - 0.00137

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.18. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 3

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	9.52E+02	1.05E+04	5.60E+03	14/14	12/14	3.00E+03	12 - 119
METAL	Antimony	mg/kg	9.32E-01	1.26E+00	1.10E+00	2/14	2/14	3.52E-02	2.26 - 26.2
METAL	Arsenic	mg/kg	6.27E-01	2.30E+01	7.21E+00	14/14	14/14	1.51E-03	1.19 - 1.41
METAL	Barium	mg/kg	2.54E+00	7.10E+01	2.92E+01	14/14	10/14	1.55E+01	0.952 - 1.13
METAL	Beryllium	mg/kg	1.07E-01	1.26E+00	4.66E-01	14/14	0/14	1.95E+00	0.119 - 0.141
METAL	Boron	mg/kg	1.40E+00	3.61E+01	5.95E+00	14/14	14/14	1.28E+00	3.57 - 4.22
METAL	Cadmium	mg/kg	3.78E-02	3.07E-01	9.75E-02	6/14	2/14	6.93E-02	0.238 - 0.281
METAL	Chromium	mg/kg	2.69E+00	6.97E+01	2.29E+01	14/14	0/14	1.80E+05	0.714 - 0.844
METAL	Cobalt	mg/kg	3.00E-01	3.07E+01	6.39E+00	14/14	14/14	2.71E-02	0.238 - 0.281
METAL	Copper	mg/kg	5.13E-01	9.59E+00	3.52E+00	14/14	6/14	2.81E+00	0.476 - 0.563
METAL	Iron	mg/kg	3.68E+03	8.93E+04	2.28E+04	14/14	14/14	3.52E+01	25.5 - 2430
METAL	Lead	mg/kg	1.08E+00	1.60E+01	6.33E+00	14/14	1/14	1.35E+01	0.476 - 0.563
METAL	Manganese	mg/kg	8.55E+00	4.17E+02	8.56E+01	14/14	14/14	2.83E+00	1.19 - 12.4
METAL	Mercury	mg/kg	1.06E-02	1.97E-01	4.66E-02	7/14	2/14	2.95E-02	0.0263 - 0.032
METAL	Molybdenum	mg/kg	1.50E-01	1.32E+00	4.56E-01	9/14	4/14	2.02E-01	0.238 - 0.281
METAL	Nickel	mg/kg	5.47E-01	1.41E+01	6.64E+00	14/14	11/14	2.56E+00	0.476 - 0.563
METAL	Selenium	mg/kg	6.12E-01	3.82E+00	1.61E+00	13/14	13/14	5.19E-02	1.19 - 1.41
METAL	Silver	mg/kg	--	--	--	0/14	0/14	7.99E-02	0.565 - 6.54
METAL	Thallium	mg/kg	--	--	--	0/14	0/14	1.42E-03	0.476 - 0.563
METAL	Uranium[a]	mg/kg	2.15E-01	3.34E+00	1.10E+00	14/14	14/14	1.80E-01	0.0476 - 0.0563
METAL	Vanadium	mg/kg	8.61E+00	6.72E+01	2.82E+01	14/14	13/14	8.64E+00	4.76 - 5.63
METAL	Zinc	mg/kg	5.58E+00	1.01E+02	3.46E+01	14/14	4/14	3.73E+01	4.76 - 5.63
ANION	Fluoride	mg/kg	2.13E+00	5.42E+00	4.05E+00	14/14	0/14	1.20E+01	1.17 - 1.39
PPCB	Total PCB[b]	mg/kg	--	--	--	0/14	0/14	6.82E-03	0.00394 - 0.00508
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/14	0/14	8.72E-04	0.389 - 0.51
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/14	0/14	4.02E-01	0.389 - 0.51
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/14	0/14	1.16E-03	0.389 - 0.51
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/14	0/14	2.26E-03	0.389 - 0.51
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/14	0/14	4.21E-02	0.389 - 0.51
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.778 - 1.02
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/14	0/14	3.21E-04	0.389 - 0.51
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/14	0/14	6.67E-05	0.389 - 0.51
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/14	0/14	3.85E-01	0.0389 - 0.051
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/14	0/14	8.91E-03	0.389 - 0.51
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/14	0/14	2.58E-04	0.389 - 0.51
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/14	0/14	1.85E-02	0.0389 - 0.051
SVOC	2-Methylphenol	mg/kg	--	--	--	0/14	0/14	7.53E-02	0.389 - 0.51
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/14	0/14	8.01E-03	0.389 - 0.51
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.389 - 0.51
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/14	0/14	8.24E-04	0.389 - 0.51
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/14	0/14	2.45E-04	0.389 - 0.51
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/14	0/14	3.42E-04	0.389 - 0.51
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/14	0/14	1.71E-01	0.389 - 0.51
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/14	0/14	1.55E-04	0.389 - 0.51
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/14	0/14	3.42E-04	0.389 - 0.51

Table 4.18. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.389 - 0.51
SVOC	Acenaphthene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOC	Acenaphthylene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOC	Acetophenone	mg/kg	--	--	--	0/14	0/14	5.84E-02	0.389 - 0.51
SVOC	Anthracene	mg/kg	--	--	--	0/14	0/14	5.81E+00	0.0389 - 0.051
SVOC	Atrazine	mg/kg	--	--	--	0/14	0/14	1.96E-04	0.389 - 0.51
SVOC	Benzaldehyde	mg/kg	--	--	--	0/14	0/14	4.15E-03	0.389 - 0.51
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/14	0/14	1.32E+00	0.0389 - 0.051
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/14	0/14	1.35E-03	0.389 - 0.51
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/14	0/14	3.61E-06	0.389 - 0.51
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/14	0/14	1.31E-04	0.389 - 0.51
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	4.65E-02	4.65E-02	4.65E-02	1/14	0/14	1.33E+00	0.0389 - 0.051
SVOC	Butyl benzyl phthalate	mg/kg	1.80E-02	2.89E-02	2.34E-02	3/14	0/14	2.36E-01	0.0389 - 0.051
SVOC	Caprolactam	mg/kg	--	--	--	0/14	0/14	2.47E-01	0.389 - 0.51
SVOC	Carbazole	mg/kg	--	--	--	0/14	0/14	3.76E-02	0.0389 - 0.051
SVOC	Dibenzofuran	mg/kg	--	--	--	0/14	0/14	1.46E-02	0.389 - 0.51
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/14	0/14	6.08E-01	0.0389 - 0.051
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/14	0/14	6.08E-01	0.0389 - 0.051
SVOC	Di-n-butyl phthalate	mg/kg	1.38E-02	2.93E-02	2.16E-02	2/14	0/14	2.27E-01	0.0389 - 0.051
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/14	0/14	5.65E+00	0.0389 - 0.051
SVOC	Diphenylamine	mg/kg	--	--	--	0/14	0/14	2.33E-01	0.389 - 0.51
SVOC	Fluoranthene	mg/kg	--	--	--	0/14	0/14	8.91E+00	0.0389 - 0.051
SVOC	Fluorene	mg/kg	--	--	--	0/14	0/14	5.45E-01	0.0389 - 0.051
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/14	0/14	1.23E-04	0.389 - 0.51
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/14	0/14	2.67E-04	0.389 - 0.51
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/14	0/14	1.28E-04	0.389 - 0.51
SVOC	Hexachloroethane	mg/kg	--	--	--	0/14	0/14	2.00E-04	0.389 - 0.51
SVOC	Isophorone	mg/kg	--	--	--	0/14	0/14	2.58E-02	0.389 - 0.51
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/14	0/14	2.97E-02	0.389 - 0.51
SVOC	Naphthalene	mg/kg	--	--	--	0/14	0/14	3.85E-04	0.0389 - 0.051
SVOC	Nitrobenzene	mg/kg	--	--	--	0/14	0/14	9.17E-05	0.389 - 0.51
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/14	0/14	8.10E-06	0.389 - 0.51
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/14	0/14	5.71E-05	0.389 - 0.51
SVOC	Phenanthrene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOC	Phenol	mg/kg	--	--	--	0/14	0/14	3.31E-01	0.389 - 0.51
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/14	0/14	1.58E-03	0.389 - 0.51
SVOC	Pyrene	mg/kg	--	--	--	0/14	0/14	1.32E+00	0.0389 - 0.051
SVOC	Total PAH[c]	mg/kg	--	--	--	0/14	0/14	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/14	0/14	9.58E-01	0.406 - 0.994
RADS	Cesium-137	pCi/g	--	--	--	0/14	0/14	4.79E-01	0.0348 - 0.0948
RADS	Neptunium-237	pCi/g	--	--	--	0/14	0/14	5.36E-02	0.45 - 0.845
RADS	Plutonium-238	pCi/g	--	--	--	0/14	0/14	2.19E-01	0.333 - 0.795
RADS	Plutonium-239/240	pCi/g	--	--	--	0/14	0/14	2.13E-01	0.374 - 1.07
RADS	Technetium-99	pCi/g	--	--	--	0/14	0/14	7.60E-03	2.73 - 4.67
RADS	Thorium-230	pCi/g	5.83E-01	2.38E+00	1.30E+00	11/14	2/14	1.83E+00	0.329 - 0.808

Table 4.18. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

			Detected Results			Freq. of	GW Protection Screen		
Type	Analysis	Unit	Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	5.87E-01	1.78E+00	1.00E+00	6/14	6/14	4.95E-02	0.463 - 0.765
RADS	Uranium-235/236	pCi/g	--	--	--	0/14	0/14	4.88E-02	0.241 - 0.641
RADS	Uranium-238	pCi/g	4.20E-01	1.55E+00	8.17E-01	9/14	9/14	4.03E-02	0.209 - 0.7
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/14	0/14	2.81E-01	0.00122 - 0.0587
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/14	0/14	2.96E-05	0.00122 - 0.0587
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.52E-03	7.08E-03	5.80E-03	2/14	0/14	2.56E+00	0.00608 - 0.293
VOC	1,1,2-Trichloroethane	mg/kg	6.55E-04	9.62E-04	8.09E-04	2/14	2/14	1.35E-05	0.00122 - 0.0587
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/14	0/14	7.82E-04	0.00122 - 0.0587
VOC	1,1-Dichloroethene	mg/kg	4.50E-04	4.50E-04	4.50E-04	1/14	0/14	1.02E-02	0.00122 - 0.0587
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.09E-03	0.00122 - 0.0587
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/14	0/14	1.16E-03	0.00122 - 0.0587
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/14	0/14	1.44E-07	0.00122 - 0.0587
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/14	0/14	2.10E-06	0.00122 - 0.0587
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.95E-02	0.00122 - 0.0587
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/14	0/14	4.84E-05	0.00122 - 0.0587
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/14	0/14	2.74E-04	0.00122 - 0.0587
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/14	0/14	1.90E-02	0.00122 - 0.0587
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.95E-02	0.00122 - 0.0587
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	4.62E-04	0.00122 - 0.0587
VOC	1,4-Dioxane	mg/kg	--	--	--	0/14	0/14	9.42E-05	0.0608 - 2.93
VOC	2-Butanone	mg/kg	1.03E-01	1.03E-01	1.03E-01	1/14	0/14	1.16E-01	0.00608 - 0.293
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/14	0/14	1.38E-06	0.00576 - 0.293
VOC	2-Hexanone	mg/kg	--	--	--	0/14	0/14	8.75E-04	0.00608 - 0.293
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/14	0/14	3.22E-03	0.00122 - 0.0587
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/14	0/14	2.81E-02	0.00608 - 0.293
VOC	Acetone	mg/kg	2.63E-03	2.01E-02	6.48E-03	11/14	0/14	3.68E-01	0.00608 - 0.293
VOC	Acrolein	mg/kg	--	--	--	0/14	0/14	8.41E-07	0.00608 - 0.293
VOC	Acrylonitrile	mg/kg	--	--	--	0/14	0/14	1.14E-05	0.00608 - 0.293
VOC	Benzene	mg/kg	--	--	--	0/14	0/14	2.33E-04	0.00122 - 0.0587
VOC	Bromochloromethane	mg/kg	--	--	--	0/14	0/14	2.08E-03	0.00122 - 0.0587
VOC	Bromodichloromethane	mg/kg	--	--	--	0/14	0/14	3.65E-05	0.00122 - 0.0587
VOC	Bromoform	mg/kg	--	--	--	0/14	0/14	8.73E-04	0.00122 - 0.0587
VOC	Bromomethane	mg/kg	--	--	--	0/14	0/14	1.91E-04	0.00122 - 0.0587
VOC	Carbon disulfide	mg/kg	--	--	--	0/14	0/14	2.40E-02	0.00608 - 0.293
VOC	Carbon tetrachloride	mg/kg	6.56E-04	6.56E-04	6.56E-04	1/14	1/14	1.77E-04	0.00122 - 0.0587
VOC	Chlorobenzene	mg/kg	--	--	--	0/14	0/14	5.28E-03	0.00122 - 0.0587
VOC	Chloroethane	mg/kg	--	--	--	0/14	0/14	2.37E-01	0.00122 - 0.0587
VOC	Chloroform	mg/kg	7.84E-04	8.24E-04	8.04E-04	2/14	2/14	6.12E-05	0.00122 - 0.0587
VOC	Chloromethane	mg/kg	--	--	--	0/14	0/14	5.26E-04	0.00122 - 0.0587
VOC	*cis* -1,2-Dichloroethene	mg/kg	2.57E-03	2.88E-02	1.55E-02	4/14	4/14	1.06E-03	0.00122 - 0.0587
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/14	0/14	1.68E-04	0.00122 - 0.0587
VOC	Cumene	mg/kg	--	--	--	0/14	0/14	7.38E-02	0.00122 - 0.0587
VOC	Cyclohexane	mg/kg	--	--	--	0/14	0/14	1.30E+00	0.00122 - 0.0587
VOC	Dibromochloromethane	mg/kg	--	--	--	0/14	0/14	2.32E-04	0.00122 - 0.0587
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/14	0/14	3.04E-02	0.00122 - 0.0587

Table 4.18. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 3 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
VOC	Ethylbenzene	mg/kg	--	--	--	0/14	0/14	1.68E-03	0.00122 - 0.0587
VOC	m,p-Xylene	mg/kg	--	--	--	0/14	0/14	1.91E-02	0.00243 - 0.117
VOC	Methyl acetate	mg/kg	--	--	--	0/14	0/14	4.11E-01	0.00608 - 0.293
VOC	Methylcyclohexane	mg/kg	--	--	--	0/14	0/14	1.40E+00	0.00122 - 0.0587
VOC	Methylene chloride	mg/kg	7.43E-03	7.43E-03	7.43E-03	1/14	1/14	2.72E-03	0.00608 - 0.293
VOC	Styrene	mg/kg	--	--	--	0/14	0/14	1.33E-01	0.00122 - 0.0587
VOC	Tetrachloroethene	mg/kg	7.30E-04	1.16E-02	4.39E-03	5/14	3/14	1.84E-03	0.00122 - 0.0587
VOC	Toluene	mg/kg	--	--	--	0/14	0/14	7.62E-02	0.00122 - 0.0587
VOC	Total Xylene	mg/kg	--	--	--	0/14	0/14	1.91E-02	0.00365 - 0.176
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/14	0/14	2.91E-03	0.00122 - 0.0587
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/14	0/14	1.68E-04	0.00122 - 0.0587
VOC	Trichloroethene	mg/kg	7.48E-02	2.36E+00	6.86E-01	6/14	6/14	1.01E-04	0.00126 - 0.144
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/14	0/14	7.31E-02	0.00122 - 0.0587
VOC	Vinyl chloride	mg/kg	--	--	--	0/14	0/14	6.47E-06	0.00122 - 0.0587

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

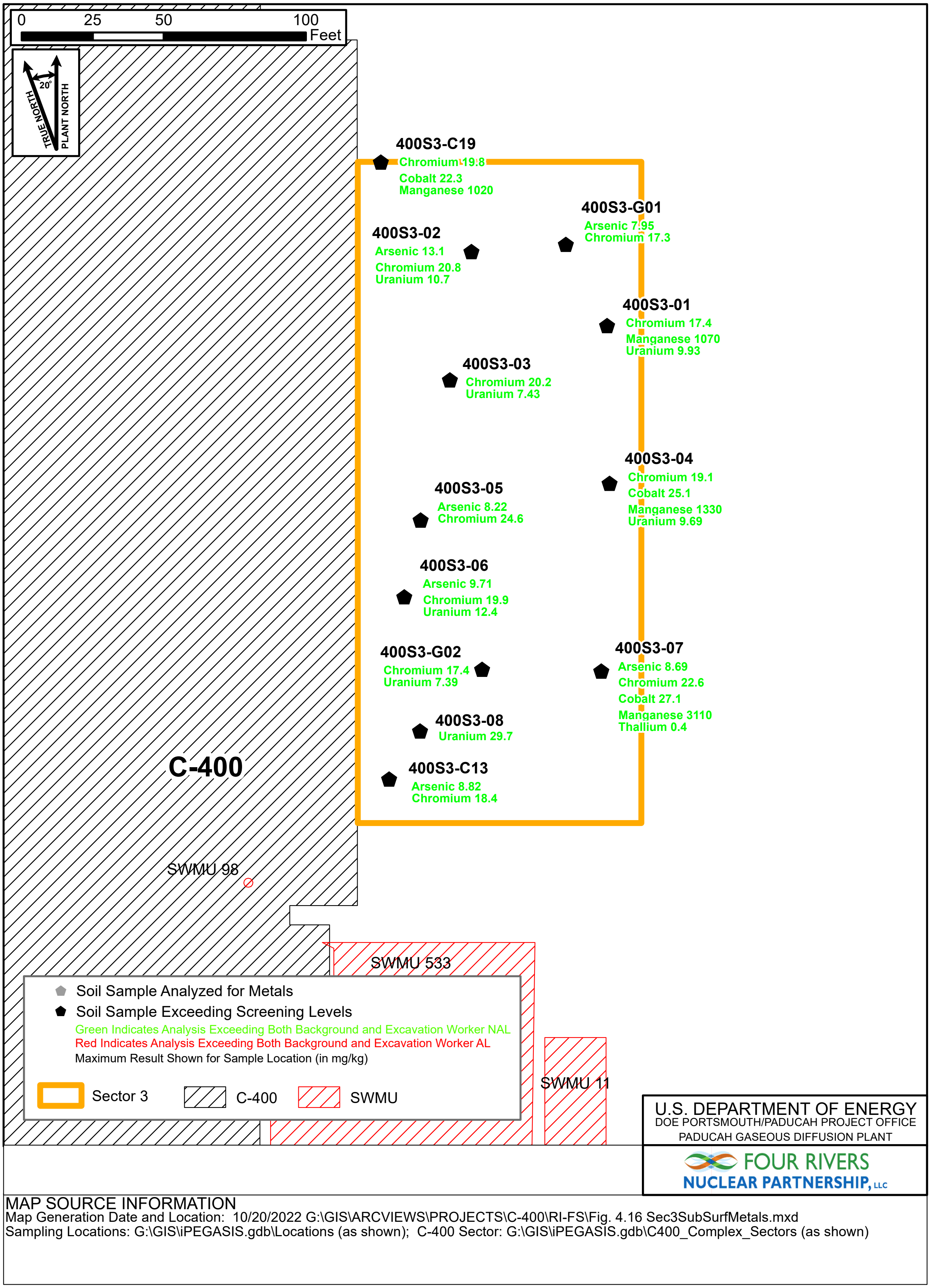


Figure 4.16. Sector 3 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals

During the WAG 6 investigation, samples collected from boring 400-046 provided the highest concentration of PCBs in Sector 3 at 3.30 mg/kg. During this investigation, there were four detections of PCBs in the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals with the maximum (0.00569 mg/kg) occurring in a sample from 1–4 ft bgs in grid 400S3-G02.

SVOCs

Several SVOCs were detected in Sector 3 surface and subsurface soil (0–16 ft bgs) but none of the results exceeded the excavation worker NALs. SVOCs exceeding the SSLs for protection of groundwater at a DAF of 1 in Sector 3 subsurface soil (1–16 ft bgs) include 2-methylnaphthalene, carbazole, naphthalene*, phenanthrene, pyrene, and Total PAHs* (SVOCs with an asterisk also exceeded the DAF of 20 SSLs). SVOCs did not exceed any of the screening criteria at depths > 16 ft bgs.

VOCs

Several VOCs were detected in Sector 3 surface and subsurface soil (0–16 ft bgs) but only one TCE result of 3.01 mg/kg out of 20 samples exceeded the excavation worker NAL at one location in a sample collected from 0–1 ft bgs (Figure 4.17). VOCs in Sector 3 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs at a DAF of 1 include 1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane*, 1,4-dichlorobenzene, methylene chloride (a potential lab contaminant), 2-butanone, chloroform, *cis*-1,2-dichloroethene*, and TCE* (VOCs with an asterisk also exceeded the DAF of 20 SSLs). TCE was detected in five out of nine samples with a maximum result of 0.296 mg/kg. In the deep soil interval (16 ft bgs to the bottom of the RGA), 1,1,2-trichloroethane, bromodichloroethane, chloroform, *cis*-1,2-dichloroethene, and TCE exceeded the protection of groundwater SSLs at a DAF of 1 (all of these except bromodichloroethane also exceeded the DAF of 20 SSLs). For TCE in the deep soil interval, with a maximum concentration of 1.23 mg/kg, there were 34 exceedances of the DAF of 1 and 24 exceedances of the DAF of 20 out of 40 samples. The maximum result was from a sample collected from 48–49 ft bgs in boring 400S3-02.

In the screening of the McNairy Formation soil, 1,1,2-trichloroethane, carbon tetrachloride, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), tetrachloroethene, and TCE exceeded the groundwater protection SSLs at a DAF of 1. TCE was detected in 6 of 14 samples from the McNairy Formation soils. The maximum detection was 2.36 mg/kg in a sample from the uppermost McNairy at a depth of 84.7–85.7 ft bgs in boring 400S3-07.

Radionuclides

Uranium-238 is the only radionuclide that was above both the background screening level and the excavation worker NAL in Sector 3 soil (0–16 ft bgs). Figure 4.18 shows the 3 out of 25 sample locations, where uranium-238 exceeded both criteria in Sector 3. Radionuclides that were detected in the Sector 3 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater at a DAF of 1 include thorium-230, uranium-233/234*, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), no radionuclides exceeded both the background criteria and the SSLs for protection of groundwater. In the screening of the McNairy Formation soil, thorium-230, uranium-233/234, and uranium-238 exceeded the groundwater protection SSLs for a DAF of 1.

The widespread occurrences of low concentrations of VOCs, SVOCs, PCBs, and radionuclides in Sector 3 soil represent minor surface spills or isolated releases from the buried utilities that pass through the sector.

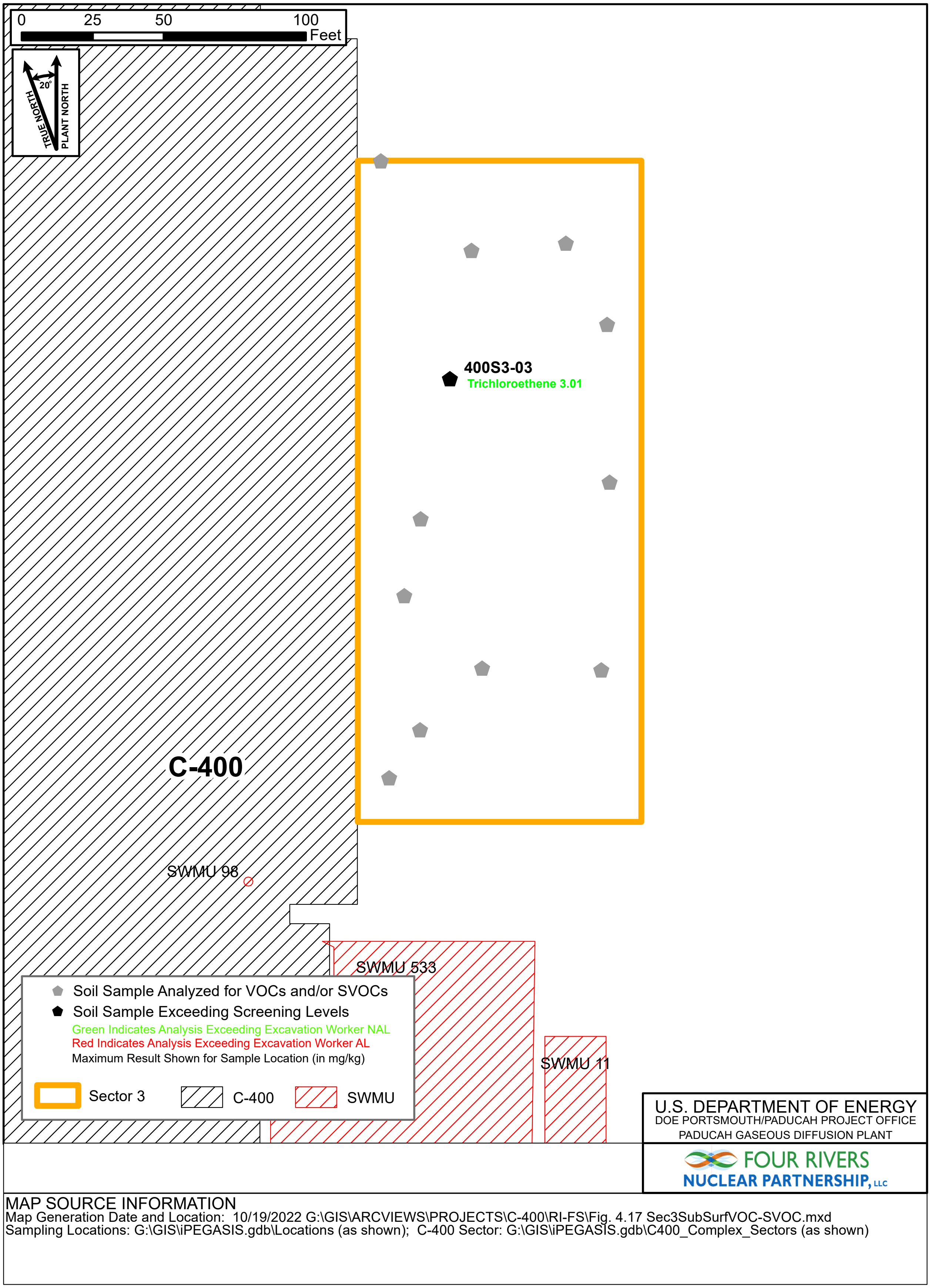


Figure 4.17. Sector 3 Surface and Subsurface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

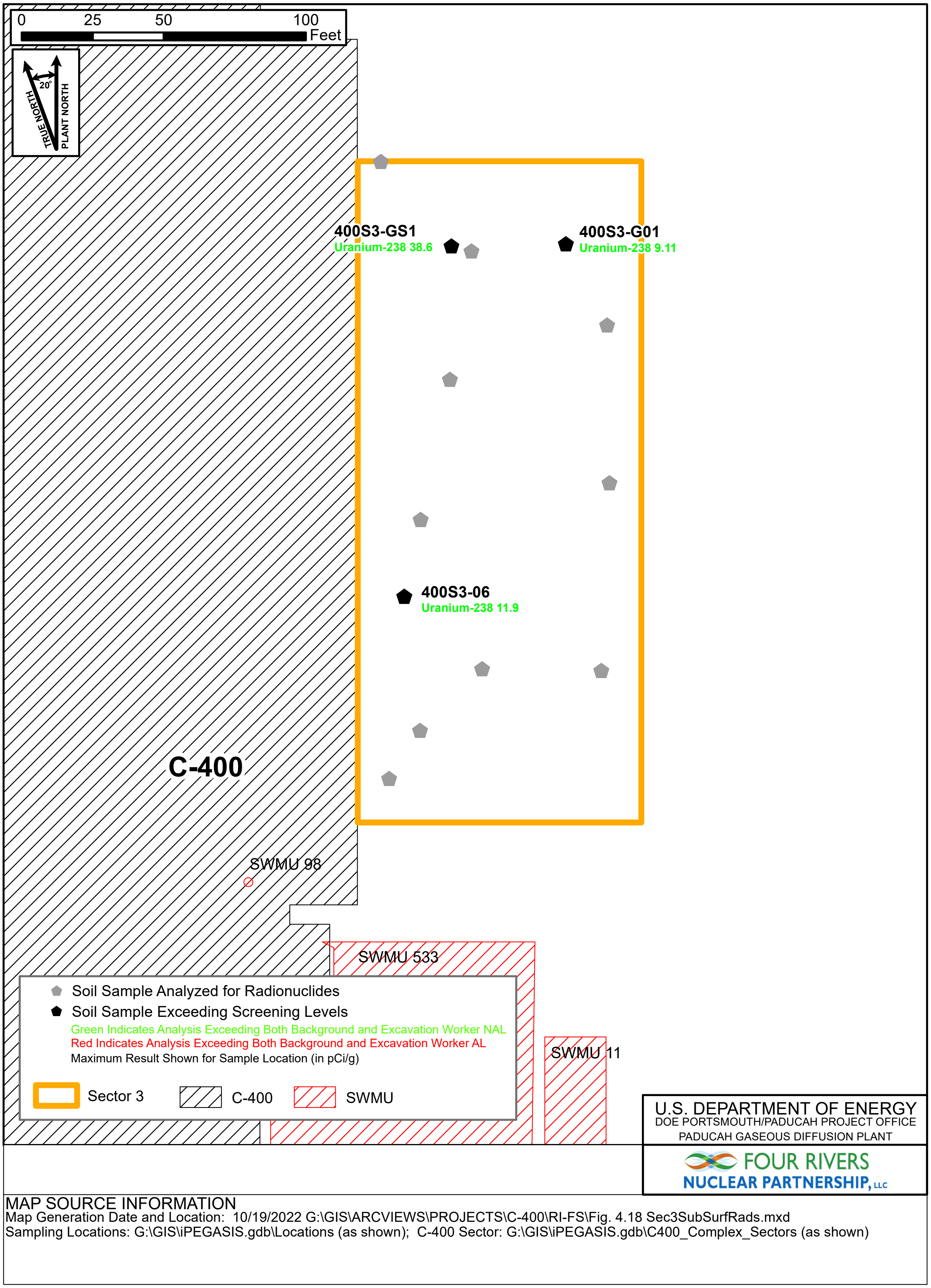


Figure 4.18. Sector 3 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

4.3.4 Sector 4

4.3.4.1 Description and process history

Sector 4 encompasses an area of approximately 37,000 ft^2, located southeast of the C-400 Cleaning Building, as shown in Figure 3.1. The Sector 4 area is covered primarily in concrete, asphalt pavement, and gravel. The concrete apron on the south end of the building is the original construction. There is limited area of exposed soil.

SWMU 11 and SWMU 533 are located within Sector 4. Additionally, the area contains an acid drain line.

A leak of TCE from the sump in the C-400 Cleaning Building degreaser area to the storm sewer was discovered in 1986. At various times TCE was released through broken pipes and joints in a leaking underground storm sewer pipe from the C-400 Cleaning Building. It had not been known previously that the sump discharged to the sewer. After the leak was discovered, discharge lines from the sump in the basement of the C-400 Cleaning Building were disconnected from the storm sewer, and soils were excavated to reduce the contamination in the area. Excavation was halted to prevent structural damage to the adjacent TCE storage tank and to 11th Street. Approximately 310 ft^3 of TCE-contaminated soil was drummed and disposed of off-site. The excavation was backfilled with clean soil, and the area was capped with a layer of clay. The amount of TCE released and the amount removed by the soil excavation are not known.

The subsurface soils at Sector 4 (including the URGA) have been treated by ERH (targeting 20–60 ft bgs). Based on historical data, TCE concentrations as high as 7,000,000 μg/kg have been reported in soil samples collected adjacent to and below the storm sewer line during removal of the contaminated soil in 1986 (EDGe 1988). SWMU 11 was investigated under the Phase I and Phase II SIs completed between 1989 and 1991 (CH2M HILL 1991; CH2M HILL 1992). The field activities for the Phase I SI consisted of drilling a deep boring within the leak area and collecting groundwater samples. The analytical results for the soil samples collected showed that TCE was detected in the soils at concentrations throughout the interval sampled (4–93 ft bgs) and that the highest concentration was from the sample collected at approximately 55–60 ft bgs. Technetium-99 was also detected at 10–15 ft bgs (at 6.6 pCi/g). As part of the Phase II SI activities, a well cluster was installed in this area, and TCE was detected at 360,000 μg/L in collected samples.

SWMU 11 was further investigated during the WAG 6 RI (DOE 1999). The WAG 6 RI found a widespread TCE-impacted area located primarily between the C-400 Cleaning Building and 11th Street and north of Tennessee Avenue. In that area, a large zone of shallow soil contained TCE at concentrations > 225,000 μg/kg indicating that a chlorinated solvent source zone was present in the UCRS soil. TCE and its degradation products were found in soils throughout the UCRS. The highest concentrations were found below the backfilled excavation at SWMU 11 (8,208,600 μg/kg) and adjacent to the TCE off-loading pumps (11,055,000 μg/kg), also known as SWMU 533.

4.3.4.2 Nature and extent of contamination—surface soils

A summary of the analytical results for Sector 4 surface soil and the screening results are provided in Table 4.19. The results of the screening for surface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface soil above both background screening levels and the industrial worker NALs were chromium, and uranium. Both of these metals exceeded the background and industrial

Table 4.19. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 4

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.72E+03	1.63E+04	7.86E+03	45/45	3/45	1.30E+04	0/45	1.00E+05	0/45	1.00E+05	0/45	5.99E+04	40/45	3.00E+03	9.76 - 112
METAL	Antimony	mg/kg	4.74E-01	3.85E+00	1.30E+00	17/27	17/27	2.10E-01	0/27	9.34E+01	0/27	2.80E+03	13/27	7.04E-01	17/27	3.52E-02	1.97 - 20
METAL	Arsenic	mg/kg	2.19E+00	1.10E+01	4.69E+00	30/46	0/46	1.20E+01	30/46	1.60E+00	0/46	1.60E+02	30/46	3.02E-02	30/46	1.51E-03	1.02 - 20
METAL	Barium	mg/kg	1.46E+01	3.29E+02	6.24E+01	46/46	1/46	2.00E+02	0/46	4.04E+04	0/46	1.00E+05	1/46	3.11E+02	44/46	1.55E+01	0.781 - 8.18
METAL	Beryllium	mg/kg	1.23E-01	5.83E-01	3.30E-01	26/27	0/27	6.70E-01	0/27	4.50E+02	0/27	1.35E+04	0/27	3.89E+01	0/27	1.95E+00	0.0976 - 0.5
METAL	Boron	mg/kg	1.17E+00	6.12E+00	3.22E+00	24/26	N/A	N/A	0/26	4.65E+04	0/26	1.00E+05	0/26	2.56E+01	22/26	1.28E+00	2.93 - 3.53
METAL	Cadmium	mg/kg	2.54E-02	2.40E+00	2.94E-01	25/27	11/27	2.10E-01	0/27	6.05E+01	0/27	1.82E+03	1/27	1.39E+00	18/27	6.93E-02	0.195 - 2
METAL	Calcium	mg/kg	1.09E+03	1.65E+05	1.93E+04	19/19	0/19	2.00E+05	0/19	N/A	0/19	N/A	N/A	N/A	N/A	N/A	100 - 2000
METAL	Chromium	mg/kg	7.21E+00	4.50E+01	1.86E+01	46/46	21/46	1.60E+01	35/46	1.23E+01	0/46	1.23E+03	0/46	3.60E+06	0/46	1.80E+05	0.586 - 2.5
METAL	Cobalt	mg/kg	9.46E-01	9.35E+00	4.64E+00	26/26	0/26	1.40E+01	0/26	6.87E+01	0/26	2.06E+03	26/26	5.43E-01	26/26	2.71E-02	0.195 - 0.235
METAL	Copper	mg/kg	1.66E+00	3.14E+01	8.70E+00	27/27	2/27	1.90E+01	0/27	9.34E+03	0/27	1.00E+05	0/27	5.62E+01	25/27	2.81E+00	0.39 - 2.5
METAL	Iron	mg/kg	2.54E+03	3.09E+04	1.44E+04	46/46	1/46	2.80E+04	0/46	1.00E+05	0/46	1.00E+05	46/46	7.04E+02	46/46	3.52E+01	19.5 - 235
METAL	Lead	mg/kg	1.84E+00	3.66E+01	1.08E+01	27/46	1/46	3.60E+01	0/46	8.00E+02	0/46	8.00E+02	0/46	2.70E+02	6/46	1.35E+01	0.39 - 20
METAL	Magnesium	mg/kg	3.19E+02	3.96E+03	1.23E+03	19/19	0/19	7.70E+03	0/19	N/A	0/19	N/A	N/A	N/A	N/A	N/A	2.5 - 5
METAL	Manganese	mg/kg	5.68E+01	1.10E+03	2.58E+02	45/45	0/45	1.50E+03	0/45	4.72E+03	0/45	1.00E+05	45/45	5.65E+01	45/45	2.83E+00	0.976 - 11.6
METAL	Mercury	mg/kg	9.66E-03	2.90E-01	3.26E-02	22/46	1/46	2.00E-01	0/46	7.01E+01	0/46	2.10E+03	0/46	5.91E-01	2/46	2.95E-02	0.0215 - 0.2
METAL	Molybdenum	mg/kg	2.53E-01	5.92E+00	8.78E-01	26/26	N/A	N/A	0/26	1.16E+03	0/26	3.48E+04	1/26	4.03E+00	26/26	2.02E-01	0.195 - 0.235
METAL	Nickel	mg/kg	4.51E+00	5.71E+01	1.05E+01	42/46	2/46	2.10E+01	0/46	4.30E+03	0/46	1.00E+05	1/46	5.12E+01	42/46	2.56E+00	0.39 - 5
METAL	Potassium	mg/kg	1.61E+02	6.26E+02	4.07E+02	17/19	0/19	1.30E+03	0/19	N/A	0/19	N/A	N/A	N/A	N/A	N/A	100 - 200
METAL	Selenium	mg/kg	4.39E-01	1.26E+00	7.61E-01	21/45	6/45	8.00E-01	0/45	1.17E+03	0/45	3.51E+04	5/45	1.04E+00	21/45	5.19E-02	1 - 20
METAL	Silver	mg/kg	1.31E-01	9.97E+00	2.51E+00	11/27	4/27	2.30E+00	0/27	1.17E+03	0/27	3.51E+04	5/27	1.60E+00	11/27	7.99E-02	0.504 - 5.82
METAL	Sodium	mg/kg	2.40E+02	3.11E+02	2.72E+02	3/19	0/19	3.20E+02	0/19	N/A	0/19	N/A	N/A	N/A	N/A	N/A	200 - 250
METAL	Thallium	mg/kg	1.50E-01	2.15E-01	1.83E-01	3/27	1/27	2.10E-01	0/27	2.34E+00	0/27	7.02E+01	3/27	2.84E-02	3/27	1.42E-03	0.39 - 20
METAL	Uranium[a]	mg/kg	7.32E-01	2.38E+02	3.95E+01	30/45	18/45	4.90E+00	5/45	4.66E+01	0/45	1.40E+03	20/45	3.60E+00	30/45	1.80E-01	0.039 - 100
METAL	Vanadium	mg/kg	6.69E+00	4.41E+01	2.08E+01	45/45	2/45	3.80E+01	0/45	1.15E+03	0/45	3.45E+04	0/45	1.73E+02	44/45	8.64E+00	2.5 - 4.71
METAL	Zinc	mg/kg	1.15E+01	9.27E+02	8.89E+01	27/27	5/27	6.50E+01	0/27	7.01E+04	0/27	1.00E+05	1/27	7.46E+02	11/27	3.73E+01	4.09 - 45.9
ANION	Fluoride	mg/kg	4.80E-01	3.69E+01	9.59E+00	26/26	N/A	N/A	0/26	9.33E+03	0/26	1.00E+05	0/26	2.40E+02	8/26	1.20E+01	1.03 - 1.2
DI/FURA	Total Dioxin/Furans[b]	mg/kg	2.81E-06	5.32E-06	4.14E-06	8/8	N/A	N/A	0/8	1.57E-05	0/8	1.57E-03	8/8	1.18E-06	8/8	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	1.19E-03	9.99E-01	1.04E-01	20/27	N/A	N/A	2/27	2.93E-01	0/27	2.93E+01	4/27	1.36E-01	16/27	6.82E-03	0.00336 - 0.182
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.00E+01	0/26	6.00E+02	0/26	1.74E-02	0/26	8.72E-04	0.332 - 3.83
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.90E+03	0/26	8.70E+04	0/26	8.04E+00	0/26	4.02E-01	0.332 - 3.83
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.90E+01	0/26	8.70E+02	0/26	2.32E-02	0/26	1.16E-03	0.332 - 3.83
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.70E+01	0/26	2.61E+03	0/26	4.52E-02	0/26	2.26E-03	0.332 - 3.83
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.80E+02	0/26	1.74E+04	0/26	8.42E-01	0/26	4.21E-02	0.332 - 3.83
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.80E+01	0/26	1.74E+03	0/26	8.72E-02	0/26	4.36E-03	0.664 - 7.66
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.57E+00	0/26	2.57E+02	0/26	6.42E-03	0/26	3.21E-04	0.332 - 3.83
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.46E-01	0/26	5.46E+01	0/26	1.33E-03	0/26	6.67E-05	0.332 - 3.83
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.84E+03	0/26	5.52E+04	0/26	7.70E+00	0/26	3.85E-01	0.0332 - 0.383
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.17E+03	0/26	3.51E+04	0/26	1.78E-01	0/26	8.91E-03	0.332 - 3.83
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.32E+00	0/26	6.96E+01	0/26	5.16E-03	0/26	2.58E-04	0.332 - 3.83
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.19E+01	0/26	2.76E+03	0/26	3.70E-01	0/26	1.85E-02	0.0332 - 0.383
SVOC	2-Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.45E+03	0/26	4.35E+04	0/26	1.51E+00	0/26	7.53E-02	0.332 - 3.83
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.87E+02	0/26	8.61E+03	0/26	1.60E-01	0/26	8.01E-03	0.332 - 3.83
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.80E+01	0/26	1.74E+03	0/26	8.72E-02	0/26	4.36E-03	0.332 - 3.83
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.80E+00	0/26	1.80E+02	0/26	1.65E-02	0/26	8.24E-04	0.332 - 3.83
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.70E+00	0/26	2.61E+02	0/26	4.90E-03	0/26	2.45E-04	0.332 - 3.83
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.41E+01	0/26	4.23E+02	0/26	6.84E-03	0/26	3.42E-04	0.332 - 3.83
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.90E+03	0/26	8.70E+04	0/26	3.42E+00	0/26	1.71E-01	0.332 - 3.83

Table 4.19. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.06E+00	0/26	4.06E+02	0/26	3.10E-03	0/26	1.55E-04	0.332 - 3.83
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.41E+01	0/26	4.23E+02	0/26	6.84E-03	0/26	3.42E-04	0.332 - 3.83
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.80E+01	0/26	1.74E+03	0/26	8.72E-02	0/26	4.36E-03	0.332 - 3.83
SVOC	Acenaphthene	mg/kg	3.40E-02	1.35E-01	7.24E-02	3/26	N/A	N/A	0/26	1.38E+03	0/26	4.14E+04	0/26	1.10E+01	0/26	5.49E-01	0.0332 - 0.383
SVOC	Acenaphthylene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.38E+03	0/26	4.14E+04	0/26	1.10E+01	0/26	5.49E-01	0.0332 - 0.383
SVOC	Acetophenone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.34E+04	0/26	7.02E+05	0/26	1.17E+00	0/26	5.84E-02	0.332 - 3.83
SVOC	Anthracene	mg/kg	1.36E-02	2.59E-01	7.91E-02	6/26	N/A	N/A	0/26	6.89E+03	0/26	1.00E+05	0/26	1.16E+02	0/26	5.81E+00	0.0332 - 0.383
SVOC	Atrazine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.53E+00	0/26	3.53E+02	0/26	3.92E-03	0/26	1.96E-04	0.332 - 3.83
SVOC	Benzaldehyde	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.64E+03	0/26	1.64E+05	0/26	8.30E-02	0/26	4.15E-03	0.332 - 3.83
SVOC	Benzo(ghi)perylene	mg/kg	1.64E-02	2.03E-01	8.65E-02	11/26	N/A	N/A	0/26	6.89E+02	0/26	2.07E+04	0/26	2.63E+01	0/26	1.32E+00	0.0332 - 0.383
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.70E+01	0/26	2.61E+03	0/26	2.70E-02	0/26	1.35E-03	0.332 - 3.83
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.25E+00	0/26	1.25E+02	0/26	7.22E-05	0/26	3.61E-06	0.332 - 3.83
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.32E+01	0/26	9.32E+03	0/26	2.62E-03	0/26	1.31E-04	0.332 - 3.83
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.06E-02	3.32E-02	1.72E-02	5/26	N/A	N/A	0/26	5.80E+01	0/26	5.80E+03	0/26	2.66E+01	0/26	1.33E+00	0.0332 - 0.383
SVOC	Butyl benzyl phthalate	mg/kg	3.08E-02	3.08E-02	3.08E-02	1/26	N/A	N/A	0/26	4.27E+02	0/26	4.27E+04	0/26	4.72E+00	0/26	2.36E-01	0.0332 - 0.383
SVOC	Caprolactam	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.43E+04	0/26	4.29E+05	0/26	4.94E+00	0/26	2.47E-01	0.332 - 3.83
SVOC	Carbazole	mg/kg	1.30E-02	4.28E-02	3.12E-02	3/26	N/A	N/A	0/26	4.06E+01	0/26	4.06E+03	0/26	7.51E-01	2/26	3.76E-02	0.0332 - 0.383
SVOC	Dibenzofuran	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.34E+02	0/26	7.02E+03	0/26	2.92E-01	0/26	1.46E-02	0.332 - 3.83
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.32E+04	0/26	6.96E+05	0/26	1.22E+01	0/26	6.08E-01	0.0332 - 0.383
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.32E+04	0/26	6.96E+05	0/26	1.22E+01	0/26	6.08E-01	0.0332 - 0.383
SVOC	Di-n-butyl phthalate	mg/kg	1.53E-02	3.12E-02	2.01E-02	6/26	N/A	N/A	0/26	2.90E+03	0/26	8.70E+04	0/26	4.54E+00	0/26	2.27E-01	0.0332 - 0.383
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.90E+02	0/26	8.70E+03	0/26	1.13E+02	0/26	5.65E+00	0.0332 - 0.383
SVOC	Diphenylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.90E+03	0/26	8.70E+04	0/26	4.66E+00	0/26	2.33E-01	0.332 - 3.83
SVOC	Fluoranthene	mg/kg	1.43E-02	1.10E+00	2.36E-01	16/26	N/A	N/A	0/26	9.19E+02	0/26	2.76E+04	0/26	1.78E+02	0/26	8.91E+00	0.0332 - 0.383
SVOC	Fluorene	mg/kg	2.73E-02	4.28E-02	3.51E-02	2/26	N/A	N/A	0/26	9.19E+02	0/26	2.76E+04	0/26	1.09E+01	0/26	5.45E-01	0.0332 - 0.383
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.26E+00	0/26	1.26E+02	0/26	2.46E-03	0/26	1.23E-04	0.332 - 3.83
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.61E+00	0/26	5.61E+02	0/26	5.34E-03	0/26	2.67E-04	0.332 - 3.83
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.45E-01	0/26	2.24E+01	0/26	2.56E-03	0/26	1.28E-04	0.332 - 3.83
SVOC	Hexachloroethane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.46E+00	0/26	8.46E+02	0/26	4.00E-03	0/26	2.00E-04	0.332 - 3.83
SVOC	Isophorone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.55E+02	0/26	8.55E+04	0/26	5.16E-01	0/26	2.58E-02	0.332 - 3.83
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.80E+02	0/26	1.74E+04	0/26	5.94E-01	0/26	2.97E-02	0.332 - 3.83
SVOC	Naphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.06E+00	0/26	4.06E+02	0/26	7.70E-03	0/26	3.85E-04	0.0332 - 0.383
SVOC	Nitrobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.24E+01	0/26	2.24E+03	0/26	1.83E-03	0/26	9.17E-05	0.332 - 3.83
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.16E-01	0/26	1.16E+01	0/26	1.62E-04	0/26	8.10E-06	0.332 - 3.83
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.77E-01	0/26	8.77E+01	0/26	1.14E-03	0/26	5.71E-05	0.332 - 3.83
SVOC	Phenanthrene	mg/kg	1.19E-02	7.74E-01	1.70E-01	13/26	N/A	N/A	0/26	1.38E+03	0/26	4.14E+04	0/26	1.10E+01	1/26	5.49E-01	0.0332 - 0.383
SVOC	Phenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.70E+03	0/26	2.61E+05	0/26	6.62E+00	0/26	3.31E-01	0.332 - 3.83
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.06E+01	0/26	3.48E+03	0/26	3.16E-02	0/26	1.58E-03	0.332 - 3.83
SVOC	Pyrene	mg/kg	1.56E-02	1.03E+00	2.31E-01	15/26	N/A	N/A	0/26	6.89E+02	0/26	2.07E+04	0/26	2.63E+01	0/26	1.32E+00	0.0332 - 0.383
SVOC	Total PAH[d]	mg/kg	1.70E-03	5.69E-01	1.79E-01	16/26	N/A	N/A	0/26	6.43E-01	0/26	6.43E+01	0/26	5.89E-01	11/26	2.94E-02	-
RADS	Americium-241	pCi/g	1.52E+00	2.02E+00	1.77E+00	2/47	N/A	N/A	0/47	6.01E+00	0/47	6.01E+02	0/47	1.92E+01	2/47	9.58E-01	0.0723 - 1.03
RADS	Americium-243	pCi/g	--	--	--	0/1	N/A	N/A	0/1	3.38E-01	0/1	3.38E+01	0/1	4.03E-02	0/1	2.02E-03	0.0491 - 0.0491
RADS	Cesium-134	pCi/g	--	--	--	0/1	N/A	N/A	0/1	2.42E-01	0/1	2.42E+01	0/1	2.53E-01	0/1	1.26E-02	0.0162 - 0.0162
RADS	Cesium-137	pCi/g	2.50E-02	2.82E+00	3.92E-01	17/47	2/47	4.90E-01	5/47	1.08E-01	0/47	1.08E+01	0/47	9.58E+00	2/47	4.79E-01	0.0154 - 0.0778
RADS	Cobalt-60	pCi/g	--	--	--	0/19	N/A	N/A	0/19	5.67E-02	0/19	5.67E+00	0/19	3.19E-02	0/19	1.59E-03	0.0119 - 0.0533
RADS	Neptunium-237	pCi/g	1.53E-01	8.10E+00	3.46E+00	5/47	5/47	1.00E-01	3/47	2.49E-01	0/47	2.49E+01	2/47	1.07E+00	5/47	5.36E-02	0.0323 - 1.26
RADS	Neptunium-239	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.08E+03	0/1	1.08E+05	0/1	8.00E-02	0/1	4.00E-03	0.169 - 0.169
RADS	Plutonium-238	pCi/g	--	--	--	0/29	0/29	7.30E-02	0/29	2.65E+01	0/29	2.65E+03	0/29	4.38E+00	0/29	2.19E-01	0.161 - 1.19

Table 4.19. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 4 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Plutonium-239/240	pCi/g	6.39E-02	1.97E+01	3.57E+00	9/48	9/48	2.50E-02	0/48	2.27E+01	0/48	2.27E+03	2/48	4.26E+00	4/48	2.13E-01	0.0435 - 1.19
RADS	Technetium-99	pCi/g	2.95E+00	3.23E+02	5.13E+01	14/48	14/48	2.50E+00	0/48	1.27E+03	0/48	1.00E+05	14/48	1.52E-01	14/48	7.60E-03	1.58 - 4.76
RADS	Thorium-228	pCi/g	3.98E-01	3.98E-01	3.98E-01	1/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	1/1	1.96E-04	1/1	9.80E-06	0.0642 - 0.0642
RADS	Thorium-230	pCi/g	2.65E-01	7.78E+01	4.87E+00	39/48	12/48	1.50E+00	2/48	3.13E+01	0/48	3.13E+03	2/48	3.66E+01	11/48	1.83E+00	0.0882 - 1.15
RADS	Thorium-232	pCi/g	4.17E-01	4.17E-01	4.17E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	1/1	1.96E-01	1/1	9.80E-03	0.0438 - 0.0438
RADS	Uranium-233/234	pCi/g	5.37E-01	2.27E+02	1.67E+01	26/28	21/28	1.20E+00	2/28	5.01E+01	0/28	5.01E+03	23/28	9.90E-01	26/28	4.95E-02	0.255 - 0.976
RADS	Uranium-234	pCi/g	1.92E+00	3.32E+00	2.48E+00	6/17	6/17	1.20E+00	0/17	5.01E+01	0/17	5.01E+03	6/17	9.90E-01	6/17	4.95E-02	0.217 - 1.3
RADS	Uranium-235	pCi/g	3.08E-02	2.64E-01	1.20E-01	18/19	15/19	6.00E-02	0/19	4.08E-01	0/19	4.08E+01	0/19	9.76E-01	16/19	4.88E-02	0.0176 - 0.0489
RADS	Uranium-235/236	pCi/g	3.42E-01	1.61E+01	4.48E+00	6/28	6/28	6.00E-02	4/28	4.08E-01	0/28	4.08E+01	2/28	9.76E-01	6/28	4.88E-02	0.135 - 0.913
RADS	Uranium-238	pCi/g	5.34E-01	3.30E+02	1.54E+01	45/46	37/46	1.20E+00	33/46	1.66E+00	2/46	1.66E+02	42/46	8.05E-01	45/46	4.03E-02	0.188 - 1.31
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.58E+03	0/39	1.00E+05	0/39	5.62E+00	0/39	2.81E-01	0.000808 - 1.3
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.91E+00	0/39	2.91E+02	0/39	5.92E-04	0/39	2.96E-05	0.000808 - 1.3
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.81E+03	0/28	8.43E+04	0/28	5.13E+01	0/28	2.56E+00	0.00404 - 0.00735
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.32E-01	0/39	1.90E+01	0/39	2.69E-04	0/39	1.35E-05	0.000808 - 1.3
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.58E+01	0/39	1.58E+03	0/39	1.56E-02	0/39	7.82E-04	0.000808 - 1.3
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.00E+02	0/39	3.00E+03	0/39	2.04E-01	0/39	1.02E-02	0.000808 - 1.3
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.87E+02	0/28	5.61E+03	0/28	4.18E-02	0/28	2.09E-03	0.000808 - 0.00147
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.59E+01	0/28	7.77E+02	0/28	2.32E-02	0/28	1.16E-03	0.000808 - 0.00147
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.49E-02	0/28	6.49E+00	0/28	2.88E-06	0/28	1.44E-07	0.000808 - 0.00147
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.68E-01	0/28	1.68E+01	0/28	4.20E-05	0/28	2.10E-06	0.000808 - 0.00147
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.76E+02	0/28	2.93E+04	0/28	5.90E-01	0/28	2.95E-02	0.000808 - 0.00147
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.09E+00	0/39	2.09E+02	0/39	9.69E-04	0/39	4.84E-05	0.000808 - 1.3
VOC	1,2-Dichloroethene	mg/kg	--	--	--	0/1	N/A	N/A	0/1	2.10E+03	0/1	6.30E+04	0/1	9.56E-02	0/1	4.78E-03	0.14 - 0.14
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.63E+00	0/39	1.99E+02	0/39	5.48E-03	0/39	2.74E-04	0.000808 - 1.3
VOC	1,2-Dimethylbenzene	mg/kg	3.15E-04	2.21E-02	1.12E-02	2/39	N/A	N/A	0/39	2.81E+02	0/39	8.43E+03	0/39	3.81E-01	1/39	1.90E-02	0.000808 - 1.3
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.76E+02	0/28	2.93E+04	0/28	5.90E-01	0/28	2.95E-02	0.000808 - 0.00147
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.15E+01	0/28	1.15E+03	0/28	9.24E-03	0/28	4.62E-04	0.000808 - 0.00147
VOC	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.91E+01	0/28	3.91E+03	0/28	1.88E-03	0/28	9.42E-05	0.0404 - 0.0735
VOC	2-Butanone	mg/kg	1.63E-03	1.80E-02	7.25E-03	8/39	N/A	N/A	0/39	2.24E+04	0/39	6.72E+05	0/39	2.32E+00	0/39	1.16E-01	0.00404 - 1.3
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.15E-02	0/28	9.15E+00	0/28	2.76E-05	0/28	1.38E-06	0.00404 - 0.00735
VOC	2-Hexanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.52E+02	0/39	4.56E+03	0/39	1.75E-02	0/39	8.75E-04	0.00404 - 1.3
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.17E+02	0/28	2.17E+04	0/28	6.44E-02	0/28	3.22E-03	0.000808 - 0.00147
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.97E+03	0/39	2.39E+05	0/39	5.62E-01	0/39	2.81E-02	0.00404 - 1.3
VOC	Acetone	mg/kg	1.94E-03	1.40E-01	2.58E-02	29/39	N/A	N/A	0/39	2.10E+05	0/39	6.30E+06	0/39	7.36E+00	0/39	3.68E-01	0.00404 - 1.3
VOC	Acrolein	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.05E-02	0/28	1.82E+00	0/28	1.68E-05	0/28	8.41E-07	0.00404 - 0.00735
VOC	Acrylonitrile	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.24E+00	0/28	1.24E+02	0/28	2.28E-04	0/28	1.14E-05	0.00404 - 0.00735
VOC	Benzene	mg/kg	3.47E-04	4.02E-03	1.59E-03	4/39	N/A	N/A	0/39	5.31E+00	0/39	5.31E+02	0/39	4.66E-03	4/39	2.33E-04	0.000808 - 1.3
VOC	Bromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.28E+01	0/28	1.88E+03	0/28	4.16E-02	0/28	2.08E-03	0.000808 - 0.00147
VOC	Bromodichloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.30E+00	0/39	1.30E+02	0/39	7.30E-04	0/39	3.65E-05	0.000808 - 1.3
VOC	Bromoform	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.56E+01	0/39	9.56E+03	0/39	1.75E-02	0/39	8.73E-04	0.000808 - 1.3
VOC	Bromomethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.03E+00	0/39	9.09E+01	0/39	3.82E-03	0/39	1.91E-04	0.000808 - 1.3
VOC	Carbon disulfide	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.52E+02	0/39	1.06E+04	0/39	4.80E-01	0/39	2.40E-02	0.00404 - 1.3
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.96E+00	0/39	2.96E+02	0/39	3.54E-03	0/39	1.77E-04	0.000808 - 1.3
VOC	Chlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.37E+02	0/39	4.11E+03	0/39	1.06E-01	0/39	5.28E-03	0.000808 - 1.3
VOC	Chloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.27E+03	0/39	6.81E+04	0/39	4.74E+00	0/39	2.37E-01	0.000808 - 1.3
VOC	Chloroform	mg/kg	6.38E-04	1.55E-03	1.02E-03	7/39	N/A	N/A	0/39	1.39E+00	0/39	1.39E+02	2/39	1.22E-03	7/39	6.12E-05	0.000808 - 1.3
VOC	Chloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.63E+01	0/39	1.39E+03	0/39	1.05E-02	0/39	5.26E-04	0.000808 - 1.3
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.50E-04	7.46E-02	8.35E-03	16/38	N/A	N/A	0/38	4.67E+02	0/38	1.40E+04	2/38	2.12E-02	11/38	1.06E-03	0.000808 - 1.3

Table 4.19. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.34E+00	0/39	9.30E+02	0/39	3.36E-03	0/39	1.68E-04	0.000808 - 1.3
VOC	Cumene	mg/kg	1.69E-03	1.69E-03	1.69E-03	1/28	N/A	N/A	0/28	1.04E+03	0/28	3.12E+04	0/28	1.48E+00	0/28	7.38E-02	0.000808 - 0.00147
VOC	Cyclohexane	mg/kg	4.15E-04	4.81E-02	7.61E-03	7/28	N/A	N/A	0/28	2.74E+03	0/28	8.22E+04	0/28	2.60E+01	0/28	1.30E+00	0.000808 - 0.00147
VOC	Dibromochloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.79E+01	0/39	7.79E+03	0/39	4.64E-03	0/39	2.32E-04	0.000808 - 1.3
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.68E+01	0/28	1.10E+03	0/28	6.08E-01	0/28	3.04E-02	0.000808 - 0.00147
VOC	Ethylbenzene	mg/kg	3.49E-04	2.32E-02	8.19E-03	3/39	N/A	N/A	0/39	2.66E+01	0/39	2.66E+03	0/39	3.36E-02	1/39	1.68E-03	0.000808 - 1.3
VOC	m,p-Xylene	mg/kg	8.30E-04	6.29E-02	2.15E-02	3/39	N/A	N/A	0/39	2.50E+02	0/39	7.50E+03	0/39	3.82E-01	1/39	1.91E-02	0.00162 - 2.5
VOC	Methyl acetate	mg/kg	1.88E-02	1.88E-02	1.88E-02	1/28	N/A	N/A	0/28	2.34E+05	0/28	7.02E+06	0/28	8.22E+00	0/28	4.11E-01	0.00404 - 0.00735
VOC	Methylcyclohexane	mg/kg	3.66E-04	6.34E-02	7.27E-03	12/28	N/A	N/A	0/28	1.30E+03	0/28	3.90E+04	0/28	2.80E+01	0/28	1.40E+00	0.000808 - 0.00147
VOC	Methylene chloride	mg/kg	2.72E-03	7.12E-03	4.69E-03	10/39	N/A	N/A	0/39	4.08E+02	0/39	1.22E+04	0/39	5.44E-02	9/39	2.72E-03	0.00404 - 1.3
VOC	Styrene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.76E+03	0/39	1.13E+05	0/39	2.66E+00	0/39	1.33E-01	0.000808 - 1.3
VOC	Tetrachloroethene	mg/kg	3.81E-04	3.81E-04	3.81E-04	1/39	N/A	N/A	0/39	4.00E+01	0/39	1.20E+03	0/39	3.69E-02	0/39	1.84E-03	0.000808 - 1.3
VOC	Toluene	mg/kg	3.43E-04	6.06E-02	8.58E-03	17/39	N/A	N/A	0/39	6.25E+03	0/39	1.00E+05	0/39	1.52E+00	0/39	7.62E-02	0.000808 - 1.3
VOC	Total Xylene	mg/kg	1.14E-03	8.50E-02	4.31E-02	2/28	N/A	N/A	0/28	2.50E+02	0/28	7.50E+03	0/28	3.82E-01	1/28	1.91E-02	0.00242 - 0.00441
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.33E-04	1.18E-03	8.57E-04	2/38	N/A	N/A	0/38	4.54E+01	0/38	1.36E+03	0/38	5.83E-02	0/38	2.91E-03	0.000808 - 1.3
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.34E+00	0/39	9.30E+02	0/39	3.36E-03	0/39	1.68E-04	0.000808 - 1.3
VOC	Trichloroethene	mg/kg	4.68E-04	6.02E-01	8.92E-02	33/39	N/A	N/A	0/39	1.90E+00	0/39	5.70E+01	27/39	2.02E-03	33/39	1.01E-04	0.000808 - 0.3
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.16E+02	0/28	9.48E+03	0/28	1.46E+00	0/28	7.31E-02	0.000808 - 0.00147
VOC	Vinyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.85E+02	0/11	1.16E+04	0/11	1.74E-01	0/11	8.70E-03	0.01 - 1.3
VOC	Vinyl chloride	mg/kg	1.53E-03	1.53E-03	1.53E-03	1/39	N/A	N/A	0/39	2.06E+00	0/39	2.06E+02	1/39	1.29E-04	1/39	6.47E-06	0.000808 - 1.3

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

worker criteria at multiple locations. Figure 4.19 shows the locations where these two metals exceeded both screening criteria in Sector 4 surface soil.

Metals that were detected in the Sector 4 surface soil above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, barium*, cadmium*, copper, iron*, lead, mercury, nickel*, selenium*, silver*, thallium*, uranium*, vanadium, and zinc* (metals with an asterisk also exceeded the DAF of 20 SSLs).

The metals most frequently detected above its background values in Sector 4 surface soil are antimony, chromium, and uranium.

PCBs

Total PCBs were detected in 20 of 27 samples in Sector 4 surface soil. The industrial worker NAL was exceeded at 2 out of 27 sample locations with a maximum result of 0.999 mg/kg (Figure 4.20). Total PCBs also exceeded the SSL for the protection of groundwater for a DAF of 1 in 16 of 27 samples and for a DAF of 20 in 4 of 27 samples.

SVOCs

Several SVOCs were detected in surface soil, mostly PAH compounds, but none of the results exceeded the industrial worker NALs. SVOCs that exceeded the SSLs for protection of groundwater, with a DAF of 1, included carbazole, phenanthrene, and Total PAHs.

VOCs

Several VOCs were detected in Sector 4 surface soil but none of the results exceeded the industrial worker NAL. 1,2-dimethylbenzene, benzene, chloroform, *cis*-1,2-dichloroethene, ethylbenzene, m,p-xylene, total xylene, methylene chloride (a potential lab contaminant), TCE, and vinyl chloride were detected in the Sector 4 surface soil above the SSLs for the protection of groundwater at a DAF of 1. Chloroform, *cis*-1,2-dichloroethene, TCE, and vinyl chloride exceeded the SSLs for both the DAF of 1 and the DAF of 20.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 4 surface soil include cesium-137, neptunium-237, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Uranium-238, with a maximum result of 330 pCi/g, also exceeded the industrial worker AL at 2 out of 46 samples, which are both from the 400S4-GS1 location. Figure 4.21 shows locations where these radionuclides exceeded both the background and industrial worker NAL/AL screening criteria in surface soil.

Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater at a DAF of 1 include cesium-137, neptunium-237*, plutonium-239/240*, technetium-99*, thorium-230*, uranium-233/234*, uranium-234*, uranium-235, uranium-235/236*, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). Americium-241, which does not have a site-specific background value, also exceeded the SSL for the protection of groundwater at a DAF of 1 in 2 of 47 samples.

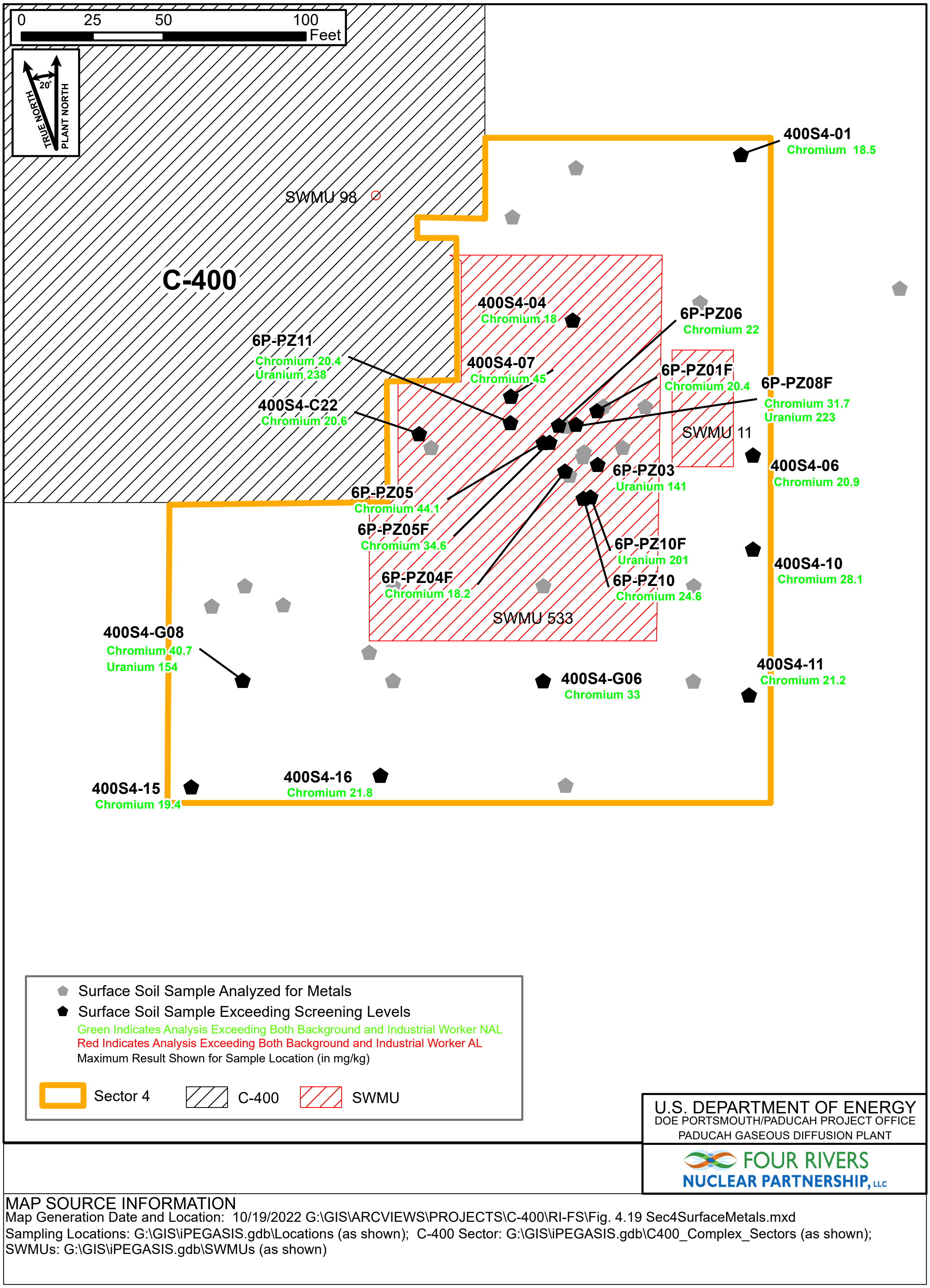


Figure 4.19. Sector 4 Surface Soil Sampling Exceeding Screening Levels for Metals

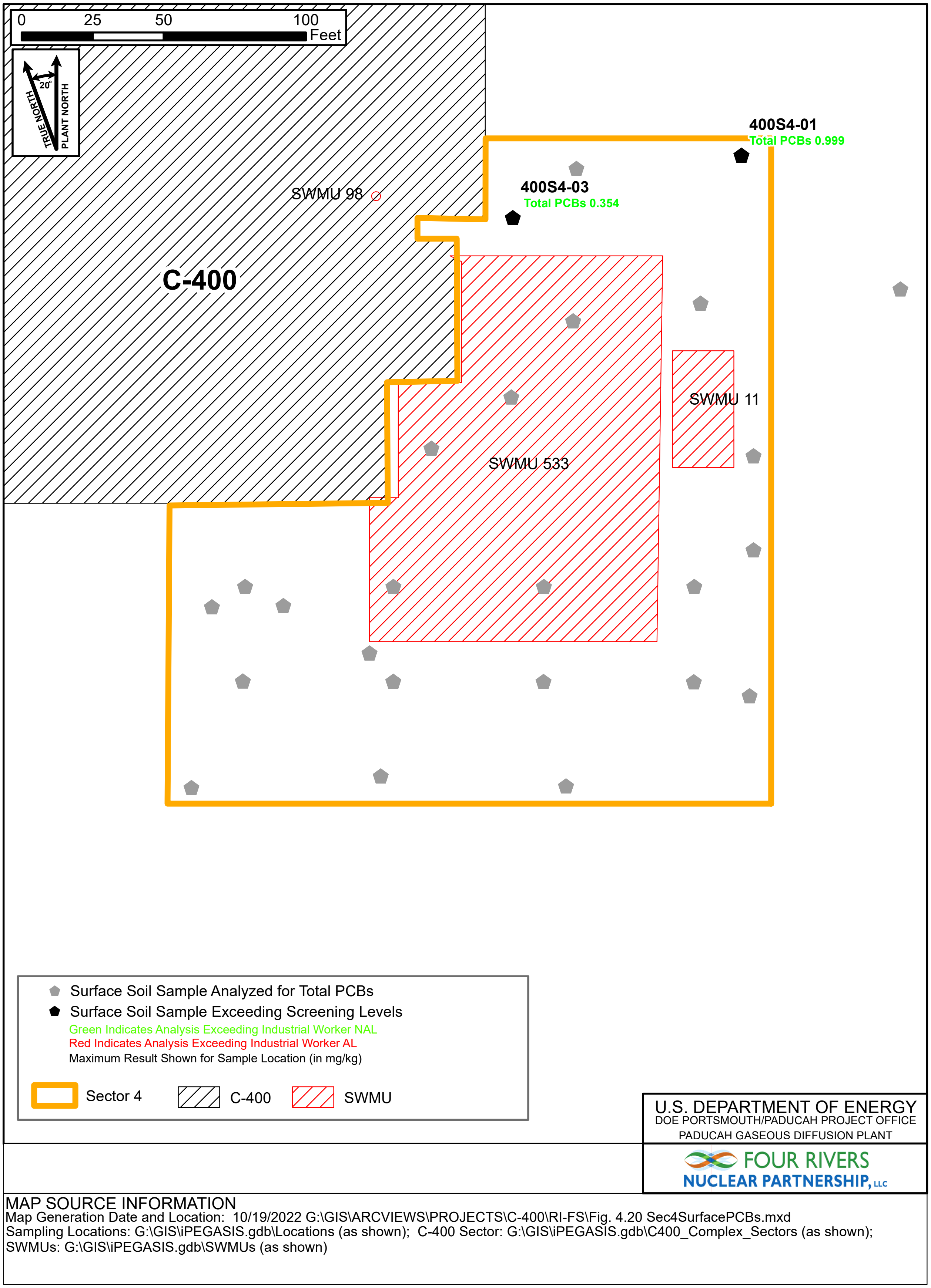


Figure 4.20. Sector 4 Surface Soil Sampling Exceeding Screening Levels for Total PCBs

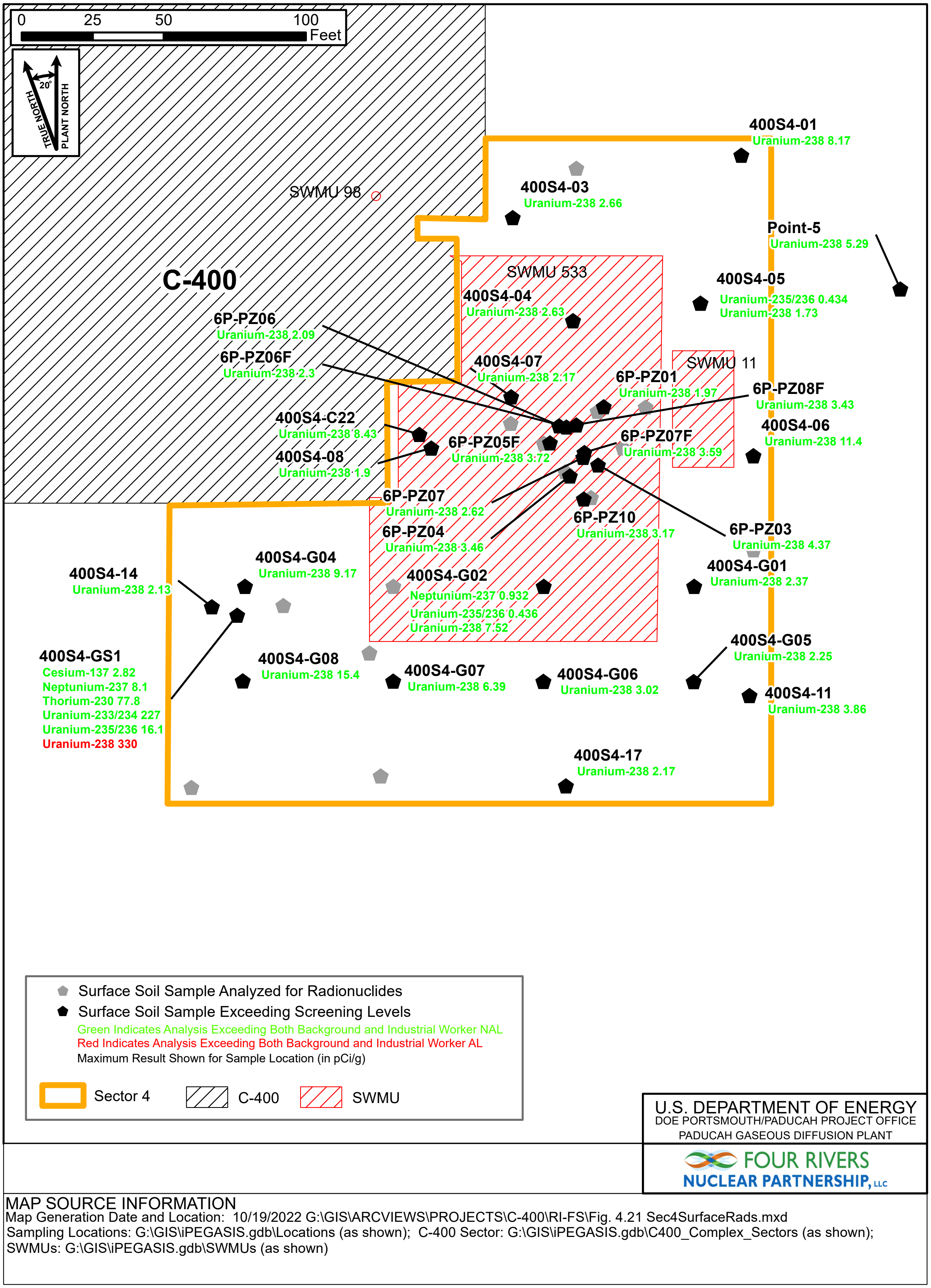


Figure 4.21. Sector 4 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

4.3.4.3 Nature and extent of contamination—surface and subsurface soils

A summary of the analytical results for Sector 4 surface and subsurface soil and the screening results are provided in Tables 4.20 through 4.23. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, iron, manganese, and uranium. The metals most frequently detected above its background values and excavation worker NALs in Sector 4 soil are chromium and uranium. Uranium metal, with a maximum of 340 mg/kg, exceeded the excavation worker AL in multiple locations (exceeded in 15 of 217 samples). Figure 4.22 shows locations where metals exceeded both background and the industrial worker NAL/AL in Sector 4 surface soil.

Metals that were detected in the Sector 4 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium*, cadmium, iron*, lead, manganese*, mercury, nickel*, selenium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), metals exceeding both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium*, cadmium, cobalt*, iron*, manganese*, mercury, nickel*, selenium*, thallium*, uranium*, and vanadium* (metals with an asterisk also exceeded the DAF of 20 SSLs).

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater at a DAF of 1 only. Metals that exceeded these SSLs included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

PCBs

Total PCBs were detected in 16 of 60 samples in Sector 4 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs, 0.0987 mg/kg, did not exceed the excavation worker NAL but Total PCBs exceeded the SSL for the protection of groundwater (for a DAF of 1 only) in 5 out of 60 samples. The maximum in the subsurface interval occurred in a sample collected from 5.5–6.5 ft bgs in boring 400S4-05. Total PCBs were detected in 29 of 191 samples, with a maximum detection of 0.0869 mg/kg, in the deep soil interval (16 ft bgs to the bottom of the RGA). The SSL for a DAF of 1 was exceeded in 14 of the samples. Total PCBs were not detected in the 54 samples from the McNairy Formation soil in Sector 4.

In addition to Total PCBs, total dioxin/furans exceeded the excavation worker NAL in 3 out of 26 samples in the 0–16 ft bgs interval and exceeded the groundwater protection SSLs in 18 out of 18 samples (for both the DAF of 1 and 20) in the 1–16 ft bgs interval. Locations where total dioxin/furans exceeded the excavation worker NAL are shown in Figure 4.23.

SVOCs

Several SVOCs were detected in Sector 4 soil (0–16 ft bgs), mostly PAH compounds, with Total PAHs exceeding the excavation worker NAL at one location out of 86 samples (Figure 4.23). Total PAHs exceeded the SSL for protection of groundwater in Sector 4 subsurface soil (1–16 ft bgs) in 7 of 60 samples for a DAF of 1 and 1 of 60 sample for a DAF of 20. A few SVOCs exceeded the SSLs for protection of groundwater at a DAF of 1 in the 1–16 ft bgs interval including 2-methylnaphthalene, acenaphthene,

Table 4.20. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 4

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.72E+03	2.39E+04	9.37E+03	217/217	43/217	1.20E+04	0/217	3.26E+04	0/217	1.00E+05	9.76 - 125
METAL	Antimony	mg/kg	4.43E-01	3.85E+00	1.07E+00	41/63	41/63	2.10E-01	0/63	1.32E+01	0/63	3.96E+02	1.97 - 20
METAL	Arsenic	mg/kg	2.19E+00	2.29E+01	5.72E+00	87/218	11/218	7.90E+00	63/218	3.74E+00	0/218	3.60E+02	1.02 - 20
METAL	Barium	mg/kg	1.46E+01	1.62E+03	9.61E+01	218/218	13/218	1.70E+02	0/218	6.47E+03	0/218	1.00E+05	0.781 - 9.58
METAL	Beryllium	mg/kg	1.23E-01	9.57E-01	4.25E-01	62/63	7/63	6.70E-01	0/63	6.55E+01	0/63	1.97E+03	0.0976 - 0.583
METAL	Boron	mg/kg	9.61E-01	6.12E+00	2.57E+00	53/62	N/A	N/A	0/62	6.57E+03	0/62	1.00E+05	2.93 - 17.5
METAL	Cadmium	mg/kg	2.42E-02	2.40E+00	1.91E-01	46/63	12/63	2.10E-01	0/63	2.53E+01	0/63	7.59E+02	0.195 - 2
METAL	Calcium	mg/kg	2.40E+02	2.52E+05	7.65E+03	155/155	20/155	6.10E+03	N/A	N/A	N/A	N/A	100 - 2000
METAL	Chromium	mg/kg	6.16E+00	1.17E+02	1.62E+01	218/218	72/218	1.60E+01	199/218	9.14E+00	0/218	9.14E+02	0.586 - 3.5
METAL	Cobalt	mg/kg	9.46E-01	1.20E+01	5.39E+00	62/62	0/62	1.30E+01	2/62	9.84E+00	0/62	2.95E+02	0.195 - 1.17
METAL	Copper	mg/kg	1.66E+00	3.14E+01	9.10E+00	63/63	3/63	1.90E+01	0/63	1.32E+03	0/63	3.96E+04	0.39 - 2.5
METAL	Iron	mg/kg	2.54E+03	5.51E+04	1.48E+04	218/218	5/218	2.80E+04	20/218	2.30E+04	0/218	1.00E+05	19.5 - 446
METAL	Lead	mg/kg	1.84E+00	1.07E+02	1.41E+01	68/218	8/218	2.30E+01	0/218	8.00E+02	0/218	8.00E+02	0.39 - 20
METAL	Magnesium	mg/kg	1.16E+02	7.84E+03	1.33E+03	155/155	7/155	2.10E+03	N/A	N/A	N/A	N/A	2.5 - 5
METAL	Manganese	mg/kg	5.68E+01	3.05E+03	3.60E+02	217/217	10/217	8.20E+02	11/217	7.74E+02	0/217	2.32E+04	0.976 - 119
METAL	Mercury	mg/kg	9.66E-03	5.70E-01	3.73E-02	48/218	2/218	1.30E-01	0/218	9.86E+00	0/218	2.96E+02	0.0215 - 0.2
METAL	Molybdenum	mg/kg	1.96E-01	5.92E+00	6.19E-01	62/62	N/A	N/A	0/62	1.64E+02	0/62	4.92E+03	0.195 - 0.254
METAL	Nickel	mg/kg	4.51E+00	7.36E+01	1.01E+01	180/218	4/218	2.10E+01	0/218	6.52E+02	0/218	1.96E+04	0.39 - 5
METAL	Potassium	mg/kg	1.61E+02	1.07E+03	4.45E+02	153/155	2/155	9.50E+02	N/A	N/A	N/A	N/A	100 - 200
METAL	Selenium	mg/kg	4.39E-01	3.46E+00	1.02E+00	69/210	53/210	7.00E-01	0/210	1.64E+02	0/210	4.92E+03	1 - 20
METAL	Silver	mg/kg	1.31E-01	9.97E+00	2.12E+00	14/63	4/63	2.30E+00	0/63	1.64E+02	0/63	4.92E+03	0.504 - 6.21
METAL	Sodium	mg/kg	2.06E+02	4.94E+02	3.31E+02	80/155	41/155	3.20E+02	N/A	N/A	N/A	N/A	200 - 250
METAL	Thallium	mg/kg	1.50E-01	2.54E-01	2.03E-01	17/63	6/63	2.10E-01	0/63	3.29E-01	0/63	9.87E+00	0.39 - 20
METAL	Uranium[a]	mg/kg	5.16E-01	3.40E+02	7.10E+01	99/217	55/217	4.60E+00	52/217	6.58E+00	15/217	1.97E+02	0.039 - 1000
METAL	Vanadium	mg/kg	6.69E+00	5.22E+01	2.37E+01	217/217	16/217	3.70E+01	0/217	1.65E+02	0/217	4.95E+03	2.5 - 23.3
METAL	Zinc	mg/kg	1.15E+01	9.27E+02	6.51E+01	63/63	9/63	6.00E+01	0/63	9.86E+03	0/63	1.00E+05	4.09 - 45.9
ANION	Fluoride	mg/kg	4.80E-01	3.69E+01	8.76E+00	62/62	N/A	N/A	0/62	1.32E+03	0/62	3.96E+04	1.03 - 1.27
PPCB	Total PCB[b]	mg/kg	1.19E-03	9.99E-01	6.58E-02	36/87	N/A	N/A	0/87	1.12E+00	0/87	1.12E+02	0.00336 - 0.182
DI/FURA	Total Dioxin/Furans[c]	mg/kg	2.75E-06	5.39E-05	9.94E-06	26/26	N/A	N/A	3/26	1.89E-05	0/26	5.67E-04	-
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/61	N/A	N/A	0/61	2.69E+01	0/61	8.07E+02	0.332 - 4
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.90E+03	0/86	5.70E+04	0.332 - 4
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.90E+01	0/86	5.70E+02	0.332 - 4
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.69E+01	0/86	1.71E+03	0.332 - 4
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.79E+02	0/86	1.14E+04	0.332 - 4
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.79E+01	0/86	1.14E+03	0.664 - 8.01
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	8.49E+00	0/86	8.49E+02	0.332 - 4
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.78E+00	0/86	1.71E+02	0.332 - 4
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.35E+03	0/86	4.05E+04	0.0332 - 0.4
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.64E+02	0/86	4.92E+03	0.332 - 4
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.52E+00	0/86	4.56E+01	0.332 - 4
SVOC	2-Methylnaphthalene	mg/kg	1.21E-02	1.78E-01	4.73E-02	7/86	N/A	N/A	0/86	6.73E+01	0/86	2.02E+03	0.0332 - 0.4
SVOC	2-Methylphenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	9.48E+02	0/86	2.84E+04	0.332 - 4
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.89E+02	0/86	5.67E+03	0.332 - 4
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.79E+01	0/86	1.14E+03	0.332 - 4
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.90E+00	0/86	5.90E+02	0.332 - 4

Table 4.20. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.69E+00	0/86	1.71E+02	0.332 - 4
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.91E+01	0/86	5.73E+02	0.332 - 4
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.90E+03	0/86	5.70E+04	0.332 - 4
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/86	N/A	N/A	0/86	9.48E+00	0/86	2.84E+02	0.332 - 4
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.91E+01	0/86	5.73E+02	0.332 - 4
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.79E+01	0/86	1.14E+03	0.332 - 4
SVOC	Acenaphthene	mg/kg	1.32E-02	7.73E-01	1.61E-01	10/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOC	Acenaphthylene	mg/kg	1.17E-02	1.17E-02	1.17E-02	1/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOC	Acetophenone	mg/kg	--	--	--	0/61	N/A	N/A	0/61	3.29E+03	0/61	9.87E+04	0.332 - 4
SVOC	Anthracene	mg/kg	1.35E-02	1.84E+00	1.94E-01	14/86	N/A	N/A	0/86	5.05E+03	0/86	1.00E+05	0.0332 - 0.4
SVOC	Atrazine	mg/kg	--	--	--	0/61	N/A	N/A	0/61	1.15E+01	0/61	1.15E+03	0.332 - 4
SVOC	Benzaldehyde	mg/kg	--	--	--	0/61	N/A	N/A	0/61	1.15E+03	0/61	9.87E+04	0.332 - 4
SVOC	Benzenemethanol	mg/kg	1.73E-01	2.80E-01	2.46E-01	4/25	N/A	N/A	0/25	1.90E+03	0/25	5.70E+04	0.345 - 3.92
SVOC	Benzo(ghi)perylene	mg/kg	1.64E-02	1.10E+00	1.37E-01	16/86	N/A	N/A	0/86	5.05E+02	0/86	1.52E+04	0.0332 - 0.4
SVOC	Benzoic acid	mg/kg	--	--	--	0/25	N/A	N/A	0/25	7.58E+04	0/25	2.27E+06	0.689 - 7.83
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.69E+01	0/86	1.71E+03	0.332 - 4
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.01E+00	0/86	3.01E+02	0.332 - 4
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/86	N/A	N/A	0/86	6.58E+01	0/86	6.58E+03	0.332 - 4
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.06E-02	2.50E-01	4.53E-02	9/86	N/A	N/A	0/86	1.90E+02	0/86	1.14E+04	0.0332 - 3.92
SVOC	Butyl benzyl phthalate	mg/kg	3.08E-02	3.08E-02	3.08E-02	1/86	N/A	N/A	0/86	1.40E+03	0/86	1.14E+05	0.0332 - 3.92
SVOC	Caprolactam	mg/kg	--	--	--	0/61	N/A	N/A	0/61	9.43E+03	0/61	2.83E+05	0.332 - 4
SVOC	Carbazole	mg/kg	1.30E-02	7.66E-01	1.65E-01	7/61	N/A	N/A	0/61	1.33E+02	0/61	1.33E+04	0.0332 - 0.4
SVOC	Dibenzofuran	mg/kg	3.24E-01	4.87E-01	4.06E-01	2/86	N/A	N/A	0/86	3.29E+01	0/86	9.87E+02	0.332 - 4
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.52E+04	0/86	4.56E+05	0.0332 - 3.92
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.52E+04	0/86	4.56E+05	0.0332 - 3.92
SVOC	Di-n-butyl phthalate	mg/kg	1.31E-02	3.12E-02	1.91E-02	13/86	N/A	N/A	0/86	1.90E+03	0/86	5.70E+04	0.0332 - 3.92
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.90E+02	0/86	5.70E+03	0.0332 - 3.92
SVOC	Diphenylamine	mg/kg	--	--	--	0/61	N/A	N/A	0/61	1.90E+03	0/61	5.70E+04	0.332 - 4
SVOC	Fluoranthene	mg/kg	1.31E-02	7.38E+00	4.18E-01	32/86	N/A	N/A	0/86	6.73E+02	0/86	2.02E+04	0.0332 - 0.4
SVOC	Fluorene	mg/kg	1.58E-02	1.01E+00	1.97E-01	8/86	N/A	N/A	0/86	6.73E+02	0/86	2.02E+04	0.0332 - 0.4
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	2.33E+00	0/86	2.33E+02	0.332 - 4
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	2.41E+01	0/86	9.87E+02	0.332 - 4
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.00E+00	0/86	3.00E+01	0.332 - 4
SVOC	Hexachloroethane	mg/kg	--	--	--	0/86	N/A	N/A	0/86	1.98E+01	0/86	5.94E+02	0.332 - 4
SVOC	Isophorone	mg/kg	--	--	--	0/86	N/A	N/A	0/86	2.79E+03	0/86	1.14E+05	0.332 - 4
SVOC	m,p-Cresol	mg/kg	--	--	--	0/25	N/A	N/A	0/25	1.90E+03	0/25	5.70E+04	0.345 - 3.92
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/61	N/A	N/A	0/61	3.79E+02	0/61	1.14E+04	0.332 - 4
SVOC	Naphthalene	mg/kg	1.76E-02	3.67E-01	1.55E-01	4/86	N/A	N/A	0/86	1.67E+01	0/86	1.67E+03	0.0332 - 0.4
SVOC	Nitrobenzene	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.63E+01	0/86	1.69E+03	0.332 - 4
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/86	N/A	N/A	0/86	3.79E-01	0/86	3.79E+01	0.332 - 4
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	4.06E+00	0/86	4.06E+02	0.332 - 4
SVOC	Phenanthrene	mg/kg	1.19E-02	7.80E+00	3.88E-01	32/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOC	Phenol	mg/kg	--	--	--	0/86	N/A	N/A	0/86	5.69E+03	0/86	1.71E+05	0.332 - 4
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/86	N/A	N/A	0/86	7.58E+01	0/86	2.27E+03	0.332 - 4
SVOC	Pyrene	mg/kg	1.26E-02	5.60E+00	3.60E-01	30/86	N/A	N/A	0/86	5.05E+02	0/86	1.52E+04	0.0332 - 0.4

Table 4.20. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 4 (Continued)

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
SVOC	Total PAH[d]	mg/kg	1.70E-03	3.55E+00	2.70E-01	27/86	N/A	N/A	1/86	2.35E+00	0/86	1.51E+02	-
RADS	Americium-241	pCi/g	6.96E-01	2.02E+00	1.41E+00	3/220	N/A	N/A	0/220	1.64E+01	0/220	1.64E+03	0.0597 - 1.11
RADS	Americium-243	pCi/g	--	--	--	0/1	N/A	N/A	0/1	2.11E+00	0/1	2.11E+02	0.0491 - 0.0491
RADS	Cesium-134	pCi/g	--	--	--	0/1	N/A	N/A	0/1	4.01E-01	0/1	4.01E+01	0.0162 - 0.0162
RADS	Cesium-137	pCi/g	2.50E-02	2.82E+00	3.04E-01	23/220	3/220	2.80E-01	2/220	5.82E-01	0/220	5.82E+01	0.0148 - 0.105
RADS	Cobalt-60	pCi/g	--	--	--	0/156	N/A	N/A	0/156	1.53E-01	0/156	1.53E+01	0.0119 - 0.0713
RADS	Neptunium-237	pCi/g	1.53E-01	8.10E+00	3.23E+00	6/220	6/220	1.00E-01	3/220	1.63E+00	0/220	1.63E+02	0.0293 - 1.41
RADS	Neptunium-239	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.46E+03	0/1	1.46E+05	0.169 - 0.169
RADS	Plutonium-238	pCi/g	--	--	--	0/65	0/65	7.30E-02	0/65	1.94E+01	0/65	1.94E+03	0.161 - 1.19
RADS	Plutonium-239/240	pCi/g	5.94E-02	1.97E+01	3.20E+00	11/221	11/221	2.50E-02	1/221	1.83E+01	0/221	1.83E+03	0.0435 - 1.19
RADS	Technetium-99	pCi/g	2.30E+00	3.23E+02	3.20E+01	24/221	23/221	2.50E+00	0/221	1.55E+03	0/221	1.00E+05	1.58 - 4.76
RADS	Thorium-228	pCi/g	3.98E-01	3.98E-01	3.98E-01	1/1	0/1	1.60E+00	0/1	6.34E+01	0/1	6.34E+03	0.0642 - 0.0642
RADS	Thorium-230	pCi/g	1.49E-01	7.78E+01	1.37E+00	203/221	16/221	1.40E+00	2/221	2.82E+01	0/221	2.82E+03	0.0852 - 1.15
RADS	Thorium-232	pCi/g	4.17E-01	4.17E-01	4.17E-01	1/1	0/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.0438 - 0.0438
RADS	Uranium-233/234	pCi/g	5.37E-01	2.27E+02	8.85E+00	53/64	33/64	1.20E+00	2/64	4.30E+01	0/64	4.30E+03	0.255 - 1.15
RADS	Uranium-234	pCi/g	1.23E+00	3.32E+00	2.27E+00	10/114	10/114	1.20E+00	0/114	4.30E+01	0/114	4.30E+03	0.061 - 1.43
RADS	Uranium-235	pCi/g	2.55E-02	2.64E-01	6.45E-02	118/156	37/156	6.00E-02	0/156	2.62E+00	0/156	2.62E+02	0.0176 - 0.0971
RADS	Uranium-235/236	pCi/g	3.42E-01	1.61E+01	3.93E+00	7/64	7/64	6.00E-02	2/64	2.62E+00	0/64	2.62E+02	0.125 - 1.03
RADS	Uranium-238	pCi/g	5.12E-01	3.30E+02	4.91E+00	174/188	87/188	1.20E+00	5/188	8.98E+00	0/188	8.98E+02	0.125 - 1.47
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	4.54E+03	0/152	1.00E+05	0.000808 - 1.3
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	1.11E+01	0/152	1.11E+03	0.000808 - 1.3
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	3.79E+03	0/76	1.00E+05	0.00404 - 0.00938
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	8.49E-01	0/152	2.55E+01	0.000808 - 1.3
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	9.52E+01	0/152	9.52E+03	0.000808 - 1.3
VOC	1,1-Dichloroethene	mg/kg	3.78E-04	4.65E-02	5.98E-03	10/177	N/A	N/A	0/177	1.26E+02	0/177	3.78E+03	0.000808 - 1.3
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/76	N/A	N/A	0/76	2.63E+01	0/76	7.89E+02	0.000808 - 0.00188
VOC	1,2,4-Trichlorobenzene	mg/kg	1.95E-03	1.95E-03	1.95E-03	1/76	N/A	N/A	0/76	3.20E+01	0/76	9.60E+02	0.000808 - 0.00188
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	4.10E-01	0/76	4.10E+01	0.000808 - 0.00188
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	7.86E-01	0/76	7.86E+01	0.000808 - 0.00188
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/76	N/A	N/A	0/76	9.43E+02	0/76	2.83E+04	0.000808 - 0.00188
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	1.13E+01	0/152	5.19E+02	0.000808 - 1.3
VOC	1,2-Dichloroethene	mg/kg	--	--	--	0/7	N/A	N/A	0/7	2.96E+02	0/7	8.88E+03	0.14 - 0.19
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	8.91E+00	0/152	2.67E+02	0.000808 - 1.3
VOC	1,2-Dimethylbenzene	mg/kg	3.15E-04	2.21E-02	7.90E-03	3/152	N/A	N/A	0/152	3.61E+02	0/152	1.08E+04	0.000808 - 1.3
VOC	1,3-Dichlorobenzene	mg/kg	4.58E-04	4.58E-04	4.58E-04	1/76	N/A	N/A	0/76	9.43E+02	0/76	2.83E+04	0.000808 - 0.00188
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/76	N/A	N/A	0/76	7.20E+01	0/76	7.20E+03	0.000808 - 0.00188
VOC	1,4-Dioxane	mg/kg	--	--	--	0/75	N/A	N/A	0/75	4.30E+01	0/75	4.30E+03	0.0404 - 0.0938
VOC	2-Butanone	mg/kg	1.63E-03	5.27E-02	1.04E-02	25/152	N/A	N/A	0/152	1.28E+04	0/152	3.84E+05	0.00404 - 1.3
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/76	N/A	N/A	0/76	4.80E-01	0/76	4.80E+01	0.00404 - 0.00938
VOC	2-Hexanone	mg/kg	--	--	--	0/152	N/A	N/A	0/152	9.69E+01	0/152	2.91E+03	0.00404 - 1.3
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	9.70E+02	0/76	9.70E+04	0.000808 - 0.00188
VOC	4-Methyl-2-pentanone	mg/kg	2.75E-03	2.75E-03	2.75E-03	1/152	N/A	N/A	0/152	2.31E+03	0/152	6.93E+04	0.00404 - 1.3
VOC	Acetone	mg/kg	1.94E-03	4.60E-01	3.68E-02	99/152	N/A	N/A	0/152	2.96E+04	0/152	8.88E+05	0.00404 - 1.3
VOC	Acrolein	mg/kg	2.71E-03	2.76E-03	2.74E-03	2/76	N/A	N/A	0/76	8.14E-02	0/76	2.44E+00	0.00404 - 0.00938
VOC	Acrylonitrile	mg/kg	--	--	--	0/76	N/A	N/A	0/76	4.46E+00	0/76	2.71E+02	0.00404 - 0.00938

Table 4.20. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
VOC	Benzene	mg/kg	3.47E-04	4.02E-03	1.26E-03	6/152	N/A	N/A	0/152	2.59E+01	0/152	1.28E+03	0.000808 - 1.3
VOC	Bromochloromethane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	8.48E+01	0/76	2.54E+03	0.000808 - 0.00188
VOC	Bromodichloromethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	7.93E+00	0/152	7.93E+02	0.000808 - 1.3
VOC	Bromoform	mg/kg	--	--	--	0/152	N/A	N/A	0/152	3.24E+02	0/152	1.97E+04	0.000808 - 1.3
VOC	Bromomethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	3.80E+00	0/152	1.14E+02	0.000808 - 1.3
VOC	Carbon disulfide	mg/kg	--	--	--	0/152	N/A	N/A	0/152	4.21E+02	0/152	1.26E+04	0.00404 - 1.3
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/152	N/A	N/A	0/152	1.57E+01	0/152	1.57E+03	0.000808 - 1.3
VOC	Chlorobenzene	mg/kg	--	--	--	0/152	N/A	N/A	0/152	1.48E+02	0/152	4.44E+03	0.000808 - 1.3
VOC	Chloroethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	3.07E+03	0/152	9.21E+04	0.000808 - 1.3
VOC	Chloroform	mg/kg	6.38E-04	1.74E-03	1.03E-03	10/152	N/A	N/A	0/152	8.90E+00	0/152	8.90E+02	0.000808 - 1.3
VOC	Chloromethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	6.26E+01	0/152	1.88E+03	0.000808 - 1.3
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.50E-04	2.50E+00	1.11E-01	70/170	N/A	N/A	0/170	6.58E+01	0/170	1.97E+03	0.000808 - 1.3
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/152	N/A	N/A	0/152	2.83E+01	0/152	1.21E+03	0.000808 - 1.3
VOC	Cumene	mg/kg	4.34E-04	1.69E-03	1.06E-03	2/76	N/A	N/A	0/76	1.02E+03	0/76	3.06E+04	0.000808 - 0.00188
VOC	Cyclohexane	mg/kg	4.15E-04	4.81E-02	6.95E-03	8/76	N/A	N/A	0/76	3.70E+03	0/76	1.11E+05	0.000808 - 0.00188
VOC	Dibromochloromethane	mg/kg	--	--	--	0/152	N/A	N/A	0/152	5.48E+01	0/152	5.48E+03	0.000808 - 1.3
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	4.94E+01	0/76	1.48E+03	0.000808 - 0.00188
VOC	Ethylbenzene	mg/kg	3.49E-04	2.32E-02	6.55E-03	4/152	N/A	N/A	0/152	1.30E+02	0/152	1.30E+04	0.000808 - 1.3
VOC	m,p-Xylene	mg/kg	8.30E-04	6.29E-02	1.71E-02	4/152	N/A	N/A	0/152	3.23E+02	0/152	9.69E+03	0.00162 - 2.5
VOC	Methyl acetate	mg/kg	1.88E-02	1.88E-02	1.88E-02	1/76	N/A	N/A	0/76	3.29E+04	0/76	9.87E+05	0.00404 - 0.00938
VOC	Methylcyclohexane	mg/kg	3.66E-04	6.34E-02	5.56E-03	17/76	N/A	N/A	0/76	1.76E+03	0/76	5.28E+04	0.000808 - 0.00188
VOC	Methylene chloride	mg/kg	1.73E-03	8.58E-03	4.22E-03	41/152	N/A	N/A	0/152	1.57E+02	0/152	4.71E+03	0.00404 - 1.3
VOC	Styrene	mg/kg	--	--	--	0/152	N/A	N/A	0/152	3.00E+03	0/152	9.00E+04	0.000808 - 1.3
VOC	Tetrachloroethene	mg/kg	3.81E-04	1.36E-03	9.27E-04	5/152	N/A	N/A	0/152	4.34E+01	0/152	1.30E+03	0.000808 - 1.3
VOC	Toluene	mg/kg	3.20E-04	6.06E-02	7.05E-03	26/152	N/A	N/A	0/152	2.18E+03	0/152	6.54E+04	0.000808 - 1.3
VOC	Total Xylene	mg/kg	1.14E-03	8.50E-02	3.04E-02	3/76	N/A	N/A	0/76	3.23E+02	0/76	9.69E+03	0.00242 - 0.00563
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.17E-04	2.80E-02	3.78E-03	18/170	N/A	N/A	0/170	5.67E+01	0/170	1.70E+03	0.000808 - 1.3
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/152	N/A	N/A	0/152	2.83E+01	0/152	1.21E+03	0.000808 - 1.3
VOC	Trichloroethene	mg/kg	3.95E-04	1.13E+02	1.97E+00	147/181	N/A	N/A	18/181	2.26E+00	1/181	6.78E+01	0.000808 - 5
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/76	N/A	N/A	0/76	4.11E+02	0/76	1.23E+04	0.000808 - 0.00188
VOC	Vinyl acetate	mg/kg	--	--	--	0/76	N/A	N/A	0/76	5.12E+02	0/76	1.54E+04	0.01 - 1.3
VOC	Vinyl chloride	mg/kg	5.97E-04	7.55E-02	1.05E-02	13/177	N/A	N/A	0/177	4.72E+00	0/177	4.72E+02	0.000808 - 1.3

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.21. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 4

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	3.02E+03	2.39E+04	9.77E+03	172/172	38/172	1.20E+04	0/172	5.99E+04	172/172	3.00E+03	10.9 - 125
METAL	Antimony	mg/kg	4.43E-01	1.41E+00	9.06E-01	24/36	24/36	2.10E-01	14/36	7.04E-01	24/36	3.52E-02	2.11 - 2.49
METAL	Arsenic	mg/kg	2.27E+00	2.29E+01	6.27E+00	57/172	10/172	7.90E+00	57/172	3.02E-02	57/172	1.51E-03	1.02 - 20
METAL	Barium	mg/kg	2.24E+01	1.62E+03	1.05E+02	172/172	12/172	1.70E+02	2/172	3.11E+02	172/172	1.55E+01	0.819 - 9.58
METAL	Beryllium	mg/kg	2.32E-01	9.57E-01	4.93E-01	36/36	4/36	6.90E-01	0/36	3.89E+01	0/36	1.95E+00	0.102 - 0.583
METAL	Boron	mg/kg	9.61E-01	4.41E+00	2.03E+00	29/36	N/A	N/A	0/36	2.56E+01	22/36	1.28E+00	3.07 - 17.5
METAL	Cadmium	mg/kg	2.42E-02	3.39E-01	6.75E-02	21/36	1/36	2.10E-01	0/36	1.39E+00	5/36	6.93E-02	0.205 - 0.254
METAL	Calcium	mg/kg	2.40E+02	2.52E+05	6.01E+03	136/136	10/136	6.10E+03	0/136	N/A	0/136	N/A	100 - 2000
METAL	Chromium	mg/kg	6.16E+00	1.17E+02	1.55E+01	172/172	1/172	4.30E+01	0/172	3.60E+06	0/172	1.80E+05	0.614 - 3.5
METAL	Cobalt	mg/kg	3.93E+00	1.20E+01	5.94E+00	36/36	0/36	1.30E+01	36/36	5.43E-01	36/36	2.71E-02	0.205 - 1.17
METAL	Copper	mg/kg	5.10E+00	2.00E+01	9.40E+00	36/36	0/36	2.50E+01	0/36	5.62E+01	36/36	2.81E+00	0.409 - 2.33
METAL	Iron	mg/kg	4.36E+03	5.51E+04	1.49E+04	172/172	4/172	2.80E+04	172/172	7.04E+02	172/172	3.52E+01	20 - 446
METAL	Lead	mg/kg	7.01E+00	1.07E+02	1.63E+01	41/172	6/172	2.30E+01	0/172	2.70E+02	8/172	1.35E+01	0.409 - 20
METAL	Magnesium	mg/kg	1.16E+02	7.84E+03	1.34E+03	136/136	5/136	2.10E+03	0/136	N/A	0/136	N/A	2.5 - 5
METAL	Manganese	mg/kg	7.86E+01	3.05E+03	3.86E+02	172/172	9/172	8.20E+02	172/172	5.65E+01	172/172	2.83E+00	1.17 - 119
METAL	Mercury	mg/kg	1.02E-02	5.70E-01	4.13E-02	26/172	1/172	1.30E-01	0/172	5.91E-01	4/172	2.95E-02	0.0247 - 0.2
METAL	Molybdenum	mg/kg	1.96E-01	1.22E+00	4.33E-01	36/36	N/A	N/A	0/36	4.03E+00	34/36	2.02E-01	0.205 - 0.254
METAL	Nickel	mg/kg	4.71E+00	7.36E+01	1.00E+01	138/172	1/172	2.20E+01	1/172	5.12E+01	138/172	2.56E+00	0.409 - 5
METAL	Potassium	mg/kg	1.69E+02	1.07E+03	4.50E+02	136/136	2/136	9.50E+02	0/136	N/A	0/136	N/A	100 - 200
METAL	Selenium	mg/kg	5.64E-01	3.46E+00	1.14E+00	48/165	43/165	7.00E-01	26/165	1.04E+00	48/165	5.19E-02	1 - 20
METAL	Silver	mg/kg	3.38E-01	1.25E+00	7.16E-01	3/36	0/36	2.70E+00	0/36	1.60E+00	3/36	7.99E-02	0.526 - 6.21
METAL	Sodium	mg/kg	2.06E+02	4.94E+02	3.34E+02	77/136	31/136	3.40E+02	0/136	N/A	0/136	N/A	200 - 250
METAL	Thallium	mg/kg	1.63E-01	2.54E-01	2.07E-01	14/36	0/36	3.40E-01	14/36	2.84E-02	14/36	1.42E-03	0.409 - 0.509
METAL	Uranium[a]	mg/kg	5.16E-01	3.40E+02	8.47E+01	69/172	36/172	4.60E+00	36/172	3.60E+00	69/172	1.80E-01	0.0409 - 1000
METAL	Vanadium	mg/kg	8.44E+00	5.22E+01	2.44E+01	172/172	14/172	3.70E+01	0/172	1.73E+02	171/172	8.64E+00	2.5 - 23.3
METAL	Zinc	mg/kg	1.57E+01	3.36E+02	4.73E+01	36/36	4/36	6.00E+01	0/36	7.46E+02	11/36	3.73E+01	4.09 - 5.09
ANION	Fluoride	mg/kg	8.80E-01	2.38E+01	8.16E+00	36/36	N/A	N/A	0/36	2.40E+02	8/36	1.20E+01	1.09 - 1.27
PPCB	Total PCB[b]	mg/kg	1.52E-03	9.87E-02	1.83E-02	16/60	N/A	N/A	0/60	1.36E-01	5/60	6.82E-03	0.00339 - 0.0185
DI/FURA	Total Dioxin/Furans[c]	mg/kg	2.75E-06	5.39E-05	1.25E-05	18/18	N/A	N/A	18/18	1.18E-06	18/18	5.91E-08	-
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/35	N/A	N/A	0/35	1.74E-02	0/35	8.72E-04	0.344 - 4
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.04E+00	0/60	4.02E-01	0.344 - 4
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.32E-02	0/60	1.16E-03	0.344 - 4
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.52E-02	0/60	2.26E-03	0.344 - 4
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.42E-01	0/60	4.21E-02	0.344 - 4
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.72E-02	0/60	4.36E-03	0.688 - 8.01
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	6.42E-03	0/60	3.21E-04	0.344 - 4
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.33E-03	0/60	6.67E-05	0.344 - 4
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.70E+00	0/60	3.85E-01	0.0344 - 0.4
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.78E-01	0/60	8.91E-03	0.344 - 4
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.16E-03	0/60	2.58E-04	0.344 - 4
SVOC	2-Methylnaphthalene	mg/kg	1.21E-02	1.78E-01	4.73E-02	7/60	N/A	N/A	0/60	3.70E-01	4/60	1.85E-02	0.0344 - 0.4
SVOC	2-Methylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.51E+00	0/60	7.53E-02	0.344 - 4
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.60E-01	0/60	8.01E-03	0.344 - 4
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.72E-02	0/60	4.36E-03	0.344 - 4
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.65E-02	0/60	8.24E-04	0.344 - 4

Table 4.21. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.90E-03	0/60	2.45E-04	0.344 - 4
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	6.84E-03	0/60	3.42E-04	0.344 - 4
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.42E+00	0/60	1.71E-01	0.344 - 4
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.10E-03	0/60	1.55E-04	0.344 - 4
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	6.84E-03	0/60	3.42E-04	0.344 - 4
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.72E-02	0/60	4.36E-03	0.344 - 4
SVOC	Acenaphthene	mg/kg	1.32E-02	7.73E-01	1.98E-01	7/60	N/A	N/A	0/60	1.10E+01	1/60	5.49E-01	0.0344 - 0.4
SVOC	Acenaphthylene	mg/kg	1.17E-02	1.17E-02	1.17E-02	1/60	N/A	N/A	0/60	1.10E+01	0/60	5.49E-01	0.0344 - 0.4
SVOC	Acetophenone	mg/kg	--	--	--	0/35	N/A	N/A	0/35	1.17E+00	0/35	5.84E-02	0.344 - 4
SVOC	Anthracene	mg/kg	1.35E-02	1.84E+00	2.81E-01	8/60	N/A	N/A	0/60	1.16E+02	0/60	5.81E+00	0.0344 - 0.4
SVOC	Atrazine	mg/kg	--	--	--	0/35	N/A	N/A	0/35	3.90E-02	0/35	1.95E-03	0.344 - 4
SVOC	Benzaldehyde	mg/kg	--	--	--	0/35	N/A	N/A	0/35	8.30E-02	0/35	4.15E-03	0.344 - 4
SVOC	Benzenemethanol	mg/kg	1.73E-01	2.80E-01	2.46E-01	4/25	N/A	N/A	0/25	9.52E-01	4/25	4.76E-02	0.345 - 3.92
SVOC	Benzo(ghi)perylene	mg/kg	2.07E-02	1.10E+00	2.49E-01	5/60	N/A	N/A	0/60	2.63E+01	0/60	1.32E+00	0.0344 - 0.4
SVOC	Benzoic acid	mg/kg	--	--	--	0/25	N/A	N/A	0/25	3.02E+01	0/25	1.51E+00	0.689 - 7.83
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.70E-02	0/60	1.35E-03	0.344 - 4
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.22E-05	0/60	3.61E-06	0.344 - 4
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.62E-03	0/60	1.31E-04	0.344 - 4
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.32E-02	2.50E-01	8.04E-02	4/60	N/A	N/A	0/60	2.66E+01	0/60	1.33E+00	0.0344 - 3.92
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.72E+00	0/60	2.36E-01	0.0344 - 3.92
SVOC	Caprolactam	mg/kg	--	--	--	0/35	N/A	N/A	0/35	4.94E+00	0/35	2.47E-01	0.344 - 4
SVOC	Carbazole	mg/kg	1.48E-02	7.66E-01	2.65E-01	4/35	N/A	N/A	1/35	7.51E-01	3/35	3.76E-02	0.0344 - 0.4
SVOC	Dibenzofuran	mg/kg	3.24E-01	4.87E-01	4.06E-01	2/60	N/A	N/A	2/60	2.92E-01	2/60	1.46E-02	0.344 - 4
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.22E+01	0/60	6.08E-01	0.0344 - 3.92
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.22E+01	0/60	6.08E-01	0.0344 - 3.92
SVOC	Di-n-butyl phthalate	mg/kg	1.31E-02	2.38E-02	1.82E-02	7/60	N/A	N/A	0/60	4.54E+00	0/60	2.27E-01	0.0344 - 3.92
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.13E+02	0/60	5.65E+00	0.0344 - 3.92
SVOC	Diphenylamine	mg/kg	--	--	--	0/35	N/A	N/A	0/35	4.66E+00	0/35	2.33E-01	0.344 - 4
SVOC	Fluoranthene	mg/kg	1.31E-02	7.38E+00	6.01E-01	16/60	N/A	N/A	0/60	1.78E+02	0/60	8.91E+00	0.0344 - 0.4
SVOC	Fluorene	mg/kg	1.58E-02	1.01E+00	2.52E-01	6/60	N/A	N/A	0/60	1.09E+01	1/60	5.45E-01	0.0344 - 0.4
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.46E-03	0/60	1.23E-04	0.344 - 4
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.34E-03	0/60	2.67E-04	0.344 - 4
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.56E-03	0/60	1.28E-04	0.344 - 4
SVOC	Hexachloroethane	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.00E-03	0/60	2.00E-04	0.344 - 4
SVOC	Isophorone	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.16E-01	0/60	2.58E-02	0.344 - 4
SVOC	m,p-Cresol	mg/kg	--	--	--	0/25	N/A	N/A	0/25	5.94E-01	0/25	2.97E-02	0.345 - 3.92
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/35	N/A	N/A	0/35	5.94E-01	0/35	2.97E-02	0.344 - 4
SVOC	Naphthalene	mg/kg	1.76E-02	3.67E-01	1.55E-01	4/60	N/A	N/A	4/60	7.70E-03	4/60	3.85E-04	0.0344 - 0.4
SVOC	Nitrobenzene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.83E-03	0/60	9.17E-05	0.344 - 4
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.62E-04	0/60	8.10E-06	0.344 - 4
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.14E-03	0/60	5.71E-05	0.344 - 4
SVOC	Phenanthrene	mg/kg	1.31E-02	7.80E+00	5.38E-01	19/60	N/A	N/A	0/60	1.10E+01	2/60	5.49E-01	0.0344 - 0.4
SVOC	Phenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	6.62E+00	0/60	3.31E-01	0.344 - 4
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.16E-02	0/60	1.58E-03	0.344 - 4
SVOC	Pyrene	mg/kg	1.26E-02	5.60E+00	4.89E-01	15/60	N/A	N/A	0/60	2.63E+01	1/60	1.32E+00	0.0344 - 0.4

Table 4.21. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Total PAH[d]	mg/kg	2.08E-03	3.55E+00	4.03E-01	11/60	N/A	N/A	1/60	5.89E-01	7/60	2.94E-02	-
RADS	Americium-241	pCi/g	6.96E-01	6.96E-01	6.96E-01	1/173	N/A	N/A	0/173	1.92E+01	0/173	9.58E-01	0.0597 - 1.11
RADS	Cesium-137	pCi/g	2.71E-02	8.68E-02	5.23E-02	6/173	0/173	2.80E-01	0/173	9.58E+00	0/173	4.79E-01	0.0148 - 0.105
RADS	Cobalt-60	pCi/g	--	--	--	0/137	N/A	N/A	0/137	3.19E-02	0/137	1.59E-03	0.0128 - 0.0713
RADS	Neptunium-237	pCi/g	2.09E+00	2.09E+00	2.09E+00	1/173	N/A	N/A	1/173	1.07E+00	1/173	5.36E-02	0.0293 - 1.41
RADS	Plutonium-238	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.38E+00	0/36	2.19E-01	0.239 - 0.985
RADS	Plutonium-239/240	pCi/g	5.94E-02	3.00E+00	1.53E+00	2/173	N/A	N/A	0/173	4.26E+00	1/173	2.13E-01	0.05 - 1.08
RADS	Technetium-99	pCi/g	2.30E+00	1.95E+01	4.85E+00	10/173	6/173	2.80E+00	10/173	1.52E-01	10/173	7.60E-03	1.58 - 4.76
RADS	Thorium-230	pCi/g	1.49E-01	2.24E+00	5.41E-01	164/173	4/173	1.40E+00	0/173	3.66E+01	1/173	1.83E+00	0.0852 - 0.944
RADS	Uranium-233/234	pCi/g	6.06E-01	3.71E+00	1.26E+00	27/36	12/36	1.20E+00	18/36	9.90E-01	27/36	4.95E-02	0.308 - 1.15
RADS	Uranium-234	pCi/g	1.23E+00	2.61E+00	1.96E+00	4/97	4/97	1.20E+00	4/97	9.90E-01	4/97	4.95E-02	0.061 - 1.43
RADS	Uranium-235	pCi/g	2.55E-02	1.67E-01	5.45E-02	100/137	22/137	6.00E-02	0/137	9.76E-01	44/137	4.88E-02	0.0198 - 0.0971
RADS	Uranium-235/236	pCi/g	6.10E-01	6.10E-01	6.10E-01	1/36	1/36	6.00E-02	0/36	9.76E-01	1/36	4.88E-02	0.125 - 1.03
RADS	Uranium-238	pCi/g	5.12E-01	5.43E+00	1.26E+00	129/142	50/142	1.20E+00	108/142	8.05E-01	129/142	4.03E-02	0.125 - 1.47
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.62E+00	0/113	2.81E-01	0.000864 - 1.3
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.92E-04	0/113	2.96E-05	0.000864 - 1.3
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	5.13E+01	0/48	2.56E+00	0.00432 - 0.00938
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	2.69E-04	0/113	1.35E-05	0.000864 - 1.3
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.56E-02	0/113	7.82E-04	0.000864 - 1.3
VOC	1,1-Dichloroethene	mg/kg	3.78E-04	4.65E-02	5.98E-03	10/138	N/A	N/A	0/138	2.04E-01	1/138	1.02E-02	0.000862 - 1.3
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.18E-02	0/48	2.09E-03	0.000864 - 0.00188
VOC	1,2,4-Trichlorobenzene	mg/kg	1.95E-03	1.95E-03	1.95E-03	1/48	N/A	N/A	0/48	2.32E-02	1/48	1.16E-03	0.000864 - 0.00188
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	2.88E-06	0/48	1.44E-07	0.000864 - 0.00188
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.20E-05	0/48	2.10E-06	0.000864 - 0.00188
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	5.90E-01	0/48	2.95E-02	0.000864 - 0.00188
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	9.69E-04	0/113	4.84E-05	0.000864 - 1.3
VOC	1,2-Dichloroethene	mg/kg	--	--	--	0/6	N/A	N/A	0/6	9.56E-02	0/6	4.78E-03	0.15 - 0.19
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.48E-03	0/113	2.74E-04	0.000864 - 1.3
VOC	1,2-Dimethylbenzene	mg/kg	1.29E-03	1.29E-03	1.29E-03	1/113	N/A	N/A	0/113	3.81E-01	0/113	1.90E-02	0.000864 - 1.3
VOC	1,3-Dichlorobenzene	mg/kg	4.58E-04	4.58E-04	4.58E-04	1/48	N/A	N/A	0/48	5.90E-01	0/48	2.95E-02	0.000864 - 0.00188
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	9.24E-03	0/48	4.62E-04	0.000864 - 0.00188
VOC	1,4-Dioxane	mg/kg	--	--	--	0/47	N/A	N/A	0/47	1.88E-03	0/47	9.42E-05	0.0432 - 0.0938
VOC	2-Butanone	mg/kg	1.97E-03	5.27E-02	1.19E-02	17/113	N/A	N/A	0/113	2.32E+00	0/113	1.16E-01	0.00432 - 1.3
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/48	N/A	N/A	0/48	2.76E-05	0/48	1.38E-06	0.00432 - 0.00938
VOC	2-Hexanone	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.75E-02	0/113	8.75E-04	0.00432 - 1.3
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	6.44E-02	0/48	3.22E-03	0.000864 - 0.00188
VOC	4-Methyl-2-pentanone	mg/kg	2.75E-03	2.75E-03	2.75E-03	1/113	N/A	N/A	0/113	5.62E-01	0/113	2.81E-02	0.00432 - 1.3
VOC	Acetone	mg/kg	2.08E-03	4.60E-01	4.13E-02	70/113	N/A	N/A	0/113	7.36E+00	1/113	3.68E-01	0.00432 - 1.3
VOC	Acrolein	mg/kg	2.71E-03	2.76E-03	2.74E-03	2/48	N/A	N/A	2/48	1.68E-05	2/48	8.41E-07	0.00432 - 0.00938
VOC	Acrylonitrile	mg/kg	--	--	--	0/48	N/A	N/A	0/48	2.28E-04	0/48	1.14E-05	0.00432 - 0.00938
VOC	Benzene	mg/kg	3.82E-04	8.32E-04	6.07E-04	2/113	N/A	N/A	0/113	4.66E-03	2/113	2.33E-04	0.000864 - 1.3
VOC	Bromochloromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.16E-02	0/48	2.08E-03	0.000864 - 0.00188
VOC	Bromodichloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	7.30E-04	0/113	3.65E-05	0.000864 - 1.3
VOC	Bromoform	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.75E-02	0/113	8.73E-04	0.000864 - 1.3
VOC	Bromomethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.82E-03	0/113	1.91E-04	0.000864 - 1.3

Table 4.21. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Carbon disulfide	mg/kg	--	--	--	0/113	N/A	N/A	0/113	4.80E-01	0/113	2.40E-02	0.00432 - 1.3
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.54E-03	0/113	1.77E-04	0.000864 - 1.3
VOC	Chlorobenzene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.06E-01	0/113	5.28E-03	0.000864 - 1.3
VOC	Chloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	4.74E+00	0/113	2.37E-01	0.000864 - 1.3
VOC	Chloroform	mg/kg	6.87E-04	1.74E-03	1.04E-03	3/113	N/A	N/A	1/113	1.22E-03	3/113	6.12E-05	0.000864 - 1.3
VOC	Chloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.05E-02	0/113	5.26E-04	0.000864 - 1.3
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.21E-04	2.50E+00	1.42E-01	54/132	N/A	N/A	18/132	2.12E-02	51/132	1.06E-03	0.000862 - 1.3
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.36E-03	0/113	1.68E-04	0.000864 - 1.3
VOC	Cumene	mg/kg	4.34E-04	4.34E-04	4.34E-04	1/48	N/A	N/A	0/48	1.48E+00	0/48	7.38E-02	0.000864 - 0.00188
VOC	Cyclohexane	mg/kg	2.34E-03	2.34E-03	2.34E-03	1/48	N/A	N/A	0/48	2.60E+01	0/48	1.30E+00	0.000864 - 0.00188
VOC	Dibromochloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	4.64E-03	0/113	2.32E-04	0.000864 - 1.3
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	6.08E-01	0/48	3.04E-02	0.000864 - 0.00188
VOC	Ethylbenzene	mg/kg	1.64E-03	1.64E-03	1.64E-03	1/113	N/A	N/A	0/113	3.36E-02	0/113	1.68E-03	0.000864 - 1.3
VOC	m,p-Xylene	mg/kg	3.69E-03	3.69E-03	3.69E-03	1/113	N/A	N/A	0/113	3.82E-01	0/113	1.91E-02	0.00173 - 2.5
VOC	Methyl acetate	mg/kg	--	--	--	0/48	N/A	N/A	0/48	8.22E+00	0/48	4.11E-01	0.00432 - 0.00938
VOC	Methylcyclohexane	mg/kg	4.41E-04	3.33E-03	1.45E-03	5/48	N/A	N/A	0/48	2.80E+01	0/48	1.40E+00	0.000864 - 0.00188
VOC	Methylene chloride	mg/kg	1.73E-03	8.58E-03	4.07E-03	31/113	N/A	N/A	0/113	5.44E-02	23/113	2.72E-03	0.00432 - 1.3
VOC	Styrene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	2.66E+00	0/113	1.33E-01	0.000864 - 1.3
VOC	Tetrachloroethene	mg/kg	6.85E-04	1.36E-03	1.06E-03	4/113	N/A	N/A	0/113	3.69E-02	0/113	1.84E-03	0.000864 - 1.3
VOC	Toluene	mg/kg	3.20E-04	1.84E-02	4.17E-03	9/113	N/A	N/A	0/113	1.52E+00	0/113	7.62E-02	0.000864 - 1.3
VOC	Total Xylene	mg/kg	4.97E-03	4.97E-03	4.97E-03	1/48	N/A	N/A	0/48	3.82E-01	0/48	1.91E-02	0.00259 - 0.00563
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.17E-04	2.80E-02	4.14E-03	16/132	N/A	N/A	0/132	5.83E-02	4/132	2.91E-03	0.000862 - 1.3
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.36E-03	0/113	1.68E-04	0.000864 - 1.3
VOC	Trichloroethene	mg/kg	3.95E-04	1.13E+02	2.51E+00	114/142	N/A	N/A	104/142	2.02E-03	114/142	1.01E-04	0.000862 - 5
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	1.46E+00	0/48	7.31E-02	0.000864 - 0.00188
VOC	Vinyl acetate	mg/kg	--	--	--	0/65	N/A	N/A	0/65	1.74E-01	0/65	8.70E-03	0.01 - 1.3
VOC	Vinyl chloride	mg/kg	5.97E-04	7.55E-02	1.12E-02	12/138	N/A	N/A	12/138	1.29E-04	12/138	6.47E-06	0.000862 - 1.3

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.22. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 4

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	8.65E+02	2.02E+04	6.80E+03	454/454	41/454	1.20E+04	0/454	5.99E+04	407/454	3.00E+03	9.62 - 125
METAL	Antimony	mg/kg	3.99E-01	5.84E+00	1.42E+00	13/71	13/71	2.10E-01	9/71	7.04E-01	13/71	3.52E-02	1 - 21.8
METAL	Arsenic	mg/kg	4.20E-01	5.26E+01	3.95E+00	74/454	4/454	7.90E+00	74/454	3.02E-02	74/454	1.51E-03	0.962 - 200
METAL	Barium	mg/kg	2.83E+00	4.09E+02	2.76E+01	454/454	4/454	1.70E+02	1/454	3.11E+02	358/454	1.55E+01	0.769 - 8.84
METAL	Beryllium	mg/kg	9.60E-02	1.89E+00	5.76E-01	68/71	20/71	6.90E-01	0/71	3.89E+01	0/71	1.95E+00	0.0962 - 0.593
METAL	Boron	mg/kg	8.97E-01	4.23E+00	1.36E+00	27/68	N/A	N/A	0/68	2.56E+01	9/68	1.28E+00	2.88 - 17.8
METAL	Cadmium	mg/kg	2.43E-02	5.39E-01	1.29E-01	6/71	1/71	2.10E-01	0/71	1.39E+00	3/71	6.93E-02	0.192 - 0.5
METAL	Calcium	mg/kg	1.55E+02	7.82E+03	7.68E+02	385/386	1/386	6.10E+03	0/386	N/A	0/386	N/A	100 - 200
METAL	Chromium	mg/kg	2.50E+00	1.11E+02	1.36E+01	443/454	20/454	4.30E+01	0/454	3.60E+06	0/454	1.80E+05	0.577 - 3.56
METAL	Cobalt	mg/kg	4.37E-01	7.77E+01	4.91E+00	69/71	3/71	1.30E+01	67/71	5.43E-01	69/71	2.71E-02	0.192 - 5
METAL	Copper	mg/kg	1.00E+00	1.25E+01	4.41E+00	71/71	0/71	2.50E+01	0/71	5.62E+01	50/71	2.81E+00	0.385 - 2.5
METAL	Iron	mg/kg	1.29E+03	1.20E+05	1.09E+04	454/454	19/454	2.80E+04	454/454	7.04E+02	454/454	3.52E+01	20 - 438
METAL	Lead	mg/kg	8.58E-01	1.44E+01	4.74E+00	71/454	0/454	2.30E+01	0/454	2.70E+02	2/454	1.35E+01	0.385 - 20
METAL	Magnesium	mg/kg	5.77E+01	2.25E+03	4.46E+02	386/386	1/386	2.10E+03	0/386	N/A	0/386	N/A	2.5 - 5
METAL	Manganese	mg/kg	2.72E+00	1.42E+03	4.50E+01	453/454	1/454	8.20E+02	80/454	5.65E+01	452/454	2.83E+00	0.962 - 11.9
METAL	Mercury	mg/kg	8.85E-03	3.00E-01	3.43E-02	15/454	1/454	1.30E-01	0/454	5.91E-01	3/454	2.95E-02	0.02 - 0.2
METAL	Molybdenum	mg/kg	9.15E-02	1.66E+00	3.31E-01	55/68	N/A	N/A	0/68	4.03E+00	36/68	2.02E-01	0.192 - 0.25
METAL	Nickel	mg/kg	1.15E+00	2.63E+02	8.25E+00	111/454	1/454	2.20E+01	1/454	5.12E+01	99/454	2.56E+00	0.385 - 5
METAL	Potassium	mg/kg	1.05E+02	7.96E+02	2.86E+02	307/386	0/386	9.50E+02	0/386	N/A	0/386	N/A	100 - 200
METAL	Selenium	mg/kg	3.64E-01	8.32E+00	1.25E+00	68/442	50/442	7.00E-01	33/442	1.04E+00	68/442	5.19E-02	0.962 - 200
METAL	Silver	mg/kg	1.09E-01	2.83E-01	1.87E-01	7/71	0/71	2.70E+00	0/71	1.60E+00	7/71	7.99E-02	0.492 - 5.45
METAL	Sodium	mg/kg	2.01E+02	3.47E+03	3.20E+02	130/386	23/386	3.40E+02	0/386	N/A	0/386	N/A	100 - 250
METAL	Thallium	mg/kg	1.54E-01	3.80E-01	2.14E-01	5/71	1/71	3.40E-01	5/71	2.84E-02	5/71	1.42E-03	0.385 - 2
METAL	Uranium[a]	mg/kg	1.25E-01	7.91E+02	6.72E+01	107/454	39/454	4.60E+00	39/454	3.60E+00	106/454	1.80E-01	0.0385 - 1000
METAL	Vanadium	mg/kg	2.58E+00	1.85E+02	2.06E+01	452/454	44/454	3.70E+01	1/454	1.73E+02	389/454	8.64E+00	2.5 - 23.7
METAL	Zinc	mg/kg	3.91E+00	4.56E+01	1.45E+01	68/71	0/71	6.00E+01	0/71	7.46E+02	3/71	3.73E+01	3.85 - 20
ANION	Fluoride	mg/kg	6.22E-01	9.81E+00	3.07E+00	68/68	N/A	N/A	0/68	2.40E+02	0/68	1.20E+01	1.02 - 2.05
PPCB	Total PCB[b]	mg/kg	1.46E-03	8.69E-02	1.66E-02	29/191	N/A	N/A	0/191	1.36E-01	14/191	6.82E-03	0.00341 - 0.1
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/69	N/A	N/A	0/69	1.74E-02	0/69	8.72E-04	0.36 - 1.89
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.04E+00	0/191	4.02E-01	0.341 - 1.89
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.32E-02	0/191	1.16E-03	0.341 - 1.89
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	4.52E-02	0/191	2.26E-03	0.341 - 1.89
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.42E-01	0/191	4.21E-02	0.341 - 1.89
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.72E-02	0/191	4.36E-03	0.47 - 3.78
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	6.42E-03	0/191	3.21E-04	0.341 - 1.89
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.33E-03	0/191	6.67E-05	0.341 - 1.89
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.70E+00	0/191	3.85E-01	0.0341 - 0.5
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.78E-01	0/191	8.91E-03	0.341 - 1.89
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.16E-03	0/191	2.58E-04	0.341 - 1.89
SVOC	2-Methylnaphthalene	mg/kg	1.36E-02	4.10E-02	2.64E-02	4/191	N/A	N/A	0/191	3.70E-01	2/191	1.85E-02	0.0341 - 0.5
SVOC	2-Methylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.51E+00	0/191	7.53E-02	0.341 - 1.89
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.60E-01	0/191	8.01E-03	0.341 - 1.89
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.72E-02	0/191	4.36E-03	0.341 - 1.89
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.65E-02	0/191	8.24E-04	0.341 - 1.89
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	4.90E-03	0/191	2.45E-04	0.341 - 1.89

Table 4.22. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	6.84E-03	0/191	3.42E-04	0.341 - 1.89
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.42E+00	0/191	1.71E-01	0.341 - 1.89
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.10E-03	0/191	1.55E-04	0.341 - 1.89
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	6.84E-03	0/191	3.42E-04	0.341 - 1.89
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.72E-02	0/191	4.36E-03	0.341 - 1.89
SVOC	Acenaphthene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5
SVOC	Acenaphthylene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5
SVOC	Acetophenone	mg/kg	--	--	--	0/69	N/A	N/A	0/69	1.17E+00	0/69	5.84E-02	0.36 - 1.89
SVOC	Anthracene	mg/kg	1.96E-02	1.96E-02	1.96E-02	1/191	N/A	N/A	0/191	1.16E+02	0/191	5.81E+00	0.0341 - 0.5
SVOC	Atrazine	mg/kg	--	--	--	0/69	N/A	N/A	0/69	3.92E-03	0/69	1.96E-04	0.36 - 1.89
SVOC	Benzaldehyde	mg/kg	--	--	--	0/69	N/A	N/A	0/69	8.30E-02	0/69	4.15E-03	0.36 - 1.89
SVOC	Benzenemethanol	mg/kg	1.13E-01	3.22E-01	1.81E-01	16/122	N/A	N/A	0/122	9.52E-01	16/122	4.76E-02	0.341 - 0.726
SVOC	Benzo(ghi)perylene	mg/kg	2.06E-02	2.29E-02	2.18E-02	2/191	N/A	N/A	0/191	2.63E+01	0/191	1.32E+00	0.0341 - 0.5
SVOC	Benzoic acid	mg/kg	--	--	--	0/112	N/A	N/A	0/112	3.02E+01	0/112	1.51E+00	0.49 - 1.45
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.70E-02	0/191	1.35E-03	0.341 - 1.89
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.22E-05	0/191	3.61E-06	0.341 - 1.89
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.62E-03	0/191	1.31E-04	0.341 - 1.89
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.29E-02	1.77E+00	2.43E-01	12/191	N/A	N/A	0/191	2.66E+01	1/191	1.33E+00	0.036 - 0.726
SVOC	Butyl benzyl phthalate	mg/kg	1.46E-02	1.46E-02	1.46E-02	1/191	N/A	N/A	0/191	4.72E+00	0/191	2.36E-01	0.036 - 0.726
SVOC	Caprolactam	mg/kg	--	--	--	0/69	N/A	N/A	0/69	4.94E+00	0/69	2.47E-01	0.36 - 1.89
SVOC	Carbazole	mg/kg	--	--	--	0/69	N/A	N/A	0/69	7.51E-01	0/69	3.76E-02	0.036 - 0.189
SVOC	Dibenzofuran	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.92E-01	0/191	1.46E-02	0.341 - 1.89
SVOC	Diethyl phthalate	mg/kg	2.27E-02	2.27E-02	2.27E-02	1/191	N/A	N/A	0/191	1.22E+01	0/191	6.08E-01	0.036 - 0.726
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.22E+01	0/191	6.08E-01	0.036 - 0.726
SVOC	Di-n-butyl phthalate	mg/kg	1.09E-02	5.68E-02	1.90E-02	32/191	N/A	N/A	0/191	4.54E+00	0/191	2.27E-01	0.036 - 0.726
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.13E+02	0/191	5.65E+00	0.036 - 0.726
SVOC	Diphenylamine	mg/kg	--	--	--	0/69	N/A	N/A	0/69	4.66E+00	0/69	2.33E-01	0.36 - 1.89
SVOC	Fluoranthene	mg/kg	9.55E-02	9.55E-02	9.55E-02	1/191	N/A	N/A	0/191	1.78E+02	0/191	8.91E+00	0.0341 - 0.5
SVOC	Fluorene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.09E+01	0/191	5.45E-01	0.0341 - 0.5
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.46E-03	0/191	1.23E-04	0.341 - 1.89
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.34E-03	0/191	2.67E-04	0.341 - 1.89
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.56E-03	0/191	1.28E-04	0.341 - 1.89
SVOC	Hexachloroethane	mg/kg	--	--	--	0/191	N/A	N/A	0/191	4.00E-03	0/191	2.00E-04	0.341 - 1.89
SVOC	Isophorone	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.16E-01	0/191	2.58E-02	0.341 - 1.89
SVOC	m,p-Cresol	mg/kg	--	--	--	0/122	N/A	N/A	0/122	5.94E-01	0/122	2.97E-02	0.341 - 0.726
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/69	N/A	N/A	0/69	5.94E-01	0/69	2.97E-02	0.36 - 1.89
SVOC	Naphthalene	mg/kg	1.19E-02	2.50E-02	2.03E-02	3/191	N/A	N/A	3/191	7.70E-03	3/191	3.85E-04	0.0341 - 0.5
SVOC	Nitrobenzene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.83E-03	0/191	9.17E-05	0.341 - 1.89
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.62E-04	0/191	8.10E-06	0.341 - 1.89
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.33E+00	0/37	6.66E-02	0.47 - 0.5
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.14E-03	0/191	5.71E-05	0.341 - 1.89
SVOC	Phenanthrene	mg/kg	1.12E-02	7.79E-02	2.95E-02	5/191	N/A	N/A	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5
SVOC	Phenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	6.62E+00	0/191	3.31E-01	0.341 - 1.89
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.16E-02	0/191	1.58E-03	0.341 - 1.89
SVOC	Pyrene	mg/kg	5.79E-02	5.79E-02	5.79E-02	1/191	N/A	N/A	0/191	2.63E+01	0/191	1.32E+00	0.0341 - 0.5

Table 4.22. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Total PAH[c]	mg/kg	4.47E-02	4.47E-02	4.47E-02	1/189	N/A	N/A	0/189	5.89E-01	1/189	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/444	N/A	N/A	0/444	1.92E+01	0/444	9.58E-01	0.0435 - 1.31
RADS	Cesium-137	pCi/g	4.54E-02	4.54E-02	4.54E-02	1/444	0/444	2.80E-01	0/444	9.58E+00	0/444	4.79E-01	0.0115 - 0.104
RADS	Cobalt-60	pCi/g	--	--	--	0/376	N/A	N/A	0/376	3.19E-02	0/376	1.59E-03	0.0101 - 0.145
RADS	Neptunium-237	pCi/g	--	--	--	0/447	N/A	N/A	0/447	1.07E+00	0/447	5.36E-02	0.0199 - 1.24
RADS	Plutonium-238	pCi/g	--	--	--	0/68	N/A	N/A	0/68	4.38E+00	0/68	2.19E-01	0.093 - 1.02
RADS	Plutonium-239/240	pCi/g	--	--	--	0/447	N/A	N/A	0/447	4.26E+00	0/447	2.13E-01	0.018 - 0.893
RADS	Technetium-99	pCi/g	1.95E+00	5.58E+00	2.90E+00	22/447	9/447	2.80E+00	22/447	1.52E-01	22/447	7.60E-03	1.58 - 4.76
RADS	Thorium-230	pCi/g	9.16E-02	2.16E+00	3.75E-01	267/444	4/444	1.40E+00	0/444	3.66E+01	1/444	1.83E+00	0.0867 - 0.91
RADS	Uranium-233/234	pCi/g	3.18E-01	1.37E+00	7.60E-01	35/68	3/68	1.20E+00	6/68	9.90E-01	35/68	4.95E-02	0.25 - 1.34
RADS	Uranium-234	pCi/g	7.47E-01	2.42E+00	1.86E+00	8/239	7/239	1.20E+00	7/239	9.90E-01	8/239	4.95E-02	0.0514 - 2.35
RADS	Uranium-235	pCi/g	1.64E-02	2.07E-01	4.89E-02	242/379	37/379	6.00E-02	0/379	9.76E-01	85/379	4.88E-02	0.0146 - 0.231
RADS	Uranium-235/236	pCi/g	1.33E-01	2.73E-01	1.93E-01	3/68	3/68	6.00E-02	0/68	9.76E-01	3/68	4.88E-02	0.133 - 1.33
RADS	Uranium-238	pCi/g	3.10E-01	6.75E+00	1.03E+00	275/332	58/332	1.20E+00	180/332	8.05E-01	275/332	4.03E-02	0.0089 - 2.34
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.62E+00	0/288	2.81E-01	0.000818 - 1.3
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.92E-04	0/288	2.96E-05	0.000818 - 1.3
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	5.13E+01	0/143	2.56E+00	0.00409 - 0.588
VOC	1,1,2-Trichloroethane	mg/kg	4.47E-04	3.10E-03	1.12E-03	9/288	N/A	N/A	9/288	2.69E-04	9/288	1.35E-05	0.000818 - 1.3
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.56E-02	0/288	7.82E-04	0.000818 - 1.3
VOC	1,1-Dichloroethene	mg/kg	4.38E-04	1.80E-03	8.89E-04	6/416	N/A	N/A	0/416	2.04E-01	0/416	1.02E-02	0.000763 - 1.3
VOC	1,2,3-Trichlorobenzene	mg/kg	1.27E-03	1.27E-03	1.27E-03	1/143	N/A	N/A	0/143	4.18E-02	0/143	2.09E-03	0.000818 - 0.118
VOC	1,2,4-Trichlorobenzene	mg/kg	6.57E-04	6.57E-04	6.57E-04	1/143	N/A	N/A	0/143	2.32E-02	0/143	1.16E-03	0.000818 - 0.118
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.88E-06	0/143	1.44E-07	0.000818 - 0.118
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	4.20E-05	0/143	2.10E-06	0.000818 - 0.118
VOC	1,2-Dichlorobenzene	mg/kg	1.42E-03	1.42E-03	1.42E-03	1/143	N/A	N/A	0/143	5.90E-01	0/143	2.95E-02	0.000818 - 0.118
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	9.69E-04	0/288	4.84E-05	0.000818 - 1.3
VOC	1,2-Dichloroethene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	9.56E-02	0/21	4.78E-03	0.15 - 2.6
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.48E-03	0/288	2.74E-04	0.000818 - 1.3
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.81E-01	0/288	1.90E-02	0.000818 - 1.3
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	5.90E-01	0/143	2.95E-02	0.000818 - 0.118
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	9.24E-03	0/143	4.62E-04	0.000818 - 0.118
VOC	1,4-Dioxane	mg/kg	2.20E-02	2.20E-02	2.20E-02	1/139	N/A	N/A	1/139	1.88E-03	1/139	9.42E-05	0.0409 - 5.88
VOC	2-Butanone	mg/kg	2.36E-03	3.03E-01	5.73E-02	16/288	N/A	N/A	0/288	2.32E+00	3/288	1.16E-01	0.001 - 1.3
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.76E-05	0/143	1.38E-06	0.00409 - 0.588
VOC	2-Hexanone	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.75E-02	0/288	8.75E-04	0.001 - 1.3
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	6.44E-02	0/143	3.22E-03	0.000818 - 0.118
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.62E-01	0/288	2.81E-02	0.001 - 1.3
VOC	Acetone	mg/kg	1.91E-03	3.01E+00	1.54E-01	179/288	N/A	N/A	0/288	7.36E+00	15/288	3.68E-01	0.001 - 1.3
VOC	Acrolein	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.68E-05	0/143	8.41E-07	0.00409 - 0.588
VOC	Acrylonitrile	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.28E-04	0/143	1.14E-05	0.00409 - 0.588
VOC	Benzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	4.66E-03	0/288	2.33E-04	0.000818 - 1.3
VOC	Bromochloromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	4.16E-02	0/143	2.08E-03	0.000818 - 0.118
VOC	Bromodichloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	7.30E-04	0/288	3.65E-05	0.000818 - 1.3
VOC	Bromoform	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.75E-02	0/288	8.73E-04	0.000818 - 1.3
VOC	Bromomethane	mg/kg	1.00E-03	1.00E-03	1.00E-03	1/288	N/A	N/A	0/288	3.82E-03	1/288	1.91E-04	0.000818 - 1.3

Table 4.22. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Carbon disulfide	mg/kg	2.17E-03	3.75E-03	2.83E-03	3/288	N/A	N/A	0/288	4.80E-01	0/288	2.40E-02	0.001 - 1.3
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.54E-03	0/288	1.77E-04	0.000818 - 1.3
VOC	Chlorobenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.06E-01	0/288	5.28E-03	0.000818 - 1.3
VOC	Chloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	4.74E+00	0/288	2.37E-01	0.000818 - 1.3
VOC	Chloroform	mg/kg	3.08E-04	4.32E-03	8.88E-04	34/288	N/A	N/A	6/288	1.22E-03	34/288	6.12E-05	0.000818 - 1.3
VOC	Chloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.05E-02	0/288	5.26E-04	0.000818 - 1.3
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.41E-04	2.21E-01	1.62E-02	106/395	N/A	N/A	23/395	2.12E-02	76/395	1.06E-03	0.000763 - 0.39
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.36E-03	0/288	1.68E-04	0.000818 - 1.3
VOC	Cumene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.48E+00	0/143	7.38E-02	0.000818 - 0.118
VOC	Cyclohexane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.60E+01	0/143	1.30E+00	0.000818 - 0.118
VOC	Dibromochloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	4.64E-03	0/288	2.32E-04	0.000818 - 1.3
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	6.08E-01	0/143	3.04E-02	0.000818 - 0.118
VOC	Ethylbenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.36E-02	0/288	1.68E-03	0.000818 - 1.3
VOC	m,p-Xylene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.82E-01	0/288	1.91E-02	0.00164 - 2.5
VOC	Methyl acetate	mg/kg	--	--	--	0/143	N/A	N/A	0/143	8.22E+00	0/143	4.11E-01	0.00409 - 0.588
VOC	Methylcyclohexane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.80E+01	0/143	1.40E+00	0.000818 - 0.118
VOC	Methylene chloride	mg/kg	1.70E-03	1.64E-01	6.87E-03	43/288	N/A	N/A	1/288	5.44E-02	24/288	2.72E-03	0.001 - 1.3
VOC	Styrene	mg/kg	6.28E-04	8.46E-04	7.46E-04	5/288	N/A	N/A	0/288	2.66E+00	0/288	1.33E-01	0.000818 - 1.3
VOC	Tetrachloroethene	mg/kg	3.95E-04	1.21E-03	7.35E-04	14/288	N/A	N/A	0/288	3.69E-02	0/288	1.84E-03	0.000818 - 1.3
VOC	Toluene	mg/kg	5.79E-04	1.19E-03	7.93E-04	4/288	N/A	N/A	0/288	1.52E+00	0/288	7.62E-02	0.000818 - 1.3
VOC	Total Xylene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	3.82E-01	0/143	1.91E-02	0.00246 - 0.353
VOC	*trans* -1,2-Dichloroethene	mg/kg	1.10E-03	1.21E-03	1.16E-03	2/395	N/A	N/A	0/395	5.83E-02	0/395	2.91E-03	0.000763 - 0.39
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.36E-03	0/288	1.68E-04	0.000818 - 1.3
VOC	Trichloroethene	mg/kg	3.38E-04	4.92E+01	1.26E+00	308/431	N/A	N/A	260/431	2.02E-03	308/431	1.01E-04	0.000763 - 5
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.46E+00	0/143	7.31E-02	0.000818 - 0.118
VOC	Vinyl acetate	mg/kg	--	--	--	0/142	N/A	N/A	0/142	1.74E-01	0/142	8.70E-03	0.01 - 1.3
VOC	Vinyl chloride	mg/kg	4.91E-04	2.25E-03	9.86E-04	5/416	N/A	N/A	5/416	1.29E-04	5/416	6.47E-06	0.000763 - 1.3

(orange)	One or more samples exceed background value
(blue)	One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.23. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 4

Type	Analysis	Unit	Detected Results			Frequency of	GW Protection Screen		DL Range
			Min	Max	Avg	Detection	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	4.27E+02	1.37E+04	4.35E+03	57/57	29/57	3.00E+03	10.5 - 20
METAL	Antimony	mg/kg	6.92E-01	9.42E+00	2.70E+00	5/54	5/54	3.52E-02	2.09 - 26.1
METAL	Arsenic	mg/kg	4.27E-01	1.38E+02	8.46E+00	54/57	54/57	1.51E-03	1.05 - 5
METAL	Barium	mg/kg	2.12E+00	9.92E+01	2.16E+01	57/57	27/57	1.55E+01	0.837 - 2.5
METAL	Beryllium	mg/kg	2.91E-02	3.06E+00	6.12E-01	54/54	5/54	1.95E+00	0.105 - 0.143
METAL	Boron	mg/kg	9.08E-01	6.58E+00	2.27E+00	40/54	33/54	1.28E+00	3.14 - 4.3
METAL	Cadmium	mg/kg	2.62E-02	8.91E-01	1.41E-01	34/54	19/54	6.93E-02	0.209 - 0.286
METAL	Calcium	mg/kg	2.25E+03	1.62E+04	9.23E+03	2/3	N/A	N/A	200 - 200
METAL	Chromium	mg/kg	1.09E+00	9.21E+01	1.38E+01	56/57	0/57	1.80E+05	0.628 - 2.5
METAL	Cobalt	mg/kg	1.47E-01	1.87E+01	3.38E+00	54/54	54/54	2.71E-02	0.209 - 0.286
METAL	Copper	mg/kg	1.74E-01	1.27E+01	3.15E+00	54/54	24/54	2.81E+00	0.418 - 0.573
METAL	Iron	mg/kg	6.65E+02	2.18E+05	1.99E+04	57/57	57/57	3.52E+01	20 - 2290
METAL	Lead	mg/kg	1.03E+00	3.24E+01	6.67E+00	54/57	6/57	1.35E+01	0.418 - 20
METAL	Magnesium	mg/kg	9.53E+01	1.55E+03	9.42E+02	3/3	N/A	N/A	2.5 - 2.5
METAL	Manganese	mg/kg	1.01E+00	3.17E+02	4.60E+01	56/57	55/57	2.83E+00	1.05 - 2.5
METAL	Mercury	mg/kg	8.38E-03	2.99E-01	3.78E-02	20/57	5/57	2.95E-02	0.0237 - 0.2
METAL	Molybdenum	mg/kg	9.92E-02	4.14E+00	4.91E-01	33/54	21/54	2.02E-01	0.209 - 0.286
METAL	Nickel	mg/kg	3.00E-01	1.84E+01	5.77E+00	56/57	37/57	2.56E+00	0.418 - 5
METAL	Potassium	mg/kg	4.47E+02	5.39E+02	4.93E+02	2/3	N/A	N/A	200 - 200
METAL	Selenium	mg/kg	3.81E-01	4.81E+00	1.42E+00	48/57	48/57	5.19E-02	1 - 1.43
METAL	Silver	mg/kg	1.28E-01	1.91E-01	1.51E-01	7/54	7/54	7.99E-02	0.521 - 11.9
METAL	Sodium	mg/kg	--	--	--	0/3	N/A	N/A	250 - 250
METAL	Thallium	mg/kg	1.69E-01	1.69E-01	1.69E-01	1/54	1/54	1.42E-03	0.418 - 0.573
METAL	Uranium[a]	mg/kg	5.19E-02	3.73E+00	9.67E-01	54/57	50/57	1.80E-01	0.0418 - 100
METAL	Vanadium	mg/kg	1.73E+00	2.63E+02	2.54E+01	57/57	51/57	8.64E+00	2.5 - 5.73
METAL	Zinc	mg/kg	2.45E+00	1.27E+02	3.44E+01	54/54	16/54	3.73E+01	4.18 - 5.73
ANION	Fluoride	mg/kg	8.08E-01	5.81E+00	3.10E+00	52/54	0/54	1.20E+01	1.1 - 1.47
PPCB	Total PCB[b]	mg/kg	--	--	--	0/54	0/54	6.82E-03	0.00353 - 0.00542
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/54	0/54	8.72E-04	0.349 - 0.545
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/54	0/54	4.02E-01	0.349 - 0.545
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/54	0/54	1.16E-03	0.349 - 0.545
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/54	0/54	2.26E-03	0.349 - 0.545
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/54	0/54	4.21E-02	0.349 - 0.545
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.698 - 1.09
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/54	0/54	3.21E-04	0.349 - 0.545
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/54	0/54	6.67E-05	0.349 - 0.545
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/54	0/54	3.85E-01	0.0349 - 0.0545
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/54	0/54	8.91E-03	0.349 - 0.545
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/54	0/54	2.58E-04	0.349 - 0.545
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/54	0/54	1.85E-02	0.0349 - 0.0545
SVOC	2-Methylphenol	mg/kg	--	--	--	0/54	0/54	7.53E-02	0.349 - 0.545
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/54	0/54	8.01E-03	0.349 - 0.545
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.349 - 0.545
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/54	0/54	8.24E-04	0.349 - 0.545
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/54	0/54	2.45E-04	0.349 - 0.545

Table 4.23. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Frequency of Detection	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/54	0/54	3.42E-04	0.349 - 0.545
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/54	0/54	1.71E-01	0.349 - 0.545
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/54	0/54	1.55E-04	0.349 - 0.545
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/54	0/54	3.42E-04	0.349 - 0.545
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.349 - 0.545
SVOC	Acenaphthene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOC	Acenaphthylene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOC	Acetophenone	mg/kg	--	--	--	0/54	0/54	5.84E-02	0.349 - 0.545
SVOC	Anthracene	mg/kg	--	--	--	0/54	0/54	5.81E+00	0.0349 - 0.0545
SVOC	Atrazine	mg/kg	--	--	--	0/54	0/54	1.96E-04	0.349 - 0.545
SVOC	Benzaldehyde	mg/kg	--	--	--	0/54	0/54	4.15E-03	0.349 - 0.545
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/54	0/54	1.32E+00	0.0349 - 0.0545
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/54	0/54	1.35E-03	0.349 - 0.545
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/54	0/54	3.61E-06	0.349 - 0.545
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/54	0/54	1.31E-04	0.349 - 0.545
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.54E-02	2.34E-02	1.94E-02	2/54	0/54	1.33E+00	0.0349 - 0.0545
SVOC	Butyl benzyl phthalate	mg/kg	2.30E+00	2.30E+00	2.30E+00	1/54	1/54	2.36E-01	0.0349 - 0.0545
SVOC	Caprolactam	mg/kg	--	--	--	0/54	0/54	2.47E-01	0.349 - 0.545
SVOC	Carbazole	mg/kg	--	--	--	0/54	0/54	3.76E-02	0.0349 - 0.0545
SVOC	Dibenzofuran	mg/kg	--	--	--	0/54	0/54	1.46E-02	0.349 - 0.545
SVOC	Diethyl phthalate	mg/kg	1.42E-02	2.88E-02	2.06E-02	4/54	0/54	6.08E-01	0.0349 - 0.0545
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/54	0/54	6.08E-01	0.0349 - 0.0545
SVOC	Di-n-butyl phthalate	mg/kg	1.30E-02	4.59E-02	2.68E-02	24/54	0/54	2.27E-01	0.0349 - 0.0545
SVOC	Di-n-octylphthalate	mg/kg	3.23E-02	3.97E-02	3.60E-02	2/54	0/54	5.65E+00	0.0349 - 0.0545
SVOC	Diphenylamine	mg/kg	--	--	--	0/54	0/54	2.33E-01	0.349 - 0.545
SVOC	Fluoranthene	mg/kg	--	--	--	0/54	0/54	8.91E+00	0.0349 - 0.0545
SVOC	Fluorene	mg/kg	--	--	--	0/54	0/54	5.45E-01	0.0349 - 0.0545
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/54	0/54	1.23E-04	0.349 - 0.545
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/54	0/54	2.67E-04	0.349 - 0.545
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/54	0/54	1.28E-04	0.349 - 0.545
SVOC	Hexachloroethane	mg/kg	--	--	--	0/54	0/54	2.00E-04	0.349 - 0.545
SVOC	Isophorone	mg/kg	--	--	--	0/54	0/54	2.58E-02	0.349 - 0.545
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/54	0/54	2.97E-02	0.349 - 0.545
SVOC	Naphthalene	mg/kg	--	--	--	0/54	0/54	3.85E-04	0.0349 - 0.0545
SVOC	Nitrobenzene	mg/kg	--	--	--	0/54	0/54	9.17E-05	0.349 - 0.545
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/54	0/54	8.10E-06	0.349 - 0.545
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/54	0/54	5.71E-05	0.349 - 0.545
SVOC	Phenanthrene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOC	Phenol	mg/kg	--	--	--	0/54	0/54	3.31E-01	0.349 - 0.545
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/54	0/54	1.58E-03	0.349 - 0.545
SVOC	Pyrene	mg/kg	--	--	--	0/54	0/54	1.32E+00	0.0349 - 0.0545
SVOC	Total PAH[c]	mg/kg	1.19E-03	1.19E-03	1.19E-03	1/54	0/54	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/57	0/57	9.58E-01	0.0451 - 0.969
RADS	Cesium-137	pCi/g	--	--	--	0/57	0/57	4.79E-01	0.0165 - 0.0906
RADS	Cobalt-60	pCi/g	--	--	--	0/3	0/3	1.59E-03	0.0147 - 0.0286

Table 4.23. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Frequency of	GW Protection Screen		DL Range
			Min	Max	Avg	Detection	DAF 1	DAF 1 SSL	
RADS	Neptunium-237	pCi/g	--	--	--	0/57	0/57	5.36E-02	0.024 - 1.3
RADS	Plutonium-238	pCi/g	--	--	--	0/54	0/54	2.19E-01	0.158 - 0.876
RADS	Plutonium-239/240	pCi/g	--	--	--	0/57	0/57	2.13E-01	0.0567 - 0.917
RADS	Technetium-99	pCi/g	--	--	--	0/57	0/57	7.60E-03	2.7 - 4.66
RADS	Thorium-230	pCi/g	2.01E-01	2.23E+00	1.07E+00	31/57	6/57	1.83E+00	0.131 - 1.41
RADS	Uranium-233/234	pCi/g	3.88E-01	1.97E+00	1.01E+00	18/54	18/54	4.95E-02	0.271 - 1.31
RADS	Uranium-234	pCi/g	--	--	--	0/2	0/2	4.95E-02	0.0913 - 0.283
RADS	Uranium-235	pCi/g	3.83E-02	6.24E-02	5.04E-02	2/3	1/3	4.88E-02	0.0186 - 0.0284
RADS	Uranium-235/236	pCi/g	3.32E-01	3.32E-01	3.32E-01	1/54	1/54	4.88E-02	0.144 - 1.08
RADS	Uranium-238	pCi/g	2.79E-01	1.96E+00	9.00E-01	31/56	31/56	4.03E-02	0.161 - 1.33
VOC	1,1,1-Trichloroethane	mg/kg	6.64E-04	8.95E-04	7.80E-04	2/86	0/86	2.81E-01	0.000932 - 1.2
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/85	0/85	2.96E-05	0.000932 - 0.21
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.05E-03	1.10E-02	5.48E-03	11/84	0/84	2.56E+00	0.00466 - 1.05
VOC	1,1,2-Trichloroethane	mg/kg	4.07E-04	1.56E-02	3.24E-03	13/85	13/85	1.35E-05	0.000932 - 0.21
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/86	0/86	7.82E-04	0.000932 - 1.2
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/86	0/86	1.02E-02	0.000932 - 0.21
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.09E-03	0.000932 - 0.21
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/84	0/84	1.16E-03	0.000932 - 0.21
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/84	0/84	1.44E-07	0.000932 - 0.21
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/84	0/84	2.10E-06	0.000932 - 0.21
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.95E-02	0.000932 - 0.21
VOC	1,2-Dichloroethane	mg/kg	7.47E-04	7.47E-04	7.47E-04	1/86	1/86	4.84E-05	0.000932 - 1.2
VOC	1,2-Dichloroethene	mg/kg	--	--	--	0/1	0/1	4.78E-03	0.19 - 0.19
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/85	0/85	2.74E-04	0.000932 - 0.21
VOC	1,2-Dimethylbenzene	mg/kg	9.32E-04	9.32E-04	9.32E-04	1/85	0/85	1.90E-02	0.000932 - 0.21
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.95E-02	0.000932 - 0.21
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	4.62E-04	0.000932 - 0.21
VOC	1,4-Dioxane	mg/kg	--	--	--	0/73	0/73	9.42E-05	0.0466 - 10.5
VOC	2-Butanone	mg/kg	2.56E-03	4.70E-01	1.81E-01	14/85	7/85	1.16E-01	0.00466 - 1.05
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/84	0/84	1.38E-06	0.00466 - 1.05
VOC	2-Hexanone	mg/kg	--	--	--	0/85	0/85	8.75E-04	0.00466 - 1.05
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/84	0/84	3.22E-03	0.000932 - 0.21
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/85	0/85	2.81E-02	0.00466 - 1.05
VOC	Acetone	mg/kg	1.97E-03	5.07E-01	2.43E-02	49/85	1/85	3.68E-01	0.00466 - 1.05
VOC	Acrolein	mg/kg	--	--	--	0/84	0/84	8.41E-07	0.00466 - 1.05
VOC	Acrylonitrile	mg/kg	--	--	--	0/84	0/84	1.14E-05	0.00466 - 1.05
VOC	Benzene	mg/kg	--	--	--	0/85	0/85	2.33E-04	0.000932 - 0.21
VOC	Bromochloromethane	mg/kg	--	--	--	0/84	0/84	2.08E-03	0.000932 - 0.21
VOC	Bromodichloromethane	mg/kg	4.47E-04	2.74E-03	1.36E-03	4/85	4/85	3.65E-05	0.000932 - 0.21
VOC	Bromoform	mg/kg	--	--	--	0/85	0/85	8.73E-04	0.000932 - 0.21
VOC	Bromomethane	mg/kg	--	--	--	0/85	0/85	1.91E-04	0.000932 - 0.21
VOC	Carbon disulfide	mg/kg	--	--	--	0/85	0/85	2.40E-02	0.00466 - 1.05
VOC	Carbon tetrachloride	mg/kg	5.69E-04	5.35E-02	1.21E-02	7/86	7/86	1.77E-04	0.000932 - 1.2
VOC	Chlorobenzene	mg/kg	--	--	--	0/85	0/85	5.28E-03	0.000932 - 0.21
VOC	Chloroethane	mg/kg	--	--	--	0/86	0/86	2.37E-01	0.000932 - 1.2

Table 4.23. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 4 (Continued)

Type	Analysis	Unit	Detected Results			Frequency of	GW Protection Screen		DL Range
			Min	Max	Avg	Detection	DAF 1	DAF 1 SSL	
VOC	Chloroform	mg/kg	4.01E-04	8.44E-03	1.82E-03	13/86	13/86	6.12E-05	0.000932 - 1.2
VOC	Chloromethane	mg/kg	--	--	--	0/86	0/86	5.26E-04	0.000932 - 1.2
VOC	*cis* -1,2-Dichloroethene	mg/kg	5.44E-04	2.63E-02	6.47E-03	14/86	10/86	1.06E-03	0.000932 - 1.2
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/85	0/85	1.68E-04	0.000932 - 0.21
VOC	Cumene	mg/kg	--	--	--	0/84	0/84	7.38E-02	0.000932 - 0.21
VOC	Cyclohexane	mg/kg	--	--	--	0/84	0/84	1.30E+00	0.000932 - 0.21
VOC	Dibromochloromethane	mg/kg	--	--	--	0/85	0/85	2.32E-04	0.000932 - 0.21
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/84	0/84	3.04E-02	0.000932 - 0.21
VOC	Ethylbenzene	mg/kg	--	--	--	0/85	0/85	1.68E-03	0.000932 - 0.21
VOC	m,p-Xylene	mg/kg	--	--	--	0/85	0/85	1.91E-02	0.00186 - 0.419
VOC	Methyl acetate	mg/kg	--	--	--	0/84	0/84	4.11E-01	0.00466 - 1.05
VOC	Methylcyclohexane	mg/kg	--	--	--	0/84	0/84	1.40E+00	0.000932 - 0.21
VOC	Methylene chloride	mg/kg	2.05E-03	3.76E-01	1.95E-02	23/86	12/86	2.72E-03	0.00466 - 1.2
VOC	Styrene	mg/kg	--	--	--	0/85	0/85	1.33E-01	0.000932 - 0.21
VOC	Tetrachloroethene	mg/kg	4.37E-04	1.08E-02	3.98E-03	17/85	11/85	1.84E-03	0.00103 - 25.9
VOC	Toluene	mg/kg	3.45E-04	8.60E-04	6.87E-04	5/85	0/85	7.62E-02	0.000932 - 0.21
VOC	Total Xylene	mg/kg	9.32E-04	9.32E-04	9.32E-04	1/84	0/84	1.91E-02	0.0028 - 0.629
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/86	0/86	2.91E-03	0.000932 - 1.2
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/85	0/85	1.68E-04	0.000932 - 0.21
VOC	Trichloroethene	mg/kg	4.06E-04	6.94E+03	1.31E+02	60/87	60/87	1.01E-04	0.00103 - 240
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/84	0/84	7.31E-02	0.000932 - 0.21
VOC	Vinyl acetate	mg/kg	--	--	--	0/1	0/1	8.70E-03	0.094 - 0.094
VOC	Vinyl chloride	mg/kg	--	--	--	0/87	0/87	6.47E-06	0.000932 - 1.2

(shaded) One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

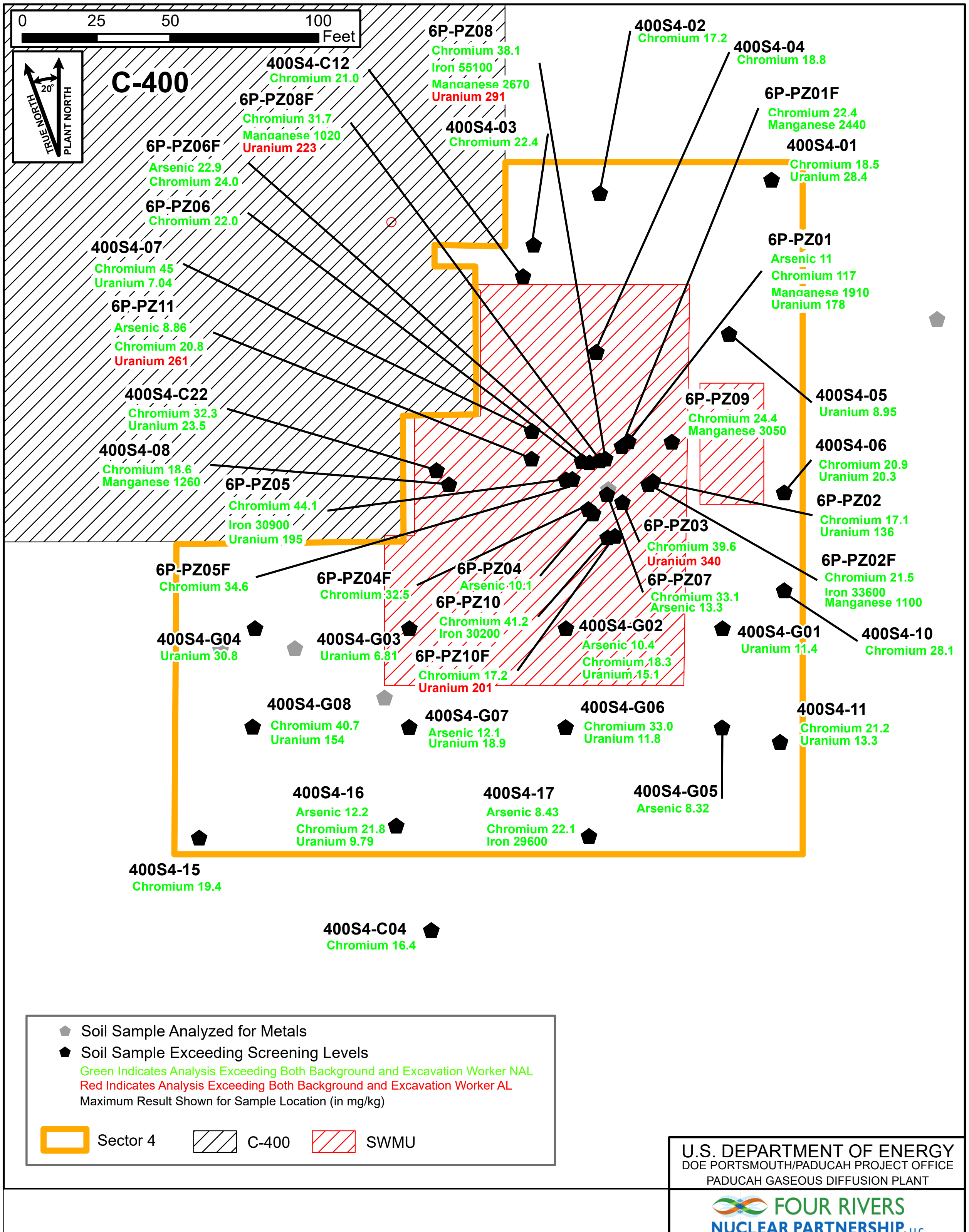
Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.



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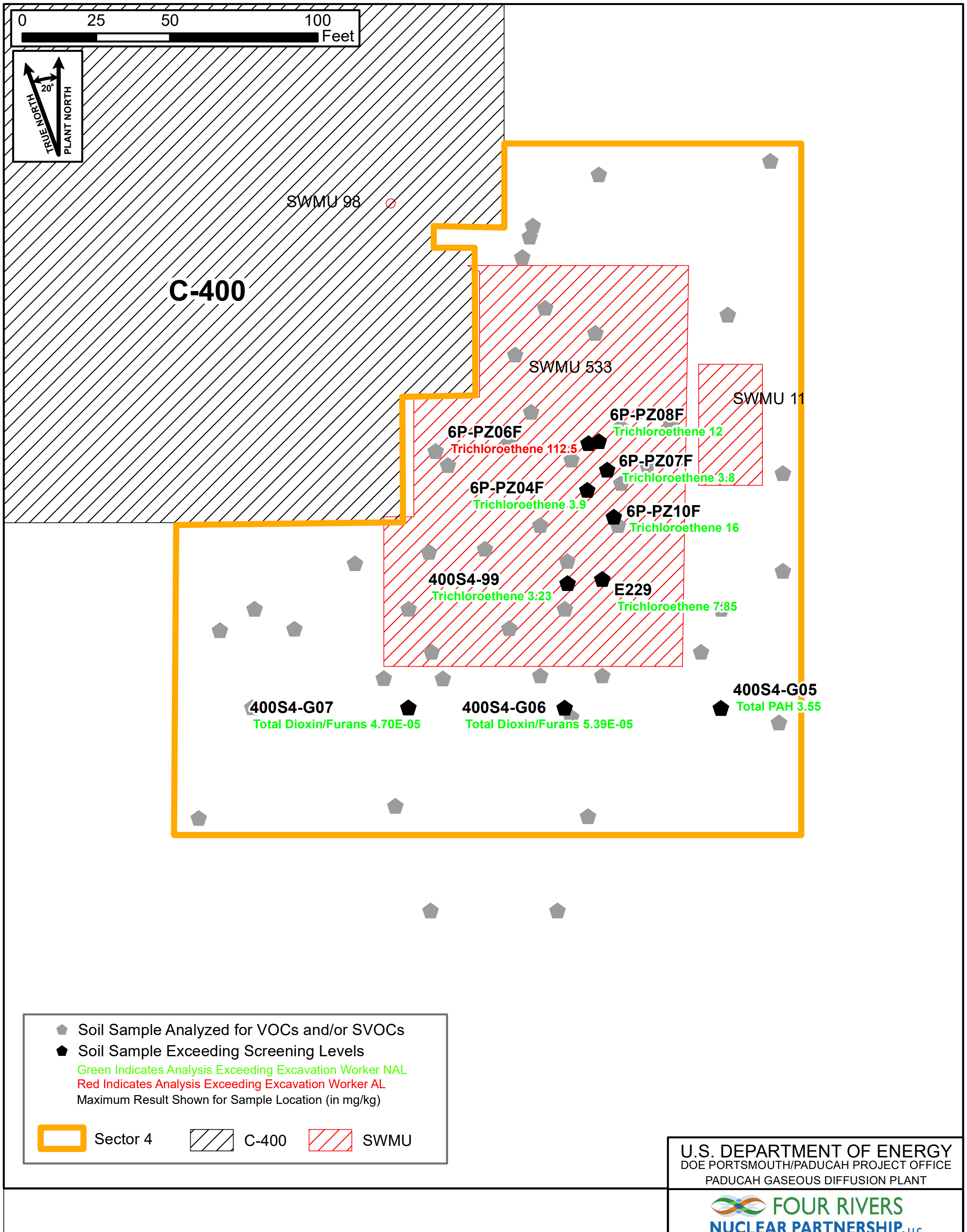
Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.22. Sector 4 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals



MAP SOURCE INFORMATION
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SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.23. Sector 4 Surface and Subsurface Soil Sampling Exceeding Screening Levels for VOCs, SVOCs, and Dioxins/Furans

benzenemethanol, carbazole*, dibenzofuran*, fluorene, phenanthrene, pyrene, naphthalene*, and Total PAHs* (SVOCs with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), 2-methylnaphthalene, benzenemethanol, bis(2-ethylhexyl)phthalate, naphthalene, and Total PAHs exceeded the DAF of 1 SSLs, with only naphthalene exceeding the DAF of 20 SSL value. In the McNairy Formation soil, only butyl benzyl phthalate exceeded the DAF of 1 SSL in 1 of 54 samples.

VOCs

Several VOCs were detected in Sector 4 surface and subsurface soil (0–16 ft bgs) but only TCE exceeded the 777 excavation worker NAL. TCE, with a maximum detected concentration of 113 mg/kg, also exceeded the excavation worker AL at 1 out of 181 sample locations (Figure 4.23). VOCs in Sector 4 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs for a DAF of 1 include 1,1-dichloroethene, 1,2,4-trichlorobenzene, acetone (a potential lab contaminant), acrolein*, benzene, chloroform*, *cis*-1,2-dichloroethene*, *trans*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), TCE*, and vinyl chloride* (VOCs with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA) 1,1,2-trichloroethane*, 1,4-dioxane*, 2-butanone, acetone (a potential lab contaminant), bromomethane, chloroform*, *cis*-1,2-dichloroethene*, methylene chloride* (a potential lab contaminant), TCE*, and vinyl chloride* exceeded the protection of groundwater SSLs for a DAF of 1 (VOCs with an asterisk also exceeded the DAF of 20 SSLs). For TCE, with a maximum concentration of 49.2 mg/kg in this interval, there were 260 out of 431 samples with exceedances of the DAF of 20 value.

In the McNairy soils, VOCs that exceeded the protection of groundwater SSLs at a DAF of 1 included 1,1,2-trichloroethane, 1,2-dichloroethane, 2-butanone, acetone (a potential lab contaminant), bromodichloromethane, carbon tetrachloride, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), tetrachloroethene, and TCE. TCE was detected in 60 of 87 samples from the McNairy soils with a maximum of 6,940 mg/kg.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, TCE and related VOCs were elevated consistent with past investigations. In the McNairy soil, the maximum TCE concentration, 6,940 mg/kg, occurred in boring 400S4-12 in the uppermost McNairy sample from 94–95 ft bgs. TCE was detected in five samples collected at deeper intervals in boring 400S4-12, from 96–97, 97–98, 98–99, 100–101, and 104–105 ft bgs, with the TCE concentration ranging from 0.0617 to 3.21 mg/kg. There was a sample collected from 95–96 ft bgs in this boring where TCE was not detected. The soil boring with the next highest TCE result was 400S4-98 with a result from the uppermost McNairy soil of 33.5 mg/kg.

Radionuclides

Radionuclides that were above both the background screening levels and the excavation worker NALs in Sector 4 surface and subsurface soil (0–16 ft bgs) include cesium-137, neptunium-237, plutonium-239/240, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Locations where radionuclides exceeded both criteria in Sector 4 are shown in Figure 4.24. Most of the exceedances occurred in the southwestern portion of the sector. Uranium-238 most frequently exceeded the excavation worker NAL screening criteria.

Radionuclides that were detected in the Sector 4 subsurface soil (1–16 ft bgs) and the deep soil interval (16 ft bgs to the bottom of the RGA) above both the background screening levels and SSLs for the protection of groundwater at a DAF of 1 include technetium-99*, thorium-230, uranium-233/234*,

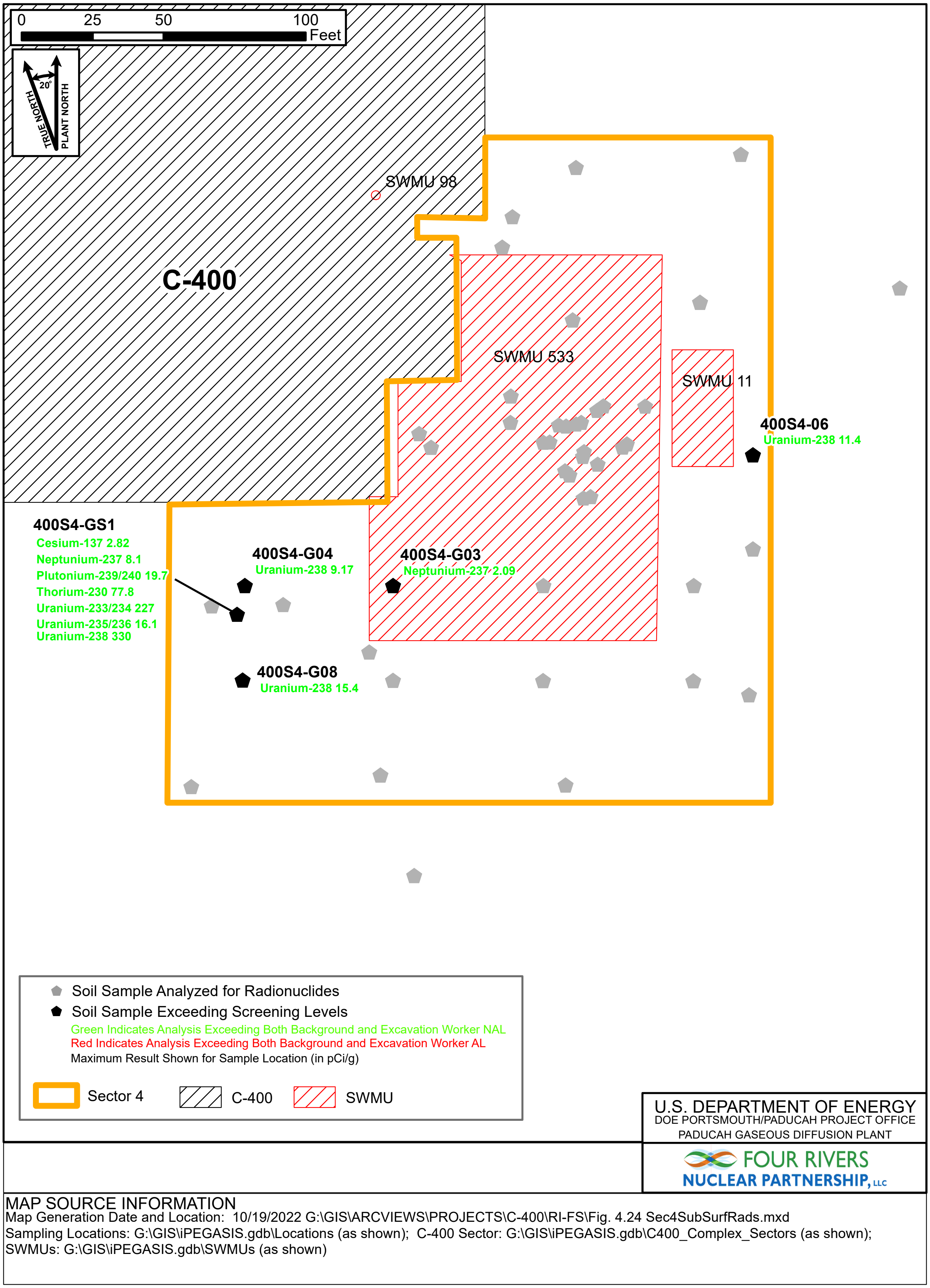


Figure 4.24. Sector 4 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

uranium-234*, uranium-235, uranium-235/236, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). Neptunium-237, which does not have a site-specific background, exceededthe DAF of 1 and the DAF of 20 SSLs in the 1–16 ft bgs interval, while plutonium-239/240 exceeded the DAF of 1 SSL in the 1–16 ft bgs interval. In the screening of the McNairy Formation soil, thorium-230, uranium-233/234, uranium-235, uranium-235/236, and uranium-238 exceeded the groundwater protection SSLs at a DAF of 1.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, technetium-99 was detected in approximately 5% of the samples with a maximum activity 19.5 pCi/g. The maximum activity for uranium-238 in these same intervals was 6.75 pCi/g.

4.3.5 Sector 5

4.3.5.1 Description and process history

Sector 5 encompasses an L-shaped area of approximately 53,000 ft^2, located southwest of the C-400 Cleaning Building. The Sector 5 area is primarily a concrete apron on the south end of the building and a mixture of soil and graveled areas and small concrete drive on the west. Sector 5 does not contain a SWMU, but part of the Phase I ERH remedial action occurred in this sector.

Overhead pipelines traverse the sector north-to-south. Also in the western portion of the sector is equipment/piping associated with the waste heat recovery system.

Two contamination areas were previously identified in Sector 5 from the WAG 6 RI:

- A VOC source area was located in soils on the southwest corner of the building with a maximum TCE value of 168,200 μg/kg at an estimated depth of 48 ft. This area below 20 ft bgs was treated by the Phase I ERH remedial action (Southwest Area).

- A VOC contamination area was adjacent to the C-400 Cleaning Building in the northeast corner of Sector 5 with a maximum TCE concentration of 110 μg/kg. The area is overlain by the Discard Waste System drain line.

Based on the WAG 6 RI, the maximum VOC concentration in soil was detected at 168,200 μg/kg. PCBs were present with a maximum level of 0.038 mg/kg.

4.3.5.2 Nature and extent of contamination—surface soils

A summary of the analytical results for Sector 5 surface soil and the screening results are provided in Table 4.24. The results of the screening for surface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface soil above both background screening levels and the industrial worker NALs were arsenic, chromium, and uranium. Most of these metals exceeded the background and industrial worker criteria at multiple locations, but arsenic only exceeded background at two locations out of 32 samples. Figure 4.25 shows the locations where these metals exceeded both screening criteria in Sector 5 surface soil.

Metals that were detected in the Sector 5 surface soil above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium*, cadmium, cobalt*, copper, iron*, lead, manganese*, selenium*, silver*, thallium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs).

Table 4.24. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 5

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	6.84E+02	1.39E+04	8.51E+03	32/32	4/32	1.30E+04	0/32	1.00E+05	0/32	1.00E+05	0/32	5.99E+04	31/32	3.00E+03	9.77 - 114
METAL	Antimony	mg/kg	4.48E-01	3.94E+00	1.42E+00	16/32	16/32	2.10E-01	0/32	9.34E+01	0/32	2.80E+03	12/32	7.04E-01	16/32	3.52E-02	1.85 - 21.9
METAL	Arsenic	mg/kg	2.28E+00	2.00E+01	5.61E+00	31/32	2/32	1.20E+01	31/32	1.60E+00	0/32	1.60E+02	31/32	3.02E-02	31/32	1.51E-03	1.01 - 5.66
METAL	Barium	mg/kg	6.19E+00	3.66E+02	1.05E+02	32/32	2/32	2.00E+02	0/32	4.04E+04	0/32	1.00E+05	1/32	3.11E+02	31/32	1.55E+01	0.782 - 4.82
METAL	Beryllium	mg/kg	1.95E-01	1.30E+00	4.49E-01	31/32	3/32	6.70E-01	0/32	4.50E+02	0/32	1.35E+04	0/32	3.89E+01	0/32	1.95E+00	0.0977 - 0.493
METAL	Boron	mg/kg	1.01E+00	9.68E+00	3.02E+00	26/32	N/A	N/A	0/32	4.65E+04	0/32	1.00E+05	0/32	2.56E+01	22/32	1.28E+00	2.93 - 14.8
METAL	Cadmium	mg/kg	2.44E-02	6.06E-01	2.41E-01	28/32	16/32	2.10E-01	0/32	6.05E+01	0/32	1.82E+03	0/32	1.39E+00	22/32	6.93E-02	0.195 - 1.06
METAL	Chromium	mg/kg	4.79E+00	4.24E+01	1.62E+01	32/32	12/32	1.60E+01	24/32	1.23E+01	0/32	1.23E+03	0/32	3.60E+06	0/32	1.80E+05	0.586 - 2.96
METAL	Cobalt	mg/kg	4.18E-01	1.80E+01	7.08E+00	32/32	2/32	1.40E+01	0/32	6.87E+01	0/32	2.06E+03	31/32	5.43E-01	32/32	2.71E-02	0.195 - 0.986
METAL	Copper	mg/kg	1.41E+00	3.50E+01	8.57E+00	32/32	2/32	1.90E+01	0/32	9.34E+03	0/32	1.00E+05	0/32	5.62E+01	29/32	2.81E+00	0.391 - 1.97
METAL	Iron	mg/kg	1.57E+03	3.45E+04	1.55E+04	32/32	2/32	2.80E+04	0/32	1.00E+05	0/32	1.00E+05	32/32	7.04E+02	32/32	3.52E+01	19.5 - 238
METAL	Lead	mg/kg	9.07E-01	4.92E+01	1.10E+01	32/32	1/32	3.60E+01	0/32	8.00E+02	0/32	8.00E+02	0/32	2.70E+02	6/32	1.35E+01	0.391 - 1.97
METAL	Manganese	mg/kg	3.79E+01	2.65E+03	5.85E+02	32/32	3/32	1.50E+03	0/32	4.72E+03	0/32	1.00E+05	31/32	5.65E+01	32/32	2.83E+00	1.02 - 24.1
METAL	Mercury	mg/kg	9.05E-03	5.81E-02	2.09E-02	26/32	0/32	2.00E-01	0/32	7.01E+01	0/32	2.10E+03	0/32	5.91E-01	3/32	2.95E-02	0.0218 - 0.0294
METAL	Molybdenum	mg/kg	2.36E-01	2.53E+00	7.08E-01	30/32	N/A	N/A	0/32	1.16E+03	0/32	3.48E+04	0/32	4.03E+00	30/32	2.02E-01	0.195 - 1.06
METAL	Nickel	mg/kg	4.24E+00	1.63E+01	9.59E+00	32/32	0/32	2.10E+01	0/32	4.30E+03	0/32	1.00E+05	0/32	5.12E+01	32/32	2.56E+00	0.391 - 1.97
METAL	Selenium	mg/kg	4.26E-01	2.08E+00	9.90E-01	24/32	12/32	8.00E-01	0/32	1.17E+03	0/32	3.51E+04	10/32	1.04E+00	24/32	5.19E-02	1.01 - 5.66
METAL	Silver	mg/kg	1.28E-01	2.81E+00	1.11E+00	7/32	1/32	2.30E+00	0/32	1.17E+03	0/32	3.51E+04	2/32	1.60E+00	7/32	7.99E-02	0.502 - 5.47
METAL	Thallium	mg/kg	1.60E-01	2.66E-01	1.86E-01	10/32	1/32	2.10E-01	0/32	2.34E+00	0/32	7.02E+01	10/32	2.84E-02	10/32	1.42E-03	0.391 - 1.97
METAL	Uranium[a]	mg/kg	8.16E-01	8.98E+01	1.21E+01	32/32	15/32	4.90E+00	3/32	4.66E+01	0/32	1.40E+03	18/32	3.60E+00	32/32	1.80E-01	0.0391 - 0.409
METAL	Vanadium	mg/kg	3.44E+00	5.37E+01	2.20E+01	32/32	2/32	3.80E+01	0/32	1.15E+03	0/32	3.45E+04	0/32	1.73E+02	29/32	8.64E+00	3.91 - 19.7
METAL	Zinc	mg/kg	1.37E+01	2.75E+02	4.65E+01	32/32	4/32	6.50E+01	0/32	7.01E+04	0/32	1.00E+05	0/32	7.46E+02	12/32	3.73E+01	4.03 - 22.7
ANION	Fluoride	mg/kg	6.14E-01	2.05E+01	8.85E+00	32/32	N/A	N/A	0/32	9.33E+03	0/32	1.00E+05	0/32	2.40E+02	8/32	1.20E+01	1 - 1.23
DI/FURA	Total Dioxin/Furans[b]	mg/kg	3.33E-06	1.06E-05	4.72E-06	10/10	N/A	N/A	0/10	1.57E-05	0/10	1.57E-03	10/10	1.18E-06	10/10	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	1.93E-03	7.40E-02	2.05E-02	15/32	N/A	N/A	0/32	2.93E-01	0/32	2.93E+01	0/32	1.36E-01	8/32	6.82E-03	0.00336 - 0.0386
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.00E+01	0/32	6.00E+02	0/32	1.74E-02	0/32	8.72E-04	0.341 - 3.96
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.90E+03	0/32	8.70E+04	0/32	8.04E+00	0/32	4.02E-01	0.341 - 3.96
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.90E+01	0/32	8.70E+02	0/32	2.32E-02	0/32	1.16E-03	0.341 - 3.96
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.70E+01	0/32	2.61E+03	0/32	4.52E-02	0/32	2.26E-03	0.341 - 3.96
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+02	0/32	1.74E+04	0/32	8.42E-01	0/32	4.21E-02	0.341 - 3.96
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+01	0/32	1.74E+03	0/32	8.72E-02	0/32	4.36E-03	0.681 - 7.92
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.57E+00	0/32	2.57E+02	0/32	6.42E-03	0/32	3.21E-04	0.341 - 3.96
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.46E-01	0/32	5.46E+01	0/32	1.33E-03	0/32	6.67E-05	0.341 - 3.96
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.84E+03	0/32	5.52E+04	0/32	7.70E+00	0/32	3.85E-01	0.0341 - 0.396
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.17E+03	0/32	3.51E+04	0/32	1.78E-01	0/32	8.91E-03	0.341 - 3.96
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.32E+00	0/32	6.96E+01	0/32	5.16E-03	0/32	2.58E-04	0.341 - 3.96
SVOC	2-Methylnaphthalene	mg/kg	1.77E-02	6.36E-02	3.68E-02	4/32	N/A	N/A	0/32	9.19E+01	0/32	2.76E+03	0/32	3.70E-01	3/32	1.85E-02	0.0341 - 0.396
SVOC	2-Methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.45E+03	0/32	4.35E+04	0/32	1.51E+00	0/32	7.53E-02	0.341 - 3.96
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.87E+02	0/32	8.61E+03	0/32	1.60E-01	0/32	8.01E-03	0.341 - 3.96
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+01	0/32	1.74E+03	0/32	8.72E-02	0/32	4.36E-03	0.341 - 3.96
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.80E+00	0/32	1.80E+02	0/32	1.65E-02	0/32	8.24E-04	0.341 - 3.96
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.70E+00	0/32	2.61E+02	0/32	4.90E-03	0/32	2.45E-04	0.341 - 3.96
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.41E+01	0/32	4.23E+02	0/32	6.84E-03	0/32	3.42E-04	0.341 - 3.96
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.90E+03	0/32	8.70E+04	0/32	3.42E+00	0/32	1.71E-01	0.341 - 3.96
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.06E+00	0/32	4.06E+02	0/32	3.10E-03	0/32	1.55E-04	0.341 - 3.96
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.41E+01	0/32	4.23E+02	0/32	6.84E-03	0/32	3.42E-04	0.341 - 3.96
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+01	0/32	1.74E+03	0/32	8.72E-02	0/32	4.36E-03	0.341 - 3.96
SVOC	Acenaphthene	mg/kg	1.34E-02	7.65E-01	1.87E-01	8/32	N/A	N/A	0/32	1.38E+03	0/32	4.14E+04	0/32	1.10E+01	1/32	5.49E-01	0.0341 - 0.396
SVOC	Acenaphthylene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.38E+03	0/32	4.14E+04	0/32	1.10E+01	0/32	5.49E-01	0.0341 - 0.396
SVOC	Acetophenone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.34E+04	0/32	7.02E+05	0/32	1.17E+00	0/32	5.84E-02	0.341 - 3.96

Table 4.24. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Anthracene	mg/kg	1.17E-02	1.28E+00	2.17E-01	14/32	N/A	N/A	0/32	6.89E+03	0/32	1.00E+05	0/32	1.16E+02	0/32	5.81E+00	0.0341 - 0.396
SVOC	Atrazine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.53E+00	0/32	3.53E+02	0/32	3.92E-03	0/32	1.96E-04	0.341 - 3.96
SVOC	Benzaldehyde	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.64E+03	0/32	1.64E+05	0/32	8.30E-02	0/32	4.15E-03	0.341 - 3.96
SVOC	Benzo(ghi)perylene	mg/kg	1.32E-02	3.22E+00	4.56E-01	15/32	N/A	N/A	0/32	6.89E+02	0/32	2.07E+04	0/32	2.63E+01	2/32	1.32E+00	0.0341 - 0.396
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.70E+01	0/32	2.61E+03	0/32	2.70E-02	0/32	1.35E-03	0.341 - 3.96
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.25E+00	0/32	1.25E+02	0/32	7.22E-05	0/32	3.61E-06	0.341 - 3.96
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.32E+01	0/32	9.32E+03	0/32	2.62E-03	0/32	1.31E-04	0.341 - 3.96
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+01	0/32	5.80E+03	0/32	2.66E+01	0/32	1.33E+00	0.0341 - 0.396
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.27E+02	0/32	4.27E+04	0/32	4.72E+00	0/32	2.36E-01	0.0341 - 0.396
SVOC	Caprolactam	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.43E+04	0/32	4.29E+05	0/32	4.94E+00	0/32	2.47E-01	0.341 - 3.96
SVOC	Carbazole	mg/kg	1.15E-02	7.23E-01	1.57E-01	8/32	N/A	N/A	0/32	4.06E+01	0/32	4.06E+03	0/32	7.51E-01	3/32	3.76E-02	0.0341 - 0.396
SVOC	Dibenzofuran	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.34E+02	0/32	7.02E+03	0/32	2.92E-01	0/32	1.46E-02	0.341 - 3.96
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.32E+04	0/32	6.96E+05	0/32	1.22E+01	0/32	6.08E-01	0.0341 - 0.396
SVOC	Dimethyl phthalate	mg/kg	2.11E-01	2.11E-01	2.11E-01	1/32	N/A	N/A	0/32	2.32E+04	0/32	6.96E+05	0/32	1.22E+01	0/32	6.08E-01	0.0341 - 0.396
SVOC	Di-n-butyl phthalate	mg/kg	1.07E-02	1.81E-02	1.40E-02	3/32	N/A	N/A	0/32	2.90E+03	0/32	8.70E+04	0/32	4.54E+00	0/32	2.27E-01	0.0341 - 0.396
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.90E+02	0/32	8.70E+03	0/32	1.13E+02	0/32	5.65E+00	0.0341 - 0.396
SVOC	Diphenylamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.90E+03	0/32	8.70E+04	0/32	4.66E+00	0/32	2.33E-01	0.341 - 3.96
SVOC	Fluoranthene	mg/kg	1.29E-02	9.10E+00	1.12E+00	24/32	N/A	N/A	0/32	9.19E+02	0/32	2.76E+04	0/32	1.78E+02	1/32	8.91E+00	0.0341 - 0.396
SVOC	Fluorene	mg/kg	1.13E-02	6.59E-01	1.39E-01	8/32	N/A	N/A	0/32	9.19E+02	0/32	2.76E+04	0/32	1.09E+01	1/32	5.45E-01	0.0341 - 0.396
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.26E+00	0/32	1.26E+02	0/32	2.46E-03	0/32	1.23E-04	0.341 - 3.96
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.61E+00	0/32	5.61E+02	0/32	5.34E-03	0/32	2.67E-04	0.341 - 3.96
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.45E-01	0/32	2.24E+01	0/32	2.56E-03	0/32	1.28E-04	0.341 - 3.96
SVOC	Hexachloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.46E+00	0/32	8.46E+02	0/32	4.00E-03	0/32	2.00E-04	0.341 - 3.96
SVOC	Isophorone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.55E+02	0/32	8.55E+04	0/32	5.16E-01	0/32	2.58E-02	0.341 - 3.96
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.80E+02	0/32	1.74E+04	0/32	5.94E-01	0/32	2.97E-02	0.341 - 3.96
SVOC	Naphthalene	mg/kg	1.43E-02	1.53E-01	6.53E-02	4/32	N/A	N/A	0/32	4.06E+00	0/32	4.06E+02	4/32	7.70E-03	4/32	3.85E-04	0.0341 - 0.396
SVOC	Nitrobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.24E+01	0/32	2.24E+03	0/32	1.83E-03	0/32	9.17E-05	0.341 - 3.96
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.16E-01	0/32	1.16E+01	0/32	1.62E-04	0/32	8.10E-06	0.341 - 3.96
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.77E-01	0/32	8.77E+01	0/32	1.14E-03	0/32	5.71E-05	0.341 - 3.96
SVOC	Phenanthrene	mg/kg	1.09E-02	6.76E+00	6.41E-01	24/32	N/A	N/A	0/32	1.38E+03	0/32	4.14E+04	0/32	1.10E+01	4/32	5.49E-01	0.0341 - 0.396
SVOC	Phenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.70E+03	0/32	2.61E+05	0/32	6.62E+00	0/32	3.31E-01	0.341 - 3.96
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.06E+01	0/32	3.48E+03	0/32	3.16E-02	0/32	1.58E-03	0.341 - 3.96
SVOC	Pyrene	mg/kg	1.40E-02	8.22E+00	1.03E+00	23/32	N/A	N/A	0/32	6.89E+02	0/32	2.07E+04	0/32	2.63E+01	3/32	1.32E+00	0.0341 - 0.396
SVOC	Total PAH[d]	mg/kg	1.56E-03	6.90E+00	7.07E-01	14/32	N/A	N/A	2/32	6.43E-01	0/32	6.43E+01	2/32	5.89E-01	11/32	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.86E+01	0/1	1.86E+03	0/1	8.84E+00	0/1	4.42E-01	0.312 - 0.312
RADS	Americium-241	pCi/g	--	--	--	0/33	N/A	N/A	0/33	6.01E+00	0/33	6.01E+02	0/33	1.92E+01	0/33	9.58E-01	0.224 - 1.18
RADS	Cesium-137	pCi/g	9.16E-02	8.09E+00	2.54E+00	5/32	2/32	4.90E-01	4/32	1.08E-01	0/32	1.08E+01	0/32	9.58E+00	2/32	4.79E-01	0.0286 - 0.144
RADS	Cobalt-60	pCi/g	--	--	--	0/1	N/A	N/A	0/1	5.67E-02	0/1	5.67E+00	0/1	3.19E-02	0/1	1.59E-03	0.0404 - 0.0404
RADS	Lead-210	pCi/g	--	--	--	0/1	N/A	N/A	0/1	7.33E+00	0/1	7.33E+02	0/1	1.78E-01	0/1	8.88E-03	12.3 - 12.3
RADS	Neptunium-237	pCi/g	3.54E+00	3.54E+00	3.54E+00	1/33	1/33	1.00E-01	1/33	2.49E-01	0/33	2.49E+01	1/33	1.07E+00	1/33	5.36E-02	0.238 - 1.05
RADS	Plutonium-238	pCi/g	--	--	--	0/33	0/33	7.30E-02	0/33	2.65E+01	0/33	2.65E+03	0/33	4.38E+00	0/33	2.19E-01	0.261 - 0.856
RADS	Plutonium-239/240	pCi/g	1.25E+01	1.25E+01	1.25E+01	1/33	1/33	2.50E-02	0/33	2.27E+01	0/33	2.27E+03	1/33	4.26E+00	1/33	2.13E-01	0.262 - 1.07
RADS	Protactinium-231	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.49E+00	0/1	1.49E+02	0/1	1.21E+01	0/1	6.06E-01	0.53 - 0.53
RADS	Radium-226	pCi/g	1.21E+00	1.21E+00	1.21E+00	1/1	0/1	1.50E+00	1/1	2.48E-02	0/1	2.48E+00	1/1	3.26E-03	1/1	1.63E-04	0.455 - 0.455
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	1.03E+01	0/1	1.03E+03	0/1	2.24E-02	0/1	1.12E-03	1.9 - 1.9
RADS	Technetium-99	pCi/g	4.51E+00	4.16E+02	6.39E+01	9/33	9/33	2.50E+00	0/33	1.27E+03	0/33	1.00E+05	9/33	1.52E-01	9/33	7.60E-03	2.74 - 4.3
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	0/1	1.96E-04	0/1	9.80E-06	0.83 - 0.83
RADS	Thorium-230	pCi/g	5.37E-01	5.40E+01	3.15E+00	29/33	9/33	1.50E+00	1/33	3.13E+01	0/33	3.13E+03	1/33	3.66E+01	5/33	1.83E+00	0.331 - 1.08
RADS	Thorium-232	pCi/g	1.59E+00	1.59E+00	1.59E+00	1/1	1/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	1/1	1.96E-01	1/1	9.80E-03	0.468 - 0.468
RADS	Uranium-233/234	pCi/g	5.79E-01	2.90E+03	9.15E+01	33/33	25/33	1.20E+00	1/33	5.01E+01	0/33	5.01E+03	28/33	9.90E-01	33/33	4.95E-02	0.328 - 16.6

Table 4.24. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-235/236	pCi/g	2.13E-01	1.77E+02	2.01E+01	9/33	9/33	6.00E-02	6/33	4.08E-01	1/33	4.08E+01	1/33	9.76E-01	9/33	4.88E-02	0.141 - 14.1
RADS	Uranium-238	pCi/g	4.53E-01	3.00E+03	9.58E+01	33/33	26/33	1.20E+00	20/33	1.66E+00	1/33	1.66E+02	30/33	8.05E-01	33/33	4.03E-02	0.17 - 16
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.58E+03	0/32	1.00E+05	0/32	5.62E+00	0/32	2.81E-01	0.000884 - 0.362
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.91E+00	0/32	2.91E+02	0/32	5.92E-04	0/32	2.96E-05	0.000884 - 0.362
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.81E+03	0/32	8.43E+04	0/32	5.13E+01	0/32	2.56E+00	0.00442 - 1.81
VOC	1,1,2-Trichloroethane	mg/kg	9.22E-04	2.41E-03	1.67E-03	2/32	N/A	N/A	0/32	6.32E-01	0/32	1.90E+01	2/32	2.69E-04	2/32	1.35E-05	0.000884 - 0.362
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.58E+01	0/32	1.58E+03	0/32	1.56E-02	0/32	7.82E-04	0.000884 - 0.362
VOC	1,1-Dichloroethene	mg/kg	9.45E-04	5.97E-03	3.90E-03	3/32	N/A	N/A	0/32	1.00E+02	0/32	3.00E+03	0/32	2.04E-01	0/32	1.02E-02	0.000884 - 0.362
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.87E+02	0/32	5.61E+03	0/32	4.18E-02	0/32	2.09E-03	0.000884 - 0.362
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.59E+01	0/32	7.77E+02	0/32	2.32E-02	0/32	1.16E-03	0.000884 - 0.362
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.49E-02	0/32	6.49E+00	0/32	2.88E-06	0/32	1.44E-07	0.000884 - 0.362
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.68E-01	0/32	1.68E+01	0/32	4.20E-05	0/32	2.10E-06	0.000884 - 0.362
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.76E+02	0/32	2.93E+04	0/32	5.90E-01	0/32	2.95E-02	0.000884 - 0.362
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.09E+00	0/32	2.09E+02	0/32	9.69E-04	0/32	4.84E-05	0.000884 - 0.362
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.63E+00	0/32	1.99E+02	0/32	5.48E-03	0/32	2.74E-04	0.000884 - 0.362
VOC	1,2-Dimethylbenzene	mg/kg	4.09E-04	1.71E-02	3.16E-03	7/32	N/A	N/A	0/32	2.81E+02	0/32	8.43E+03	0/32	3.81E-01	0/32	1.90E-02	0.000884 - 0.362
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.76E+02	0/32	2.93E+04	0/32	5.90E-01	0/32	2.95E-02	0.000884 - 0.362
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.15E+01	0/32	1.15E+03	0/32	9.24E-03	0/32	4.62E-04	0.000884 - 0.362
VOC	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.91E+01	0/28	3.91E+03	0/28	1.88E-03	0/28	9.42E-05	0.0442 - 18.1
VOC	2-Butanone	mg/kg	1.84E-03	2.25E-01	2.76E-02	10/32	N/A	N/A	0/32	2.24E+04	0/32	6.72E+05	0/32	2.32E+00	1/32	1.16E-01	0.00442 - 1.81
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.15E-02	0/32	9.15E+00	0/32	2.76E-05	0/32	1.38E-06	0.00442 - 1.81
VOC	2-Hexanone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.52E+02	0/32	4.56E+03	0/32	1.75E-02	0/32	8.75E-04	0.00442 - 1.81
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.17E+02	0/32	2.17E+04	0/32	6.44E-02	0/32	3.22E-03	0.000884 - 0.362
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.97E+03	0/32	2.39E+05	0/32	5.62E-01	0/32	2.81E-02	0.00442 - 1.81
VOC	Acetone	mg/kg	2.88E-03	2.49E-01	3.17E-02	20/32	N/A	N/A	0/32	2.10E+05	0/32	6.30E+06	0/32	7.36E+00	0/32	3.68E-01	0.00442 - 1.81
VOC	Acrolein	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.05E-02	0/32	1.82E+00	0/32	1.68E-05	0/32	8.41E-07	0.00442 - 1.81
VOC	Acrylonitrile	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.24E+00	0/32	1.24E+02	0/32	2.28E-04	0/32	1.14E-05	0.00442 - 1.81
VOC	Benzene	mg/kg	3.83E-04	8.47E-04	5.89E-04	5/32	N/A	N/A	0/32	5.31E+00	0/32	5.31E+02	0/32	4.66E-03	5/32	2.33E-04	0.000884 - 0.362
VOC	Bromochloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.28E+01	0/32	1.88E+03	0/32	4.16E-02	0/32	2.08E-03	0.000884 - 0.362
VOC	Bromodichloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.30E+00	0/32	1.30E+02	0/32	7.30E-04	0/32	3.65E-05	0.000884 - 0.362
VOC	Bromoform	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.56E+01	0/32	9.56E+03	0/32	1.75E-02	0/32	8.73E-04	0.000884 - 0.362
VOC	Bromomethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.03E+00	0/32	9.09E+01	0/32	3.82E-03	0/32	1.91E-04	0.000884 - 0.362
VOC	Carbon disulfide	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/32	N/A	N/A	0/32	3.52E+02	0/32	1.06E+04	0/32	4.80E-01	0/32	2.40E-02	0.00442 - 1.81
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.96E+00	0/32	2.96E+02	0/32	3.54E-03	0/32	1.77E-04	0.000884 - 0.362
VOC	Chlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.37E+02	0/32	4.11E+03	0/32	1.06E-01	0/32	5.28E-03	0.000884 - 0.362
VOC	Chloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.27E+03	0/32	6.81E+04	0/32	4.74E+00	0/32	2.37E-01	0.000884 - 0.362
VOC	Chloroform	mg/kg	3.36E-04	6.58E-04	5.29E-04	5/32	N/A	N/A	0/32	1.39E+00	0/32	1.39E+02	0/32	1.22E-03	5/32	6.12E-05	0.000884 - 0.362
VOC	Chloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.63E+01	0/32	1.39E+03	0/32	1.05E-02	0/32	5.26E-04	0.000884 - 0.362
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.55E-04	1.85E+00	4.98E-01	9/32	N/A	N/A	0/32	4.67E+02	0/32	1.40E+04	6/32	2.12E-02	8/32	1.06E-03	0.000884 - 0.362
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.34E+00	0/32	9.30E+02	0/32	3.36E-03	0/32	1.68E-04	0.000884 - 0.362
VOC	Cumene	mg/kg	1.30E-03	1.30E-03	1.30E-03	1/32	N/A	N/A	0/32	1.04E+03	0/32	3.12E+04	0/32	1.48E+00	0/32	7.38E-02	0.000884 - 0.362
VOC	Cyclohexane	mg/kg	4.66E-04	1.15E-03	7.59E-04	6/32	N/A	N/A	0/32	2.74E+03	0/32	8.22E+04	0/32	2.60E+01	0/32	1.30E+00	0.000884 - 0.362
VOC	Dibromochloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.79E+01	0/32	7.79E+03	0/32	4.64E-03	0/32	2.32E-04	0.000884 - 0.362
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.68E+01	0/32	1.10E+03	0/32	6.08E-01	0/32	3.04E-02	0.000884 - 0.362
VOC	Ethylbenzene	mg/kg	4.25E-04	1.03E-02	2.10E-03	7/32	N/A	N/A	0/32	2.66E+01	0/32	2.66E+03	0/32	3.36E-02	2/32	1.68E-03	0.000884 - 0.362
VOC	m,p-Xylene	mg/kg	7.77E-04	4.81E-02	7.92E-03	8/32	N/A	N/A	0/32	2.50E+02	0/32	7.50E+03	0/32	3.82E-01	1/32	1.91E-02	0.00177 - 0.724
VOC	Methyl acetate	mg/kg	2.33E-03	2.33E-03	2.33E-03	1/32	N/A	N/A	0/32	2.34E+05	0/32	7.02E+06	0/32	8.22E+00	0/32	4.11E-01	0.00442 - 1.81
VOC	Methylcyclohexane	mg/kg	5.99E-04	2.34E-03	1.31E-03	8/32	N/A	N/A	0/32	1.30E+03	0/32	3.90E+04	0/32	2.80E+01	0/32	1.40E+00	0.000884 - 0.362
VOC	Methylene chloride	mg/kg	1.66E-03	5.26E-03	3.39E-03	14/32	N/A	N/A	0/32	4.08E+02	0/32	1.22E+04	0/32	5.44E-02	10/32	2.72E-03	0.00442 - 1.81
VOC	Styrene	mg/kg	1.18E-03	1.18E-03	1.18E-03	1/32	N/A	N/A	0/32	3.76E+03	0/32	1.13E+05	0/32	2.66E+00	0/32	1.33E-01	0.000884 - 0.362

Table 4.24. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Tetrachloroethene	mg/kg	3.63E-04	8.35E-02	2.86E-02	5/32	N/A	N/A	0/32	4.00E+01	0/32	1.20E+03	1/32	3.69E-02	3/32	1.84E-03	0.000884 - 0.362
VOC	Toluene	mg/kg	3.89E-04	1.40E-02	2.76E-03	17/32	N/A	N/A	0/32	6.25E+03	0/32	1.00E+05	0/32	1.52E+00	0/32	7.62E-02	0.000884 - 0.362
VOC	Total Xylene	mg/kg	1.20E-03	6.53E-02	1.21E-02	7/32	N/A	N/A	0/32	2.50E+02	0/32	7.50E+03	0/32	3.82E-01	1/32	1.91E-02	0.00265 - 1.09
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.80E-04	2.71E-02	1.39E-02	4/32	N/A	N/A	0/32	4.54E+01	0/32	1.36E+03	0/32	5.83E-02	3/32	2.91E-03	0.000884 - 0.362
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.34E+00	0/32	9.30E+02	0/32	3.36E-03	0/32	1.68E-04	0.000884 - 0.362
VOC	Trichloroethene	mg/kg	3.72E-04	2.36E+01	2.39E+00	12/32	N/A	N/A	2/32	1.90E+00	0/32	5.70E+01	8/32	2.02E-03	12/32	1.01E-04	0.000884 - 0.362
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.16E+02	0/32	9.48E+03	0/32	1.46E+00	0/32	7.31E-02	0.000884 - 0.362
VOC	Vinyl chloride	mg/kg	6.69E-04	2.21E-01	7.41E-02	3/32	N/A	N/A	0/32	2.06E+00	0/32	2.06E+02	3/32	1.29E-04	3/32	6.47E-06	0.000884 - 0.362

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

Background value is the lower of Surface or Subsurface Background levels.

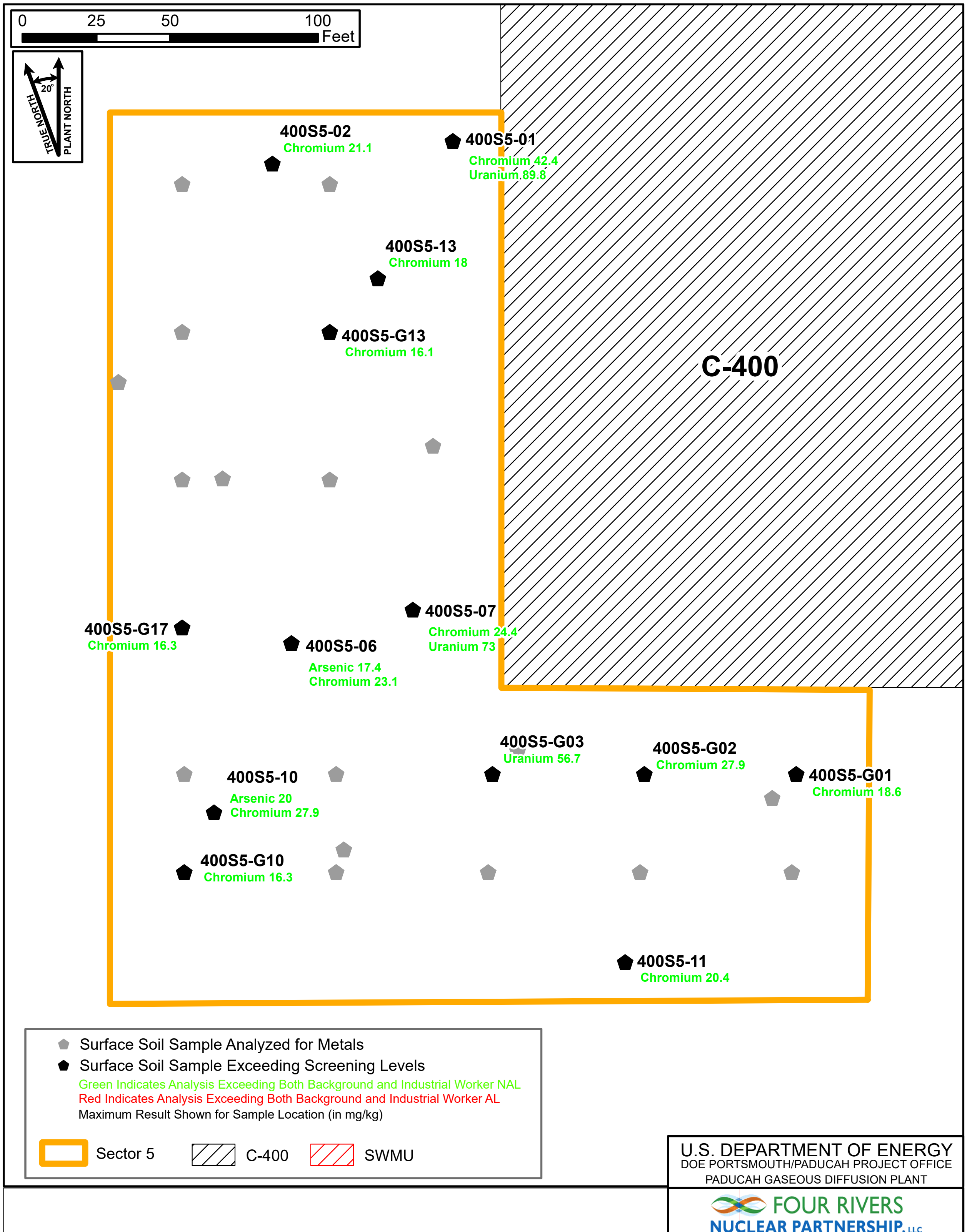
-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts.)

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.



MAP SOURCE INFORMATION
Map Generation Date and Location: 10/19/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.25 Sec5SurfaceMetals.mxd
Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.25. Sector 5 Surface Soil Sampling Exceeding Screening Levels for Metals

PCBs

Total PCBs were detected in 15 of 32 samples in Sector 5 surface soil. The maximum result, 0.074 mg/kg, did not exceed the industrial worker NAL. Total PCBs exceeded the SSL for the protection of groundwater (for a DAF of 1 only) in 8 of the 32 samples analyzed. These results were consistent with the WAG 6 RI results.

Total dioxins/furans were also detected in Sector 5 surface soil at concentrations that exceed the SSLs for the protection of groundwater at both the DAF of 1 and the DAF of 20 in 10 out of 10 samples.

SVOCs

Several SVOCs were detected in surface soil, mostly PAH compounds, with Total PAHs exceeding the industrial worker NAL at two locations out of 32 samples (Figure 4.26). SVOCs that exceeded the SSLs for protection of groundwater, with a DAF of 1, included 2-methylnaphthalene, acenaphthene, benzo(ghi)perylene, carbazole, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, and Total PAHs. Naphthalene and Total PAHs also exceeded the DAF of 20 SSLs.

VOCs

Several VOCs were detected in Sector 5 surface soil with TCE, at a maximum concentration of 23.6 mg/kg, exceeding the industrial worker NAL at 2 out of 32 sample locations (Figure 4.26). Detections of 2-butanone, 1,1,2-trichloroethane, benzene, chloroform, *cis*-1,2-dichloroethene, ethylbenzene, m,p-xylene, methylene chloride (a potential lab contaminant), tetrachloroethene, total xylene, *trans*-1,2-dichloroethene, TCE, and vinyl chloride were found in the Sector 5 surface soil above the SSLs for the protection of groundwater at a DAF of 1 with 1,1,2-trichloroethane, *cis*-1,2-dichloroethene, tetrachloroethene, TCE, and vinyl chloride all exceeding the SSLs for both the DAF of 1 and the DAF of 20.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 5 surface soil include cesium-137, neptunium-237, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Uranium-235/236, with a maximum activity of 177 pCi/g, and uranium-238, with a maximum result of 3,000 pCi/g exceeded the industrial worker ALs. Figure 4.27 shows where radionuclides exceeded both background and industrial worker NALs/ALs.

Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include cesium-137, neptunium-237, plutonium-239/240, technetium-99, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238. All of these also exceeded the DAF of 20 SSLs, with the exception of cesium-137.

4.3.5.3 Nature and extent of contamination—surface and subsurface soils

A summary of the analytical results for Sector 5 surface and subsurface soil and the screening results are provided in Tables 4.25 through 4.28. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, cobalt, iron, manganese, and uranium. Figure 4.28 shows where samples containing these metals exceeding both criteria are located. No metals in Sector 5 exceeded the excavation worker ALs.

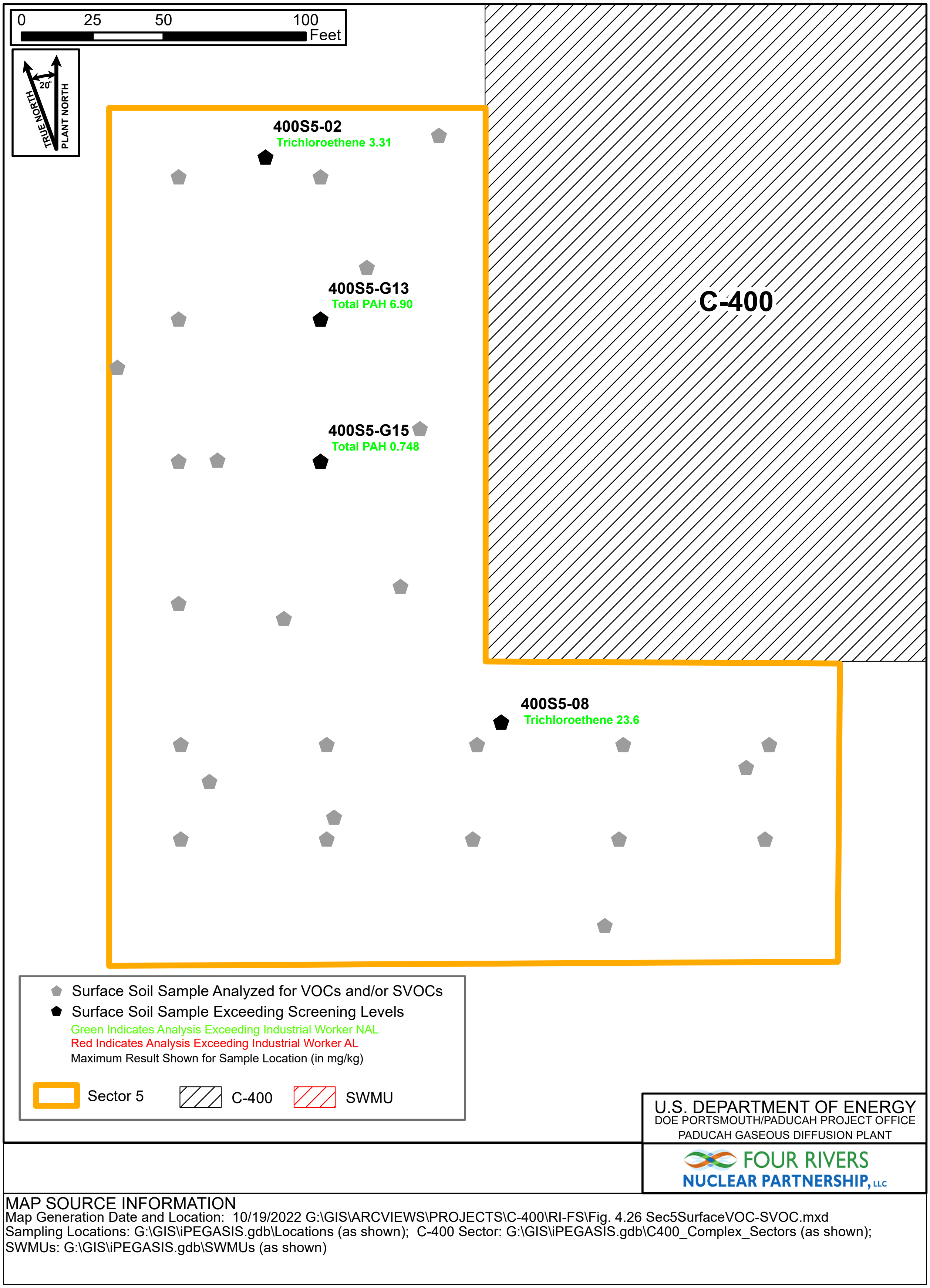


Figure 4.26. Sector 5 Surface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

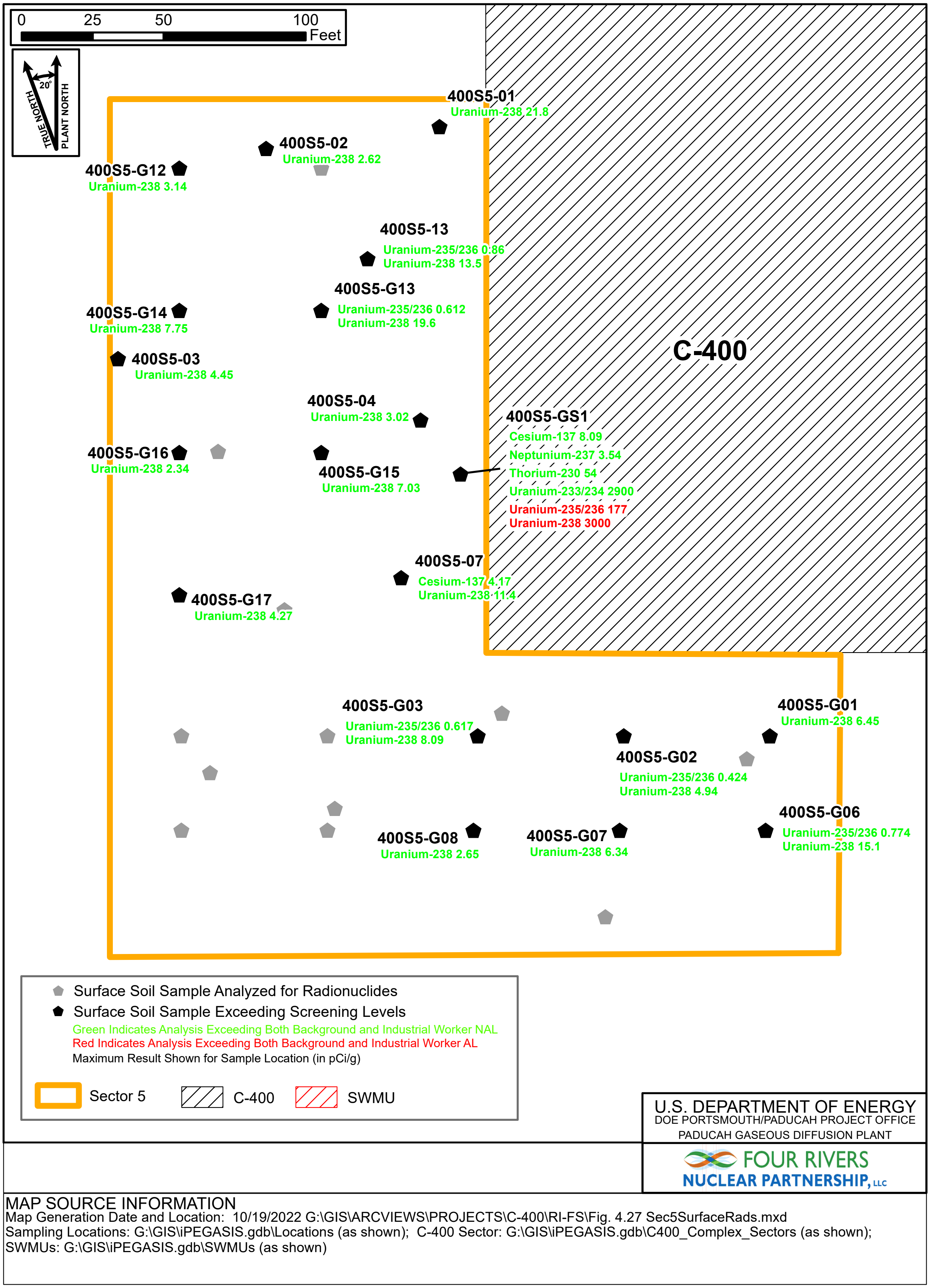


Figure 4.27. Sector 5 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

Table 4.25. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 5

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	6.84E+02	2.12E+04	1.09E+04	73/73	31/73	1.20E+04	0/73	3.26E+04	0/73	1.00E+05	9.77 - 123
METAL	Antimony	mg/kg	3.95E-01	3.94E+00	1.22E+00	28/73	28/73	2.10E-01	0/73	1.32E+01	0/73	3.96E+02	1.85 - 21.9
METAL	Arsenic	mg/kg	2.28E+00	2.00E+01	5.61E+00	71/73	7/73	7.90E+00	56/73	3.74E+00	0/73	3.60E+02	1.01 - 5.66
METAL	Barium	mg/kg	6.19E+00	3.66E+02	1.06E+02	73/73	6/73	1.70E+02	0/73	6.47E+03	0/73	1.00E+05	0.782 - 9.55
METAL	Beryllium	mg/kg	1.62E-01	1.30E+00	4.92E-01	72/73	10/73	6.70E-01	0/73	6.55E+01	0/73	1.97E+03	0.0977 - 0.493
METAL	Boron	mg/kg	8.98E-01	9.68E+00	2.47E+00	58/73	N/A	N/A	0/73	6.57E+03	0/73	1.00E+05	2.93 - 14.8
METAL	Cadmium	mg/kg	2.24E-02	6.06E-01	1.61E-01	51/73	16/73	2.10E-01	0/73	2.53E+01	0/73	7.59E+02	0.195 - 1.06
METAL	Chromium	mg/kg	4.79E+00	5.14E+01	1.73E+01	73/73	33/73	1.60E+01	71/73	9.14E+00	0/73	9.14E+02	0.586 - 2.96
METAL	Cobalt	mg/kg	4.18E-01	2.53E+01	7.34E+00	73/73	5/73	1.30E+01	13/73	9.84E+00	0/73	2.95E+02	0.195 - 0.986
METAL	Copper	mg/kg	1.41E+00	3.50E+01	9.38E+00	73/73	3/73	1.90E+01	0/73	1.32E+03	0/73	3.96E+04	0.391 - 1.97
METAL	Iron	mg/kg	1.57E+03	3.45E+04	1.66E+04	73/73	3/73	2.80E+04	6/73	2.30E+04	0/73	1.00E+05	19.5 - 246
METAL	Lead	mg/kg	9.07E-01	4.92E+01	1.08E+01	73/73	2/73	2.30E+01	0/73	8.00E+02	0/73	8.00E+02	0.391 - 1.97
METAL	Manganese	mg/kg	3.79E+01	2.86E+03	5.61E+02	73/73	11/73	8.20E+02	13/73	7.74E+02	0/73	2.32E+04	1.02 - 285
METAL	Mercury	mg/kg	9.05E-03	5.96E-02	2.09E-02	56/73	0/73	1.30E-01	0/73	9.86E+00	0/73	2.96E+02	0.0218 - 0.0299
METAL	Molybdenum	mg/kg	1.57E-01	2.53E+00	5.89E-01	71/73	N/A	N/A	0/73	1.64E+02	0/73	4.92E+03	0.195 - 1.06
METAL	Nickel	mg/kg	4.24E+00	2.06E+01	1.02E+01	73/73	0/73	2.10E+01	0/73	6.52E+02	0/73	1.96E+04	0.391 - 1.97
METAL	Selenium	mg/kg	4.17E-01	3.25E+00	1.20E+00	64/73	49/73	7.00E-01	0/73	1.64E+02	0/73	4.92E+03	1.01 - 5.66
METAL	Silver	mg/kg	1.28E-01	2.81E+00	8.25E-01	15/73	1/73	2.30E+00	0/73	1.64E+02	0/73	4.92E+03	0.502 - 5.73
METAL	Thallium	mg/kg	1.51E-01	2.82E-01	1.95E-01	29/73	7/73	2.10E-01	0/73	3.29E-01	0/73	9.87E+00	0.391 - 1.97
METAL	Uranium[a]	mg/kg	5.42E-01	8.98E+01	6.29E+00	73/73	18/73	4.60E+00	14/73	6.58E+00	0/73	1.97E+02	0.0391 - 0.409
METAL	Vanadium	mg/kg	3.44E+00	6.20E+01	2.58E+01	73/73	7/73	3.70E+01	0/73	1.65E+02	0/73	4.95E+03	3.91 - 19.7
METAL	Zinc	mg/kg	1.15E+01	2.75E+02	3.81E+01	73/73	6/73	6.00E+01	0/73	9.86E+03	0/73	1.00E+05	4.03 - 22.7
ANION	Fluoride	mg/kg	6.14E-01	2.05E+01	7.87E+00	73/73	N/A	N/A	0/73	1.32E+03	0/73	3.96E+04	1 - 2.36
DI/FURA	Total Dioxin/Furans[b]	mg/kg	3.07E-06	1.58E-05	5.65E-06	32/32	N/A	N/A	0/32	1.89E-05	0/32	5.67E-04	-
PPCB	Total PCB[c]	mg/kg	1.53E-03	7.40E-02	1.50E-02	23/72	N/A	N/A	0/72	1.12E+00	0/72	1.12E+02	0.00336 - 0.0386
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.69E+01	0/72	8.07E+02	0.341 - 3.96
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.90E+03	0/72	5.70E+04	0.341 - 3.96
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.90E+01	0/72	5.70E+02	0.341 - 3.96
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.69E+01	0/72	1.71E+03	0.341 - 3.96
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+02	0/72	1.14E+04	0.341 - 3.96
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+01	0/72	1.14E+03	0.681 - 7.92
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	8.49E+00	0/72	8.49E+02	0.341 - 3.96
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.78E+00	0/72	1.71E+02	0.341 - 3.96
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.35E+03	0/72	4.05E+04	0.0341 - 0.396
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.64E+02	0/72	4.92E+03	0.341 - 3.96
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.52E+00	0/72	4.56E+01	0.341 - 3.96
SVOC	2-Methylnaphthalene	mg/kg	1.73E-02	6.36E-02	3.07E-02	6/72	N/A	N/A	0/72	6.73E+01	0/72	2.02E+03	0.0341 - 0.396
SVOC	2-Methylphenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.48E+02	0/72	2.84E+04	0.341 - 3.96
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.89E+02	0/72	5.67E+03	0.341 - 3.96
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+01	0/72	1.14E+03	0.341 - 3.96
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.90E+00	0/72	5.90E+02	0.341 - 3.96
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.69E+00	0/72	1.71E+02	0.341 - 3.96
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.91E+01	0/72	5.73E+02	0.341 - 3.96
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.90E+03	0/72	5.70E+04	0.341 - 3.96
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.48E+00	0/72	2.84E+02	0.341 - 3.96

Table 4.25. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.91E+01	0/72	5.73E+02	0.341 - 3.96
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+01	0/72	1.14E+03	0.341 - 3.96
SVOC	Acenaphthene	mg/kg	1.29E-02	7.65E-01	1.30E-01	12/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOC	Acenaphthylene	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOC	Acetophenone	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.29E+03	0/72	9.87E+04	0.341 - 3.96
SVOC	Anthracene	mg/kg	1.17E-02	1.28E+00	1.56E-01	22/72	N/A	N/A	0/72	5.05E+03	0/72	1.00E+05	0.0341 - 0.396
SVOC	Atrazine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.15E+01	0/72	1.15E+03	0.341 - 3.96
SVOC	Benzaldehyde	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.15E+03	0/72	9.87E+04	0.341 - 3.96
SVOC	Benzo(ghi)perylene	mg/kg	1.12E-02	3.22E+00	3.32E-01	23/72	N/A	N/A	0/72	5.05E+02	0/72	1.52E+04	0.0341 - 0.396
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.69E+01	0/72	1.71E+03	0.341 - 3.96
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.01E+00	0/72	3.01E+02	0.341 - 3.96
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/72	N/A	N/A	0/72	6.58E+01	0/72	6.58E+03	0.341 - 3.96
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.39E-02	1.63E-02	1.51E-02	2/72	N/A	N/A	0/72	1.90E+02	0/72	1.14E+04	0.0341 - 0.396
SVOC	Butyl benzyl phthalate	mg/kg	1.66E-02	1.66E-02	1.66E-02	1/72	N/A	N/A	0/72	1.40E+03	0/72	1.14E+05	0.0341 - 0.396
SVOC	Caprolactam	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.43E+03	0/72	2.83E+05	0.341 - 3.96
SVOC	Carbazole	mg/kg	1.15E-02	7.23E-01	1.20E-01	11/72	N/A	N/A	0/72	1.33E+02	0/72	1.33E+04	0.0341 - 0.396
SVOC	Dibenzofuran	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.29E+01	0/72	9.87E+02	0.341 - 3.96
SVOC	Diethyl phthalate	mg/kg	1.82E-02	1.82E-02	1.82E-02	1/72	N/A	N/A	0/72	1.52E+04	0/72	4.56E+05	0.0341 - 0.396
SVOC	Dimethyl phthalate	mg/kg	2.11E-01	2.11E-01	2.11E-01	1/72	N/A	N/A	0/72	1.52E+04	0/72	4.56E+05	0.0341 - 0.396
SVOC	Di-n-butyl phthalate	mg/kg	1.07E-02	3.38E-02	1.68E-02	9/72	N/A	N/A	0/72	1.90E+03	0/72	5.70E+04	0.0341 - 0.396
SVOC	Di-n-octylphthalate	mg/kg	1.70E-02	1.70E-02	1.70E-02	1/72	N/A	N/A	0/72	1.90E+02	0/72	5.70E+03	0.0341 - 0.396
SVOC	Diphenylamine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.90E+03	0/72	5.70E+04	0.341 - 3.96
SVOC	Fluoranthene	mg/kg	1.02E-02	9.10E+00	6.90E-01	45/72	N/A	N/A	0/72	6.73E+02	0/72	2.02E+04	0.0341 - 0.396
SVOC	Fluorene	mg/kg	1.13E-02	6.59E-01	9.16E-02	13/72	N/A	N/A	0/72	6.73E+02	0/72	2.02E+04	0.0341 - 0.396
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.33E+00	0/72	2.33E+02	0.341 - 3.96
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.41E+01	0/72	9.87E+02	0.341 - 3.96
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.00E+00	0/72	3.00E+01	0.341 - 3.96
SVOC	Hexachloroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.98E+01	0/72	5.94E+02	0.341 - 3.96
SVOC	Isophorone	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.79E+03	0/72	1.14E+05	0.341 - 3.96
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+02	0/72	1.14E+04	0.341 - 3.96
SVOC	Naphthalene	mg/kg	1.33E-02	1.53E-01	5.19E-02	6/72	N/A	N/A	0/72	1.67E+01	0/72	1.67E+03	0.0341 - 0.396
SVOC	Nitrobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.63E+01	0/72	1.69E+03	0.341 - 3.96
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E-01	0/72	3.79E+01	0.341 - 3.96
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.06E+00	0/72	4.06E+02	0.341 - 3.96
SVOC	Phenanthrene	mg/kg	1.09E-02	6.76E+00	4.60E-01	37/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOC	Phenol	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.69E+03	0/72	1.71E+05	0.341 - 3.96
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/72	N/A	N/A	0/72	7.58E+01	0/72	2.27E+03	0.341 - 3.96
SVOC	Pyrene	mg/kg	1.19E-02	8.22E+00	6.60E-01	41/72	N/A	N/A	0/72	5.05E+02	0/72	1.52E+04	0.0341 - 0.396
SVOC	Total PAH[d]	mg/kg	1.23E-03	6.90E+00	4.20E-01	29/72	N/A	N/A	1/72	2.35E+00	0/72	1.51E+02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.18E+01	0/1	1.18E+03	0.312 - 0.312
RADS	Americium-241	pCi/g	--	--	--	0/74	N/A	N/A	0/74	1.64E+01	0/74	1.64E+03	0.0764 - 1.18
RADS	Cesium-137	pCi/g	9.16E-02	8.09E+00	2.54E+00	5/73	2/73	2.80E-01	2/73	5.82E-01	0/73	5.82E+01	0.0286 - 0.144
RADS	Cobalt-60	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.53E-01	0/1	1.53E+01	0.0404 - 0.0404
RADS	Lead-210	pCi/g	--	--	--	0/1	N/A	N/A	0/1	4.04E+00	0/1	4.04E+02	12.3 - 12.3
RADS	Neptunium-237	pCi/g	3.54E+00	3.54E+00	3.54E+00	1/74	1/74	1.00E-01	1/74	1.63E+00	0/74	1.63E+02	0.238 - 1.05

Table 4.25. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect	FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Plutonium-238	pCi/g	--	--	--	0/74	0/74	7.30E-02	0/74	1.94E+01	0/74	1.94E+03	0.261 - 0.862
RADS	Plutonium-239/240	pCi/g	1.25E+01	1.25E+01	1.25E+01	1/74	1/74	2.50E-02	0/74	1.83E+01	0/74	1.83E+03	0.234 - 1.09
RADS	Protactinium-231	pCi/g	--	--	--	0/1	N/A	N/A	0/1	6.23E+00	0/1	6.23E+02	0.53 - 0.53
RADS	Radium-226	pCi/g	1.21E+00	1.21E+00	1.21E+00	1/1	0/1	1.50E+00	1/1	1.64E-01	0/1	1.64E+01	0.455 - 0.455
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	2.49E+01	0/1	2.49E+03	1.9 - 1.9
RADS	Technetium-99	pCi/g	4.51E+00	4.16E+02	4.59E+01	14/74	14/74	2.50E+00	0/74	1.55E+03	0/74	1.00E+05	2.74 - 4.97
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	6.34E+01	0/1	6.34E+03	0.83 - 0.83
RADS	Thorium-230	pCi/g	5.37E-01	5.40E+01	2.10E+00	65/74	21/74	1.40E+00	1/74	2.82E+01	0/74	2.82E+03	0.331 - 1.08
RADS	Thorium-232	pCi/g	1.59E+00	1.59E+00	1.59E+00	1/1	1/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.468 - 0.468
RADS	Uranium-233/234	pCi/g	5.72E-01	2.90E+03	4.53E+01	68/74	36/74	1.20E+00	1/74	4.30E+01	0/74	4.30E+03	0.255 - 16.6
RADS	Uranium-235/236	pCi/g	1.87E-01	1.77E+02	1.31E+01	14/74	14/74	6.00E-02	1/74	2.62E+00	0/74	2.62E+02	0.116 - 14.1
RADS	Uranium-238	pCi/g	4.53E-01	3.00E+03	4.37E+01	74/74	41/74	1.20E+00	7/74	8.98E+00	1/74	8.98E+02	0.136 - 16
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.54E+03	0/72	1.00E+05	0.000884 - 2.24
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.11E+01	0/72	1.11E+03	0.000884 - 2.24
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.79E+03	0/72	1.00E+05	0.00442 - 11.2
VOC	1,1,2-Trichloroethane	mg/kg	9.22E-04	1.94E-02	6.84E-03	5/72	N/A	N/A	0/72	8.49E-01	0/72	2.55E+01	0.000884 - 2.24
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.52E+01	0/72	9.52E+03	0.000884 - 2.24
VOC	1,1-Dichloroethene	mg/kg	9.45E-04	9.14E-03	5.23E-03	7/72	N/A	N/A	0/72	1.26E+02	0/72	3.78E+03	0.000884 - 2.24
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.63E+01	0/72	7.89E+02	0.000884 - 2.24
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.20E+01	0/72	9.60E+02	0.000884 - 2.24
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.10E-01	0/72	4.10E+01	0.000884 - 2.24
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	7.86E-01	0/72	7.86E+01	0.000884 - 2.24
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.43E+02	0/72	2.83E+04	0.000884 - 2.24
VOC	1,2-Dichloroethane	mg/kg	4.96E-04	1.55E-03	1.02E-03	2/72	N/A	N/A	0/72	1.13E+01	0/72	5.19E+02	0.000884 - 2.24
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	8.91E+00	0/72	2.67E+02	0.000884 - 2.24
VOC	1,2-Dimethylbenzene	mg/kg	4.09E-04	1.71E-02	2.76E-03	10/72	N/A	N/A	0/72	3.61E+02	0/72	1.08E+04	0.000884 - 2.24
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.43E+02	0/72	2.83E+04	0.000884 - 2.24
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	7.20E+01	0/72	7.20E+03	0.000884 - 2.24
VOC	1,4-Dioxane	mg/kg	--	--	--	0/62	N/A	N/A	0/62	4.30E+01	0/62	4.30E+03	0.0442 - 112
VOC	2-Butanone	mg/kg	1.84E-03	2.25E-01	1.54E-02	28/72	N/A	N/A	0/72	1.28E+04	0/72	3.84E+05	0.00442 - 11.2
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.80E-01	0/72	4.80E+01	0.00442 - 11.2
VOC	2-Hexanone	mg/kg	2.34E-03	2.34E-03	2.34E-03	1/72	N/A	N/A	0/72	9.69E+01	0/72	2.91E+03	0.00442 - 11.2
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	9.70E+02	0/72	9.70E+04	0.000884 - 2.24
VOC	4-Methyl-2-pentanone	mg/kg	2.15E-03	2.15E-03	2.15E-03	1/72	N/A	N/A	0/72	2.31E+03	0/72	6.93E+04	0.00442 - 11.2
VOC	Acetone	mg/kg	2.26E-03	2.51E-01	4.21E-02	53/72	N/A	N/A	0/72	2.96E+04	0/72	8.88E+05	0.00442 - 11.2
VOC	Acrolein	mg/kg	2.98E-03	2.98E-03	2.98E-03	1/72	N/A	N/A	0/72	8.14E-02	0/72	2.44E+00	0.00442 - 11.2
VOC	Acrylonitrile	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.46E+00	0/72	2.71E+02	0.00442 - 11.2
VOC	Benzene	mg/kg	3.59E-04	1.01E-03	6.51E-04	9/72	N/A	N/A	0/72	2.59E+01	0/72	1.28E+03	0.000884 - 2.24
VOC	Bromochloromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	8.48E+01	0/72	2.54E+03	0.000884 - 2.24
VOC	Bromodichloromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	7.93E+00	0/72	7.93E+02	0.000884 - 2.24
VOC	Bromoform	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.24E+02	0/72	1.97E+04	0.000884 - 2.24
VOC	Bromomethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.80E+00	0/72	1.14E+02	0.000884 - 2.24
VOC	Carbon disulfide	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/72	N/A	N/A	0/72	4.21E+02	0/72	1.26E+04	0.00442 - 11.2
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.57E+01	0/72	1.57E+03	0.000884 - 2.24
VOC	Chlorobenzene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	1.48E+02	0/72	4.44E+03	0.000884 - 2.24

Table 4.25. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect	FOE	Bkgd	FOE	NAL	FOE	AL	
VOC	Chloroethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	3.07E+03	0/72	9.21E+04	0.000884 - 2.24
VOC	Chloroform	mg/kg	3.36E-04	6.93E-03	2.00E-03	8/72	N/A	N/A	0/72	8.90E+00	0/72	8.90E+02	0.000884 - 2.24
VOC	Chloromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	6.26E+01	0/72	1.88E+03	0.000884 - 2.24
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.55E-04	9.11E+00	1.17E+00	27/72	N/A	N/A	0/72	6.58E+01	0/72	1.97E+03	0.000884 - 2.24
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.83E+01	0/72	1.21E+03	0.000884 - 2.24
VOC	Cumene	mg/kg	1.30E-03	1.30E-03	1.30E-03	1/72	N/A	N/A	0/72	1.02E+03	0/72	3.06E+04	0.000884 - 2.24
VOC	Cyclohexane	mg/kg	4.35E-04	1.15E-03	7.12E-04	7/72	N/A	N/A	0/72	3.70E+03	0/72	1.11E+05	0.000884 - 2.24
VOC	Dibromochloromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	5.48E+01	0/72	5.48E+03	0.000884 - 2.24
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.94E+01	0/72	1.48E+03	0.000884 - 2.24
VOC	Ethylbenzene	mg/kg	3.59E-04	1.03E-02	1.89E-03	10/72	N/A	N/A	0/72	1.30E+02	0/72	1.30E+04	0.000884 - 2.24
VOC	m,p-Xylene	mg/kg	7.77E-04	4.81E-02	7.25E-03	11/72	N/A	N/A	0/72	3.23E+02	0/72	9.69E+03	0.00177 - 4.49
VOC	Methyl acetate	mg/kg	2.27E-03	2.33E-03	2.30E-03	2/72	N/A	N/A	0/72	3.29E+04	0/72	9.87E+05	0.00442 - 11.2
VOC	Methylcyclohexane	mg/kg	4.15E-04	2.34E-03	1.11E-03	14/72	N/A	N/A	0/72	1.76E+03	0/72	5.28E+04	0.000884 - 2.24
VOC	Methylene chloride	mg/kg	1.66E-03	6.99E-03	3.69E-03	37/72	N/A	N/A	0/72	1.57E+02	0/72	4.71E+03	0.00442 - 11.2
VOC	Styrene	mg/kg	1.18E-03	1.18E-03	1.18E-03	1/72	N/A	N/A	0/72	3.00E+03	0/72	9.00E+04	0.000884 - 2.24
VOC	Tetrachloroethene	mg/kg	3.63E-04	8.35E-02	1.86E-02	8/72	N/A	N/A	0/72	4.34E+01	0/72	1.30E+03	0.000884 - 2.24
VOC	Toluene	mg/kg	3.89E-04	1.40E-02	2.26E-03	30/72	N/A	N/A	0/72	2.18E+03	0/72	6.54E+04	0.000884 - 2.24
VOC	Total Xylene	mg/kg	1.20E-03	6.53E-02	1.07E-02	10/72	N/A	N/A	0/72	3.23E+02	0/72	9.69E+03	0.00265 - 6.73
VOC	*trans* -1,2-Dichloroethene	mg/kg	4.96E-04	4.62E-02	1.81E-02	11/72	N/A	N/A	0/72	5.67E+01	0/72	1.70E+03	0.000884 - 2.24
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/72	N/A	N/A	0/72	2.83E+01	0/72	1.21E+03	0.000884 - 2.24
VOC	Trichloroethene	mg/kg	3.72E-04	1.44E+02	8.01E+00	22/72	N/A	N/A	3/72	2.26E+00	1/72	6.78E+01	0.000884 - 2.24
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/72	N/A	N/A	0/72	4.11E+02	0/72	1.23E+04	0.000884 - 2.24
VOC	Vinyl chloride	mg/kg	5.93E-04	4.79E-01	9.23E-02	10/72	N/A	N/A	0/72	4.72E+00	0/72	4.72E+02	0.000884 - 2.24

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(orange)	One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

Background value is the lower of Surface or Subsurface Background levels.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts.)

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.26. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 5

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
METAL	Aluminum	mg/kg	3.98E+03	2.12E+04	1.27E+04	41/41	25/41	1.20E+04	0/41	5.99E+04	41/41	3.00E+03	10.5 - 123
METAL	Antimony	mg/kg	3.95E-01	1.87E+00	9.54E-01	12/41	12/41	2.10E-01	6/41	7.04E-01	12/41	3.52E-02	2.04 - 2.45
METAL	Arsenic	mg/kg	2.52E+00	1.69E+01	5.62E+00	40/41	5/41	7.90E+00	40/41	3.02E-02	40/41	1.51E-03	1.03 - 5.4
METAL	Barium	mg/kg	2.50E+01	2.24E+02	1.07E+02	41/41	4/41	1.70E+02	0/41	3.11E+02	41/41	1.55E+01	0.826 - 9.55
METAL	Beryllium	mg/kg	1.62E-01	8.43E-01	5.24E-01	41/41	5/41	6.90E-01	0/41	3.89E+01	0/41	1.95E+00	0.103 - 0.123
METAL	Boron	mg/kg	8.98E-01	8.07E+00	2.02E+00	32/41	N/A	N/A	0/41	2.56E+01	28/41	1.28E+00	3.1 - 3.68
METAL	Cadmium	mg/kg	2.24E-02	1.80E-01	6.34E-02	23/41	0/41	2.10E-01	0/41	1.39E+00	6/41	6.93E-02	0.206 - 0.246
METAL	Chromium	mg/kg	9.20E+00	5.14E+01	1.82E+01	41/41	2/41	4.30E+01	0/41	3.60E+06	0/41	1.80E+05	0.619 - 0.737
METAL	Cobalt	mg/kg	2.36E+00	2.53E+01	7.55E+00	41/41	3/41	1.30E+01	41/41	5.43E-01	41/41	2.71E-02	0.206 - 0.246
METAL	Copper	mg/kg	4.79E+00	2.69E+01	1.00E+01	41/41	1/41	2.50E+01	0/41	5.62E+01	41/41	2.81E+00	0.413 - 0.491
METAL	Iron	mg/kg	6.34E+03	2.92E+04	1.75E+04	41/41	1/41	2.80E+04	41/41	7.04E+02	41/41	3.52E+01	21.6 - 246
METAL	Lead	mg/kg	2.98E+00	2.01E+01	1.07E+01	41/41	0/41	2.30E+01	0/41	2.70E+02	7/41	1.35E+01	0.413 - 0.491
METAL	Manganese	mg/kg	5.60E+01	2.86E+03	5.43E+02	41/41	6/41	8.20E+02	40/41	5.65E+01	41/41	2.83E+00	1.03 - 285
METAL	Mercury	mg/kg	9.18E-03	5.96E-02	2.09E-02	30/41	0/41	1.30E-01	0/41	5.91E-01	3/41	2.95E-02	0.023 - 0.0299
METAL	Molybdenum	mg/kg	1.57E-01	1.42E+00	5.02E-01	41/41	N/A	N/A	0/41	4.03E+00	38/41	2.02E-01	0.206 - 0.246
METAL	Nickel	mg/kg	5.49E+00	2.06E+01	1.07E+01	41/41	0/41	2.20E+01	0/41	5.12E+01	41/41	2.56E+00	0.413 - 0.491
METAL	Selenium	mg/kg	4.17E-01	3.25E+00	1.32E+00	40/41	34/41	7.00E-01	23/41	1.04E+00	40/41	5.19E-02	1.03 - 5.4
METAL	Silver	mg/kg	3.23E-01	1.45E+00	5.74E-01	8/41	0/41	2.70E+00	0/41	1.60E+00	8/41	7.99E-02	0.51 - 5.73
METAL	Thallium	mg/kg	1.51E-01	2.82E-01	1.99E-01	19/41	0/41	3.40E-01	19/41	2.84E-02	19/41	1.42E-03	0.413 - 0.491
METAL	Uranium[a]	mg/kg	5.42E-01	1.81E+01	1.76E+00	41/41	2/41	4.60E+00	2/41	3.60E+00	41/41	1.80E-01	0.0413 - 0.0491
METAL	Vanadium	mg/kg	7.93E+00	6.20E+01	2.87E+01	41/41	5/41	3.70E+01	0/41	1.73E+02	40/41	8.64E+00	4.13 - 4.91
METAL	Zinc	mg/kg	1.15E+01	6.73E+01	3.15E+01	41/41	2/41	6.00E+01	0/41	7.46E+02	11/41	3.73E+01	4.13 - 21.6
ANION	Fluoride	mg/kg	1.47E+00	1.69E+01	7.11E+00	41/41	N/A	N/A	0/41	2.40E+02	7/41	1.20E+01	1.06 - 2.36
DI/FURA	Total Dioxin/Furans[b]	mg/kg	3.07E-06	1.58E-05	6.07E-06	22/22	N/A	N/A	22/22	1.18E-06	22/22	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	1.53E-03	1.48E-02	4.73E-03	8/40	N/A	N/A	0/40	1.36E-01	1/40	6.82E-03	0.00345 - 0.0209
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.74E-02	0/40	8.72E-04	0.341 - 0.435
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.04E+00	0/40	4.02E-01	0.341 - 0.435
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.32E-02	0/40	1.16E-03	0.341 - 0.435
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.52E-02	0/40	2.26E-03	0.341 - 0.435
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.42E-01	0/40	4.21E-02	0.341 - 0.435
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.681 - 0.87
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.42E-03	0/40	3.21E-04	0.341 - 0.435
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.33E-03	0/40	6.67E-05	0.341 - 0.435
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.70E+00	0/40	3.85E-01	0.0341 - 0.0435
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.78E-01	0/40	8.91E-03	0.341 - 0.435
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.16E-03	0/40	2.58E-04	0.341 - 0.435
SVOC	2-Methylnaphthalene	mg/kg	1.73E-02	1.97E-02	1.85E-02	2/40	N/A	N/A	0/40	3.70E-01	1/40	1.85E-02	0.0341 - 0.0435
SVOC	2-Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.51E+00	0/40	7.53E-02	0.341 - 0.435
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.60E-01	0/40	8.01E-03	0.341 - 0.435
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.341 - 0.435
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.65E-02	0/40	8.24E-04	0.341 - 0.435
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.90E-03	0/40	2.45E-04	0.341 - 0.435
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.84E-03	0/40	3.42E-04	0.341 - 0.435
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.42E+00	0/40	1.71E-01	0.341 - 0.435
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.10E-03	0/40	1.55E-04	0.341 - 0.435

Table 4.26. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	Provisional Background FOE	Provisional Background Bkgd	GW Protection Screen DAF 20	GW Protection Screen DAF 20 SSL	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.84E-03	0/40	3.42E-04	0.341 - 0.435
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.72E-02	0/40	4.36E-03	0.341 - 0.435
SVOC	Acenaphthene	mg/kg	1.29E-02	2.13E-02	1.63E-02	4/40	N/A	N/A	0/40	1.10E+01	0/40	5.49E-01	0.0341 - 0.0435
SVOC	Acenaphthylene	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/40	N/A	N/A	0/40	1.10E+01	0/40	5.49E-01	0.0341 - 0.0435
SVOC	Acetophenone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.17E+00	0/40	5.84E-02	0.341 - 0.435
SVOC	Anthracene	mg/kg	1.34E-02	2.36E-01	4.94E-02	8/40	N/A	N/A	0/40	1.16E+02	0/40	5.81E+00	0.0341 - 0.0435
SVOC	Atrazine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.92E-03	0/40	1.96E-04	0.341 - 0.435
SVOC	Benzaldehyde	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.30E-02	0/40	4.15E-03	0.341 - 0.435
SVOC	Benzo(ghi)perylene	mg/kg	1.12E-02	3.81E-01	9.86E-02	8/40	N/A	N/A	0/40	2.63E+01	0/40	1.32E+00	0.0341 - 0.0435
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.70E-02	0/40	1.35E-03	0.341 - 0.435
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.22E-05	0/40	3.61E-06	0.341 - 0.435
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.62E-03	0/40	1.31E-04	0.341 - 0.435
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.39E-02	1.63E-02	1.51E-02	2/40	N/A	N/A	0/40	2.66E+01	0/40	1.33E+00	0.0341 - 0.0435
SVOC	Butyl benzyl phthalate	mg/kg	1.66E-02	1.66E-02	1.66E-02	1/40	N/A	N/A	0/40	4.72E+00	0/40	2.36E-01	0.0341 - 0.0435
SVOC	Caprolactam	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.94E+00	0/40	2.47E-01	0.341 - 0.435
SVOC	Carbazole	mg/kg	1.50E-02	2.50E-02	2.15E-02	3/40	N/A	N/A	0/40	7.51E-01	0/40	3.76E-02	0.0341 - 0.0435
SVOC	Dibenzofuran	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.92E-01	0/40	1.46E-02	0.341 - 0.435
SVOC	Diethyl phthalate	mg/kg	1.82E-02	1.82E-02	1.82E-02	1/40	N/A	N/A	0/40	1.22E+01	0/40	6.08E-01	0.0341 - 0.0435
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.22E+01	0/40	6.08E-01	0.0341 - 0.0435
SVOC	Di-n-butyl phthalate	mg/kg	1.24E-02	3.38E-02	1.82E-02	6/40	N/A	N/A	0/40	4.54E+00	0/40	2.27E-01	0.0341 - 0.0435
SVOC	Di-n-octylphthalate	mg/kg	1.70E-02	1.70E-02	1.70E-02	1/40	N/A	N/A	0/40	1.13E+02	0/40	5.65E+00	0.0341 - 0.0435
SVOC	Diphenylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.66E+00	0/40	2.33E-01	0.341 - 0.435
SVOC	Fluoranthene	mg/kg	1.02E-02	2.40E+00	1.95E-01	21/40	N/A	N/A	0/40	1.78E+02	0/40	8.91E+00	0.0341 - 0.0435
SVOC	Fluorene	mg/kg	1.16E-02	2.27E-02	1.52E-02	5/40	N/A	N/A	0/40	1.09E+01	0/40	5.45E-01	0.0341 - 0.0435
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.46E-03	0/40	1.23E-04	0.341 - 0.435
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.34E-03	0/40	2.67E-04	0.341 - 0.435
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.56E-03	0/40	1.28E-04	0.341 - 0.435
SVOC	Hexachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.00E-03	0/40	2.00E-04	0.341 - 0.435
SVOC	Isophorone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.16E-01	0/40	2.58E-02	0.341 - 0.435
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.94E-01	0/40	2.97E-02	0.341 - 0.435
SVOC	Naphthalene	mg/kg	1.33E-02	3.69E-02	2.51E-02	2/40	N/A	N/A	2/40	7.70E-03	2/40	3.85E-04	0.0341 - 0.0435
SVOC	Nitrobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.83E-03	0/40	9.17E-05	0.341 - 0.435
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.62E-04	0/40	8.10E-06	0.341 - 0.435
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.14E-03	0/40	5.71E-05	0.341 - 0.435
SVOC	Phenanthrene	mg/kg	1.80E-02	7.57E-01	1.26E-01	13/40	N/A	N/A	0/40	1.10E+01	1/40	5.49E-01	0.0341 - 0.0435
SVOC	Phenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.62E+00	0/40	3.31E-01	0.341 - 0.435
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.16E-02	0/40	1.58E-03	0.341 - 0.435
SVOC	Pyrene	mg/kg	1.19E-02	1.98E+00	1.94E-01	18/40	N/A	N/A	0/40	2.63E+01	1/40	1.32E+00	0.0341 - 0.0435
SVOC	Total PAH[d]	mg/kg	1.23E-03	1.61E+00	1.52E-01	15/40	N/A	N/A	1/40	5.89E-01	7/40	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/41	N/A	N/A	0/41	1.92E+01	0/41	9.58E-01	0.0764 - 0.846
RADS	Cesium-137	pCi/g	--	--	--	0/41	0/41	2.80E-01	0/41	9.58E+00	0/41	4.79E-01	0.0303 - 0.0676
RADS	Neptunium-237	pCi/g	--	--	--	0/41	N/A	N/A	0/41	1.07E+00	0/41	5.36E-02	0.373 - 0.883
RADS	Plutonium-238	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.38E+00	0/41	2.19E-01	0.324 - 0.862
RADS	Plutonium-239/240	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.26E+00	0/41	2.13E-01	0.234 - 1.09
RADS	Technetium-99	pCi/g	6.72E+00	2.62E+01	1.33E+01	5/41	5/41	2.80E+00	5/41	1.52E-01	5/41	7.60E-03	2.8 - 4.97

Table 4.26. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Thorium-230	pCi/g	7.38E-01	2.44E+00	1.26E+00	36/41	9/41	1.40E+00	0/41	3.66E+01	1/41	1.83E+00	0.398 - 0.828
RADS	Uranium-233/234	pCi/g	5.72E-01	1.70E+01	1.80E+00	35/41	11/41	1.20E+00	20/41	9.90E-01	35/41	4.95E-02	0.255 - 0.912
RADS	Uranium-235/236	pCi/g	1.87E-01	6.53E-01	3.64E-01	5/41	5/41	6.00E-02	0/41	9.76E-01	5/41	4.88E-02	0.116 - 0.883
RADS	Uranium-238	pCi/g	5.32E-01	1.84E+01	1.79E+00	41/41	15/41	1.20E+00	32/41	8.05E-01	41/41	4.03E-02	0.136 - 0.714
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.62E+00	0/40	2.81E-01	0.000922 - 2.24
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.92E-04	0/40	2.96E-05	0.000922 - 2.24
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.13E+01	0/40	2.56E+00	0.00461 - 11.2
VOC	1,1,2-Trichloroethane	mg/kg	5.26E-03	1.94E-02	1.03E-02	3/40	N/A	N/A	3/40	2.69E-04	3/40	1.35E-05	0.000922 - 2.24
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.56E-02	0/40	7.82E-04	0.000922 - 2.24
VOC	1,1-Dichloroethene	mg/kg	2.21E-03	9.14E-03	6.23E-03	4/40	N/A	N/A	0/40	2.04E-01	0/40	1.02E-02	0.000922 - 2.24
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.18E-02	0/40	2.09E-03	0.000922 - 2.24
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.32E-02	0/40	1.16E-03	0.000922 - 2.24
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.88E-06	0/40	1.44E-07	0.000922 - 2.24
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-05	0/40	2.10E-06	0.000922 - 2.24
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.90E-01	0/40	2.95E-02	0.000922 - 2.24
VOC	1,2-Dichloroethane	mg/kg	4.96E-04	1.55E-03	1.02E-03	2/40	N/A	N/A	1/40	9.69E-04	2/40	4.84E-05	0.000922 - 2.24
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.48E-03	0/40	2.74E-04	0.000922 - 2.24
VOC	1,2-Dimethylbenzene	mg/kg	6.64E-04	3.89E-03	1.83E-03	3/40	N/A	N/A	0/40	3.81E-01	0/40	1.90E-02	0.000922 - 2.24
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.90E-01	0/40	2.95E-02	0.000922 - 2.24
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.24E-03	0/40	4.62E-04	0.000922 - 2.24
VOC	1,4-Dioxane	mg/kg	--	--	--	0/34	N/A	N/A	0/34	1.88E-03	0/34	9.42E-05	0.0461 - 112
VOC	2-Butanone	mg/kg	2.37E-03	2.48E-02	8.57E-03	18/40	N/A	N/A	0/40	2.32E+00	0/40	1.16E-01	0.00461 - 11.2
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.76E-05	0/40	1.38E-06	0.00461 - 11.2
VOC	2-Hexanone	mg/kg	2.34E-03	2.34E-03	2.34E-03	1/40	N/A	N/A	0/40	1.75E-02	1/40	8.75E-04	0.00461 - 11.2
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.44E-02	0/40	3.22E-03	0.000922 - 2.24
VOC	4-Methyl-2-pentanone	mg/kg	2.15E-03	2.15E-03	2.15E-03	1/40	N/A	N/A	0/40	5.62E-01	0/40	2.81E-02	0.00461 - 11.2
VOC	Acetone	mg/kg	2.26E-03	2.51E-01	4.84E-02	33/40	N/A	N/A	0/40	7.36E+00	0/40	3.68E-01	0.00461 - 11.2
VOC	Acrolein	mg/kg	2.98E-03	2.98E-03	2.98E-03	1/40	N/A	N/A	1/40	1.68E-05	1/40	8.41E-07	0.00461 - 11.2
VOC	Acrylonitrile	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.28E-04	0/40	1.14E-05	0.00461 - 11.2
VOC	Benzene	mg/kg	3.59E-04	1.01E-03	7.28E-04	4/40	N/A	N/A	0/40	4.66E-03	4/40	2.33E-04	0.000922 - 2.24
VOC	Bromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.16E-02	0/40	2.08E-03	0.000922 - 2.24
VOC	Bromodichloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.30E-04	0/40	3.65E-05	0.000922 - 2.24
VOC	Bromoform	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.75E-02	0/40	8.73E-04	0.000922 - 2.24
VOC	Bromomethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.82E-03	0/40	1.91E-04	0.000922 - 2.24
VOC	Carbon disulfide	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.80E-01	0/40	2.40E-02	0.00461 - 11.2
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.54E-03	0/40	1.77E-04	0.000922 - 2.24
VOC	Chlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.06E-01	0/40	5.28E-03	0.000922 - 2.24
VOC	Chloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.74E+00	0/40	2.37E-01	0.000922 - 2.24
VOC	Chloroform	mg/kg	4.72E-04	6.93E-03	4.46E-03	3/40	N/A	N/A	2/40	1.22E-03	3/40	6.12E-05	0.000922 - 2.24
VOC	Chloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.05E-02	0/40	5.26E-04	0.000922 - 2.24
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.87E-04	9.11E+00	1.51E+00	18/40	N/A	N/A	8/40	2.12E-02	14/40	1.06E-03	0.000922 - 2.24
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.36E-03	0/40	1.68E-04	0.000922 - 2.24
VOC	Cumene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.48E+00	0/40	7.38E-02	0.000922 - 2.24
VOC	Cyclohexane	mg/kg	4.35E-04	4.35E-04	4.35E-04	1/40	N/A	N/A	0/40	2.60E+01	0/40	1.30E+00	0.000922 - 2.24
VOC	Dibromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.64E-03	0/40	2.32E-04	0.000922 - 2.24

Table 4.26. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.08E-01	0/40	3.04E-02	0.000922 - 2.24
VOC	Ethylbenzene	mg/kg	3.59E-04	3.21E-03	1.41E-03	3/40	N/A	N/A	0/40	3.36E-02	1/40	1.68E-03	0.000922 - 2.24
VOC	m,p-Xylene	mg/kg	1.29E-03	1.33E-02	5.46E-03	3/40	N/A	N/A	0/40	3.82E-01	0/40	1.91E-02	0.00184 - 4.49
VOC	Methyl acetate	mg/kg	2.27E-03	2.27E-03	2.27E-03	1/40	N/A	N/A	0/40	8.22E+00	0/40	4.11E-01	0.00461 - 11.2
VOC	Methylcyclohexane	mg/kg	4.15E-04	1.48E-03	8.49E-04	6/40	N/A	N/A	0/40	2.80E+01	0/40	1.40E+00	0.000922 - 2.24
VOC	Methylene chloride	mg/kg	1.76E-03	6.99E-03	3.87E-03	23/40	N/A	N/A	0/40	5.44E-02	16/40	2.72E-03	0.00461 - 11.2
VOC	Styrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.66E+00	0/40	1.33E-01	0.000922 - 2.24
VOC	Tetrachloroethene	mg/kg	6.27E-04	4.11E-03	1.98E-03	3/40	N/A	N/A	0/40	3.69E-02	1/40	1.84E-03	0.000922 - 2.24
VOC	Toluene	mg/kg	3.95E-04	7.19E-03	1.62E-03	13/40	N/A	N/A	0/40	1.52E+00	0/40	7.62E-02	0.000922 - 2.24
VOC	Total Xylene	mg/kg	1.96E-03	1.72E-02	7.30E-03	3/40	N/A	N/A	0/40	3.82E-01	0/40	1.91E-02	0.00277 - 6.73
VOC	*trans* -1,2-Dichloroethene	mg/kg	4.96E-04	4.62E-02	2.05E-02	7/40	N/A	N/A	0/40	5.83E-02	5/40	2.91E-03	0.000922 - 2.24
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.36E-03	0/40	1.68E-04	0.000922 - 2.24
VOC	Trichloroethene	mg/kg	5.13E-04	1.44E+02	1.48E+01	10/40	N/A	N/A	6/40	2.02E-03	10/40	1.01E-04	0.000922 - 2.24
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.46E+00	0/40	7.31E-02	0.000922 - 2.24
VOC	Vinyl chloride	mg/kg	5.93E-04	4.79E-01	1.00E-01	7/40	N/A	N/A	7/40	1.29E-04	7/40	6.47E-06	0.000922 - 2.24

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

Background value is the lower of Surface or Subsurface Background levels.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts.)

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.27. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 5

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.22E+03	1.66E+04	9.00E+03	43/43	9/43	1.20E+04	0/43	5.99E+04	42/43	3.00E+03	9.41 - 119
METAL	Antimony	mg/kg	4.05E-01	5.09E+00	1.01E+00	16/43	16/43	2.10E-01	6/43	7.04E-01	16/43	3.52E-02	1 - 20.4
METAL	Arsenic	mg/kg	4.31E-01	1.19E+01	2.52E+00	40/43	1/43	7.90E+00	40/43	3.02E-02	40/43	1.51E-03	0.941 - 5
METAL	Barium	mg/kg	1.05E+01	2.69E+02	4.32E+01	43/43	1/43	1.70E+02	0/43	3.11E+02	37/43	1.55E+01	0.753 - 4.45
METAL	Beryllium	mg/kg	2.06E-01	1.17E+00	6.04E-01	42/43	17/43	6.90E-01	0/43	3.89E+01	0/43	1.95E+00	0.0941 - 0.5
METAL	Boron	mg/kg	8.90E-01	2.44E+00	1.43E+00	16/41	N/A	N/A	0/41	2.56E+01	7/41	1.28E+00	2.82 - 3.65
METAL	Cadmium	mg/kg	2.82E-02	6.38E-01	2.46E-01	3/43	1/43	2.10E-01	0/43	1.39E+00	2/43	6.93E-02	0.188 - 0.5
METAL	Calcium	mg/kg	1.15E+03	1.25E+03	1.20E+03	2/2	0/2	6.10E+03	N/A	N/A	N/A	N/A	100 - 100
METAL	Chromium	mg/kg	3.57E+00	7.18E+01	1.47E+01	43/43	3/43	4.30E+01	0/43	3.60E+06	0/43	1.80E+05	0.565 - 2.5
METAL	Cobalt	mg/kg	3.33E-01	2.27E+01	5.00E+00	41/43	3/43	1.30E+01	40/43	5.43E-01	41/43	2.71E-02	0.188 - 5
METAL	Copper	mg/kg	1.65E+00	9.44E+00	4.95E+00	43/43	0/43	2.50E+01	0/43	5.62E+01	33/43	2.81E+00	0.376 - 2.5
METAL	Iron	mg/kg	1.23E+03	4.80E+04	1.42E+04	43/43	4/43	2.80E+04	43/43	7.04E+02	43/43	3.52E+01	18.8 - 237
METAL	Lead	mg/kg	1.45E+00	1.09E+01	4.64E+00	43/43	0/43	2.30E+01	0/43	2.70E+02	0/43	1.35E+01	0.376 - 1
METAL	Magnesium	mg/kg	6.57E+02	9.23E+02	7.90E+02	2/2	0/2	2.10E+03	N/A	N/A	N/A	N/A	5 - 5
METAL	Manganese	mg/kg	4.50E+00	1.26E+03	1.26E+02	43/43	1/43	8.20E+02	21/43	5.65E+01	43/43	2.83E+00	0.941 - 11.5
METAL	Mercury	mg/kg	8.82E-03	3.89E-02	1.96E-02	8/43	0/43	1.30E-01	0/43	5.91E-01	1/43	2.95E-02	0.02 - 0.0309
METAL	Molybdenum	mg/kg	9.59E-02	7.39E-01	2.75E-01	39/41	N/A	N/A	0/41	4.03E+00	24/41	2.02E-01	0.188 - 0.243
METAL	Nickel	mg/kg	1.39E+00	1.11E+01	5.60E+00	41/43	0/43	2.20E+01	0/43	5.12E+01	36/43	2.56E+00	0.376 - 5
METAL	Potassium	mg/kg	1.26E+02	2.79E+02	2.03E+02	2/2	0/2	9.50E+02	N/A	N/A	N/A	N/A	100 - 100
METAL	Selenium	mg/kg	3.87E-01	4.74E+00	1.19E+00	38/43	28/43	7.00E-01	20/43	1.04E+00	38/43	5.19E-02	0.941 - 1.22
METAL	Silver	mg/kg	1.48E-01	3.61E-01	2.28E-01	5/43	0/43	2.70E+00	0/43	1.60E+00	5/43	7.99E-02	0.506 - 5.1
METAL	Sodium	mg/kg	2.03E+02	2.17E+02	2.10E+02	2/2	0/2	3.40E+02	N/A	N/A	N/A	N/A	100 - 200
METAL	Thallium	mg/kg	1.57E-01	3.02E-01	1.97E-01	7/43	0/43	3.40E-01	7/43	2.84E-02	7/43	1.42E-03	0.376 - 2
METAL	Uranium[a]	mg/kg	3.73E-01	1.78E+00	9.41E-01	41/43	0/43	4.60E+00	0/43	3.60E+00	41/43	1.80E-01	0.0376 - 1
METAL	Vanadium	mg/kg	5.77E+00	6.02E+01	2.29E+01	43/43	7/43	3.70E+01	0/43	1.73E+02	38/43	8.64E+00	2.5 - 4.87
METAL	Zinc	mg/kg	4.24E+00	4.32E+01	1.67E+01	41/43	0/43	6.00E+01	0/43	7.46E+02	2/43	3.73E+01	3.76 - 20
ANION	Fluoride	mg/kg	5.61E-01	9.85E+00	2.53E+00	41/41	N/A	N/A	0/41	2.40E+02	0/41	1.20E+01	1.03 - 1.27
PPCB	Total PCB[b]	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.36E-01	0/99	6.82E-03	0.0035 - 0.1
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.74E-02	0/42	8.72E-04	0.353 - 0.433
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.04E+00	0/99	4.02E-01	0.353 - 0.5
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.32E-02	0/99	1.16E-03	0.353 - 0.5
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.52E-02	0/99	2.26E-03	0.353 - 0.5
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.42E-01	0/99	4.21E-02	0.353 - 0.5
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.72E-02	0/99	4.36E-03	0.45 - 0.866
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	6.42E-03	0/99	3.21E-04	0.353 - 0.5
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.33E-03	0/99	6.67E-05	0.353 - 0.5
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.70E+00	0/99	3.85E-01	0.0353 - 0.5
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.78E-01	0/99	8.91E-03	0.353 - 0.5
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.16E-03	0/99	2.58E-04	0.353 - 0.5
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.70E-01	0/99	1.85E-02	0.0353 - 0.5
SVOC	2-Methylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.51E+00	0/99	7.53E-02	0.353 - 0.5
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.60E-01	0/99	8.01E-03	0.353 - 0.5
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.72E-02	0/99	4.36E-03	0.353 - 0.5
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.65E-02	0/99	8.24E-04	0.353 - 0.5
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.90E-03	0/99	2.45E-04	0.353 - 0.5

Table 4.27. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. of Detect.	Provisional Background FOE	Bkgd	GW Protection Screen DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	6.84E-03	0/99	3.42E-04	0.353 - 0.5
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.42E+00	0/99	1.71E-01	0.353 - 0.5
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.10E-03	0/99	1.55E-04	0.353 - 0.5
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	6.84E-03	0/99	3.42E-04	0.353 - 0.5
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.72E-02	0/99	4.36E-03	0.353 - 0.5
SVOC	Acenaphthene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5
SVOC	Acenaphthylene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5
SVOC	Acetophenone	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.17E+00	0/42	5.84E-02	0.353 - 0.433
SVOC	Anthracene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.16E+02	0/99	5.81E+00	0.0353 - 0.5
SVOC	Atrazine	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.92E-03	0/42	1.96E-04	0.353 - 0.433
SVOC	Benzaldehyde	mg/kg	--	--	--	0/42	N/A	N/A	0/42	8.30E-02	0/42	4.15E-03	0.353 - 0.433
SVOC	Benzenemethanol	mg/kg	--	--	--	0/57	N/A	N/A	0/57	9.52E-01	0/57	4.76E-02	0.45 - 0.5
SVOC	Benzo(ghi)perylene	mg/kg	1.31E-02	1.39E-02	1.35E-02	2/99	N/A	N/A	0/99	2.63E+01	0/99	1.32E+00	0.0353 - 0.5
SVOC	Benzoic acid	mg/kg	--	--	--	0/52	N/A	N/A	0/52	3.02E+01	0/52	1.51E+00	0.45 - 0.5
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.70E-02	0/99	1.35E-03	0.353 - 0.5
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.22E-05	0/99	3.61E-06	0.353 - 0.5
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.62E-03	0/99	1.31E-04	0.353 - 0.5
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.43E-02	2.59E-02	1.92E-02	4/99	N/A	N/A	0/99	2.66E+01	0/99	1.33E+00	0.0353 - 0.5
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.72E+00	0/99	2.36E-01	0.0353 - 0.5
SVOC	Caprolactam	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.94E+00	0/42	2.47E-01	0.353 - 0.433
SVOC	Carbazole	mg/kg	--	--	--	0/42	N/A	N/A	0/42	7.51E-01	0/42	3.76E-02	0.0353 - 0.0433
SVOC	Dibenzofuran	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.92E-01	0/99	1.46E-02	0.353 - 0.5
SVOC	Diethyl phthalate	mg/kg	1.53E-02	1.67E-02	1.60E-02	2/99	N/A	N/A	0/99	1.22E+01	0/99	6.08E-01	0.0353 - 0.5
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.22E+01	0/99	6.08E-01	0.0353 - 0.5
SVOC	Di-n-butyl phthalate	mg/kg	1.15E-02	1.20E+00	1.73E-01	15/99	N/A	N/A	0/99	4.54E+00	3/99	2.27E-01	0.0353 - 0.5
SVOC	Di-n-octylphthalate	mg/kg	3.55E-02	3.55E-02	3.55E-02	1/99	N/A	N/A	0/99	1.13E+02	0/99	5.65E+00	0.0353 - 0.5
SVOC	Diphenylamine	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.66E+00	0/42	2.33E-01	0.353 - 0.433
SVOC	Fluoranthene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.78E+02	0/99	8.91E+00	0.0353 - 0.5
SVOC	Fluorene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.09E+01	0/99	5.45E-01	0.0353 - 0.5
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.46E-03	0/99	1.23E-04	0.353 - 0.5
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.34E-03	0/99	2.67E-04	0.353 - 0.5
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.56E-03	0/99	1.28E-04	0.353 - 0.5
SVOC	Hexachloroethane	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.00E-03	0/99	2.00E-04	0.353 - 0.5
SVOC	Isophorone	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.16E-01	0/99	2.58E-02	0.353 - 0.5
SVOC	m,p-Cresol	mg/kg	--	--	--	0/57	N/A	N/A	0/57	5.94E-01	0/57	2.97E-02	0.45 - 0.5
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.94E-01	0/42	2.97E-02	0.353 - 0.433
SVOC	Naphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.70E-03	0/99	3.85E-04	0.0353 - 0.5
SVOC	Nitrobenzene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.83E-03	0/99	9.17E-05	0.353 - 0.5
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.62E-04	0/99	8.10E-06	0.353 - 0.5
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/57	N/A	N/A	0/57	1.33E+00	0/57	6.66E-02	0.45 - 0.5
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.14E-03	0/99	5.71E-05	0.353 - 0.5
SVOC	Phenanthrene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5
SVOC	Phenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	6.62E+00	0/99	3.31E-01	0.353 - 0.5
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.16E-02	0/99	1.58E-03	0.353 - 0.5
SVOC	Pyrene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.63E+01	0/99	1.32E+00	0.0353 - 0.5

Table 4.27. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	Total PAH[c]	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.89E-01	0/99	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/41	N/A	N/A	0/41	1.92E+01	0/41	9.58E-01	0.243 - 1.02
RADS	Cesium-137	pCi/g	--	--	--	0/41	0/41	2.80E-01	0/41	9.58E+00	0/41	4.79E-01	0.024 - 0.0752
RADS	Neptunium-237	pCi/g	--	--	--	0/43	N/A	N/A	0/43	1.07E+00	0/43	5.36E-02	0.0263 - 0.972
RADS	Plutonium-238	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.38E+00	0/41	2.19E-01	0.191 - 0.871
RADS	Plutonium-239/240	pCi/g	--	--	--	0/43	N/A	N/A	0/43	4.26E+00	0/43	2.13E-01	0.0204 - 1.03
RADS	Technetium-99	pCi/g	--	--	--	0/43	0/43	2.80E+00	0/43	1.52E-01	0/43	7.60E-03	1.86 - 4.15
RADS	Thorium-230	pCi/g	6.37E-01	2.31E+00	1.06E+00	31/41	7/41	1.40E+00	0/41	3.66E+01	2/41	1.83E+00	0.274 - 1.29
RADS	Uranium-233/234	pCi/g	5.22E-01	2.12E+00	9.15E-01	27/41	3/41	1.20E+00	8/41	9.90E-01	27/41	4.95E-02	0.276 - 0.731
RADS	Uranium-234	pCi/g	--	--	--	0/2	0/2	1.20E+00	0/2	9.90E-01	0/2	4.95E-02	0.743 - 1.24
RADS	Uranium-235	pCi/g	--	--	--	0/2	0/2	6.00E-02	0/2	9.76E-01	0/2	4.88E-02	0.0506 - 0.231
RADS	Uranium-235/236	pCi/g	2.37E-01	3.50E-01	2.78E-01	3/41	3/41	6.00E-02	0/41	9.76E-01	3/41	4.88E-02	0.193 - 0.656
RADS	Uranium-238	pCi/g	3.68E-01	1.94E+00	9.29E-01	32/43	8/43	1.20E+00	16/43	8.05E-01	32/43	4.03E-02	0.192 - 0.717
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.62E+00	0/44	2.81E-01	0.00087 - 0.002
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.92E-04	0/44	2.96E-05	0.00087 - 0.002
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.13E+01	0/42	2.56E+00	0.00435 - 0.00597
VOC	1,1,2-Trichloroethane	mg/kg	7.49E-04	9.33E-04	8.41E-04	2/44	N/A	N/A	2/44	2.69E-04	2/44	1.35E-05	0.00087 - 0.002
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.56E-02	0/44	7.82E-04	0.00087 - 0.002
VOC	1,1-Dichloroethene	mg/kg	3.54E-04	4.42E-04	3.98E-04	2/105	N/A	N/A	0/105	2.04E-01	0/105	1.02E-02	0.00087 - 0.00504
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.18E-02	0/42	2.09E-03	0.00087 - 0.00119
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.32E-02	0/42	1.16E-03	0.00087 - 0.00119
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.88E-06	0/42	1.44E-07	0.00087 - 0.00119
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.20E-05	0/42	2.10E-06	0.00087 - 0.00119
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.90E-01	0/42	2.95E-02	0.00087 - 0.00119
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	9.69E-04	0/44	4.84E-05	0.00087 - 0.002
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.48E-03	0/44	2.74E-04	0.00087 - 0.002
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.81E-01	0/44	1.90E-02	0.00087 - 0.002
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.90E-01	0/42	2.95E-02	0.00087 - 0.00119
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	9.24E-03	0/42	4.62E-04	0.00087 - 0.00119
VOC	1,4-Dioxane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.88E-03	0/42	9.42E-05	0.0435 - 0.0597
VOC	2-Butanone	mg/kg	4.66E-03	4.66E-03	4.66E-03	1/44	N/A	N/A	0/44	2.32E+00	0/44	1.16E-01	0.001 - 0.05
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.76E-05	0/42	1.38E-06	0.00435 - 0.00597
VOC	2-Hexanone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.75E-02	0/44	8.75E-04	0.001 - 0.0099
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.44E-02	0/42	3.22E-03	0.00087 - 0.00119
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.62E-01	0/44	2.81E-02	0.001 - 0.05
VOC	Acetone	mg/kg	2.09E-03	1.08E-02	4.09E-03	16/44	N/A	N/A	0/44	7.36E+00	0/44	3.68E-01	0.001 - 0.05
VOC	Acrolein	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.68E-05	0/42	8.41E-07	0.00435 - 0.00597
VOC	Acrylonitrile	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.28E-04	0/42	1.14E-05	0.00435 - 0.00597
VOC	Benzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.66E-03	0/44	2.33E-04	0.00087 - 0.002
VOC	Bromochloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.16E-02	0/42	2.08E-03	0.00087 - 0.00119
VOC	Bromodichloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	7.30E-04	0/44	3.65E-05	0.00087 - 0.002
VOC	Bromoform	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.75E-02	0/44	8.73E-04	0.00087 - 0.002
VOC	Bromomethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.82E-03	0/44	1.91E-04	0.00087 - 0.004
VOC	Carbon disulfide	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.80E-01	0/44	2.40E-02	0.001 - 0.00597
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.54E-03	0/44	1.77E-04	0.00087 - 0.002

Table 4.27. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
VOC	Chlorobenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.06E-01	0/44	5.28E-03	0.00087 - 0.002
VOC	Chloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.74E+00	0/44	2.37E-01	0.00087 - 0.004
VOC	Chloroform	mg/kg	3.54E-04	1.79E-03	7.46E-04	6/44	N/A	N/A	1/44	1.22E-03	6/44	6.12E-05	0.00087 - 0.002
VOC	Chloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.05E-02	0/44	5.26E-04	0.00087 - 0.004
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.62E-04	3.87E-01	2.57E-02	30/105	N/A	N/A	5/105	2.12E-02	24/105	1.06E-03	0.00087 - 0.101
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.36E-03	0/44	1.68E-04	0.00087 - 0.002
VOC	Cumene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.48E+00	0/42	7.38E-02	0.00087 - 0.00119
VOC	Cyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.60E+01	0/42	1.30E+00	0.00087 - 0.00119
VOC	Dibromochloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.64E-03	0/44	2.32E-04	0.00087 - 0.002
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.08E-01	0/42	3.04E-02	0.00087 - 0.00119
VOC	Ethylbenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.36E-02	0/44	1.68E-03	0.00087 - 0.002
VOC	m,p-Xylene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.82E-01	0/44	1.91E-02	0.00174 - 0.00239
VOC	Methyl acetate	mg/kg	--	--	--	0/42	N/A	N/A	0/42	8.22E+00	0/42	4.11E-01	0.00435 - 0.00597
VOC	Methylcyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.80E+01	0/42	1.40E+00	0.00087 - 0.00119
VOC	Methylene chloride	mg/kg	3.29E-03	4.79E-03	4.15E-03	4/44	N/A	N/A	0/44	5.44E-02	4/44	2.72E-03	0.001 - 0.00597
VOC	Styrene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.66E+00	0/44	1.33E-01	0.00087 - 0.002
VOC	Tetrachloroethene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.69E-02	0/44	1.84E-03	0.00087 - 0.002
VOC	Toluene	mg/kg	5.56E-04	5.58E-04	5.57E-04	2/44	N/A	N/A	0/44	1.52E+00	0/44	7.62E-02	0.00087 - 0.002
VOC	Total Xylene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.82E-01	0/42	1.91E-02	0.00261 - 0.00358
VOC	*trans* -1,2-Dichloroethene	mg/kg	4.96E-04	4.96E-04	4.96E-04	1/105	N/A	N/A	0/105	5.83E-02	0/105	2.91E-03	0.00087 - 0.00504
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.36E-03	0/44	1.68E-04	0.00087 - 0.002
VOC	Trichloroethene	mg/kg	4.11E-04	8.67E+00	2.36E-01	48/107	N/A	N/A	42/107	2.02E-03	48/107	1.01E-04	0.00087 - 5
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.46E+00	0/42	7.31E-02	0.00087 - 0.00119
VOC	Vinyl chloride	mg/kg	--	--	--	0/105	N/A	N/A	0/105	1.29E-04	0/105	6.47E-06	0.00087 - 0.00504

(orange)	One or more samples exceed background value
(blue)	One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.28. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 5

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	8.24E+02	1.61E+04	6.73E+03	15/15	9/15	3.00E+03	11.3 - 129
METAL	Antimony	mg/kg	1.13E+00	1.13E+00	1.13E+00	1/15	1/15	3.52E-02	2.35 - 13.8
METAL	Arsenic	mg/kg	7.01E-01	2.32E+01	7.13E+00	15/15	15/15	1.51E-03	1.13 - 1.52
METAL	Barium	mg/kg	3.15E+00	1.26E+03	1.91E+02	15/15	7/15	1.55E+01	0.905 - 10.3
METAL	Beryllium	mg/kg	1.05E-01	3.34E+00	9.15E-01	15/15	3/15	1.95E+00	0.113 - 0.152
METAL	Boron	mg/kg	1.16E+00	7.29E+01	1.70E+01	13/15	12/15	1.28E+00	3.39 - 35.1
METAL	Cadmium	mg/kg	3.64E-02	2.56E-01	1.69E-01	4/15	3/15	6.93E-02	0.226 - 0.304
METAL	Chromium	mg/kg	2.67E+00	1.05E+02	3.43E+01	15/15	0/15	1.80E+05	0.679 - 0.912
METAL	Cobalt	mg/kg	8.68E-01	3.56E+01	8.39E+00	15/15	15/15	2.71E-02	0.226 - 0.304
METAL	Copper	mg/kg	7.13E-01	8.46E+00	2.62E+00	15/15	5/15	2.81E+00	0.452 - 0.608
METAL	Iron	mg/kg	2.76E+03	1.59E+05	3.28E+04	15/15	15/15	3.52E+01	22.6 - 1380
METAL	Lead	mg/kg	2.52E+00	1.91E+01	6.65E+00	15/15	3/15	1.35E+01	0.452 - 0.608
METAL	Manganese	mg/kg	6.39E+00	1.54E+03	2.16E+02	15/15	15/15	2.83E+00	1.13 - 15.2
METAL	Mercury	mg/kg	1.27E-02	2.73E-02	1.81E-02	3/15	0/15	2.95E-02	0.0259 - 0.0346
METAL	Molybdenum	mg/kg	1.24E-01	1.11E+00	3.44E-01	12/15	7/15	2.02E-01	0.226 - 0.304
METAL	Nickel	mg/kg	1.26E+00	3.37E+01	1.06E+01	15/15	11/15	2.56E+00	0.452 - 0.608
METAL	Selenium	mg/kg	4.75E-01	1.11E+01	2.58E+00	13/15	13/15	5.19E-02	1.13 - 1.52
METAL	Silver	mg/kg	2.70E-01	1.16E+00	7.15E-01	2/15	2/15	7.99E-02	0.587 - 6.52
METAL	Thallium	mg/kg	3.02E-01	3.02E-01	3.02E-01	1/15	1/15	1.42E-03	0.452 - 0.608
METAL	Uranium[a]	mg/kg	1.83E-01	2.93E+00	9.94E-01	15/15	15/15	1.80E-01	0.0452 - 0.0608
METAL	Vanadium	mg/kg	5.24E+00	9.94E+01	3.10E+01	15/15	12/15	8.64E+00	4.52 - 6.08
METAL	Zinc	mg/kg	6.47E+00	9.59E+01	3.38E+01	15/15	7/15	3.73E+01	4.52 - 6.08
ANION	Fluoride	mg/kg	7.62E-01	9.98E+00	4.27E+00	14/15	0/15	1.20E+01	1.2 - 1.57
PPCB	Total PCB[b]	mg/kg	2.78E-03	9.03E-03	4.90E-03	3/25	1/25	6.82E-03	0.00403 - 0.1
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/15	0/15	8.72E-04	0.405 - 0.591
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/25	0/25	4.02E-01	0.405 - 0.591
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/25	0/25	1.16E-03	0.405 - 0.591
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/25	0/25	2.26E-03	0.405 - 0.591
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/25	0/25	4.21E-02	0.405 - 0.591
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.46 - 1.18
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/25	0/25	3.21E-04	0.405 - 0.591
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/25	0/25	6.67E-05	0.405 - 0.591
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/25	0/25	3.85E-01	0.0405 - 0.5
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/25	0/25	8.91E-03	0.405 - 0.591
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/25	0/25	2.58E-04	0.405 - 0.591
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/25	0/25	1.85E-02	0.0405 - 0.5
SVOC	2-Methylphenol	mg/kg	--	--	--	0/25	0/25	7.53E-02	0.405 - 0.591
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/25	0/25	8.01E-03	0.405 - 0.591
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.405 - 0.591
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/25	0/25	8.24E-04	0.405 - 0.591
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/25	0/25	2.45E-04	0.405 - 0.591
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/25	0/25	3.42E-04	0.405 - 0.591
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/25	0/25	1.71E-01	0.405 - 0.591
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/25	0/25	1.55E-04	0.405 - 0.591
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/25	0/25	3.42E-04	0.405 - 0.591

Table 4.28. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.405 - 0.591
SVOC	Acenaphthene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOC	Acenaphthylene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOC	Acetophenone	mg/kg	--	--	--	0/15	0/15	5.84E-02	0.405 - 0.591
SVOC	Anthracene	mg/kg	--	--	--	0/25	0/25	5.81E+00	0.0405 - 0.5
SVOC	Atrazine	mg/kg	--	--	--	0/15	0/15	1.96E-04	0.405 - 0.591
SVOC	Benzaldehyde	mg/kg	--	--	--	0/15	0/15	4.15E-03	0.405 - 0.591
SVOC	Benzenemethanol	mg/kg	--	--	--	0/10	0/10	4.76E-02	0.46 - 0.5
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/25	0/25	1.32E+00	0.0405 - 0.5
SVOC	Benzoic acid	mg/kg	--	--	--	0/10	0/10	1.51E+00	0.46 - 0.5
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/25	0/25	1.35E-03	0.405 - 0.591
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/25	0/25	3.61E-06	0.405 - 0.591
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/25	0/25	1.31E-04	0.405 - 0.591
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	2.63E-02	2.63E-02	2.63E-02	1/25	0/25	1.33E+00	0.0405 - 0.5
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/25	0/25	2.36E-01	0.0405 - 0.5
SVOC	Caprolactam	mg/kg	--	--	--	0/15	0/15	2.47E-01	0.405 - 0.591
SVOC	Carbazole	mg/kg	--	--	--	0/15	0/15	3.76E-02	0.0405 - 0.0591
SVOC	Dibenzofuran	mg/kg	--	--	--	0/25	0/25	1.46E-02	0.405 - 0.591
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/25	0/25	6.08E-01	0.0405 - 0.5
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/25	0/25	6.08E-01	0.0405 - 0.5
SVOC	Di-n-butyl phthalate	mg/kg	1.60E-02	4.36E-02	2.98E-02	2/25	0/25	2.27E-01	0.0405 - 0.5
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/25	0/25	5.65E+00	0.0405 - 0.5
SVOC	Diphenylamine	mg/kg	--	--	--	0/15	0/15	2.33E-01	0.405 - 0.591
SVOC	Fluoranthene	mg/kg	--	--	--	0/25	0/25	8.91E+00	0.0405 - 0.5
SVOC	Fluorene	mg/kg	--	--	--	0/25	0/25	5.45E-01	0.0405 - 0.5
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/25	0/25	1.23E-04	0.405 - 0.591
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/25	0/25	2.67E-04	0.405 - 0.591
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/25	0/25	1.28E-04	0.405 - 0.591
SVOC	Hexachloroethane	mg/kg	--	--	--	0/25	0/25	2.00E-04	0.405 - 0.591
SVOC	Isophorone	mg/kg	--	--	--	0/25	0/25	2.58E-02	0.405 - 0.591
SVOC	m,p-Cresol	mg/kg	--	--	--	0/10	0/10	2.97E-02	0.46 - 0.5
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/15	0/15	2.97E-02	0.405 - 0.591
SVOC	Naphthalene	mg/kg	--	--	--	0/25	0/25	3.85E-04	0.0405 - 0.5
SVOC	Nitrobenzene	mg/kg	--	--	--	0/25	0/25	9.17E-05	0.405 - 0.591
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/25	0/25	8.10E-06	0.405 - 0.591
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/10	0/10	6.66E-02	0.46 - 0.5
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/25	0/25	5.71E-05	0.405 - 0.591
SVOC	Phenanthrene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOC	Phenol	mg/kg	--	--	--	0/25	0/25	3.31E-01	0.405 - 0.591
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/25	0/25	1.58E-03	0.405 - 0.591
SVOC	Pyrene	mg/kg	--	--	--	0/25	0/25	1.32E+00	0.0405 - 0.5
SVOC	Total PAH[c]	mg/kg	--	--	--	0/25	0/25	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/15	0/15	9.58E-01	0.228 - 0.852
RADS	Cesium-137	pCi/g	--	--	--	0/15	0/15	4.79E-01	0.0269 - 0.0535
RADS	Neptunium-237	pCi/g	--	--	--	0/15	0/15	5.36E-02	0.372 - 1.17

Table 4.28. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
RADS	Plutonium-238	pCi/g	--	--	--	0/15	0/15	2.19E-01	0.172 - 0.662
RADS	Plutonium-239/240	pCi/g	--	--	--	0/15	0/15	2.13E-01	0.172 - 0.564
RADS	Technetium-99	pCi/g	--	--	--	0/15	0/15	7.60E-03	3.01 - 4.85
RADS	Thorium-230	pCi/g	7.03E-01	1.71E+00	1.12E+00	9/15	0/15	1.83E+00	0.488 - 0.884
RADS	Uranium-233/234	pCi/g	4.55E-01	1.55E+00	8.32E-01	8/15	8/15	4.95E-02	0.306 - 0.591
RADS	Uranium-235/236	pCi/g	--	--	--	0/15	0/15	4.88E-02	0.129 - 0.517
RADS	Uranium-238	pCi/g	3.70E-01	1.53E+00	7.49E-01	14/15	14/15	4.03E-02	0.114 - 0.544
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/15	0/15	2.81E-01	0.00116 - 0.0019
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/15	0/15	2.96E-05	0.00116 - 0.0019
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/15	0/15	2.56E+00	0.0058 - 0.00949
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/15	0/15	1.35E-05	0.00116 - 0.0019
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/15	0/15	7.82E-04	0.00116 - 0.0019
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/39	0/39	1.02E-02	0.00116 - 0.0493
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.09E-03	0.00116 - 0.0019
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/15	0/15	1.16E-03	0.00116 - 0.0019
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/15	0/15	1.44E-07	0.00116 - 0.0019
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/15	0/15	2.10E-06	0.00116 - 0.0019
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.95E-02	0.00116 - 0.0019
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/15	0/15	4.84E-05	0.00116 - 0.0019
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/15	0/15	2.74E-04	0.00116 - 0.0019
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/15	0/15	1.90E-02	0.00116 - 0.0019
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.95E-02	0.00116 - 0.0019
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	4.62E-04	0.00116 - 0.0019
VOC	1,4-Dioxane	mg/kg	--	--	--	0/15	0/15	9.42E-05	0.058 - 0.0949
VOC	2-Butanone	mg/kg	--	--	--	0/15	0/15	1.16E-01	0.0058 - 0.00949
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/15	0/15	1.38E-06	0.0058 - 0.00949
VOC	2-Hexanone	mg/kg	--	--	--	0/15	0/15	8.75E-04	0.0058 - 0.00949
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/15	0/15	3.22E-03	0.00116 - 0.0019
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/15	0/15	2.81E-02	0.0058 - 0.00949
VOC	Acetone	mg/kg	2.91E-03	1.01E-02	5.21E-03	9/15	0/15	3.68E-01	0.0058 - 0.00949
VOC	Acrolein	mg/kg	--	--	--	0/15	0/15	8.41E-07	0.0058 - 0.00949
VOC	Acrylonitrile	mg/kg	--	--	--	0/15	0/15	1.14E-05	0.0058 - 0.00949
VOC	Benzene	mg/kg	--	--	--	0/15	0/15	2.33E-04	0.00116 - 0.0019
VOC	Bromochloromethane	mg/kg	--	--	--	0/15	0/15	2.08E-03	0.00116 - 0.0019
VOC	Bromodichloromethane	mg/kg	--	--	--	0/15	0/15	3.65E-05	0.00116 - 0.0019
VOC	Bromoform	mg/kg	--	--	--	0/15	0/15	8.73E-04	0.00116 - 0.0019
VOC	Bromomethane	mg/kg	--	--	--	0/15	0/15	1.91E-04	0.00116 - 0.0019
VOC	Carbon disulfide	mg/kg	--	--	--	0/15	0/15	2.40E-02	0.0058 - 0.00949
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/15	0/15	1.77E-04	0.00116 - 0.0019
VOC	Chlorobenzene	mg/kg	--	--	--	0/15	0/15	5.28E-03	0.00116 - 0.0019
VOC	Chloroethane	mg/kg	--	--	--	0/15	0/15	2.37E-01	0.00116 - 0.0019
VOC	Chloroform	mg/kg	--	--	--	0/15	0/15	6.12E-05	0.00116 - 0.0019
VOC	Chloromethane	mg/kg	--	--	--	0/15	0/15	5.26E-04	0.00116 - 0.0019
VOC	*cis*-1,2-Dichloroethene	mg/kg	1.42E-03	1.99E-03	1.66E-03	3/39	3/39	1.06E-03	0.00116 - 0.0493
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/15	0/15	1.68E-04	0.00116 - 0.0019

Table 4.28. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 5 (Continued)

			Detected Results			Freq. of	GW Protection Screen		
Type	Analysis	Unit	Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	DL Range
VOC	Cumene	mg/kg	--	--	--	0/15	0/15	7.38E-02	0.00116 - 0.0019
VOC	Cyclohexane	mg/kg	--	--	--	0/15	0/15	1.30E+00	0.00116 - 0.0019
VOC	Dibromochloromethane	mg/kg	--	--	--	0/15	0/15	2.32E-04	0.00116 - 0.0019
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/15	0/15	3.04E-02	0.00116 - 0.0019
VOC	Ethylbenzene	mg/kg	--	--	--	0/15	0/15	1.68E-03	0.00116 - 0.0019
VOC	m,p-Xylene	mg/kg	--	--	--	0/15	0/15	1.91E-02	0.00232 - 0.0038
VOC	Methyl acetate	mg/kg	--	--	--	0/15	0/15	4.11E-01	0.0058 - 0.00949
VOC	Methylcyclohexane	mg/kg	--	--	--	0/15	0/15	1.40E+00	0.00116 - 0.0019
VOC	Methylene chloride	mg/kg	--	--	--	0/15	0/15	2.72E-03	0.0058 - 0.00949
VOC	Styrene	mg/kg	--	--	--	0/15	0/15	1.33E-01	0.00116 - 0.0019
VOC	Tetrachloroethene	mg/kg	--	--	--	0/15	0/15	1.84E-03	0.00116 - 0.0019
VOC	Toluene	mg/kg	8.66E-04	6.19E-03	3.53E-03	2/15	0/15	7.62E-02	0.00116 - 0.0019
VOC	Total Xylene	mg/kg	--	--	--	0/15	0/15	1.91E-02	0.00348 - 0.00569
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/39	0/39	2.91E-03	0.00116 - 0.0493
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/15	0/15	1.68E-04	0.00116 - 0.0019
VOC	Trichloroethene	mg/kg	6.57E-03	1.95E-01	3.20E-02	13/40	13/40	1.01E-04	0.00116 - 0.0493
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/15	0/15	7.31E-02	0.00116 - 0.0019
VOC	Vinyl chloride	mg/kg	--	--	--	0/39	0/39	6.47E-06	0.00116 - 0.0493

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

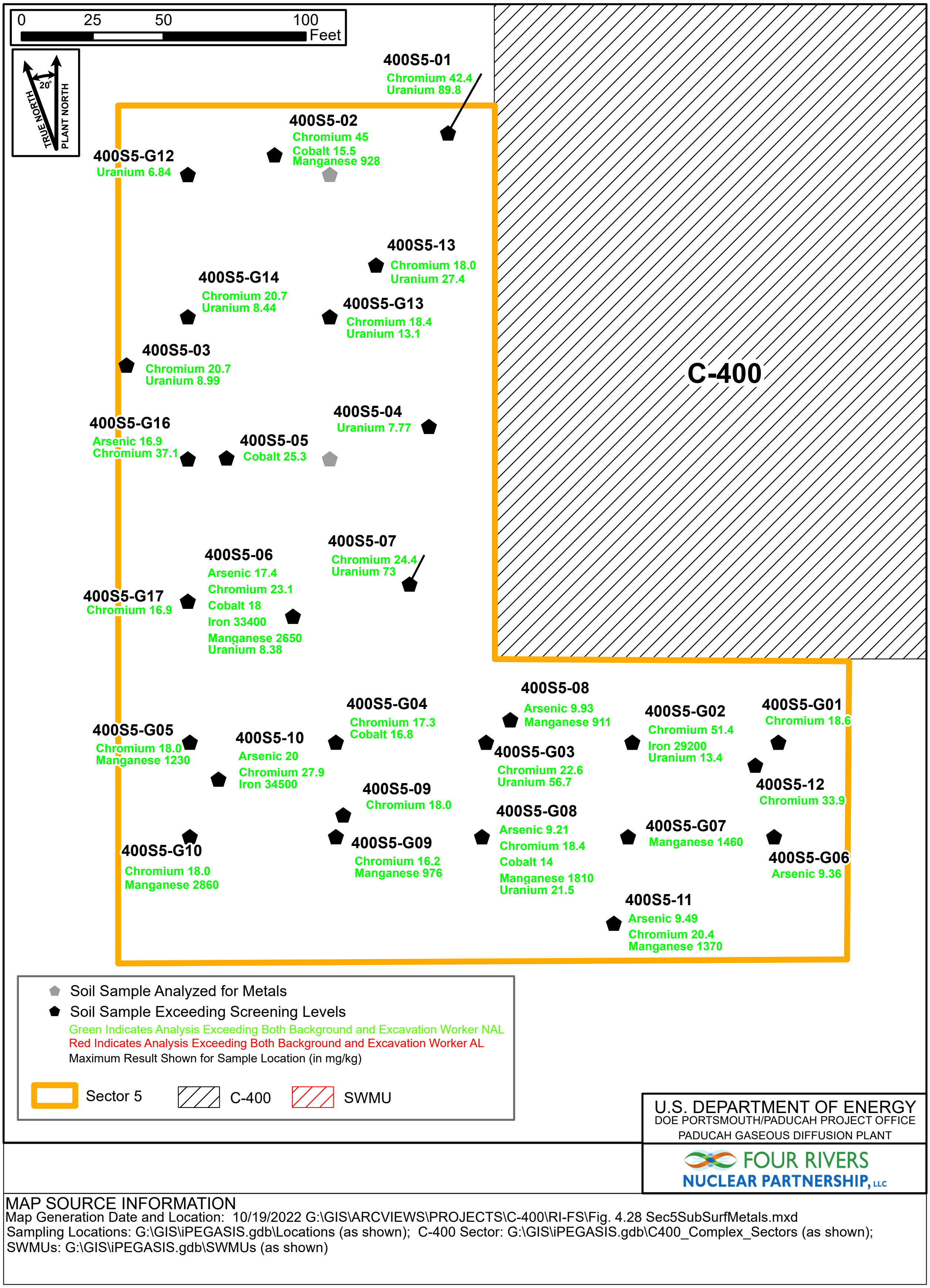


Figure 4.28. Sector 5 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals

Metals that were detected in the Sector 5 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium, cobalt*, copper, iron*, manganese*, selenium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), metals exceeding both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium, cadmium, cobalt*, iron*, manganese*, selenium*, and vanadium (metals with an asterisk also exceeded the DAF of 20 SSLs).

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater at a DAF of 1 only. Metals that exceeded these SSLs included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

PCBs

Total PCBs were detected in eight of 40 samples in Sector 5 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs, 0.0148 mg/kg, did not exceed the excavation worker NAL but Total PCBs exceeded the SSL for the protection of groundwater (for a DAF of 1 only) in 1 of the 40 samples. Total PCBs were not detected in the deep soil interval (16 ft bgs to the bottom of the RGA) in 99 samples, but were detected in 3 of 25 samples from the McNairy soil (maximum detection was 0.00903 mg/kg).

In addition to Total PCBs, total dioxin/furans exceeded the groundwater protection SSLs in 22 of 22 samples (for both the DAF of 1 and 20) in the 1–16 ft bgs interval.

SVOCs

Several SVOCs were detected in Sector 5 soil (0–16 ft bgs), mostly PAH compounds, with Total PAHs exceeding the excavation worker NAL in 1 of 72 samples (Figure 4.29). Total PAHs exceeded the SSLs for protection of groundwater in Sector 5 subsurface soil (1–16 ft bgs) in 7 out of 40 samples for a DAF of 1 and 1 out of 40 samples for a DAF of 20. A few SVOCs exceeded the SSLs for protection of groundwater at a DAF of 1, including 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, and Total PAHs. Naphthalene and Total PAHs also exceeded the DAF of 20 SSLs in the 1–16 ft bgs soil interval. In the deep soil interval (16 ft bgs to the bottom of the RGA), only di-n-butyl phthalate exceeded the DAF of 1 SSL. No SVOCs exceeded the groundwater protection SSLs in the McNairy Formation soil.

VOCs

Several VOCs were detected in Sector 5 surface and subsurface soil (0–16 ft bgs) but only TCE exceeded the excavation worker NAL (Figure 4.29). TCE, with a maximum detected concentration of 144 mg/kg, also exceeded the excavation worker AL at 1 out of 72 sample locations. VOCs in Sector 5 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs for a DAF of 1 include 1,1,2-trichloroethane*, 1,2-dichloroethane*, 2-hexanone, acrolein*, benzene, chloroform*, *cis*-1,2-dichloroethene*, ethylbenzene, methylene chloride (a potential lab contaminant), tetrachloroethene, *trans*-1,2-dichloroethene, TCE*, and vinyl chloride* (VOCs with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA) 1,1,2-trichloroethane, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), and TCE exceeded the protection of groundwater SSLs for a DAF of 1 (all of these VOCs also exceeded the DAF of 20 SSLs, with the exception of methylene chloride). For TCE, with a maximum concentration of 8.67 mg/kg in this interval, there were 42 exceedances of the DAF of 20 value out of 107 samples.

In the McNairy soils, VOCs that exceeded the protection of groundwater SSLs for a DAF of 1 included *cis*-1,2-dichloroethene and TCE. TCE was detected in 13 of 40 samples from the McNairy soils with a maximum concentration of 0.195 mg/kg.

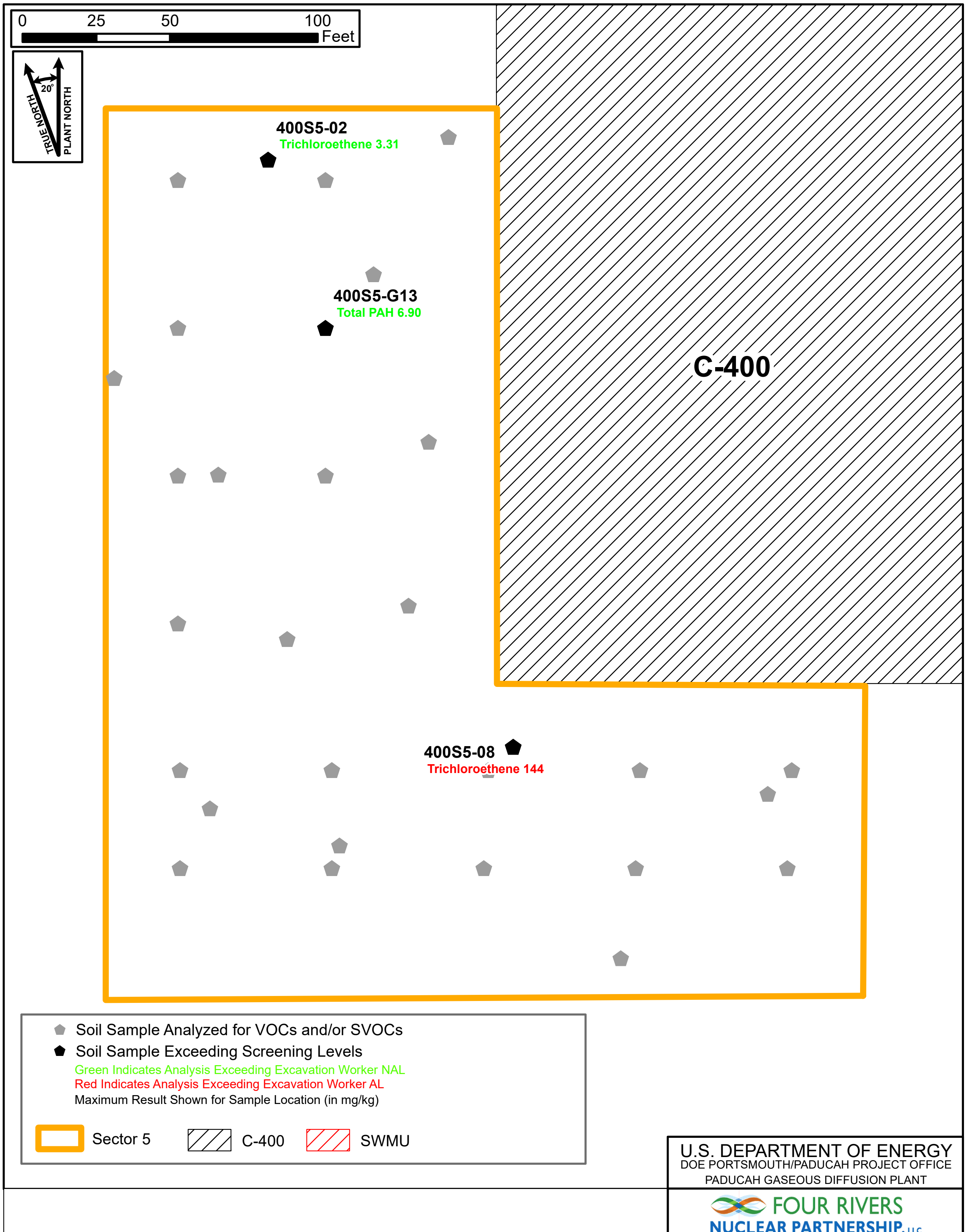


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Figure 4.29. Sector 5 Surface and Subsurface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, TCE was detected in 58 of 147 samples. The maximum result of 144 mg/kg occurred in the 5.5–6.5 ft bgs sample from boring 400S5-08 (this same boring had a TCE result in the 0–1 ft bgs sample of 23.6 mg/kg). All of the higher TCE soil concentrations for the current RI sampling effort (i.e., > 1 mg/kg) were in samples collected less than 10 ft bgs. The highest concentration of TCE in soil deeper than 10 ft bgs was 0.375 mg/kg in a sample collected at 59–60 ft bgs in boring 400S5-12.

VOCs in subsurface soils are further discussed in Sections 4.3.8 and 4.7 of this report.

Radionuclides

Radionuclides that were above both the background screening levels and the excavation worker NALs in Sector 5 surface and subsurface soil (0–16 ft bgs) include cesium-137, neptunium-237, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Figure 4.30 shows where these radionuclides were detected at activities above both background and the excavation worker NALs. Most exceedances occurred at location 400S5-GS1, a biased sample location determined from the GWS. Uranium-238, with a maximum activity of 3,000 pCi/g, exceeded the excavation worker AL at this location.

Radionuclides that were detected in the Sector 5 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Technetium-99, uranium-233/234, and uranium-238 also exceeded the DAF of 20 SSLs in this interval. In the deep soil interval (16 ft bgs to the bottom of the RGA), thorium-230, uranium-233/234, uranium-235/236, and uranium-238 exceeded both the background criteria and the SSLs for protection of groundwater at a DAF of 1, with uranium-233/234 and uranium-238 also exceeding the DAF of 20 SSLs. In the screening of the McNairy Formation soil, only uranium-233/234 and uranium-238 exceeded the groundwater protection SSLs for a DAF of 1.

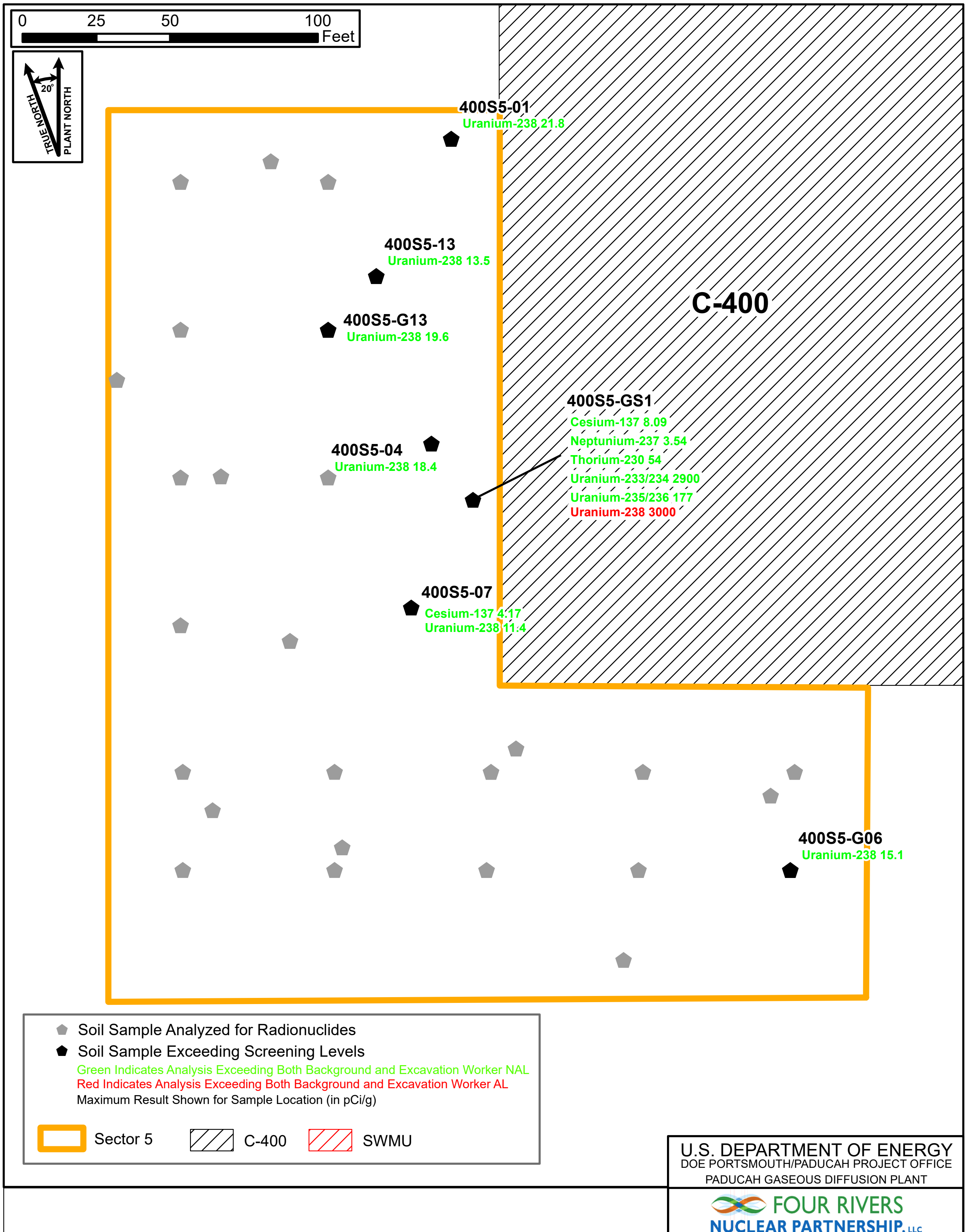
In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, technetium-99 was detected in 5 of 84 samples (all within the 1–16 ft bgs interval) with a maximum activity of 26.2 pCi/g. The maximum activity for uranium-238 in these same intervals was 18.4 pCi/g.

In addition to the area of VOC contamination near the southwestern corner of the C-400 Cleaning Building, another area of contamination was identified in the WAG 6 RI in the northeastern portion of Sector 5 (just west of the C-400 Cleaning Building). This area has been impacted by VOCs, SVOCs, metals, and radionuclides. Releases from the building perimeter drain collection line or a sewer line leading from the C-400 Cleaning Building may have resulted in this area of contamination.

4.3.6 Sector 6

4.3.6.1 Description and process history

Sector 6 encompasses an area of approximately 26,000 ft^2 on the western side of the C-400 Cleaning Building. The Sector 6 area is covered primarily in grassy soils with gravel roadways and concrete pads. SWMU 47 and the associated bermed area are included in Sector 6. From the early 1960s to 1986, the C-400 Technetium Storage Tank was used in the technetium recovery process to store a waste solution of chromium and technetium-99. The technetium recovery process consisted of dissolution of technetium-bearing material, precipitation of uranium and impurities from the solution, and the recovery of the technetium via ion exchange. The tank contained extracted liquid from process operations in the C-400 Cleaning Building. The tank was emptied of liquids (approximately 200 gal of solution) and removed in 1986, as part of RCRA permitting activities. Prior to dismantling and disposal, the 4,000 gal tank was located on a concrete pad on the west side of the C-400 Cleaning Building.



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SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.30. Sector 5 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

An electrical transformer area exists in the west central portion of the sector but the electrical transformers and feeder line do not contain PCBs.

4.3.6.2 Nature and extent of contamination—surface soils

A summary of the analytical results for Sector 6 surface soil and the screening results are provided in Table 4.29. The results of the screening for surface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface soil above both background screening levels and the industrial worker NALs were arsenic, chromium, cobalt, and uranium (Figure 4.31). Metals that were detected in the Sector 6 surface soil above both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 include aluminum, antimony*, arsenic*, barium*, cadmium*, cobalt*, copper*, iron*, lead, manganese*, nickel*, selenium*, silver*, thallium*, uranium*, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs).

The metals most frequently detected above their respective background values in Sector 6 surface soil are cadmium, selenium, and uranium.

PCBs

Total PCBs were detected in 9 of 19 samples in Sector 6 surface soil. Two detections of Total PCBs out of 19 samples, with a maximum result of 0.733 mg/kg, exceeded the industrial worker NAL. Total PCBs also exceeded the SSL for the protection of groundwater for both a DAF of 1 in 7 of 19 samples and a DAF of 20 in 2 of 19 samples. The locations where Total PCBs exceeded the industrial worker NAL are shown in Figure 4.32.

SVOCs

Several SVOCs were detected in surface soil, mostly PAH compounds, and Total PAHs exceeded the industrial worker NAL in 4 out of 18 samples (Figure 4.33). SVOCs that exceeded the SSLs for protection of groundwater at a DAF of 1 included benzo(ghi)perylene, bis(2-ethylhexyl)phthalate (a potential lab contaminant), carbazole, fluoranthene, phenanthrene, pyrene, and Total PAHs. Both carbazole and Total PAHs exceeded the DAF of 20 SSLs.

VOCs

Several VOCs were detected in Sector 6 surface soil but none of the results exceeded the industrial worker NAL. In samples from Sector 6, 2-butanone, benzene, chloroform, methylene chloride (a potential lab contaminant), and TCE were detected in the surface soil above the SSLs for the protection of groundwater at a DAF of 1. TCE and methylene chloride exceeded the SSLs for both the DAF of 1 and the DAF of 20.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 6 surface soil include cesium-137, neptunium-237, plutonium-239/240, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Americium-241, which does not have a site-specific background, also exceeded the industrial worker NAL. In addition, thorium-230 with a maximum activity of 10,600 pCi/g and uranium-238 with a maximum activity of 440 pCi/g also exceeded industrial worker ALs. Figure 4.34 shows the locations where radionuclides exceeded both background and industrial worker NALs/ALs in Sector 6 surface soil. Technetium-99 exceeded background in 15 of 19 samples with a maximum detection of 1,610 pCi/g.

Table 4.29. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 6

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	4.67E+03	1.48E+04	8.84E+03	18/18	3/18	1.30E+04	0/18	1.00E+05	0/18	1.00E+05	0/18	5.99E+04	18/18	3.00E+03	5 - 114
METAL	Antimony	mg/kg	6.30E-01	6.98E+01	7.98E+00	11/19	11/19	2.10E-01	0/19	9.34E+01	0/19	2.80E+03	10/19	7.04E-01	11/19	3.52E-02	2.01 - 30
METAL	Arsenic	mg/kg	2.65E+00	2.24E+01	7.05E+00	19/19	2/19	1.20E+01	19/19	1.60E+00	0/19	1.60E+02	19/19	3.02E-02	19/19	1.51E-03	0.971 - 11
METAL	Barium	mg/kg	1.38E+01	3.25E+02	1.03E+02	18/19	2/19	2.00E+02	0/19	4.04E+04	0/19	1.00E+05	2/19	3.11E+02	17/19	1.55E+01	0.777 - 100
METAL	Beryllium	mg/kg	1.32E-01	7.00E-01	4.46E-01	18/18	1/18	6.70E-01	0/18	4.50E+02	0/18	1.35E+04	0/18	3.89E+01	0/18	1.95E+00	0.0971 - 0.114
METAL	Boron	mg/kg	1.16E+00	4.05E+00	2.43E+00	17/17	N/A	N/A	0/17	4.65E+04	0/17	1.00E+05	0/17	2.56E+01	16/17	1.28E+00	2.91 - 3.42
METAL	Cadmium	mg/kg	4.12E-02	1.60E+01	1.40E+00	18/19	13/19	2.10E-01	0/19	6.05E+01	0/19	1.82E+03	3/19	1.39E+00	16/19	6.93E-02	0.05 - 12
METAL	Calcium	mg/kg	8.20E+04	8.20E+04	8.20E+04	1/1	0/1	2.00E+05	0/1	N/A	0/1	N/A	N/A	N/A	N/A	N/A	250 - 250
METAL	Chromium	mg/kg	1.05E+01	7.61E+01	2.22E+01	18/19	10/19	1.60E+01	17/19	1.23E+01	0/19	1.23E+03	0/19	3.60E+06	0/19	1.80E+05	0.583 - 85
METAL	Cobalt	mg/kg	1.57E+00	1.04E+02	1.16E+01	18/18	1/18	1.40E+01	1/18	6.87E+01	0/18	2.06E+03	18/18	5.43E-01	18/18	2.71E-02	0.194 - 0.228
METAL	Copper	mg/kg	5.32E+00	3.05E+02	3.57E+01	18/19	6/19	1.90E+01	0/19	9.34E+03	0/19	1.00E+05	2/19	5.62E+01	18/19	2.81E+00	0.389 - 35
METAL	Iron	mg/kg	4.66E+03	2.95E+04	1.66E+04	19/19	1/19	2.80E+04	0/19	1.00E+05	0/19	1.00E+05	19/19	7.04E+02	19/19	3.52E+01	5 - 228
METAL	Lead	mg/kg	4.83E+00	5.99E+01	2.03E+01	19/19	2/19	3.60E+01	0/19	8.00E+02	0/19	8.00E+02	0/19	2.70E+02	10/19	1.35E+01	0.389 - 13
METAL	Magnesium	mg/kg	3.58E+03	3.58E+03	3.58E+03	1/1	0/1	7.70E+03	0/1	N/A	0/1	N/A	N/A	N/A	N/A	N/A	50 - 50
METAL	Manganese	mg/kg	1.37E+02	3.84E+03	5.09E+02	19/19	1/19	1.50E+03	0/19	4.72E+03	0/19	1.00E+05	19/19	5.65E+01	19/19	2.83E+00	1.05 - 105
METAL	Mercury	mg/kg	1.12E-02	1.57E-01	3.28E-02	16/19	0/19	2.00E-01	0/19	7.01E+01	0/19	2.10E+03	0/19	5.91E-01	5/19	2.95E-02	0.0225 - 10
METAL	Molybdenum	mg/kg	3.41E-01	1.88E+00	7.48E-01	18/19	N/A	N/A	0/19	1.16E+03	0/19	3.48E+04	0/19	4.03E+00	18/19	2.02E-01	0.194 - 15
METAL	Nickel	mg/kg	7.33E+00	1.35E+02	3.31E+01	18/19	6/19	2.10E+01	0/19	4.30E+03	0/19	1.00E+05	4/19	5.12E+01	18/19	2.56E+00	0.389 - 65
METAL	Selenium	mg/kg	5.33E-01	1.57E+00	1.09E+00	15/19	13/19	8.00E-01	0/19	1.17E+03	0/19	3.51E+04	8/19	1.04E+00	15/19	5.19E-02	0.5 - 20
METAL	Silver	mg/kg	1.39E-01	6.91E+00	2.24E+00	8/19	2/19	2.30E+00	0/19	1.17E+03	0/19	3.51E+04	2/19	1.60E+00	8/19	7.99E-02	0.2 - 10
METAL	Sodium	mg/kg	7.00E+01	7.00E+01	7.00E+01	1/1	0/1	3.20E+02	0/1	N/A	0/1	N/A	N/A	N/A	N/A	N/A	20 - 20
METAL	Thallium	mg/kg	1.40E-01	1.01E+00	2.88E-01	8/18	3/18	2.10E-01	0/18	2.34E+00	0/18	7.02E+01	8/18	2.84E-02	8/18	1.42E-03	0.2 - 0.456
METAL	Uranium[a]	mg/kg	1.59E+00	3.00E+02	5.09E+01	19/19	15/19	4.90E+00	4/19	4.66E+01	0/19	1.40E+03	17/19	3.60E+00	19/19	1.80E-01	0.0401 - 20
METAL	Vanadium	mg/kg	5.65E+00	3.28E+01	2.28E+01	18/19	0/19	3.80E+01	0/19	1.15E+03	0/19	3.45E+04	0/19	1.73E+02	17/19	8.64E+00	1 - 70
METAL	Zinc	mg/kg	1.51E+01	6.96E+02	1.21E+02	19/19	10/19	6.50E+01	0/19	7.01E+04	0/19	1.00E+05	0/19	7.46E+02	17/19	3.73E+01	2 - 44.4
ANION	Fluoride	mg/kg	2.27E+00	3.12E+01	1.49E+01	17/17	N/A	N/A	0/17	9.33E+03	0/17	1.00E+05	0/17	2.40E+02	10/17	1.20E+01	1.06 - 1.21
PPCB	Total PCB[b]	mg/kg	1.66E-03	7.33E-01	1.53E-01	9/19	N/A	N/A	2/19	2.93E-01	0/19	2.93E+01	2/19	1.36E-01	7/19	6.82E-03	0.00367 - 5
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.00E+01	0/17	6.00E+02	0/17	1.74E-02	0/17	8.72E-04	0.361 - 14.5
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.90E+03	0/18	8.70E+04	0/18	8.04E+00	0/18	4.02E-01	0.35 - 14.5
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.90E+01	0/18	8.70E+02	0/18	2.32E-02	0/18	1.16E-03	0.35 - 14.5
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.70E+01	0/18	2.61E+03	0/18	4.52E-02	0/18	2.26E-03	0.35 - 14.5
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.80E+02	0/18	1.74E+04	0/18	8.42E-01	0/18	4.21E-02	0.35 - 14.5
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.80E+01	0/18	1.74E+03	0/18	8.72E-02	0/18	4.36E-03	0.722 - 29
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.57E+00	0/18	2.57E+02	0/18	6.42E-03	0/18	3.21E-04	0.35 - 14.5
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.46E-01	0/18	5.46E+01	0/18	1.33E-03	0/18	6.67E-05	0.35 - 14.5
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.84E+03	0/18	5.52E+04	0/18	7.70E+00	0/18	3.85E-01	0.0361 - 1.45
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.17E+03	0/18	3.51E+04	0/18	1.78E-01	0/18	8.91E-03	0.35 - 14.5
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.32E+00	0/18	6.96E+01	0/18	5.16E-03	0/18	2.58E-04	0.361 - 14.5
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.19E+01	0/18	2.76E+03	0/18	3.70E-01	0/18	1.85E-02	0.0361 - 1.45
SVOC	2-Methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.45E+03	0/18	4.35E+04	0/18	1.51E+00	0/18	7.53E-02	0.35 - 14.5
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.87E+02	0/18	8.61E+03	0/18	1.60E-01	0/18	8.01E-03	0.361 - 14.5
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.80E+01	0/18	1.74E+03	0/18	8.72E-02	0/18	4.36E-03	0.35 - 14.5
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.80E+00	0/18	1.80E+02	0/18	1.65E-02	0/18	8.24E-04	0.361 - 14.5
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.70E+00	0/18	2.61E+02	0/18	4.90E-03	0/18	2.45E-04	0.361 - 14.5
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.41E+01	0/18	4.23E+02	0/18	6.84E-03	0/18	3.42E-04	0.35 - 14.5
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.90E+03	0/18	8.70E+04	0/18	3.42E+00	0/18	1.71E-01	0.35 - 14.5
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.06E+00	0/18	4.06E+02	0/18	3.10E-03	0/18	1.55E-04	0.35 - 14.5
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.41E+01	0/18	4.23E+02	0/18	6.84E-03	0/18	3.42E-04	0.35 - 14.5

Table 4.29. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	Provisional Background FOE	Provisional Background Bkgd	Industrial Worker FOE	Industrial Worker NAL	Industrial Worker FOE	Industrial Worker AL	GW Protection Screen DAF 20	GW Protection Screen DAF 20 SSL	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.80E+01	0/18	1.74E+03	0/18	8.72E-02	0/18	4.36E-03	0.361 - 14.5
SVOC	Acenaphthene	mg/kg	1.58E-02	3.81E-01	1.45E-01	6/18	N/A	N/A	0/18	1.38E+03	0/18	4.14E+04	0/18	1.10E+01	0/18	5.49E-01	0.0361 - 1.45
SVOC	Acenaphthylene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.38E+03	0/18	4.14E+04	0/18	1.10E+01	0/18	5.49E-01	0.0361 - 1.45
SVOC	Acetophenone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.34E+04	0/17	7.02E+05	0/17	1.17E+00	0/17	5.84E-02	0.361 - 14.5
SVOC	Anthracene	mg/kg	2.08E-02	1.06E+00	3.77E-01	6/18	N/A	N/A	0/18	6.89E+03	0/18	1.00E+05	0/18	1.16E+02	0/18	5.81E+00	0.0361 - 1.45
SVOC	Atrazine	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.53E+00	0/17	3.53E+02	0/17	3.92E-03	0/17	1.96E-04	0.361 - 14.5
SVOC	Benzaldehyde	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.64E+03	0/17	1.64E+05	0/17	8.30E-02	0/17	4.15E-03	0.361 - 14.5
SVOC	Benzenemethanol	mg/kg	--	--	--	0/1	N/A	N/A	0/1	2.90E+03	0/1	8.70E+04	0/1	9.52E-01	0/1	4.76E-02	0.35 - 0.35
SVOC	Benzo(ghi)perylene	mg/kg	2.22E-02	1.81E+00	4.64E-01	10/18	N/A	N/A	0/18	6.89E+02	0/18	2.07E+04	0/18	2.63E+01	2/18	1.32E+00	0.0361 - 1.45
SVOC	Benzoic acid	mg/kg	--	--	--	0/1	N/A	N/A	0/1	1.16E+05	0/1	3.48E+06	0/1	3.02E+01	0/1	1.51E+00	1.7 - 1.7
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.70E+01	0/18	2.61E+03	0/18	2.70E-02	0/18	1.35E-03	0.35 - 14.5
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.25E+00	0/18	1.25E+02	0/18	7.22E-05	0/18	3.61E-06	0.0069 - 14.5
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.32E+01	0/18	9.32E+03	0/18	2.62E-03	0/18	1.31E-04	0.35 - 14.5
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	2.11E-02	7.00E+00	1.77E+00	4/18	N/A	N/A	0/18	5.80E+01	0/18	5.80E+03	0/18	2.66E+01	1/18	1.33E+00	0.0361 - 1.45
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.27E+02	0/18	4.27E+04	0/18	4.72E+00	0/18	2.36E-01	0.0361 - 1.45
SVOC	Caprolactam	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.43E+04	0/17	4.29E+05	0/17	4.94E+00	0/17	2.47E-01	0.361 - 14.5
SVOC	Carbazole	mg/kg	1.58E-02	7.73E-01	2.12E-01	6/17	N/A	N/A	0/17	4.06E+01	0/17	4.06E+03	1/17	7.51E-01	3/17	3.76E-02	0.0361 - 1.45
SVOC	Dibenzofuran	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.34E+02	0/18	7.02E+03	0/18	2.92E-01	0/18	1.46E-02	0.35 - 14.5
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.32E+04	0/18	6.96E+05	0/18	1.22E+01	0/18	6.08E-01	0.0361 - 1.45
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.32E+04	0/18	6.96E+05	0/18	1.22E+01	0/18	6.08E-01	0.0361 - 1.45
SVOC	Di-n-butyl phthalate	mg/kg	1.15E-02	4.21E-02	2.15E-02	4/18	N/A	N/A	0/18	2.90E+03	0/18	8.70E+04	0/18	4.54E+00	0/18	2.27E-01	0.0361 - 1.45
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.90E+02	0/18	8.70E+03	0/18	1.13E+02	0/18	5.65E+00	0.0361 - 1.45
SVOC	Diphenylamine	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.90E+03	0/17	8.70E+04	0/17	4.66E+00	0/17	2.33E-01	0.361 - 14.5
SVOC	Fluoranthene	mg/kg	4.62E-02	9.06E+00	1.39E+00	17/18	N/A	N/A	0/18	9.19E+02	0/18	2.76E+04	0/18	1.78E+02	1/18	8.91E+00	0.0361 - 1.45
SVOC	Fluorene	mg/kg	1.44E-02	4.64E-01	1.86E-01	5/18	N/A	N/A	0/18	9.19E+02	0/18	2.76E+04	0/18	1.09E+01	0/18	5.45E-01	0.0361 - 1.45
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.26E+00	0/18	1.26E+02	0/18	2.46E-03	0/18	1.23E-04	0.35 - 14.5
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.61E+00	0/18	5.61E+02	0/18	5.34E-03	0/18	2.67E-04	0.35 - 14.5
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.45E-01	0/18	2.24E+01	0/18	2.56E-03	0/18	1.28E-04	0.361 - 14.5
SVOC	Hexachloroethane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.46E+00	0/18	8.46E+02	0/18	4.00E-03	0/18	2.00E-04	0.35 - 14.5
SVOC	Isophorone	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.55E+02	0/18	8.55E+04	0/18	5.16E-01	0/18	2.58E-02	0.35 - 14.5
SVOC	m,p-Cresol	mg/kg	--	--	--	0/1	N/A	N/A	0/1	2.90E+03	0/1	8.70E+04	0/1	5.94E-01	0/1	2.97E-02	0.69 - 0.69
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.80E+02	0/17	1.74E+04	0/17	5.94E-01	0/17	2.97E-02	0.361 - 14.5
SVOC	Naphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.06E+00	0/18	4.06E+02	0/18	7.70E-03	0/18	3.85E-04	0.0361 - 1.45
SVOC	Nitrobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.24E+01	0/18	2.24E+03	0/18	1.83E-03	0/18	9.17E-05	0.361 - 14.5
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.16E-01	0/18	1.16E+01	0/18	1.62E-04	0/18	8.10E-06	0.0069 - 14.5
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/1	N/A	N/A	0/1	1.66E+02	0/1	1.66E+04	0/1	1.33E+00	0/1	6.66E-02	0.35 - 0.35
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.77E-01	0/18	8.77E+01	0/18	1.14E-03	0/18	5.71E-05	0.361 - 14.5
SVOC	Phenanthrene	mg/kg	1.39E-02	5.27E+00	8.35E-01	15/18	N/A	N/A	0/18	1.38E+03	0/18	4.14E+04	0/18	1.10E+01	3/18	5.49E-01	0.0361 - 1.45
SVOC	Phenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.70E+03	0/18	2.61E+05	0/18	6.62E+00	0/18	3.31E-01	0.35 - 14.5
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.06E+01	0/18	3.48E+03	0/18	3.16E-02	0/18	1.58E-03	0.361 - 14.5
SVOC	Pyrene	mg/kg	3.35E-02	5.85E+00	1.04E+00	17/18	N/A	N/A	0/18	6.89E+02	0/18	2.07E+04	0/18	2.63E+01	3/18	1.32E+00	0.0361 - 1.45
SVOC	Pyridine	mg/kg	--	--	--	0/1	N/A	N/A	0/1	2.34E+02	0/1	7.02E+03	0/1	1.36E-02	0/1	6.80E-04	0.69 - 0.69
SVOC	Total PAH[c]	mg/kg	2.91E-02	4.92E+00	8.43E-01	17/18	N/A	N/A	4/18	6.43E-01	0/18	6.43E+01	4/18	5.89E-01	15/18	2.94E-02	-
RADS	Americium-241	pCi/g	6.75E-01	3.93E+01	1.65E+01	5/19	N/A	N/A	2/19	6.01E+00	0/19	6.01E+02	2/19	1.92E+01	4/19	9.58E-01	0.016 - 0.797
RADS	Cesium-137	pCi/g	5.08E-02	3.42E+00	7.66E-01	15/19	5/19	4.90E-01	14/19	1.08E-01	0/19	1.08E+01	0/19	9.58E+00	5/19	4.79E-01	0.0295 - 0.287
RADS	Neptunium-237	pCi/g	1.15E-01	1.86E+01	4.47E+00	5/19	5/19	1.00E-01	4/19	2.49E-01	0/19	2.49E+01	3/19	1.07E+00	5/19	5.36E-02	0.011 - 1
RADS	Plutonium-238	pCi/g	7.30E-02	3.51E+00	1.94E+00	3/19	2/19	7.30E-02	0/19	2.65E+01	0/19	2.65E+03	0/19	4.38E+00	2/19	2.19E-01	0.015 - 1.37
RADS	Plutonium-239/240	pCi/g	1.23E+00	2.39E+02	5.56E+01	7/19	7/19	2.50E-02	2/19	2.27E+01	0/19	2.27E+03	4/19	4.26E+00	7/19	2.13E-01	0.01 - 1.33

Table 4.29. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 6 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Technetium-99	pCi/g	4.68E+00	1.61E+03	1.75E+02	15/19	15/19	2.50E+00	1/19	1.27E+03	0/19	1.00E+05	15/19	1.52E-01	15/19	7.60E-03	0.5 - 4.05
RADS	Thorium-228	pCi/g	7.70E-01	7.70E-01	7.70E-01	1/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	1/1	1.96E-04	1/1	9.80E-06	0.04 - 0.04
RADS	Thorium-230	pCi/g	6.85E-01	1.06E+04	7.50E+02	17/19	14/19	1.50E+00	5/19	3.13E+01	1/19	3.13E+03	5/19	3.66E+01	14/19	1.83E+00	0.02 - 3.9
RADS	Thorium-232	pCi/g	8.60E-01	8.60E-01	8.60E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	1/1	1.96E-01	1/1	9.80E-03	0.02 - 0.02
RADS	Uranium-233/234	pCi/g	1.36E+00	4.13E+02	4.72E+01	18/18	18/18	1.20E+00	4/18	5.01E+01	0/18	5.01E+03	18/18	9.90E-01	18/18	4.95E-02	0.45 - 1.8
RADS	Uranium-234	pCi/g	6.85E+00	6.85E+00	6.85E+00	1/1	1/1	1.20E+00	0/1	5.01E+01	0/1	5.01E+03	1/1	9.90E-01	1/1	4.95E-02	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	5.00E-01	2.80E+01	7.08E+00	8/19	8/19	6.00E-02	8/19	4.08E-01	0/19	4.08E+01	5/19	9.76E-01	8/19	4.88E-02	0.01 - 1.49
RADS	Uranium-238	pCi/g	1.33E+00	4.40E+02	4.93E+01	19/19	19/19	1.20E+00	17/19	1.66E+00	2/19	1.66E+02	19/19	8.05E-01	19/19	4.03E-02	0.02 - 1.46
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.58E+03	0/17	1.00E+05	0/17	5.62E+00	0/17	2.81E-01	0.000929 - 0.113
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.91E+00	0/17	2.91E+02	0/17	5.92E-04	0/17	2.96E-05	0.000929 - 0.113
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.81E+03	0/17	8.43E+04	0/17	5.13E+01	0/17	2.56E+00	0.00465 - 0.564
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.32E-01	0/17	1.90E+01	0/17	2.69E-04	0/17	1.35E-05	0.000929 - 0.113
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.58E+01	0/17	1.58E+03	0/17	1.56E-02	0/17	7.82E-04	0.000929 - 0.113
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.00E+02	0/17	3.00E+03	0/17	2.04E-01	0/17	1.02E-02	0.000929 - 0.113
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.87E+02	0/17	5.61E+03	0/17	4.18E-02	0/17	2.09E-03	0.000929 - 0.113
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.59E+01	0/17	7.77E+02	0/17	2.32E-02	0/17	1.16E-03	0.000929 - 0.113
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.49E-02	0/17	6.49E+00	0/17	2.88E-06	0/17	1.44E-07	0.000929 - 0.113
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.68E-01	0/17	1.68E+01	0/17	4.20E-05	0/17	2.10E-06	0.000929 - 0.113
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.76E+02	0/17	2.93E+04	0/17	5.90E-01	0/17	2.95E-02	0.000929 - 0.113
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.09E+00	0/17	2.09E+02	0/17	9.69E-04	0/17	4.84E-05	0.000929 - 0.113
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.63E+00	0/17	1.99E+02	0/17	5.48E-03	0/17	2.74E-04	0.000929 - 0.113
VOC	1,2-Dimethylbenzene	mg/kg	3.74E-04	3.74E-04	3.74E-04	1/17	N/A	N/A	0/17	2.81E+02	0/17	8.43E+03	0/17	3.81E-01	0/17	1.90E-02	0.000929 - 0.113
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.76E+02	0/17	2.93E+04	0/17	5.90E-01	0/17	2.95E-02	0.000929 - 0.113
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.15E+01	0/17	1.15E+03	0/17	9.24E-03	0/17	4.62E-04	0.000929 - 0.113
VOC	1,4-Dioxane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.91E+01	0/17	3.91E+03	0/17	1.88E-03	0/17	9.42E-05	0.0465 - 5.64
VOC	2-Butanone	mg/kg	2.65E-03	2.56E-01	8.79E-02	3/17	N/A	N/A	0/17	2.24E+04	0/17	6.72E+05	0/17	2.32E+00	1/17	1.16E-01	0.00465 - 0.564
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.15E-02	0/17	9.15E+00	0/17	2.76E-05	0/17	1.38E-06	0.00465 - 0.564
VOC	2-Hexanone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.52E+02	0/17	4.56E+03	0/17	1.75E-02	0/17	8.75E-04	0.00465 - 0.564
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.17E+02	0/17	2.17E+04	0/17	6.44E-02	0/17	3.22E-03	0.000929 - 0.113
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	7.97E+03	0/17	2.39E+05	0/17	5.62E-01	0/17	2.81E-02	0.00465 - 0.564
VOC	Acetone	mg/kg	3.50E-03	3.20E-02	1.13E-02	5/17	N/A	N/A	0/17	2.10E+05	0/17	6.30E+06	0/17	7.36E+00	0/17	3.68E-01	0.00465 - 0.564
VOC	Acrolein	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.05E-02	0/17	1.82E+00	0/17	1.68E-05	0/17	8.41E-07	0.00465 - 0.564
VOC	Acrylonitrile	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.24E+00	0/17	1.24E+02	0/17	2.28E-04	0/17	1.14E-05	0.00465 - 0.564
VOC	Benzene	mg/kg	5.30E-04	6.55E-04	5.93E-04	2/17	N/A	N/A	0/17	5.31E+00	0/17	5.31E+02	0/17	4.66E-03	2/17	2.33E-04	0.000929 - 0.113
VOC	Bromochloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.28E+01	0/17	1.88E+03	0/17	4.16E-02	0/17	2.08E-03	0.000929 - 0.113
VOC	Bromodichloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.30E+00	0/17	1.30E+02	0/17	7.30E-04	0/17	3.65E-05	0.000929 - 0.113
VOC	Bromoform	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.56E+01	0/17	9.56E+03	0/17	1.75E-02	0/17	8.73E-04	0.000929 - 0.113
VOC	Bromomethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.03E+00	0/17	9.09E+01	0/17	3.82E-03	0/17	1.91E-04	0.000929 - 0.113
VOC	Carbon disulfide	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.52E+02	0/17	1.06E+04	0/17	4.80E-01	0/17	2.40E-02	0.00465 - 0.564
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.96E+00	0/17	2.96E+02	0/17	3.54E-03	0/17	1.77E-04	0.000929 - 0.113
VOC	Chlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.37E+02	0/17	4.11E+03	0/17	1.06E-01	0/17	5.28E-03	0.000929 - 0.113
VOC	Chloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.27E+03	0/17	6.81E+04	0/17	4.74E+00	0/17	2.37E-01	0.000929 - 0.113
VOC	Chloroform	mg/kg	8.88E-04	8.88E-04	8.88E-04	1/17	N/A	N/A	0/17	1.39E+00	0/17	1.39E+02	0/17	1.22E-03	1/17	6.12E-05	0.000929 - 0.113
VOC	Chloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.63E+01	0/17	1.39E+03	0/17	1.05E-02	0/17	5.26E-04	0.000929 - 0.113
VOC	*cis* -1,2-Dichloroethene	mg/kg	9.29E-04	9.29E-04	9.29E-04	1/17	N/A	N/A	0/17	4.67E+02	0/17	1.40E+04	0/17	2.12E-02	0/17	1.06E-03	0.000929 - 0.113
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.34E+00	0/17	9.30E+02	0/17	3.36E-03	0/17	1.68E-04	0.000929 - 0.113
VOC	Cumene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.04E+03	0/17	3.12E+04	0/17	1.48E+00	0/17	7.38E-02	0.000929 - 0.113
VOC	Cyclohexane	mg/kg	5.67E-04	1.65E-03	1.11E-03	2/17	N/A	N/A	0/17	2.74E+03	0/17	8.22E+04	0/17	2.60E+01	0/17	1.30E+00	0.000929 - 0.113

Table 4.29. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 6 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	Dibromochloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	7.79E+01	0/17	7.79E+03	0/17	4.64E-03	0/17	2.32E-04	0.000929 - 0.113
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.68E+01	0/17	1.10E+03	0/17	6.08E-01	0/17	3.04E-02	0.000929 - 0.113
VOC	Ethylbenzene	mg/kg	3.83E-04	3.83E-04	3.83E-04	1/17	N/A	N/A	0/17	2.66E+01	0/17	2.66E+03	0/17	3.36E-02	0/17	1.68E-03	0.000929 - 0.113
VOC	m,p-Xylene	mg/kg	6.41E-04	9.17E-04	7.79E-04	2/17	N/A	N/A	0/17	2.50E+02	0/17	7.50E+03	0/17	3.82E-01	0/17	1.91E-02	0.00186 - 0.226
VOC	Methyl acetate	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.34E+05	0/17	7.02E+06	0/17	8.22E+00	0/17	4.11E-01	0.00465 - 0.564
VOC	Methylcyclohexane	mg/kg	4.12E-04	2.40E-03	1.06E-03	4/17	N/A	N/A	0/17	1.30E+03	0/17	3.90E+04	0/17	2.80E+01	0/17	1.40E+00	0.000929 - 0.113
VOC	Methylene chloride	mg/kg	2.41E-03	2.30E-01	4.82E-02	5/17	N/A	N/A	0/17	4.08E+02	0/17	1.22E+04	1/17	5.44E-02	2/17	2.72E-03	0.00465 - 0.564
VOC	Styrene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.76E+03	0/17	1.13E+05	0/17	2.66E+00	0/17	1.33E-01	0.000929 - 0.113
VOC	Tetrachloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.00E+01	0/17	1.20E+03	0/17	3.69E-02	0/17	1.84E-03	0.000929 - 0.113
VOC	Toluene	mg/kg	3.41E-04	1.55E-03	8.27E-04	7/17	N/A	N/A	0/17	6.25E+03	0/17	1.00E+05	0/17	1.52E+00	0/17	7.62E-02	0.000929 - 0.113
VOC	Total Xylene	mg/kg	1.29E-03	1.29E-03	1.29E-03	1/17	N/A	N/A	0/17	2.50E+02	0/17	7.50E+03	0/17	3.82E-01	0/17	1.91E-02	0.00279 - 0.338
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.54E+01	0/17	1.36E+03	0/17	5.83E-02	0/17	2.91E-03	0.000929 - 0.113
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.34E+00	0/17	9.30E+02	0/17	3.36E-03	0/17	1.68E-04	0.000929 - 0.113
VOC	Trichloroethene	mg/kg	3.67E-04	1.02E-02	3.07E-03	4/17	N/A	N/A	0/17	1.90E+00	0/17	5.70E+01	1/17	2.02E-03	4/17	1.01E-04	0.000929 - 0.121
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.16E+02	0/17	9.48E+03	0/17	1.46E+00	0/17	7.31E-02	0.000929 - 0.113
VOC	Vinyl chloride	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.06E+00	0/17	2.06E+02	0/17	1.29E-04	0/17	6.47E-06	0.000929 - 0.113

- One or more samples exceed AL value
- One or more samples exceed NAL value
- One or more samples exceed background value
- One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salt).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

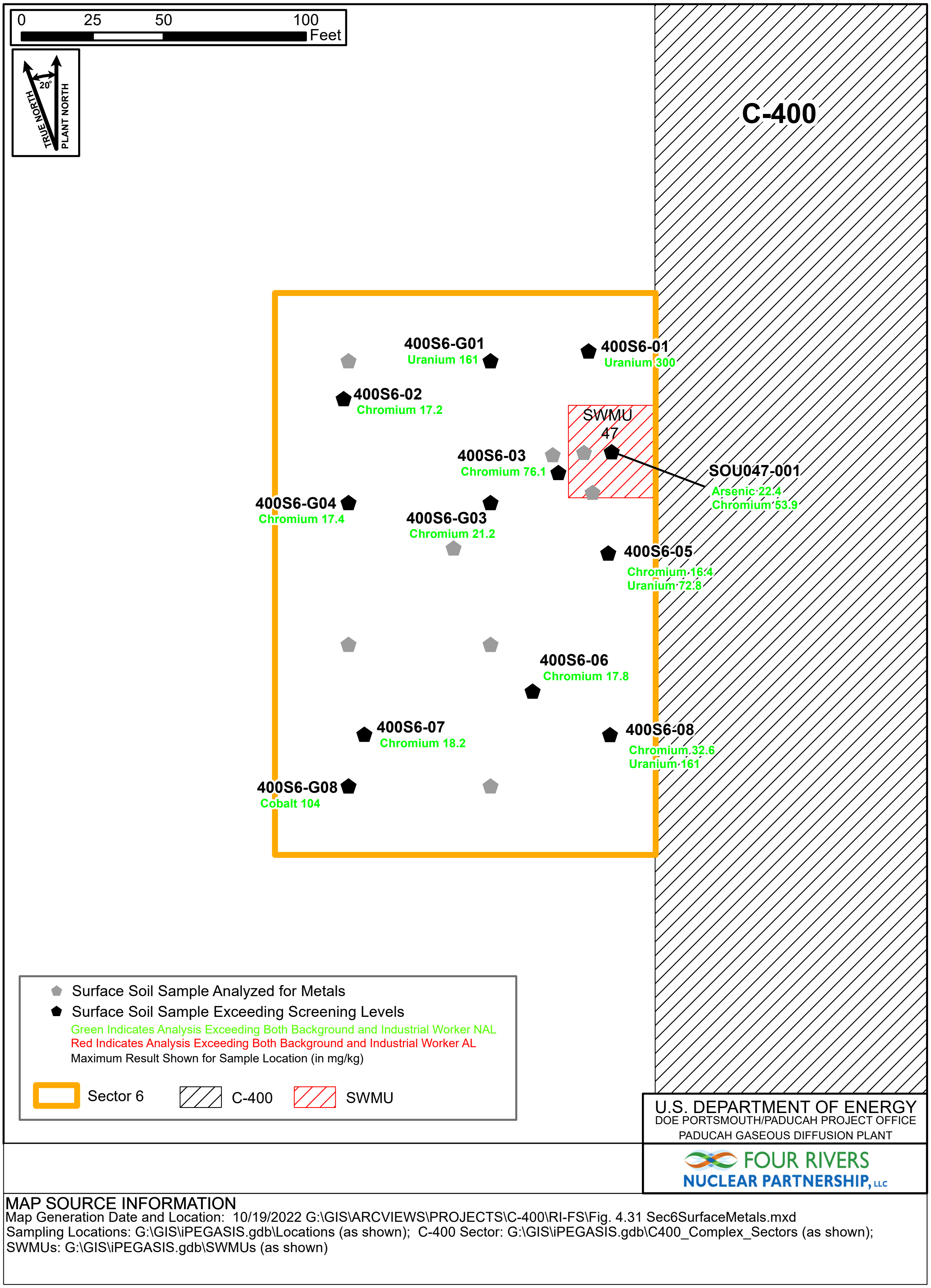


Figure 4.31. Sector 6 Surface Soil Sampling Exceeding Screening Levels for Metals

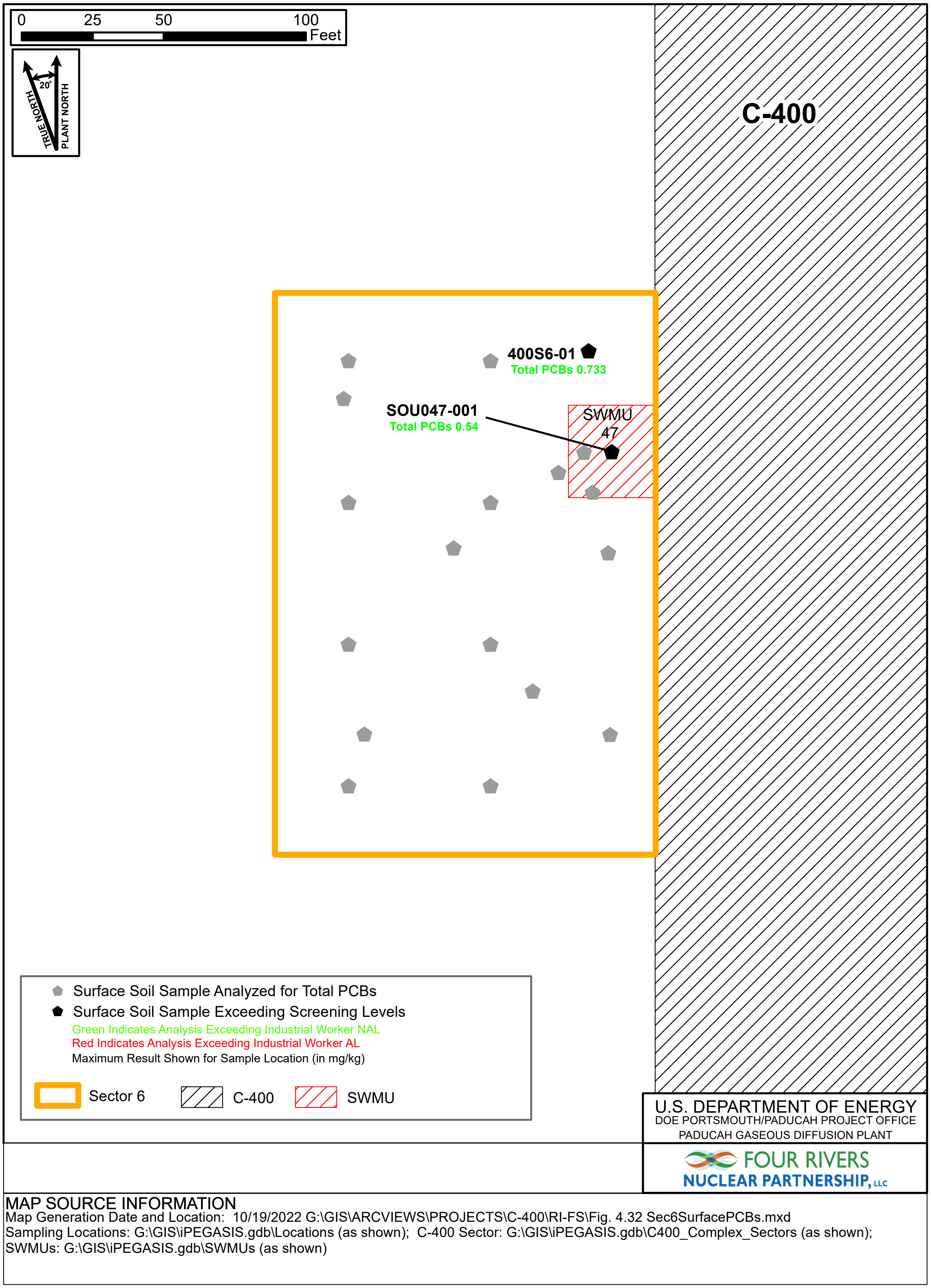


Figure 4.32. Sector 6 Surface Soil Sampling Exceeding Screening Levels for Total PCBs

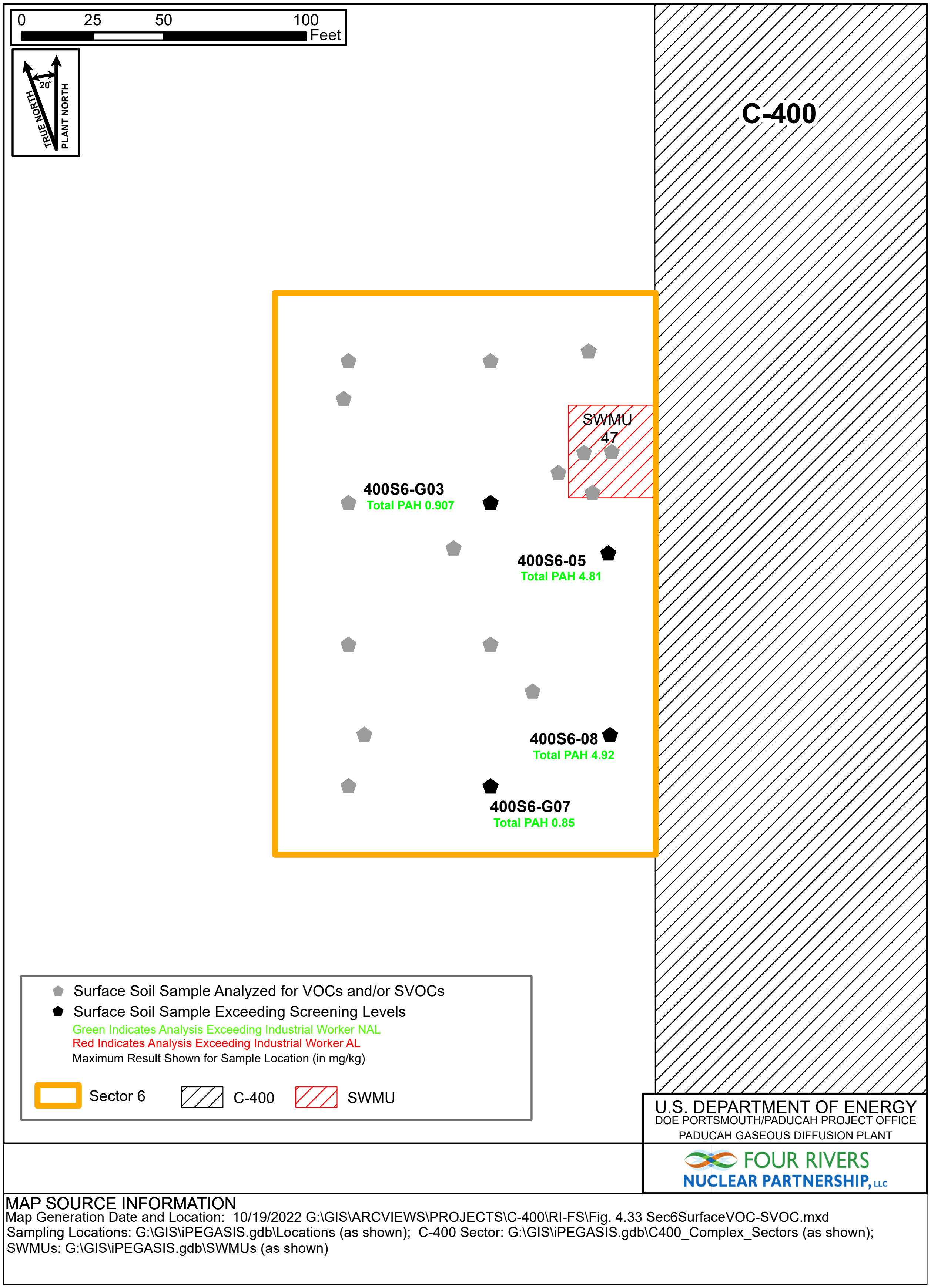


Figure 4.33. Sector 6 Surface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

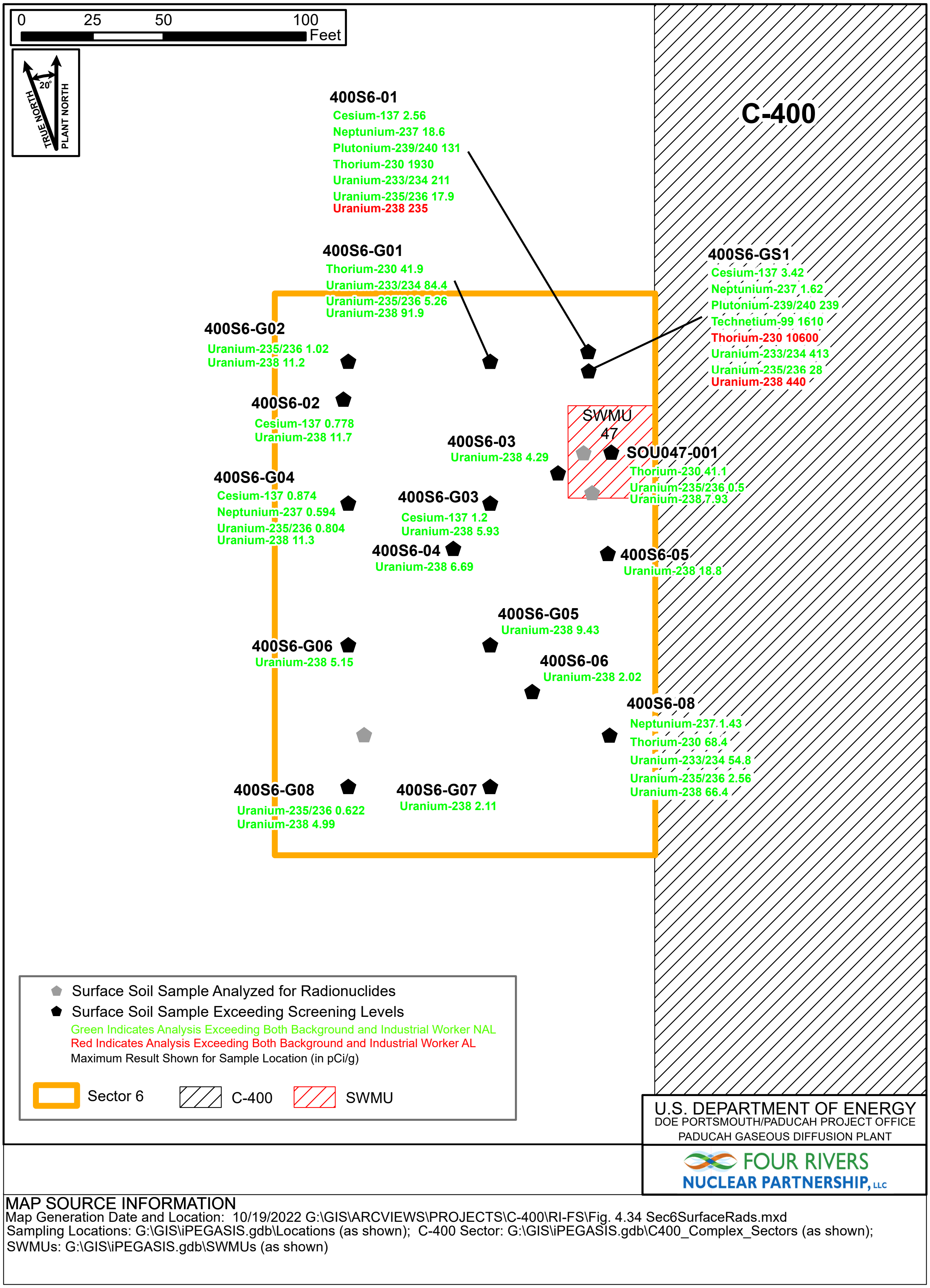


Figure 4.34. Sector 6 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include cesium-137, neptunium-237*, plutonium-238, plutonium-239/240*, technetium-99*, thorium-230*, uranium-233/234*, uranium-234*, uranium-235/236*, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). Americium-241, which does not have a site-specific background, also exceeded the groundwater protection SSLs for both a DAF of 1 in 4 of 19 samples and a DAF of 20 in 2 of 19 samples.

4.3.6.3 Nature and extent of contamination—surface and subsurface soils

A summary of the analytical results for Sector 6 surface and subsurface soil and the screening results are provided in Tables 4.30 through 4.33. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs include antimony, arsenic, chromium, cobalt, iron, manganese, thallium, and uranium. The metals most frequently detected above its background values and excavation worker NALs in Sector 6 soil are antimony, chromium, and uranium. Uranium metal exceeded the excavation worker AL at two locations out of 40 samples in Sector 6. Locations where metals exceeded both the background and excavation worker NAL/AL screening criteria are shown in Figure 4.35.

Metals that were detected in the Sector 6 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater for a DAF of 1 include aluminum, antimony, arsenic, barium, cadmium, cobalt, manganese, nickel, selenium, thallium, and uranium (all of these metals also exceeded the DAF of 20 SSLs, with the exception of aluminum and nickel). In the deep soil interval (16 ft bgs to the bottom of the RGA), the metals exceeding both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony, arsenic, cobalt, iron, manganese, selenium, and vanadium (all of these metals also exceeded the DAF of 20 SSLs, with the exception of aluminum and vanadium).

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater at a DAF of 1 only. Metals that exceeded these SSLs included aluminum, arsenic, barium, beryllium, boron, cadmium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

PCBs

Total PCBs were not detected in 18 samples collected and analyzed in Sector 6 subsurface soil (1–16 ft bgs). There was one detected result of Total PCBs (0.00549 mg/kg) out of 28 samples in the deep soil interval (16 ft bgs to the bottom of the RGA) at a depth of 20–21 ft bgs at location 400S6-01, but no screening criteria were exceeded.

SVOCs

Several SVOCs were detected in Sector 6 soil (0–16 ft bgs), mostly PAH compounds, with Total PAHs exceeding the excavation worker NAL at 2 out of 36 sample locations (Figure 4.36). Total PAHs exceeded the SSL for protection of groundwater in Sector 6 subsurface soil (1–16 ft bgs) in 1 out of 18 samples for a DAF of 20 and 6 out of 18 samples for a DAF of 1. SVOCs did not exceed any of the screening criteria at depths > 16 ft bgs.

Table 4.30. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 6

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	4.63E+03	1.99E+04	9.74E+03	39/39	11/39	1.20E+04	0/39	3.26E+04	0/39	1.00E+05	5 - 120
METAL	Antimony	mg/kg	2.60E-01	7.10E+01	1.39E+01	21/40	21/40	2.10E-01	4/40	1.32E+01	0/40	3.96E+02	0.56 - 30
METAL	Arsenic	mg/kg	2.65E+00	2.24E+01	6.34E+00	40/40	4/40	7.90E+00	35/40	3.74E+00	0/40	3.60E+02	0.971 - 11
METAL	Barium	mg/kg	1.38E+01	4.21E+02	1.18E+02	39/40	5/40	1.70E+02	0/40	6.47E+03	0/40	1.00E+05	0.777 - 100
METAL	Beryllium	mg/kg	1.32E-01	8.90E-01	4.64E-01	39/39	3/39	6.70E-01	0/39	6.55E+01	0/39	1.97E+03	0.0971 - 0.12
METAL	Boron	mg/kg	9.76E-01	4.05E+00	2.21E+00	32/33	N/A	N/A	0/33	6.57E+03	0/33	1.00E+05	2.91 - 3.6
METAL	Cadmium	mg/kg	1.30E-02	1.60E+01	1.18E+00	35/40	15/40	2.10E-01	0/40	2.53E+01	0/40	7.59E+02	0.05 - 12
METAL	Calcium	mg/kg	5.37E+02	8.20E+04	1.49E+04	6/6	1/6	6.10E+03	0/6	N/A	0/6	N/A	50 - 250
METAL	Chromium	mg/kg	1.05E+01	7.61E+01	1.99E+01	38/40	19/40	1.60E+01	38/40	9.14E+00	0/40	9.14E+02	0.583 - 85
METAL	Cobalt	mg/kg	1.57E+00	1.04E+02	9.46E+00	39/39	4/39	1.30E+01	6/39	9.84E+00	0/39	2.95E+02	0.194 - 0.24
METAL	Copper	mg/kg	3.80E+00	3.05E+02	2.11E+01	39/40	7/40	1.90E+01	0/40	1.32E+03	0/40	3.96E+04	0.389 - 35
METAL	Iron	mg/kg	4.66E+03	2.95E+04	1.66E+04	40/40	1/40	2.80E+04	5/40	2.30E+04	0/40	1.00E+05	5 - 240
METAL	Lead	mg/kg	3.22E+00	5.99E+01	1.46E+01	40/40	6/40	2.30E+01	0/40	8.00E+02	0/40	8.00E+02	0.3 - 13
METAL	Magnesium	mg/kg	3.14E+02	3.58E+03	1.46E+03	6/6	1/6	2.10E+03	0/6	N/A	0/6	N/A	50 - 57.9
METAL	Manganese	mg/kg	1.37E+02	3.84E+03	5.09E+02	40/40	4/40	8.20E+02	4/40	7.74E+02	0/40	2.32E+04	0.2 - 105
METAL	Mercury	mg/kg	1.02E-02	1.57E-01	2.70E-02	28/40	1/40	1.30E-01	0/40	9.86E+00	0/40	2.96E+02	0.0225 - 10
METAL	Molybdenum	mg/kg	1.46E-01	1.88E+00	6.30E-01	36/40	N/A	N/A	0/40	1.64E+02	0/40	4.92E+03	0.194 - 15
METAL	Nickel	mg/kg	4.00E+00	1.35E+02	2.11E+01	39/40	8/40	2.10E+01	0/40	6.52E+02	0/40	1.96E+04	0.389 - 65
METAL	Selenium	mg/kg	4.17E-01	2.04E+00	1.22E+00	34/40	30/40	7.00E-01	0/40	1.64E+02	0/40	4.92E+03	0.5 - 20
METAL	Silver	mg/kg	2.20E-02	6.91E+00	1.24E+00	15/40	2/40	2.30E+00	0/40	1.64E+02	0/40	4.92E+03	0.2 - 10
METAL	Sodium	mg/kg	2.92E+01	3.76E+02	1.69E+02	6/6	1/6	3.20E+02	0/6	N/A	0/6	N/A	20 - 23.2
METAL	Thallium	mg/kg	1.10E-01	1.01E+00	2.50E-01	18/39	7/39	2.10E-01	3/39	3.29E-01	0/39	9.87E+00	0.2 - 0.48
METAL	Uranium[a]	mg/kg	5.79E-01	3.00E+02	3.44E+01	40/40	23/40	4.60E+00	22/40	6.58E+00	2/40	1.97E+02	0.03 - 20
METAL	Vanadium	mg/kg	5.65E+00	3.61E+01	2.43E+01	39/40	0/40	3.70E+01	0/40	1.65E+02	0/40	4.95E+03	1 - 70
METAL	Zinc	mg/kg	9.80E+00	6.96E+02	7.19E+01	40/40	11/40	6.00E+01	0/40	9.86E+03	0/40	1.00E+05	2 - 44.4
ANION	Fluoride	mg/kg	1.35E+00	3.12E+01	1.22E+01	33/33	N/A	N/A	0/33	1.32E+03	0/33	3.96E+04	1.06 - 1.24
PPCB	Total PCB[b]	mg/kg	1.66E-03	7.33E-01	1.53E-01	9/37	N/A	N/A	0/37	1.12E+00	0/37	1.12E+02	0.00367 - 5
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.69E+01	0/32	8.07E+02	0.361 - 14.5
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.90E+03	0/36	5.70E+04	0.35 - 14.5
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.90E+01	0/36	5.70E+02	0.35 - 14.5
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.69E+01	0/36	1.71E+03	0.35 - 14.5
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.79E+02	0/36	1.14E+04	0.35 - 14.5
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.79E+01	0/36	1.14E+03	0.722 - 29
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	8.49E+00	0/36	8.49E+02	0.35 - 14.5
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.78E+00	0/36	1.71E+02	0.35 - 14.5
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.35E+03	0/36	4.05E+04	0.0361 - 1.45
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.64E+02	0/36	4.92E+03	0.35 - 14.5
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.52E+00	0/36	4.56E+01	0.361 - 14.5
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	6.73E+01	0/36	2.02E+03	0.0361 - 1.45
SVOC	2-Methylphenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	9.48E+02	0/36	2.84E+04	0.35 - 14.5
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.89E+02	0/36	5.67E+03	0.361 - 14.5
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.79E+01	0/36	1.14E+03	0.35 - 14.5
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.90E+00	0/36	5.90E+02	0.361 - 14.5
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.69E+00	0/36	1.71E+02	0.361 - 14.5
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.91E+01	0/36	5.73E+02	0.35 - 14.5

Table 4.30. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	Provisional Background FOE	Provisional Background Bkgd	Excavation Worker FOE	Excavation Worker NAL	Excavation Worker FOE	Excavation Worker AL	DL Range
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.90E+03	0/36	5.70E+04	0.35 - 14.5
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/36	N/A	N/A	0/36	9.48E+00	0/36	2.84E+02	0.35 - 14.5
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.91E+01	0/36	5.73E+02	0.35 - 14.5
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.79E+01	0/36	1.14E+03	0.361 - 14.5
SVOC	Acenaphthene	mg/kg	1.58E-02	3.81E-01	1.03E-01	9/36	N/A	N/A	0/36	1.01E+03	0/36	3.03E+04	0.0361 - 1.45
SVOC	Acenaphthylene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.01E+03	0/36	3.03E+04	0.0361 - 1.45
SVOC	Acetophenone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.29E+03	0/32	9.87E+04	0.361 - 14.5
SVOC	Anthracene	mg/kg	2.08E-02	1.06E+00	2.89E-01	8/36	N/A	N/A	0/36	5.05E+03	0/36	1.00E+05	0.0361 - 1.45
SVOC	Atrazine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.15E+01	0/32	1.15E+03	0.361 - 14.5
SVOC	Benzaldehyde	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.15E+03	0/32	9.87E+04	0.361 - 14.5
SVOC	Benzenemethanol	mg/kg	--	--	--	0/4	N/A	N/A	0/4	1.90E+03	0/4	5.70E+04	0.35 - 0.4
SVOC	Benzo(ghi)perylene	mg/kg	2.22E-02	1.81E+00	3.96E-01	12/36	N/A	N/A	0/36	5.05E+02	0/36	1.52E+04	0.0361 - 1.45
SVOC	Benzoic acid	mg/kg	--	--	--	0/4	N/A	N/A	0/4	7.58E+04	0/4	2.27E+06	1.7 - 1.9
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.69E+01	0/36	1.71E+03	0.35 - 14.5
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.01E+00	0/36	3.01E+02	0.0069 - 14.5
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/36	N/A	N/A	0/36	6.58E+01	0/36	6.58E+03	0.35 - 14.5
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	2.11E-02	7.00E+00	1.77E+00	4/36	N/A	N/A	0/36	1.90E+02	0/36	1.14E+04	0.0361 - 1.45
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.40E+03	0/36	1.14E+05	0.0361 - 1.45
SVOC	Caprolactam	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.43E+03	0/32	2.83E+05	0.361 - 14.5
SVOC	Carbazole	mg/kg	1.40E-02	7.73E-01	1.63E-01	8/32	N/A	N/A	0/32	1.33E+02	0/32	1.33E+04	0.0361 - 1.45
SVOC	Dibenzofuran	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.29E+01	0/36	9.87E+02	0.35 - 14.5
SVOC	Diethyl phthalate	mg/kg	1.46E-02	3.43E-02	2.45E-02	2/36	N/A	N/A	0/36	1.52E+04	0/36	4.56E+05	0.0361 - 1.45
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.52E+04	0/36	4.56E+05	0.0361 - 1.45
SVOC	Di-n-butyl phthalate	mg/kg	1.15E-02	4.21E-02	2.00E-02	7/36	N/A	N/A	0/36	1.90E+03	0/36	5.70E+04	0.0361 - 1.45
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.90E+02	0/36	5.70E+03	0.0361 - 1.45
SVOC	Diphenylamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.90E+03	0/32	5.70E+04	0.361 - 14.5
SVOC	Fluoranthene	mg/kg	1.39E-02	9.06E+00	9.64E-01	26/36	N/A	N/A	0/36	6.73E+02	0/36	2.02E+04	0.0361 - 1.45
SVOC	Fluorene	mg/kg	1.44E-02	4.64E-01	1.57E-01	6/36	N/A	N/A	0/36	6.73E+02	0/36	2.02E+04	0.0361 - 1.45
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	2.33E+00	0/36	2.33E+02	0.35 - 14.5
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	2.41E+01	0/36	9.87E+02	0.35 - 14.5
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.00E+00	0/36	3.00E+01	0.361 - 14.5
SVOC	Hexachloroethane	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.98E+01	0/36	5.94E+02	0.35 - 14.5
SVOC	Isophorone	mg/kg	--	--	--	0/36	N/A	N/A	0/36	2.79E+03	0/36	1.14E+05	0.35 - 14.5
SVOC	m,p-Cresol	mg/kg	--	--	--	0/4	N/A	N/A	0/4	1.90E+03	0/4	5.70E+04	0.69 - 0.8
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.79E+02	0/32	1.14E+04	0.361 - 14.5
SVOC	Naphthalene	mg/kg	1.48E-02	1.48E-02	1.48E-02	1/36	N/A	N/A	0/36	1.67E+01	0/36	1.67E+03	0.0361 - 1.45
SVOC	Nitrobenzene	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.63E+01	0/36	1.69E+03	0.361 - 14.5
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/36	N/A	N/A	0/36	3.79E-01	0/36	3.79E+01	0.0069 - 14.5
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/4	N/A	N/A	0/4	3.79E+02	0/4	1.14E+04	0.35 - 0.4
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	4.06E+00	0/36	4.06E+02	0.361 - 14.5
SVOC	Phenanthrene	mg/kg	1.37E-02	5.27E+00	6.13E-01	21/36	N/A	N/A	0/36	1.01E+03	0/36	3.03E+04	0.0361 - 1.45
SVOC	Phenol	mg/kg	--	--	--	0/36	N/A	N/A	0/36	5.69E+03	0/36	1.71E+05	0.35 - 14.5
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/36	N/A	N/A	0/36	7.58E+01	0/36	2.27E+03	0.361 - 14.5
SVOC	Pyrene	mg/kg	1.16E-02	5.85E+00	7.35E-01	26/36	N/A	N/A	0/36	5.05E+02	0/36	1.52E+04	0.0361 - 1.45
SVOC	Pyridine	mg/kg	--	--	--	0/4	N/A	N/A	0/4	3.29E+01	0/4	9.87E+02	0.69 - 0.8

Table 4.30. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 6 (Continued)

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
SVOC	Total PAH[c]	mg/kg	1.54E-03	4.92E+00	6.39E-01	24/36	N/A	N/A	2/36	2.35E+00	0/36	1.51E+02	-
RADS	Americium-241	pCi/g	1.00E-02	3.93E+01	1.10E+01	8/38	N/A	N/A	2/38	1.64E+01	0/38	1.64E+03	0.009 - 0.973
RADS	Cesium-137	pCi/g	5.08E-02	3.42E+00	7.43E-01	16/38	11/38	2.80E-01	5/38	5.82E-01	0/38	5.82E+01	0.0295 - 0.287
RADS	Neptunium-237	pCi/g	1.15E-01	1.86E+01	3.60E+00	7/38	7/38	1.00E-01	2/38	1.63E+00	0/38	1.63E+02	0.011 - 1.97
RADS	Plutonium-238	pCi/g	7.30E-02	3.51E+00	1.48E+00	4/38	3/38	7.30E-02	0/38	1.94E+01	0/38	1.94E+03	0.015 - 1.37
RADS	Plutonium-239/240	pCi/g	6.30E-03	2.39E+02	4.15E+01	10/38	9/38	2.50E-02	3/38	1.83E+01	0/38	1.83E+03	0.0043 - 1.33
RADS	Technetium-99	pCi/g	4.68E+00	1.61E+03	1.21E+02	23/38	23/38	2.50E+00	1/38	1.55E+03	0/38	1.00E+05	0.49 - 4.57
RADS	Thorium-228	pCi/g	7.70E-01	1.11E+00	9.48E-01	4/4	0/4	1.60E+00	0/4	6.34E+01	0/4	6.34E+03	0.02 - 0.04
RADS	Thorium-230	pCi/g	6.05E-01	1.06E+04	4.10E+02	32/38	20/38	1.40E+00	7/38	2.82E+01	1/38	2.82E+03	0.007 - 3.9
RADS	Thorium-232	pCi/g	8.60E-01	1.16E+00	9.95E-01	4/4	0/4	1.50E+00	0/4	2.60E+01	0/4	2.60E+03	0.007 - 0.02
RADS	Uranium-233/234	pCi/g	7.95E-01	4.13E+02	3.21E+01	33/34	27/34	1.20E+00	5/34	4.30E+01	0/34	4.30E+03	0.422 - 1.8
RADS	Uranium-234	pCi/g	7.50E-01	8.10E+00	4.12E+00	4/4	2/4	1.20E+00	0/4	4.30E+01	0/4	4.30E+03	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	2.90E-02	2.80E+01	4.53E+00	15/38	13/38	6.00E-02	4/38	2.62E+00	0/38	2.62E+02	0.01 - 1.49
RADS	Uranium-238	pCi/g	5.41E-01	4.40E+02	3.21E+01	37/38	32/38	1.20E+00	11/38	8.98E+00	0/38	8.98E+02	0.009 - 1.46
VOC	1,1,1,2-Tetrachloroethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	4.68E+01	0/6	4.68E+03	0.0054 - 0.0062
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	4.54E+03	0/38	1.00E+05	0.000888 - 0.113
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	1.11E+01	0/38	1.11E+03	0.000888 - 0.113
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.79E+03	0/32	1.00E+05	0.00444 - 0.564
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	8.49E-01	0/38	2.55E+01	0.000888 - 0.113
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	9.52E+01	0/38	9.52E+03	0.000888 - 0.113
VOC	1,1-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/38	N/A	N/A	0/38	1.26E+02	0/38	3.78E+03	0.000888 - 0.113
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.63E+01	0/32	7.89E+02	0.000888 - 0.113
VOC	1,2,3-Trichloropropane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.53E-01	0/6	1.53E+01	0.0054 - 0.0062
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.20E+01	0/32	9.60E+02	0.000888 - 0.113
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.10E-01	0/32	4.10E+01	0.000888 - 0.113
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	7.86E-01	0/38	7.86E+01	0.000888 - 0.113
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.43E+02	0/32	2.83E+04	0.000888 - 0.113
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	1.13E+01	0/38	5.19E+02	0.000888 - 0.113
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	8.91E+00	0/38	2.67E+02	0.000888 - 0.113
VOC	1,2-Dimethylbenzene	mg/kg	3.74E-04	3.74E-04	3.74E-04	1/38	N/A	N/A	0/38	3.61E+02	0/38	1.08E+04	0.000888 - 0.113
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.43E+02	0/32	2.83E+04	0.000888 - 0.113
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.20E+01	0/32	7.20E+03	0.000888 - 0.113
VOC	1,4-Dioxane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.30E+01	0/32	4.30E+03	0.0444 - 5.64
VOC	2-Butanone	mg/kg	2.65E-03	2.56E-01	4.46E-02	8/32	N/A	N/A	0/32	1.28E+04	0/32	3.84E+05	0.00444 - 0.564
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.80E-01	0/32	4.80E+01	0.00444 - 0.564
VOC	2-Hexanone	mg/kg	--	--	--	0/38	N/A	N/A	0/38	9.69E+01	0/38	2.91E+03	0.00444 - 0.564
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.70E+02	0/32	9.70E+04	0.000888 - 0.113
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/38	N/A	N/A	0/38	2.31E+03	0/38	6.93E+04	0.00444 - 0.564
VOC	Acetone	mg/kg	1.63E-03	1.95E-01	4.36E-02	21/36	N/A	N/A	0/36	2.96E+04	0/36	8.88E+05	0.00444 - 0.564
VOC	Acrolein	mg/kg	2.44E-03	2.44E-03	2.44E-03	1/32	N/A	N/A	0/32	8.14E-02	0/32	2.44E+00	0.00444 - 0.564
VOC	Acrylonitrile	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.46E+00	0/32	2.71E+02	0.00444 - 0.564
VOC	Benzene	mg/kg	5.30E-04	6.55E-04	5.93E-04	2/38	N/A	N/A	0/38	2.59E+01	0/38	1.28E+03	0.000888 - 0.113
VOC	Bromochloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.48E+01	0/32	2.54E+03	0.000888 - 0.113
VOC	Bromodichloromethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	7.93E+00	0/38	7.93E+02	0.000888 - 0.113
VOC	Bromoform	mg/kg	--	--	--	0/38	N/A	N/A	0/38	3.24E+02	0/38	1.97E+04	0.000888 - 0.113

Table 4.30. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	Provisional Background FOE	Provisional Background Bkgd	Excavation Worker FOE	Excavation Worker NAL	Excavation Worker FOE	Excavation Worker AL	DL Range
VOC	Bromomethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	3.80E+00	0/38	1.14E+02	0.000888 - 0.113
VOC	Carbon disulfide	mg/kg	--	--	--	0/38	N/A	N/A	0/38	4.21E+02	0/38	1.26E+04	0.00444 - 0.564
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/38	N/A	N/A	0/38	1.57E+01	0/38	1.57E+03	0.000888 - 0.113
VOC	Chlorobenzene	mg/kg	--	--	--	0/38	N/A	N/A	0/38	1.48E+02	0/38	4.44E+03	0.000888 - 0.113
VOC	Chloroethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	3.07E+03	0/38	9.21E+04	0.000888 - 0.113
VOC	Chloroform	mg/kg	8.88E-04	8.88E-04	8.88E-04	1/38	N/A	N/A	0/38	8.90E+00	0/38	8.90E+02	0.000888 - 0.113
VOC	Chloromethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	6.26E+01	0/38	1.88E+03	0.000888 - 0.113
VOC	*cis* -1,2-Dichloroethene	mg/kg	9.29E-04	1.77E-01	3.95E-02	5/38	N/A	N/A	0/38	6.58E+01	0/38	1.97E+03	0.000888 - 0.113
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/38	N/A	N/A	0/38	2.83E+01	0/38	1.21E+03	0.000888 - 0.113
VOC	Cumene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.02E+03	0/32	3.06E+04	0.000888 - 0.113
VOC	Cyclohexane	mg/kg	5.67E-04	1.65E-03	1.11E-03	2/32	N/A	N/A	0/32	3.70E+03	0/32	1.11E+05	0.000888 - 0.113
VOC	Dibromochloromethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	5.48E+01	0/38	5.48E+03	0.000888 - 0.113
VOC	Dibromomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.28E+01	0/6	3.84E+02	0.0054 - 0.0062
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	4.94E+01	0/38	1.48E+03	0.000888 - 0.113
VOC	Ethyl methacrylate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	7.61E+02	0/6	2.28E+04	0.0054 - 0.0062
VOC	Ethylbenzene	mg/kg	3.83E-04	3.83E-04	3.83E-04	1/38	N/A	N/A	0/38	1.30E+02	0/38	1.30E+04	0.000888 - 0.113
VOC	Iodomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	6.26E+01	0/6	1.88E+03	0.0054 - 0.0062
VOC	m,p-Xylene	mg/kg	6.41E-04	9.17E-04	7.79E-04	2/38	N/A	N/A	0/38	3.23E+02	0/38	9.69E+03	0.00178 - 0.226
VOC	Methyl acetate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.29E+04	0/32	9.87E+05	0.00444 - 0.564
VOC	Methylcyclohexane	mg/kg	4.12E-04	2.40E-03	1.06E-03	4/32	N/A	N/A	0/32	1.76E+03	0/32	5.28E+04	0.000888 - 0.113
VOC	Methylene chloride	mg/kg	2.41E-03	2.30E-01	2.13E-02	15/38	N/A	N/A	0/38	1.57E+02	0/38	4.71E+03	0.00444 - 0.564
VOC	Styrene	mg/kg	--	--	--	0/38	N/A	N/A	0/38	3.00E+03	0/38	9.00E+04	0.000888 - 0.113
VOC	Tetrachloroethene	mg/kg	--	--	--	0/38	N/A	N/A	0/38	4.34E+01	0/38	1.30E+03	0.000888 - 0.113
VOC	Toluene	mg/kg	3.41E-04	6.54E-03	1.69E-03	13/38	N/A	N/A	0/38	2.18E+03	0/38	6.54E+04	0.000888 - 0.113
VOC	Total Xylene	mg/kg	1.29E-03	1.29E-03	1.29E-03	1/32	N/A	N/A	0/32	3.23E+02	0/32	9.69E+03	0.00266 - 0.338
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/38	N/A	N/A	0/38	5.67E+01	0/38	1.70E+03	0.000888 - 0.113
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/38	N/A	N/A	0/38	2.83E+01	0/38	1.21E+03	0.000888 - 0.113
VOC	*Trans* -1,4-Dichloro-2-butene	mg/kg	--	--	--	0/6	N/A	N/A	0/6	2.19E-01	0/6	2.19E+01	0.011 - 0.012
VOC	Trichloroethene	mg/kg	3.67E-04	6.28E-02	1.22E-02	7/38	N/A	N/A	0/38	2.26E+00	0/38	6.78E+01	0.000888 - 0.125
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/38	N/A	N/A	0/38	4.11E+02	0/38	1.23E+04	0.000888 - 0.113
VOC	Vinyl acetate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	5.12E+02	0/6	1.54E+04	0.0054 - 0.0062
VOC	Vinyl chloride	mg/kg	5.88E-03	5.88E-03	5.88E-03	1/38	N/A	N/A	0/38	4.72E+00	0/38	4.72E+02	0.000888 - 0.113

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salt).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.31. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 6

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	4.63E+03	1.99E+04	1.05E+04	21/21	7/21	1.20E+04	0/21	5.99E+04	21/21	3.00E+03	5 - 120
METAL	Antimony	mg/kg	2.60E-01	7.10E+01	2.05E+01	10/21	10/21	2.10E-01	7/21	7.04E-01	10/21	3.52E-02	0.56 - 30
METAL	Arsenic	mg/kg	3.20E+00	1.01E+01	5.71E+00	21/21	1/21	7.90E+00	21/21	3.02E-02	21/21	1.51E-03	1 - 11
METAL	Barium	mg/kg	2.05E+01	4.21E+02	1.32E+02	21/21	3/21	1.70E+02	3/21	3.11E+02	21/21	1.55E+01	0.806 - 100
METAL	Beryllium	mg/kg	2.10E-01	8.90E-01	4.80E-01	21/21	2/21	6.90E-01	0/21	3.89E+01	0/21	1.95E+00	0.1 - 0.12
METAL	Boron	mg/kg	9.76E-01	3.04E+00	1.95E+00	15/16	N/A	N/A	0/16	2.56E+01	11/16	1.28E+00	3.02 - 3.6
METAL	Cadmium	mg/kg	1.30E-02	1.51E+01	9.45E-01	17/21	2/21	2.10E-01	1/21	1.39E+00	4/21	6.93E-02	0.05 - 12
METAL	Calcium	mg/kg	5.37E+02	4.33E+03	1.46E+03	5/5	0/5	6.10E+03	N/A	N/A	N/A	N/A	50 - 57.9
METAL	Chromium	mg/kg	1.08E+01	4.12E+01	1.78E+01	20/21	0/21	4.30E+01	0/21	3.60E+06	0/21	1.80E+05	0.605 - 85
METAL	Cobalt	mg/kg	3.26E+00	1.69E+01	7.65E+00	21/21	3/21	1.30E+01	21/21	5.43E-01	21/21	2.71E-02	0.2 - 0.24
METAL	Copper	mg/kg	3.80E+00	1.93E+01	8.58E+00	21/21	0/21	2.50E+01	0/21	5.62E+01	21/21	2.81E+00	0.403 - 35
METAL	Iron	mg/kg	1.11E+04	2.55E+04	1.66E+04	21/21	0/21	2.80E+04	21/21	7.04E+02	21/21	3.52E+01	5 - 240
METAL	Lead	mg/kg	3.22E+00	1.78E+01	9.42E+00	21/21	0/21	2.30E+01	0/21	2.70E+02	1/21	1.35E+01	0.3 - 0.48
METAL	Magnesium	mg/kg	3.14E+02	1.82E+03	1.03E+03	5/5	0/5	2.10E+03	N/A	N/A	N/A	N/A	50 - 57.9
METAL	Manganese	mg/kg	2.06E+02	1.69E+03	5.08E+02	21/21	3/21	8.20E+02	21/21	5.65E+01	21/21	2.83E+00	0.2 - 11.9
METAL	Mercury	mg/kg	1.02E-02	3.41E-02	1.92E-02	12/21	0/21	1.30E-01	0/21	5.91E-01	1/21	2.95E-02	0.0229 - 10
METAL	Molybdenum	mg/kg	1.46E-01	1.24E+00	5.12E-01	18/21	N/A	N/A	0/21	4.03E+00	17/21	2.02E-01	0.202 - 15
METAL	Nickel	mg/kg	4.00E+00	2.28E+01	1.08E+01	21/21	2/21	2.20E+01	0/21	5.12E+01	21/21	2.56E+00	0.403 - 0.58
METAL	Selenium	mg/kg	4.17E-01	2.04E+00	1.31E+00	19/21	16/21	7.00E-01	15/21	1.04E+00	19/21	5.19E-02	0.5 - 1.2
METAL	Silver	mg/kg	2.20E-02	2.95E-01	9.90E-02	7/21	0/21	2.70E+00	0/21	1.60E+00	2/21	7.99E-02	0.2 - 5.78
METAL	Sodium	mg/kg	2.92E+01	3.76E+02	1.89E+02	5/5	1/5	3.40E+02	N/A	N/A	N/A	N/A	20 - 23.2
METAL	Thallium	mg/kg	1.10E-01	3.50E-01	2.19E-01	10/21	1/21	3.40E-01	10/21	2.84E-02	10/21	1.42E-03	0.2 - 0.48
METAL	Uranium[a]	mg/kg	5.79E-01	2.01E+02	1.94E+01	21/21	7/21	4.60E+00	7/21	3.60E+00	21/21	1.80E-01	0.03 - 0.473
METAL	Vanadium	mg/kg	1.36E+01	3.61E+01	2.56E+01	21/21	0/21	3.70E+01	0/21	1.73E+02	21/21	8.64E+00	1 - 4.8
METAL	Zinc	mg/kg	9.80E+00	5.32E+01	2.72E+01	21/21	0/21	6.00E+01	0/21	7.46E+02	4/21	3.73E+01	2 - 25
ANION	Fluoride	mg/kg	1.35E+00	2.69E+01	9.36E+00	16/16	N/A	N/A	0/16	2.40E+02	3/16	1.20E+01	1.1 - 1.24
PPCB	Total PCB[b]	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.36E-01	0/18	6.82E-03	0.00371 - 5
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.74E-02	0/15	8.72E-04	0.374 - 7.46
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.04E+00	0/18	4.02E-01	0.37 - 7.46
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.32E-02	0/18	1.16E-03	0.37 - 7.46
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.52E-02	0/18	2.26E-03	0.37 - 7.46
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.42E-01	0/18	4.21E-02	0.37 - 7.46
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0.749 - 14.9
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.42E-03	0/18	3.21E-04	0.37 - 7.46
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.33E-03	0/18	6.67E-05	0.37 - 7.46
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.70E+00	0/18	3.85E-01	0.0374 - 0.746
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.78E-01	0/18	8.91E-03	0.37 - 7.46
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.16E-03	0/18	2.58E-04	0.374 - 7.46
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.70E-01	0/18	1.85E-02	0.0374 - 0.746
SVOC	2-Methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.51E+00	0/18	7.53E-02	0.37 - 7.46
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.60E-01	0/18	8.01E-03	0.374 - 7.46
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0.37 - 7.46
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.65E-02	0/18	8.24E-04	0.374 - 7.46
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.90E-03	0/18	2.45E-04	0.374 - 7.46
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.84E-03	0/18	3.42E-04	0.37 - 7.46

Table 4.31. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.42E+00	0/18	1.71E-01	0.37 - 7.46
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.10E-03	0/18	1.55E-04	0.37 - 7.46
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.84E-03	0/18	3.42E-04	0.37 - 7.46
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0.374 - 7.46
SVOC	Acenaphthene	mg/kg	1.58E-02	2.20E-02	1.86E-02	3/18	N/A	N/A	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOC	Acenaphthylene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOC	Acetophenone	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.17E+00	0/15	5.84E-02	0.374 - 7.46
SVOC	Anthracene	mg/kg	2.48E-02	2.96E-02	2.72E-02	2/18	N/A	N/A	0/18	1.16E+02	0/18	5.81E+00	0.0374 - 0.746
SVOC	Atrazine	mg/kg	--	--	--	0/15	N/A	N/A	0/15	3.92E-03	0/15	1.96E-04	0.374 - 7.46
SVOC	Benzaldehyde	mg/kg	--	--	--	0/15	N/A	N/A	0/15	8.30E-02	0/15	4.15E-03	0.374 - 7.46
SVOC	Benzenemethanol	mg/kg	--	--	--	0/3	N/A	N/A	0/3	9.52E-01	0/3	4.76E-02	0.37 - 0.4
SVOC	Benzo(ghi)perylene	mg/kg	2.64E-02	8.66E-02	5.65E-02	2/18	N/A	N/A	0/18	2.63E+01	0/18	1.32E+00	0.0374 - 0.746
SVOC	Benzoic acid	mg/kg	--	--	--	0/3	N/A	N/A	0/3	3.02E+01	0/3	1.51E+00	1.8 - 1.9
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.70E-02	0/18	1.35E-03	0.37 - 7.46
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.22E-05	0/18	3.61E-06	0.0073 - 7.46
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.62E-03	0/18	1.31E-04	0.37 - 7.46
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.66E+01	0/18	1.33E+00	0.0374 - 0.746
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.72E+00	0/18	2.36E-01	0.0374 - 0.746
SVOC	Caprolactam	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.94E+00	0/15	2.47E-01	0.374 - 7.46
SVOC	Carbazole	mg/kg	1.40E-02	1.66E-02	1.53E-02	2/15	N/A	N/A	0/15	7.51E-01	0/15	3.76E-02	0.0374 - 0.746
SVOC	Dibenzofuran	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.92E-01	0/18	1.46E-02	0.37 - 7.46
SVOC	Diethyl phthalate	mg/kg	1.46E-02	3.43E-02	2.45E-02	2/18	N/A	N/A	0/18	1.22E+01	0/18	6.08E-01	0.0374 - 0.746
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.22E+01	0/18	6.08E-01	0.0374 - 0.746
SVOC	Di-n-butyl phthalate	mg/kg	1.24E-02	2.79E-02	1.81E-02	3/18	N/A	N/A	0/18	4.54E+00	0/18	2.27E-01	0.0374 - 0.746
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.13E+02	0/18	5.65E+00	0.0374 - 0.746
SVOC	Diphenylamine	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.66E+00	0/15	2.33E-01	0.374 - 7.46
SVOC	Fluoranthene	mg/kg	1.39E-02	7.24E-01	1.55E-01	9/18	N/A	N/A	0/18	1.78E+02	0/18	8.91E+00	0.0374 - 0.746
SVOC	Fluorene	mg/kg	1.56E-02	1.56E-02	1.56E-02	1/18	N/A	N/A	0/18	1.09E+01	0/18	5.45E-01	0.0374 - 0.746
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.46E-03	0/18	1.23E-04	0.37 - 7.46
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.34E-03	0/18	2.67E-04	0.37 - 7.46
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.56E-03	0/18	1.28E-04	0.374 - 7.46
SVOC	Hexachloroethane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.00E-03	0/18	2.00E-04	0.37 - 7.46
SVOC	Isophorone	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.16E-01	0/18	2.58E-02	0.37 - 7.46
SVOC	m,p-Cresol	mg/kg	--	--	--	0/3	N/A	N/A	0/3	5.94E-01	0/3	2.97E-02	0.73 - 0.8
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.94E-01	0/15	2.97E-02	0.374 - 7.46
SVOC	Naphthalene	mg/kg	1.48E-02	1.48E-02	1.48E-02	1/18	N/A	N/A	1/18	7.70E-03	1/18	3.85E-04	0.0374 - 0.746
SVOC	Nitrobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.83E-03	0/18	9.17E-05	0.374 - 7.46
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.62E-04	0/18	8.10E-06	0.0073 - 7.46
SVOC	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/3	N/A	N/A	0/3	1.33E+00	0/3	6.66E-02	0.37 - 0.4
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.14E-03	0/18	5.71E-05	0.374 - 7.46
SVOC	Phenanthrene	mg/kg	1.37E-02	1.39E-01	6.02E-02	6/18	N/A	N/A	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOC	Phenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.62E+00	0/18	3.31E-01	0.37 - 7.46
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.16E-02	0/18	1.58E-03	0.374 - 7.46
SVOC	Pyrene	mg/kg	1.16E-02	8.06E-01	1.52E-01	9/18	N/A	N/A	0/18	2.63E+01	0/18	1.32E+00	0.0374 - 0.746
SVOC	Pyridine	mg/kg	--	--	--	0/3	N/A	N/A	0/3	1.36E-02	0/3	6.80E-04	0.73 - 0.8

Table 4.31. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Total PAH[c]	mg/kg	1.54E-03	6.04E-01	1.43E-01	7/18	N/A	N/A	1/18	5.89E-01	6/18	2.94E-02	-
RADS	Americium-241	pCi/g	1.00E-02	4.71E+00	1.83E+00	3/19	N/A	N/A	0/19	1.92E+01	1/19	9.58E-01	0.009 - 0.973
RADS	Cesium-137	pCi/g	3.91E-01	3.91E-01	3.91E-01	1/19	1/19	2.80E-01	0/19	9.58E+00	0/19	4.79E-01	0.0325 - 0.14
RADS	Neptunium-237	pCi/g	1.46E-01	2.67E+00	1.41E+00	2/19	N/A	N/A	1/19	1.07E+00	2/19	5.36E-02	0.012 - 1.97
RADS	Plutonium-238	pCi/g	8.40E-02	8.40E-02	8.40E-02	1/19	N/A	N/A	0/19	4.38E+00	0/19	2.19E-01	0.018 - 0.733
RADS	Plutonium-239/240	pCi/g	6.30E-03	2.17E+01	8.63E+00	3/19	N/A	N/A	1/19	4.26E+00	2/19	2.13E-01	0.0043 - 0.89
RADS	Technetium-99	pCi/g	4.87E+00	5.05E+01	1.91E+01	8/19	8/19	2.80E+00	8/19	1.52E-01	8/19	7.60E-03	0.49 - 4.57
RADS	Thorium-228	pCi/g	9.40E-01	1.11E+00	1.01E+00	3/3	0/3	1.60E+00	3/3	1.96E-04	3/3	9.80E-06	0.02 - 0.04
RADS	Thorium-230	pCi/g	6.05E-01	2.85E+02	2.37E+01	15/19	6/19	1.40E+00	2/19	3.66E+01	3/19	1.83E+00	0.007 - 0.839
RADS	Thorium-232	pCi/g	9.20E-01	1.16E+00	1.04E+00	3/3	0/3	1.50E+00	3/3	1.96E-01	3/3	9.80E-03	0.007 - 0.02
RADS	Uranium-233/234	pCi/g	7.95E-01	1.59E+02	1.39E+01	15/16	9/16	1.20E+00	13/16	9.90E-01	15/16	4.95E-02	0.422 - 1.41
RADS	Uranium-234	pCi/g	7.50E-01	8.10E+00	3.21E+00	3/3	1/3	1.20E+00	1/3	9.90E-01	3/3	4.95E-02	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	2.90E-02	8.66E+00	1.62E+00	7/19	5/19	6.00E-02	2/19	9.76E-01	6/19	4.88E-02	0.01 - 0.594
RADS	Uranium-238	pCi/g	5.41E-01	1.79E+02	1.39E+01	18/19	13/19	1.20E+00	15/19	8.05E-01	18/19	4.03E-02	0.009 - 0.951
VOC	1,1,1,2-Tetrachloroethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	4.38E-03	0/6	2.19E-04	0.0054 - 0.0062
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.62E+00	0/21	2.81E-01	0.000888 - 0.0062
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.92E-04	0/21	2.96E-05	0.000888 - 0.0062
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.13E+01	0/15	2.56E+00	0.00444 - 0.00653
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	2.69E-04	0/21	1.35E-05	0.000888 - 0.0062
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.56E-02	0/21	7.82E-04	0.000888 - 0.0062
VOC	1,1-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/21	N/A	N/A	0/21	2.04E-01	0/21	1.02E-02	0.000888 - 0.0062
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.18E-02	0/15	2.09E-03	0.000888 - 0.00131
VOC	1,2,3-Trichloropropane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	6.48E-06	0/6	3.24E-07	0.0054 - 0.0062
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.32E-02	0/15	1.16E-03	0.000888 - 0.00131
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.88E-06	0/15	1.44E-07	0.000888 - 0.00131
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.20E-05	0/21	2.10E-06	0.000888 - 0.0062
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.90E-01	0/15	2.95E-02	0.000888 - 0.00131
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	9.69E-04	0/21	4.84E-05	0.000888 - 0.0062
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.48E-03	0/21	2.74E-04	0.000888 - 0.0062
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.81E-01	0/21	1.90E-02	0.000888 - 0.0062
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.90E-01	0/15	2.95E-02	0.000888 - 0.00131
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	9.24E-03	0/15	4.62E-04	0.000888 - 0.00131
VOC	1,4-Dioxane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.88E-03	0/15	9.42E-05	0.0444 - 0.0653
VOC	2-Butanone	mg/kg	3.53E-03	3.15E-02	1.86E-02	5/15	N/A	N/A	0/15	2.32E+00	0/15	1.16E-01	0.00444 - 0.00653
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.76E-05	0/15	1.38E-06	0.00444 - 0.00653
VOC	2-Hexanone	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.75E-02	0/21	8.75E-04	0.00444 - 0.025
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	6.44E-02	0/15	3.22E-03	0.000888 - 0.00131
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.62E-01	0/21	2.81E-02	0.00444 - 0.025
VOC	Acetone	mg/kg	1.63E-03	1.95E-01	5.37E-02	16/19	N/A	N/A	0/19	7.36E+00	0/19	3.68E-01	0.00444 - 0.025
VOC	Acrolein	mg/kg	2.44E-03	2.44E-03	2.44E-03	1/15	N/A	N/A	1/15	1.68E-05	1/15	8.41E-07	0.00444 - 0.00653
VOC	Acrylonitrile	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.28E-04	0/15	1.14E-05	0.00444 - 0.00653
VOC	Benzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.66E-03	0/21	2.33E-04	0.000888 - 0.0062
VOC	Bromochloromethane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.16E-02	0/15	2.08E-03	0.000888 - 0.00131
VOC	Bromodichloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	7.30E-04	0/21	3.65E-05	0.000888 - 0.0062
VOC	Bromoform	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.75E-02	0/21	8.73E-04	0.000888 - 0.0062

Table 4.31. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Bromomethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.82E-03	0/21	1.91E-04	0.000888 - 0.012
VOC	Carbon disulfide	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.80E-01	0/21	2.40E-02	0.00444 - 0.00653
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.54E-03	0/21	1.77E-04	0.000888 - 0.0062
VOC	Chlorobenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.06E-01	0/21	5.28E-03	0.000888 - 0.0062
VOC	Chloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.74E+00	0/21	2.37E-01	0.000888 - 0.012
VOC	Chloroform	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.22E-03	0/21	6.12E-05	0.000888 - 0.0062
VOC	Chloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.05E-02	0/21	5.26E-04	0.000888 - 0.012
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.20E-03	1.77E-01	4.92E-02	4/21	N/A	N/A	1/21	2.12E-02	4/21	1.06E-03	0.000888 - 0.112
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.36E-03	0/21	1.68E-04	0.000888 - 0.0062
VOC	Cumene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.48E+00	0/15	7.38E-02	0.000888 - 0.00131
VOC	Cyclohexane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.60E+01	0/15	1.30E+00	0.000888 - 0.00131
VOC	Dibromochloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.64E-03	0/21	2.32E-04	0.000888 - 0.0062
VOC	Dibromomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	3.94E-03	0/6	1.97E-04	0.0054 - 0.0062
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.08E-01	0/21	3.04E-02	0.000888 - 0.012
VOC	Ethyl methacrylate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	2.14E-01	0/6	1.07E-02	0.0054 - 0.0062
VOC	Ethylbenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.36E-02	0/21	1.68E-03	0.000888 - 0.0062
VOC	Iodomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.05E-02	0/6	5.26E-04	0.0054 - 0.0062
VOC	m,p-Xylene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.82E-01	0/21	1.91E-02	0.00178 - 0.0062
VOC	Methyl acetate	mg/kg	--	--	--	0/15	N/A	N/A	0/15	8.22E+00	0/15	4.11E-01	0.00444 - 0.00653
VOC	Methylcyclohexane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.80E+01	0/15	1.40E+00	0.000888 - 0.00131
VOC	Methylene chloride	mg/kg	2.67E-03	1.40E-02	7.81E-03	10/21	N/A	N/A	0/21	5.44E-02	9/21	2.72E-03	0.00444 - 0.00653
VOC	Styrene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	2.66E+00	0/21	1.33E-01	0.000888 - 0.0062
VOC	Tetrachloroethene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.69E-02	0/21	1.84E-03	0.000888 - 0.0062
VOC	Toluene	mg/kg	5.00E-04	6.54E-03	2.69E-03	6/21	N/A	N/A	0/21	1.52E+00	0/21	7.62E-02	0.000888 - 0.0062
VOC	Total Xylene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	3.82E-01	0/15	1.91E-02	0.00266 - 0.00392
VOC	*trans* -1,2-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/21	N/A	N/A	0/21	5.83E-02	1/21	2.91E-03	0.000888 - 0.0062
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.36E-03	0/21	1.68E-04	0.000888 - 0.0062
VOC	*Trans* -1,4-Dichloro-2-butene	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.24E-05	0/6	6.22E-07	0.011 - 0.012
VOC	Trichloroethene	mg/kg	2.14E-03	6.28E-02	2.44E-02	3/21	N/A	N/A	3/21	2.02E-03	3/21	1.01E-04	0.000888 - 0.125
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.46E+00	0/21	7.31E-02	0.000888 - 0.0062
VOC	Vinyl acetate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.74E-01	0/6	8.70E-03	0.0054 - 0.0062
VOC	Vinyl chloride	mg/kg	5.88E-03	5.88E-03	5.88E-03	1/21	N/A	N/A	1/21	1.29E-04	1/21	6.47E-06	0.000888 - 0.0062

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salt).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.32. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 6

Type	Analysis	Unit	Detected Results			Frequency of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detection	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.24E+03	1.43E+04	8.02E+03	27/27	3/27	1.20E+04	0/27	5.99E+04	24/27	3.00E+03	9.88 - 119
METAL	Antimony	mg/kg	4.53E-01	7.31E-01	5.62E-01	4/27	4/27	2.10E-01	1/27	7.04E-01	4/27	3.52E-02	2.06 - 22.6
METAL	Arsenic	mg/kg	6.03E-01	5.42E+01	4.65E+00	27/27	3/27	7.90E+00	27/27	3.02E-02	27/27	1.51E-03	0.988 - 1.19
METAL	Barium	mg/kg	5.54E+00	6.67E+01	2.53E+01	27/27	0/27	1.70E+02	0/27	3.11E+02	19/27	1.55E+01	0.79 - 0.955
METAL	Beryllium	mg/kg	1.46E-01	1.16E+00	5.92E-01	27/27	10/27	6.90E-01	0/27	3.89E+01	0/27	1.95E+00	0.0988 - 0.119
METAL	Boron	mg/kg	9.86E-01	1.98E+00	1.33E+00	9/27	N/A	N/A	0/27	2.56E+01	5/27	1.28E+00	2.96 - 3.58
METAL	Cadmium	mg/kg	2.08E-02	5.44E-02	3.19E-02	6/27	0/27	2.10E-01	0/27	1.39E+00	0/27	6.93E-02	0.198 - 0.239
METAL	Chromium	mg/kg	4.44E+00	6.00E+01	1.57E+01	27/27	2/27	4.30E+01	0/27	3.60E+06	0/27	1.80E+05	0.593 - 0.716
METAL	Cobalt	mg/kg	7.96E-01	2.53E+01	5.33E+00	27/27	2/27	1.30E+01	27/27	5.43E-01	27/27	2.71E-02	0.198 - 0.239
METAL	Copper	mg/kg	1.20E+00	9.67E+00	3.90E+00	27/27	0/27	2.50E+01	0/27	5.62E+01	19/27	2.81E+00	0.395 - 0.477
METAL	Iron	mg/kg	4.61E+03	5.95E+04	1.90E+04	27/27	7/27	2.80E+04	27/27	7.04E+02	27/27	3.52E+01	19.8 - 238
METAL	Lead	mg/kg	1.29E+00	1.72E+01	4.49E+00	27/27	0/27	2.30E+01	0/27	2.70E+02	1/27	1.35E+01	0.395 - 0.477
METAL	Manganese	mg/kg	1.00E+01	9.65E+02	1.17E+02	27/27	1/27	8.20E+02	14/27	5.65E+01	27/27	2.83E+00	0.988 - 11.4
METAL	Mercury	mg/kg	9.78E-03	1.63E-02	1.30E-02	2/27	0/27	1.30E-01	0/27	5.91E-01	0/27	2.95E-02	0.0227 - 0.0291
METAL	Molybdenum	mg/kg	9.21E-02	9.77E-01	3.02E-01	26/27	N/A	N/A	0/27	4.03E+00	15/27	2.02E-01	0.198 - 0.239
METAL	Nickel	mg/kg	2.20E+00	1.19E+01	5.72E+00	27/27	0/27	2.20E+01	0/27	5.12E+01	25/27	2.56E+00	0.395 - 0.477
METAL	Selenium	mg/kg	4.23E-01	2.40E+00	9.69E-01	21/27	11/27	7.00E-01	6/27	1.04E+00	21/27	5.19E-02	0.988 - 1.19
METAL	Silver	mg/kg	1.43E-01	2.32E+00	6.59E-01	11/27	0/27	2.70E+00	1/27	1.60E+00	11/27	7.99E-02	0.514 - 5.79
METAL	Thallium	mg/kg	1.71E-01	1.95E-01	1.83E-01	3/27	0/27	3.40E-01	3/27	2.84E-02	3/27	1.42E-03	0.395 - 0.477
METAL	Uranium[a]	mg/kg	3.24E-01	2.51E+00	9.79E-01	27/27	0/27	4.60E+00	0/27	3.60E+00	27/27	1.80E-01	0.0395 - 0.0477
METAL	Vanadium	mg/kg	4.36E+00	6.33E+01	2.29E+01	27/27	5/27	3.70E+01	0/27	1.73E+02	24/27	8.64E+00	3.95 - 4.77
METAL	Zinc	mg/kg	3.31E+00	3.35E+01	1.61E+01	27/27	0/27	6.00E+01	0/27	7.46E+02	0/27	3.73E+01	3.95 - 4.77
ANION	Fluoride	mg/kg	7.17E-01	4.05E+00	2.18E+00	27/27	N/A	N/A	0/27	2.40E+02	0/27	1.20E+01	1.02 - 1.22
PPCB	Total PCB[b]	mg/kg	5.49E-03	5.49E-03	5.49E-03	1/28	N/A	N/A	0/28	1.36E-01	0/28	6.82E-03	0.00355 - 0.0043
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.74E-02	0/28	8.72E-04	0.352 - 0.43
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.04E+00	0/28	4.02E-01	0.352 - 0.43
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.32E-02	0/28	1.16E-03	0.352 - 0.43
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.52E-02	0/28	2.26E-03	0.352 - 0.43
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.42E-01	0/28	4.21E-02	0.352 - 0.43
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.72E-02	0/28	4.36E-03	0.703 - 0.861
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.42E-03	0/28	3.21E-04	0.352 - 0.43
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.33E-03	0/28	6.67E-05	0.352 - 0.43
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.70E+00	0/28	3.85E-01	0.0352 - 0.043
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.78E-01	0/28	8.91E-03	0.352 - 0.43
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.16E-03	0/28	2.58E-04	0.352 - 0.43
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.70E-01	0/28	1.85E-02	0.0352 - 0.043
SVOC	2-Methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.51E+00	0/28	7.53E-02	0.352 - 0.43
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.60E-01	0/28	8.01E-03	0.352 - 0.43
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.72E-02	0/28	4.36E-03	0.352 - 0.43
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.65E-02	0/28	8.24E-04	0.352 - 0.43
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.90E-03	0/28	2.45E-04	0.352 - 0.43
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.84E-03	0/28	3.42E-04	0.352 - 0.43
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.42E+00	0/28	1.71E-01	0.352 - 0.43
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.10E-03	0/28	1.55E-04	0.352 - 0.43
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.84E-03	0/28	3.42E-04	0.352 - 0.43

Table 4.32. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results			Frequency of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detection	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.72E-02	0/28	4.36E-03	0.352 - 0.43
SVOC	Acenaphthene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOC	Acenaphthylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOC	Acetophenone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.17E+00	0/28	5.84E-02	0.352 - 0.43
SVOC	Anthracene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.16E+02	0/28	5.81E+00	0.0352 - 0.043
SVOC	Atrazine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.92E-03	0/28	1.96E-04	0.352 - 0.43
SVOC	Benzaldehyde	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.30E-02	0/28	4.15E-03	0.352 - 0.43
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.63E+01	0/28	1.32E+00	0.0352 - 0.043
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.70E-02	0/28	1.35E-03	0.352 - 0.43
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.22E-05	0/28	3.61E-06	0.352 - 0.43
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.62E-03	0/28	1.31E-04	0.352 - 0.43
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.30E-02	1.73E-02	1.52E-02	2/28	N/A	N/A	0/28	2.66E+01	0/28	1.33E+00	0.0352 - 0.043
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.72E+00	0/28	2.36E-01	0.0352 - 0.043
SVOC	Caprolactam	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.94E+00	0/28	2.47E-01	0.352 - 0.43
SVOC	Carbazole	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.51E-01	0/28	3.76E-02	0.0352 - 0.043
SVOC	Dibenzofuran	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.92E-01	0/28	1.46E-02	0.352 - 0.43
SVOC	Diethyl phthalate	mg/kg	1.22E-02	1.65E-02	1.42E-02	3/28	N/A	N/A	0/28	1.22E+01	0/28	6.08E-01	0.0352 - 0.043
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.22E+01	0/28	6.08E-01	0.0352 - 0.043
SVOC	Di-n-butyl phthalate	mg/kg	1.40E-02	4.63E-02	2.28E-02	18/28	N/A	N/A	0/28	4.54E+00	0/28	2.27E-01	0.0352 - 0.043
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.13E+02	0/28	5.65E+00	0.0352 - 0.043
SVOC	Diphenylamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.66E+00	0/28	2.33E-01	0.352 - 0.43
SVOC	Fluoranthene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.78E+02	0/28	8.91E+00	0.0352 - 0.043
SVOC	Fluorene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.09E+01	0/28	5.45E-01	0.0352 - 0.043
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.46E-03	0/28	1.23E-04	0.352 - 0.43
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.34E-03	0/28	2.67E-04	0.352 - 0.43
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.56E-03	0/28	1.28E-04	0.352 - 0.43
SVOC	Hexachloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.00E-03	0/28	2.00E-04	0.352 - 0.43
SVOC	Isophorone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.16E-01	0/28	2.58E-02	0.352 - 0.43
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.94E-01	0/28	2.97E-02	0.352 - 0.43
SVOC	Naphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.70E-03	0/28	3.85E-04	0.0352 - 0.043
SVOC	Nitrobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.83E-03	0/28	9.17E-05	0.352 - 0.43
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.62E-04	0/28	8.10E-06	0.352 - 0.43
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.14E-03	0/28	5.71E-05	0.352 - 0.43
SVOC	Phenanthrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOC	Phenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.62E+00	0/28	3.31E-01	0.352 - 0.43
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.16E-02	0/28	1.58E-03	0.352 - 0.43
SVOC	Pyrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.63E+01	0/28	1.32E+00	0.0352 - 0.043
SVOC	Total PAH[c]	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.89E-01	0/28	2.94E-02	-
RADS	Americium-241	pCi/g	1.39E-01	1.39E-01	1.39E-01	1/27	N/A	N/A	0/27	1.92E+01	0/27	9.58E-01	0.139 - 0.827
RADS	Cesium-137	pCi/g	--	--	--	0/27	0/27	2.80E-01	0/27	9.58E+00	0/27	4.79E-01	0.0214 - 0.082
RADS	Neptunium-237	pCi/g	--	--	--	0/27	N/A	N/A	0/27	1.07E+00	0/27	5.36E-02	0.328 - 0.786
RADS	Plutonium-238	pCi/g	--	--	--	0/27	N/A	N/A	0/27	4.38E+00	0/27	2.19E-01	0.255 - 0.853
RADS	Plutonium-239/240	pCi/g	--	--	--	0/27	N/A	N/A	0/27	4.26E+00	0/27	2.13E-01	0.272 - 1.1
RADS	Technetium-99	pCi/g	--	--	--	0/27	0/27	2.80E+00	0/27	1.52E-01	0/27	7.60E-03	2.41 - 3.6
RADS	Thorium-230	pCi/g	4.59E-01	1.20E+00	8.24E-01	19/27	0/27	1.40E+00	0/27	3.66E+01	0/27	1.83E+00	0.285 - 0.912

Table 4.32. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

			Detected Results			Frequency of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detection	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	4.54E-01	1.23E+00	8.95E-01	10/27	1/27	1.20E+00	4/27	9.90E-01	10/27	4.95E-02	0.428 - 1.32
RADS	Uranium-235/236	pCi/g	--	--	--	0/27	0/27	6.00E-02	0/27	9.76E-01	0/27	4.88E-02	0.256 - 0.901
RADS	Uranium-238	pCi/g	4.65E-01	1.26E+00	8.66E-01	19/27	2/27	1.20E+00	12/27	8.05E-01	19/27	4.03E-02	0.244 - 1.21
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.62E+00	0/28	2.81E-01	0.00091 - 0.00133
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.92E-04	0/28	2.96E-05	0.00091 - 0.00133
VOC	trifluoroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.13E+01	0/28	2.56E+00	0.00455 - 0.00666
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.69E-04	0/28	1.35E-05	0.00091 - 0.00133
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.56E-02	0/28	7.82E-04	0.00091 - 0.00133
VOC	1,1-Dichloroethene	mg/kg	7.98E-04	7.98E-04	7.98E-04	1/28	N/A	N/A	0/28	2.04E-01	0/28	1.02E-02	0.00091 - 0.00133
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.18E-02	0/28	2.09E-03	0.00091 - 0.00133
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.32E-02	0/28	1.16E-03	0.00091 - 0.00133
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.88E-06	0/28	1.44E-07	0.00091 - 0.00133
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.20E-05	0/28	2.10E-06	0.00091 - 0.00133
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.90E-01	0/28	2.95E-02	0.00091 - 0.00133
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.69E-04	0/28	4.84E-05	0.00091 - 0.00133
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.48E-03	0/28	2.74E-04	0.00091 - 0.00133
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.81E-01	0/28	1.90E-02	0.00091 - 0.00133
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.90E-01	0/28	2.95E-02	0.00091 - 0.00133
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.24E-03	0/28	4.62E-04	0.00091 - 0.00133
VOC	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.88E-03	0/28	9.42E-05	0.0455 - 0.0666
VOC	2-Butanone	mg/kg	1.56E-03	1.19E-02	6.73E-03	2/28	N/A	N/A	0/28	2.32E+00	0/28	1.16E-01	0.00455 - 0.00666
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.76E-05	0/28	1.38E-06	0.00455 - 0.00666
VOC	2-Hexanone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.75E-02	0/28	8.75E-04	0.00455 - 0.00666
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.44E-02	0/28	3.22E-03	0.00091 - 0.00133
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.62E-01	0/28	2.81E-02	0.00455 - 0.00666
VOC	Acetone	mg/kg	1.94E-03	6.46E-02	1.13E-02	9/28	N/A	N/A	0/28	7.36E+00	0/28	3.68E-01	0.00455 - 0.00666
VOC	Acrolein	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.68E-05	0/28	8.41E-07	0.00455 - 0.00666
VOC	Acrylonitrile	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.28E-04	0/28	1.14E-05	0.00455 - 0.00666
VOC	Benzene	mg/kg	5.14E-04	5.14E-04	5.14E-04	1/28	N/A	N/A	0/28	4.66E-03	1/28	2.33E-04	0.00091 - 0.00133
VOC	Bromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.16E-02	0/28	2.08E-03	0.00091 - 0.00133
VOC	Bromodichloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.30E-04	0/28	3.65E-05	0.00091 - 0.00133
VOC	Bromoform	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.75E-02	0/28	8.73E-04	0.00091 - 0.00133
VOC	Bromomethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.82E-03	0/28	1.91E-04	0.00091 - 0.00133
VOC	Carbon disulfide	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.80E-01	0/28	2.40E-02	0.00455 - 0.00666
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.54E-03	0/28	1.77E-04	0.00091 - 0.00133
VOC	Chlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.06E-01	0/28	5.28E-03	0.00091 - 0.00133
VOC	Chloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.74E+00	0/28	2.37E-01	0.00091 - 0.00133
VOC	Chloroform	mg/kg	3.88E-04	1.68E-03	7.84E-04	4/28	N/A	N/A	1/28	1.22E-03	4/28	6.12E-05	0.00091 - 0.00133
VOC	Chloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.05E-02	0/28	5.26E-04	0.00091 - 0.00133
VOC	*cis* -1,2-Dichloroethene	mg/kg	4.30E-04	1.05E-01	1.79E-02	11/28	N/A	N/A	2/28	2.12E-02	8/28	1.06E-03	0.00091 - 0.105
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.36E-03	0/28	1.68E-04	0.00091 - 0.00133
VOC	Cumene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.48E+00	0/28	7.38E-02	0.00091 - 0.00133
VOC	Cyclohexane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.60E+01	0/28	1.30E+00	0.00091 - 0.00133
VOC	Dibromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.64E-03	0/28	2.32E-04	0.00091 - 0.00133
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.08E-01	0/28	3.04E-02	0.00091 - 0.00133

Table 4.32. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results			Frequency of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detection	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Ethylbenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.36E-02	0/28	1.68E-03	0.00091 - 0.00133
VOC	m,p-Xylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.82E-01	0/28	1.91E-02	0.00182 - 0.00266
VOC	Methyl acetate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.22E+00	0/28	4.11E-01	0.00455 - 0.00666
VOC	Methylcyclohexane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.80E+01	0/28	1.40E+00	0.00091 - 0.00133
VOC	Methylene chloride	mg/kg	2.23E-03	2.79E-03	2.47E-03	8/28	N/A	N/A	0/28	5.44E-02	2/28	2.72E-03	0.00455 - 0.00666
VOC	Styrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.66E+00	0/28	1.33E-01	0.00091 - 0.00133
VOC	Tetrachloroethene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.69E-02	0/28	1.84E-03	0.00091 - 0.00133
VOC	Toluene	mg/kg	5.86E-04	5.86E-04	5.86E-04	1/28	N/A	N/A	0/28	1.52E+00	0/28	7.62E-02	0.00091 - 0.00133
VOC	Total Xylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.82E-01	0/28	1.91E-02	0.00273 - 0.00399
VOC	*trans* -1,2-Dichloroethene	mg/kg	7.98E-04	7.98E-04	7.98E-04	1/28	N/A	N/A	0/28	5.83E-02	0/28	2.91E-03	0.00091 - 0.00133
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.36E-03	0/28	1.68E-04	0.00091 - 0.00133
VOC	Trichloroethene	mg/kg	3.97E-04	1.24E-01	1.91E-02	10/28	N/A	N/A	6/28	2.02E-03	10/28	1.01E-04	0.00091 - 0.105
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.46E+00	0/28	7.31E-02	0.00091 - 0.00133
VOC	Vinyl chloride	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.29E-04	0/28	6.47E-06	0.00091 - 0.00133

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salt).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.33. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 6

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.82E+03	1.39E+04	8.35E+03	6/6	5/6	3.00E+03	12.2 - 14.4
METAL	Antimony	mg/kg	--	--	--	0/6	0/6	3.52E-02	2.62 - 24.6
METAL	Arsenic	mg/kg	9.17E-01	2.97E+01	8.67E+00	6/6	6/6	1.51E-03	1.22 - 1.44
METAL	Barium	mg/kg	1.11E+01	3.07E+02	8.23E+01	6/6	4/6	1.55E+01	1.11 - 9.75
METAL	Beryllium	mg/kg	2.13E-01	3.03E+00	1.03E+00	6/6	1/6	1.95E+00	0.122 - 0.144
METAL	Boron	mg/kg	2.28E+00	3.33E+01	1.25E+01	6/6	6/6	1.28E+00	3.66 - 4.31
METAL	Cadmium	mg/kg	3.11E-02	7.74E-01	2.97E-01	3/6	2/6	6.93E-02	0.244 - 0.287
METAL	Chromium	mg/kg	7.95E+00	6.69E+01	4.33E+01	6/6	0/6	1.80E+05	0.731 - 0.862
METAL	Cobalt	mg/kg	1.05E+00	4.04E+01	1.50E+01	6/6	6/6	2.71E-02	0.244 - 0.287
METAL	Copper	mg/kg	2.08E+00	2.94E+01	9.10E+00	6/6	5/6	2.81E+00	0.487 - 0.574
METAL	Iron	mg/kg	6.60E+03	2.73E+05	6.19E+04	6/6	6/6	3.52E+01	27.8 - 2440
METAL	Lead	mg/kg	2.08E+00	2.41E+01	8.80E+00	6/6	1/6	1.35E+01	0.487 - 0.574
METAL	Manganese	mg/kg	1.92E+01	2.47E+03	4.36E+02	6/6	6/6	2.83E+00	1.38 - 122
METAL	Mercury	mg/kg	1.77E-02	1.77E-02	1.77E-02	1/6	0/6	2.95E-02	0.0275 - 0.0331
METAL	Molybdenum	mg/kg	1.22E-01	4.17E+00	1.24E+00	5/6	3/6	2.02E-01	0.244 - 0.287
METAL	Nickel	mg/kg	2.11E+00	4.91E+01	2.46E+01	6/6	5/6	2.56E+00	0.487 - 0.574
METAL	Selenium	mg/kg	1.01E+00	3.85E+00	2.26E+00	6/6	6/6	5.19E-02	1.22 - 1.44
METAL	Silver	mg/kg	2.60E+00	2.60E+00	2.60E+00	1/6	1/6	7.99E-02	0.654 - 6.15
METAL	Thallium	mg/kg	2.07E-01	7.73E-01	4.90E-01	2/6	2/6	1.42E-03	0.487 - 0.574
METAL	Uranium[a]	mg/kg	6.85E-01	4.13E+00	2.18E+00	6/6	6/6	1.80E-01	0.0487 - 0.0574
METAL	Vanadium	mg/kg	1.15E+01	3.27E+01	1.99E+01	6/6	6/6	8.64E+00	4.87 - 5.74
METAL	Zinc	mg/kg	1.06E+01	1.24E+02	6.44E+01	6/6	4/6	3.73E+01	4.87 - 28.7
ANION	Fluoride	mg/kg	1.38E+00	5.67E+00	2.72E+00	6/6	0/6	1.20E+01	1.2 - 1.54
PPCB	Total PCB[b]	mg/kg	--	--	--	0/6	0/6	6.82E-03	0.0049 - 0.00546
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/6	0/6	8.72E-04	0.487 - 0.544
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/6	0/6	4.02E-01	0.487 - 0.544
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/6	0/6	1.16E-03	0.487 - 0.544
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/6	0/6	2.26E-03	0.487 - 0.544
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/6	0/6	4.21E-02	0.487 - 0.544
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/6	0/6	4.36E-03	0.974 - 1.09
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/6	0/6	3.21E-04	0.487 - 0.544
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/6	0/6	6.67E-05	0.487 - 0.544
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/6	0/6	3.85E-01	0.0487 - 0.0544
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/6	0/6	8.91E-03	0.487 - 0.544
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/6	0/6	2.58E-04	0.487 - 0.544
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/6	0/6	1.85E-02	0.0487 - 0.0544
SVOC	2-Methylphenol	mg/kg	--	--	--	0/6	0/6	7.53E-02	0.487 - 0.544
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/6	0/6	8.01E-03	0.487 - 0.544
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/6	0/6	4.36E-03	0.487 - 0.544
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/6	0/6	8.24E-04	0.487 - 0.544
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/6	0/6	2.45E-04	0.487 - 0.544
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/6	0/6	3.42E-04	0.487 - 0.544
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/6	0/6	1.71E-01	0.487 - 0.544
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/6	0/6	1.55E-04	0.487 - 0.544
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/6	0/6	3.42E-04	0.487 - 0.544

Table 4.33. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	Freq. of Detect.	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/6	0/6	4.36E-03	0.487 - 0.544
SVOC	Acenaphthene	mg/kg	--	--	--	0/6	0/6	5.49E-01	0.0487 - 0.0544
SVOC	Acenaphthylene	mg/kg	--	--	--	0/6	0/6	5.49E-01	0.0487 - 0.0544
SVOC	Acetophenone	mg/kg	--	--	--	0/6	0/6	5.84E-02	0.487 - 0.544
SVOC	Anthracene	mg/kg	--	--	--	0/6	0/6	5.81E+00	0.0487 - 0.0544
SVOC	Atrazine	mg/kg	--	--	--	0/6	0/6	1.96E-04	0.487 - 0.544
SVOC	Benzaldehyde	mg/kg	--	--	--	0/6	0/6	4.15E-03	0.487 - 0.544
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/6	0/6	1.32E+00	0.0487 - 0.0544
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/6	0/6	1.35E-03	0.487 - 0.544
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/6	0/6	3.61E-06	0.487 - 0.544
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/6	0/6	1.31E-04	0.487 - 0.544
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.70E-02	1.70E-02	1.70E-02	1/6	0/6	1.33E+00	0.0487 - 0.0544
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/6	0/6	2.36E-01	0.0487 - 0.0544
SVOC	Caprolactam	mg/kg	--	--	--	0/6	0/6	2.47E-01	0.487 - 0.544
SVOC	Carbazole	mg/kg	--	--	--	0/6	0/6	3.76E-02	0.0487 - 0.0544
SVOC	Dibenzofuran	mg/kg	--	--	--	0/6	0/6	1.46E-02	0.487 - 0.544
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/6	0/6	6.08E-01	0.0487 - 0.0544
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/6	0/6	6.08E-01	0.0487 - 0.0544
SVOC	Di-n-butyl phthalate	mg/kg	2.73E-02	2.73E-02	2.73E-02	1/6	0/6	2.27E-01	0.0487 - 0.0544
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/6	0/6	5.65E+00	0.0487 - 0.0544
SVOC	Diphenylamine	mg/kg	--	--	--	0/6	0/6	2.33E-01	0.487 - 0.544
SVOC	Fluoranthene	mg/kg	--	--	--	0/6	0/6	8.91E+00	0.0487 - 0.0544
SVOC	Fluorene	mg/kg	--	--	--	0/6	0/6	5.45E-01	0.0487 - 0.0544
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/6	0/6	1.23E-04	0.487 - 0.544
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/6	0/6	2.67E-04	0.487 - 0.544
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/6	0/6	1.28E-04	0.487 - 0.544
SVOC	Hexachloroethane	mg/kg	--	--	--	0/6	0/6	2.00E-04	0.487 - 0.544
SVOC	Isophorone	mg/kg	--	--	--	0/6	0/6	2.58E-02	0.487 - 0.544
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/6	0/6	2.97E-02	0.487 - 0.544
SVOC	Naphthalene	mg/kg	--	--	--	0/6	0/6	3.85E-04	0.0487 - 0.0544
SVOC	Nitrobenzene	mg/kg	--	--	--	0/6	0/6	9.17E-05	0.487 - 0.544
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/6	0/6	8.10E-06	0.487 - 0.544
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/6	0/6	5.71E-05	0.487 - 0.544
SVOC	Phenanthrene	mg/kg	--	--	--	0/6	0/6	5.49E-01	0.0487 - 0.0544
SVOC	Phenol	mg/kg	--	--	--	0/6	0/6	3.31E-01	0.487 - 0.544
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/6	0/6	1.58E-03	0.487 - 0.544
SVOC	Pyrene	mg/kg	--	--	--	0/6	0/6	1.32E+00	0.0487 - 0.0544
SVOC	Total PAH[c]	mg/kg	--	--	--	0/6	0/6	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/6	0/6	9.58E-01	0.388 - 0.762
RADS	Cesium-137	pCi/g	--	--	--	0/6	0/6	4.79E-01	0.0424 - 0.0664
RADS	Neptunium-237	pCi/g	--	--	--	0/6	0/6	5.36E-02	0.47 - 1
RADS	Plutonium-238	pCi/g	--	--	--	0/6	0/6	2.19E-01	0.365 - 0.468
RADS	Plutonium-239/240	pCi/g	--	--	--	0/6	0/6	2.13E-01	0.445 - 0.623
RADS	Technetium-99	pCi/g	--	--	--	0/6	0/6	7.60E-03	2.76 - 4.59
RADS	Thorium-230	pCi/g	7.87E-01	1.79E+00	1.33E+00	3/6	0/6	1.83E+00	0.579 - 1.11

Table 4.33. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. of Detect.	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	7.22E-01	1.92E+00	1.13E+00	4/6	4/6	4.95E-02	0.534 - 1.15
RADS	Uranium-235/236	pCi/g	3.38E-01	3.38E-01	3.38E-01	1/6	1/6	4.88E-02	0.253 - 0.858
RADS	Uranium-238	pCi/g	4.62E-01	1.36E+00	8.63E-01	5/6	5/6	4.03E-02	0.327 - 1.25
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/6	0/6	2.81E-01	0.00148 - 0.00167
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/6	0/6	2.96E-05	0.00148 - 0.00167
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/6	0/6	2.56E+00	0.00741 - 0.00836
VOC	1,1,2-Trichloroethane	mg/kg	1.24E-03	1.24E-03	1.24E-03	1/6	1/6	1.35E-05	0.00148 - 0.00167
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/6	0/6	7.82E-04	0.00148 - 0.00167
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/6	0/6	1.02E-02	0.00148 - 0.00167
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/6	0/6	2.09E-03	0.00148 - 0.00167
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/6	0/6	1.16E-03	0.00148 - 0.00167
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/6	0/6	1.44E-07	0.00148 - 0.00167
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/6	0/6	2.10E-06	0.00148 - 0.00167
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	2.95E-02	0.00148 - 0.00167
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/6	0/6	4.84E-05	0.00148 - 0.00167
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/6	0/6	2.74E-04	0.00148 - 0.00167
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/6	0/6	1.90E-02	0.00148 - 0.00167
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	2.95E-02	0.00148 - 0.00167
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	4.62E-04	0.00148 - 0.00167
VOC	1,4-Dioxane	mg/kg	--	--	--	0/6	0/6	9.42E-05	0.0741 - 0.0836
VOC	2-Butanone	mg/kg	--	--	--	0/6	0/6	1.16E-01	0.00741 - 0.00836
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/6	0/6	1.38E-06	0.00741 - 0.00836
VOC	2-Hexanone	mg/kg	--	--	--	0/6	0/6	8.75E-04	0.00741 - 0.00836
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/6	0/6	3.22E-03	0.00148 - 0.00167
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/6	0/6	2.81E-02	0.00741 - 0.00836
VOC	Acetone	mg/kg	3.89E-03	5.68E-02	1.78E-02	5/6	0/6	3.68E-01	0.00741 - 0.00836
VOC	Acrolein	mg/kg	2.93E-03	2.93E-03	2.93E-03	1/6	1/6	8.41E-07	0.00741 - 0.00836
VOC	Acrylonitrile	mg/kg	--	--	--	0/6	0/6	1.14E-05	0.00741 - 0.00836
VOC	Benzene	mg/kg	--	--	--	0/6	0/6	2.33E-04	0.00148 - 0.00167
VOC	Bromochloromethane	mg/kg	--	--	--	0/6	0/6	2.08E-03	0.00148 - 0.00167
VOC	Bromodichloromethane	mg/kg	--	--	--	0/6	0/6	3.65E-05	0.00148 - 0.00167
VOC	Bromoform	mg/kg	--	--	--	0/6	0/6	8.73E-04	0.00148 - 0.00167
VOC	Bromomethane	mg/kg	--	--	--	0/6	0/6	1.91E-04	0.00148 - 0.00167
VOC	Carbon disulfide	mg/kg	6.62E-03	6.62E-03	6.62E-03	1/6	0/6	2.40E-02	0.00741 - 0.00836
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/6	0/6	1.77E-04	0.00148 - 0.00167
VOC	Chlorobenzene	mg/kg	--	--	--	0/6	0/6	5.28E-03	0.00148 - 0.00167
VOC	Chloroethane	mg/kg	--	--	--	0/6	0/6	2.37E-01	0.00148 - 0.00167
VOC	Chloroform	mg/kg	1.01E-03	1.01E-03	1.01E-03	1/6	1/6	6.12E-05	0.00148 - 0.00167
VOC	Chloromethane	mg/kg	--	--	--	0/6	0/6	5.26E-04	0.00148 - 0.00167
VOC	*cis* -1,2-Dichloroethene	mg/kg	1.08E-02	1.08E-02	1.08E-02	1/6	1/6	1.06E-03	0.00148 - 0.00167
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/6	0/6	1.68E-04	0.00148 - 0.00167
VOC	Cumene	mg/kg	--	--	--	0/6	0/6	7.38E-02	0.00148 - 0.00167
VOC	Cyclohexane	mg/kg	--	--	--	0/6	0/6	1.30E+00	0.00148 - 0.00167
VOC	Dibromochloromethane	mg/kg	--	--	--	0/6	0/6	2.32E-04	0.00148 - 0.00167
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/6	0/6	3.04E-02	0.00148 - 0.00167

Table 4.33. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 6 (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	Freq. of Detect.	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
VOC	Ethylbenzene	mg/kg	--	--	--	0/6	0/6	1.68E-03	0.00148 - 0.00167
VOC	m,p-Xylene	mg/kg	--	--	--	0/6	0/6	1.91E-02	0.00296 - 0.00335
VOC	Methyl acetate	mg/kg	--	--	--	0/6	0/6	4.11E-01	0.00741 - 0.00836
VOC	Methylcyclohexane	mg/kg	--	--	--	0/6	0/6	1.40E+00	0.00148 - 0.00167
VOC	Methylene chloride	mg/kg	3.66E-03	3.66E-03	3.66E-03	1/6	1/6	2.72E-03	0.00741 - 0.00836
VOC	Styrene	mg/kg	--	--	--	0/6	0/6	1.33E-01	0.00148 - 0.00167
VOC	Tetrachloroethene	mg/kg	2.15E-03	2.15E-03	2.15E-03	1/6	1/6	1.84E-03	0.00148 - 0.00167
VOC	Toluene	mg/kg	--	--	--	0/6	0/6	7.62E-02	0.00148 - 0.00167
VOC	Total Xylene	mg/kg	--	--	--	0/6	0/6	1.91E-02	0.00445 - 0.00502
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/6	0/6	2.91E-03	0.00148 - 0.00167
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/6	0/6	1.68E-04	0.00148 - 0.00167
VOC	Trichloroethene	mg/kg	1.28E-02	4.16E+00	2.09E+00	2/6	2/6	1.01E-04	0.00148 - 0.15
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/6	0/6	7.31E-02	0.00148 - 0.00167
VOC	Vinyl chloride	mg/kg	--	--	--	0/6	0/6	6.47E-06	0.00148 - 0.00167

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salt).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

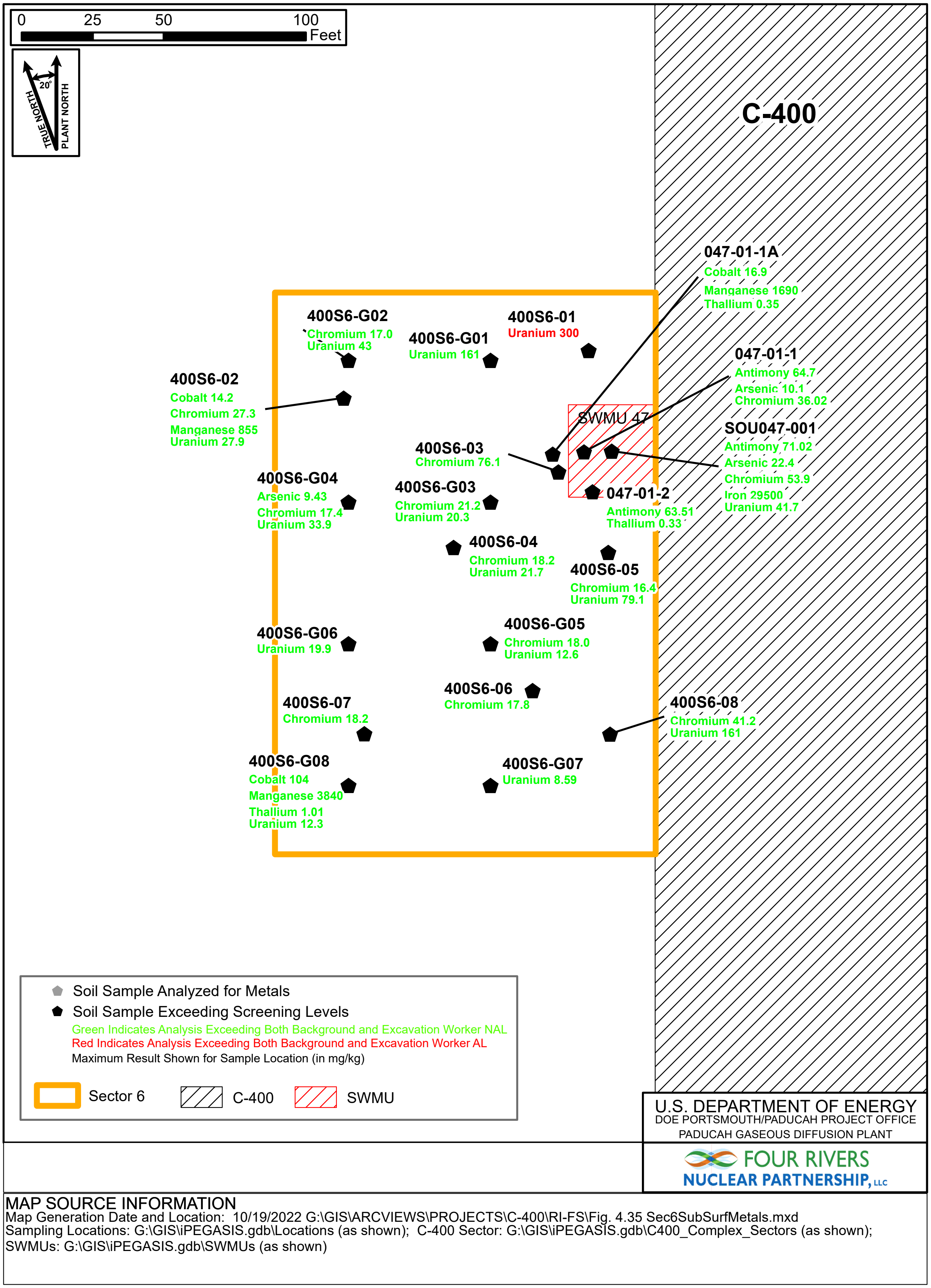
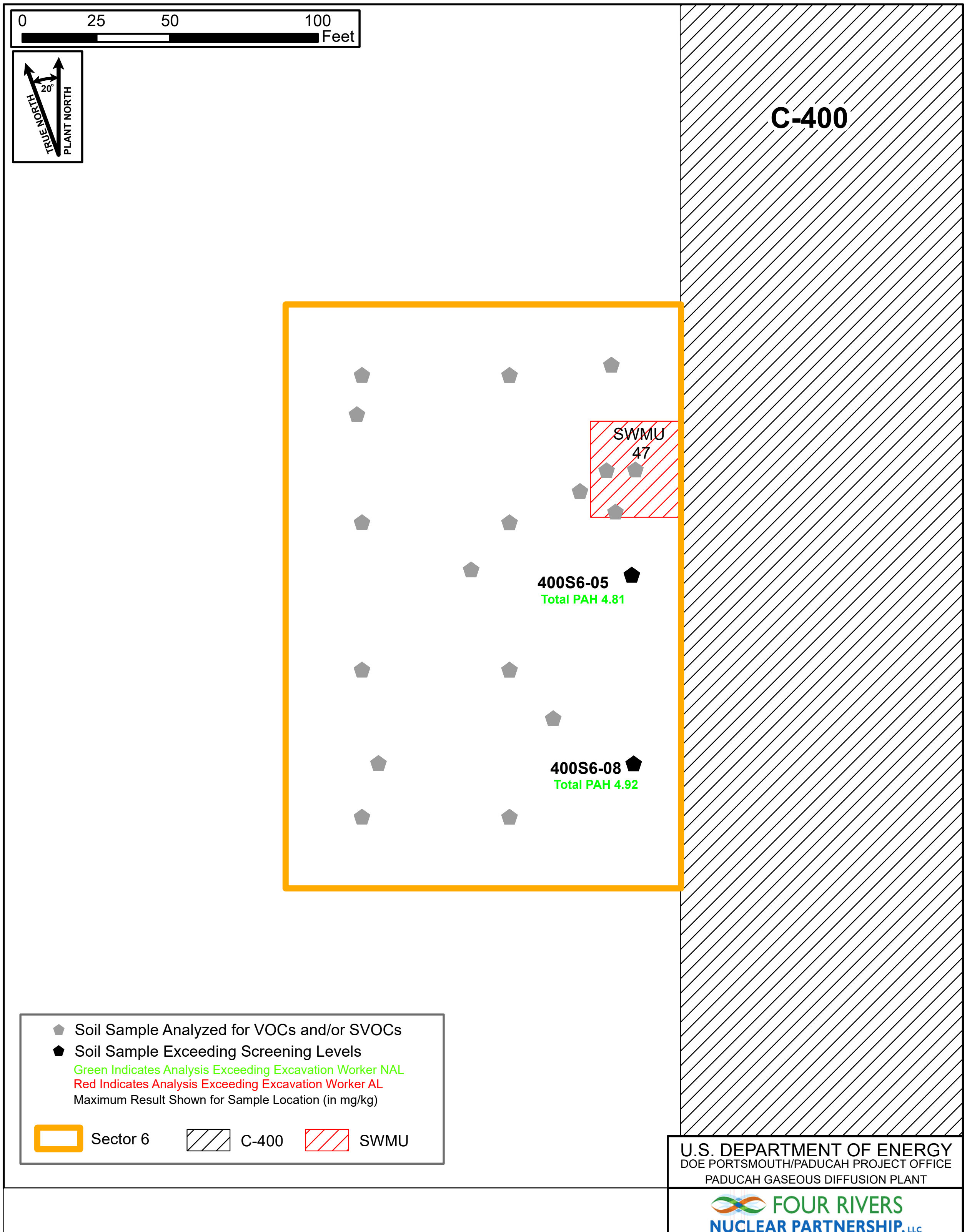


Figure 4.35. Sector 6 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals



MAP SOURCE INFORMATION
Map Generation Date and Location: 10/19/2022 G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\Fig. 4.36 Sec6SubSurfVOC-SVOC.mxd
Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.36. Sector 6 Surface and Subsurface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

VOCs

Several VOCs were detected in Sector 6 surface and subsurface soil (0–16 ft bgs) but none of the results exceeded the excavation worker NALs. VOCs in Sector 6 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs at a DAF of 1 include acrolein*, *cis*-1,2-dichloroethene*, *trans*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), TCE*, and vinyl chloride* (VOCs with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA), benzene, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), and TCE exceeded the protection of groundwater SSLs for a DAF of 1. All of these, with the exception of benzene and methylene chloride, also exceeded the DAF of 20 SSLs. For TCE, with a maximum concentration of 0.124 mg/kg, there were 10 exceedances out of 28 samples for the DAF of 1 value and 6 exceedances out of 28 samples for the DAF of 20 value.

In the screening of the McNairy Formation soil, 1,1,2-trichloroethane, acrolein, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), tetrachloroethene, and TCE exceeded the groundwater protection SSLs for the DAF of 1.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, TCE was detected in 13 of 49 samples with a maximum concentration 0.124 mg/kg. The maximum result was from a sample collected from 30.5–31.5 ft bgs in boring 400S6-05. The maximum for TCE in McNairy Formation soil was 4.16 mg/kg from a sample in the uppermost McNairy at location 400S6-01.

Radionuclides

Radionuclides that were above both the background screening levels and the excavation worker NALs in Sector 6 surface and subsurface soil (0–16 ft bgs) include cesium-137, neptunium-237, plutonium-239/240, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238 (Figure 4.37). Thorium-230 also exceeded the excavation worker AL in 1 out of 38 samples. Americium-241, which does not have a site-specific background, also exceeded the excavation worker NAL in 2 out of 38 samples. Uranium-238 and thorium-230 most frequently exceeded the excavation worker NAL screening criteria compared to the other isotopes.

Radionuclides that were detected in the Sector 6 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater at both a DAF of 1 and a DAF of 20 include technetium-99, thorium-230, uranium-233/234, uranium-234, uranium-235/236, and uranium-238. Americium-241, neptunium-237, and plutonium-239/240, which do not have site-specific backgrounds, exceeded the groundwater protection SSLs for a DAF of 1; both neptunium-237 and plutonium-239/240 also exceeded the SSLs for a DAF of 20 in 1 out of 19 samples.

In the deep soil interval (16 ft bgs to the bottom of the RGA), only uranium-233/234 and uranium-238 exceeded both the background criteria and the SSLs for protection of groundwater at a DAF of 1 and a DAF of 20. In the screening of the McNairy Formation soil, uranium-233/234, uranium-235/236, and uranium-238 exceeded the groundwater protection SSLs at a DAF of 1.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, technetium-99 was detected in 8 of 46 samples, with a maximum activity of 50.5 pCi/g from a historical sample collected from 1–4 ft bgs. The maximum activity for uranium-238 in these same intervals was 179 pCi/g.

The main area of contamination in this sector is defined from surface and subsurface soil samples collected during the WAG 6 RI and this investigation is near the bermed area around the former location of the Technetium Storage Tank. Other soil contamination appears related to the drain lines on the western side of the C-400 Cleaning Building.

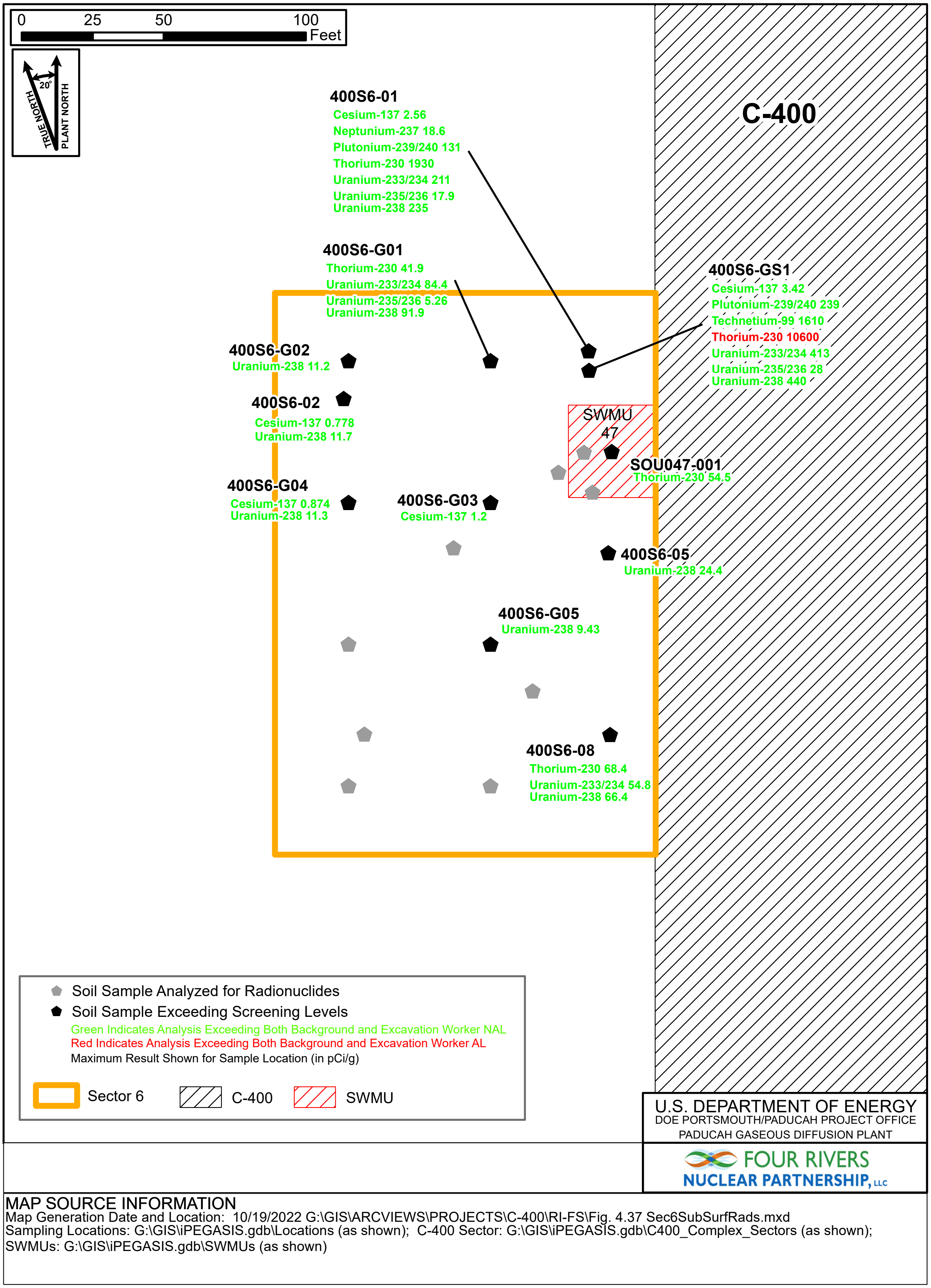


Figure 4.37. Sector 6 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

4.3.7 Sector 7

4.3.7.1 Description and process history

Sector 7 encompasses an area of approximately 32,000 ft^2, located northwest of the C-400 Cleaning Building. The surface of the sector is predominantly covered by gravel and concrete; there is a limited area of exposed soil. Overhead pipelines traverse the sector north-to-south.

SWMU 203, located in Sector 7 at the northwest corner of the building, was a convergence point for effluent from the C-400 Cleaning Building (primarily from the west side). The unit is a 6-ft wide × 11-ft long × 6-ft deep concrete pit that includes a 4-ft diameter × 4½-ft deep sump in the floor. The concrete walls of the sump are lined with acid-proof brick. Influent to the system was discharged directly into the sump, which emptied into the NSDD.

SWMU 203 was investigated during the WAG 6 RI (DOE 1999). The WAG 6 RI found surface and subsurface soils contamination in one area associated with the Discard Waste System. A surface soil sample collected in the area surrounding the Discard Waste System contained mercury at a concentration that exceeded PGDP background level by a factor of 41. The same sample exhibited high radioactivity from technetium-99. While mercury was not detected in subsurface samples collected from the 15 and 32 ft bgs at this location, technetium-99 activity slightly exceeded the background value at 15 ft bgs. The WAG 6 RI concluded that both mercury and technetium-99 probably were related to surface spills and releases of C-400 Cleaning Building effluent to the Discard Waste System. TCE also was detected at 4,500 mg/kg at a depth of 28.5–32 ft bgs in the same boring that contained elevated metals and radioactivity. The RI report stated that the source for TCE may have been the Discard Waste System, but lack of TCE at shallow depths near the sump suggested a different source. A subsurface spill or release from the northwest corner of the C-400 Cleaning Building, which is located approximately 25 ft to the southeast, may have been the source of the TCE.

4.3.7.2 Nature and extent of contamination—surface soils

A summary of the analytical results for Sector 7 surface soil and the screening results are provided in Table 4.34. The results of the screening for surface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface soil above both background screening levels and the industrial worker NALs were chromium and uranium. These two metals exceeded the background and industrial worker criteria at multiple locations in the sector (Figure 4.38).

Metals that were detected in the Sector 7 surface soil above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, cadmium*, copper*, lead, mercury*, nickel*, selenium*, uranium*, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs).

The metals most frequently detected above their respective background values in Sector 7 surface soil are antimony, selenium, and uranium.

PCBs

Total PCBs were detected in 3 of 19 samples in Sector 7 surface soil. The maximum result, 0.0086 mg/kg, did not exceed the industrial worker NAL. Concentrations of Total PCBs exceeded the SSL for the protection of groundwater for a DAF of 1 at 2 locations out of 19 samples.

Table 4.34. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 7

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	3.16E+03	1.45E+04	9.27E+03	19/19	3/19	1.30E+04	0/19	1.00E+05	0/19	1.00E+05	0/19	5.99E+04	19/19	3.00E+03	9.87 - 114
METAL	Antimony	mg/kg	3.56E-01	1.27E+00	8.55E-01	14/19	14/19	2.10E-01	0/19	9.34E+01	0/19	2.80E+03	9/19	7.04E-01	14/19	3.52E-02	1.92 - 2.46
METAL	Arsenic	mg/kg	3.24E+00	9.00E+00	5.47E+00	19/19	0/19	1.20E+01	19/19	1.60E+00	0/19	1.60E+02	19/19	3.02E-02	19/19	1.51E-03	1.01 - 4.94
METAL	Barium	mg/kg	1.10E+01	1.06E+02	7.10E+01	19/19	0/19	2.00E+02	0/19	4.04E+04	0/19	1.00E+05	0/19	3.11E+02	18/19	1.55E+01	0.79 - 0.993
METAL	Beryllium	mg/kg	1.22E-01	7.44E-01	4.34E-01	19/19	2/19	6.70E-01	0/19	4.50E+02	0/19	1.35E+04	0/19	3.89E+01	0/19	1.95E+00	0.0987 - 0.124
METAL	Boron	mg/kg	1.12E+00	4.26E+00	1.97E+00	17/19	0/19	N/A	0/19	4.65E+04	0/19	1.00E+05	0/19	2.56E+01	14/19	1.28E+00	2.96 - 3.72
METAL	Cadmium	mg/kg	5.45E-02	1.70E+00	2.97E-01	16/19	6/19	2.10E-01	0/19	6.05E+01	0/19	1.82E+03	1/19	1.39E+00	13/19	6.93E-02	0.202 - 0.987
METAL	Chromium	mg/kg	9.08E+00	4.01E+01	1.82E+01	19/19	11/19	1.60E+01	15/19	1.23E+01	0/19	1.23E+03	0/19	3.60E+06	0/19	1.80E+05	0.592 - 0.745
METAL	Cobalt	mg/kg	1.88E+00	9.63E+00	6.53E+00	19/19	0/19	1.40E+01	0/19	6.87E+01	0/19	2.06E+03	19/19	5.43E-01	19/19	2.71E-02	0.197 - 0.248
METAL	Copper	mg/kg	2.84E+00	2.61E+02	2.41E+01	19/19	3/19	1.90E+01	0/19	9.34E+03	0/19	1.00E+05	1/19	5.62E+01	19/19	2.81E+00	0.395 - 4.23
METAL	Iron	mg/kg	3.88E+03	2.51E+04	1.58E+04	19/19	0/19	2.80E+04	0/19	1.00E+05	0/19	1.00E+05	19/19	7.04E+02	19/19	3.52E+01	19.7 - 248
METAL	Lead	mg/kg	3.58E+00	5.65E+01	1.24E+01	19/19	1/19	3.60E+01	0/19	8.00E+02	0/19	8.00E+02	0/19	2.70E+02	4/19	1.35E+01	0.395 - 0.496
METAL	Manganese	mg/kg	1.07E+02	5.81E+02	3.14E+02	19/19	0/19	1.50E+03	0/19	4.72E+03	0/19	1.00E+05	19/19	5.65E+01	19/19	2.83E+00	0.987 - 12.4
METAL	Mercury	mg/kg	1.19E-02	7.55E+00	6.02E-01	18/19	4/19	2.00E-01	0/19	7.01E+01	0/19	2.10E+03	3/19	5.91E-01	9/19	2.95E-02	0.0223 - 0.446
METAL	Molybdenum	mg/kg	2.52E-01	1.62E+00	5.34E-01	19/19	0/19	N/A	0/19	1.16E+03	0/19	3.48E+04	0/19	4.03E+00	19/19	2.02E-01	0.202 - 0.987
METAL	Nickel	mg/kg	4.85E+00	1.32E+02	1.98E+01	19/19	4/19	2.10E+01	0/19	4.30E+03	0/19	1.00E+05	1/19	5.12E+01	19/19	2.56E+00	0.395 - 0.496
METAL	Selenium	mg/kg	4.75E-01	1.67E+00	1.00E+00	17/19	13/19	8.00E-01	0/19	1.17E+03	0/19	3.51E+04	9/19	1.04E+00	17/19	5.19E-02	1.01 - 4.94
METAL	Silver	mg/kg	1.24E-01	1.25E+00	4.75E-01	10/19	0/19	2.30E+00	0/19	1.17E+03	0/19	3.51E+04	0/19	1.60E+00	10/19	7.99E-02	0.48 - 5.63
METAL	Thallium	mg/kg	1.45E-01	1.92E-01	1.67E-01	5/19	0/19	2.10E-01	0/19	2.34E+00	0/19	7.02E+01	5/19	2.84E-02	5/19	1.42E-03	0.395 - 0.496
METAL	Uranium[a]	mg/kg	7.52E-01	8.39E+01	1.78E+01	19/19	13/19	4.90E+00	2/19	4.66E+01	0/19	1.40E+03	14/19	3.60E+00	19/19	1.80E-01	0.0395 - 0.0496
METAL	Vanadium	mg/kg	8.44E+00	3.76E+01	2.28E+01	19/19	0/19	3.80E+01	0/19	1.15E+03	0/19	3.45E+04	0/19	1.73E+02	18/19	8.64E+00	3.95 - 4.96
METAL	Zinc	mg/kg	1.25E+01	1.38E+02	4.74E+01	19/19	3/19	6.50E+01	0/19	7.01E+04	0/19	1.00E+05	0/19	7.46E+02	8/19	3.73E+01	4.05 - 21.4
ANION	Fluoride	mg/kg	4.81E-01	3.68E+01	1.39E+01	19/19	0/19	N/A	0/19	9.33E+03	0/19	1.00E+05	0/19	2.40E+02	12/19	1.20E+01	1.06 - 1.26
DI/FURA	Total Dioxin/Furans[b]	mg/kg	5.80E-06	5.80E-06	5.80E-06	1/1	0/1	N/A	0/1	1.57E-05	0/1	1.57E-03	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	4.23E-03	8.60E-03	7.03E-03	3/19	0/19	N/A	0/19	2.93E-01	0/19	2.93E+01	0/19	1.36E-01	2/19	6.82E-03	0.00351 - 0.733
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.00E+01	0/19	6.00E+02	0/19	1.74E-02	0/19	8.72E-04	0.346 - 4.15
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.90E+03	0/19	8.70E+04	0/19	8.04E+00	0/19	4.02E-01	0.346 - 4.15
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.90E+01	0/19	8.70E+02	0/19	2.32E-02	0/19	1.16E-03	0.346 - 4.15
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+01	0/19	2.61E+03	0/19	4.52E-02	0/19	2.26E-03	0.346 - 4.15
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.80E+02	0/19	1.74E+04	0/19	8.42E-01	0/19	4.21E-02	0.346 - 4.15
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.80E+01	0/19	1.74E+03	0/19	8.72E-02	0/19	4.36E-03	0.693 - 8.29
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.57E+00	0/19	2.57E+02	0/19	6.42E-03	0/19	3.21E-04	0.346 - 4.15
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.46E-01	0/19	5.46E+01	0/19	1.33E-03	0/19	6.67E-05	0.346 - 4.15
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.84E+03	0/19	5.52E+04	0/19	7.70E+00	0/19	3.85E-01	0.0346 - 0.415
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.17E+03	0/19	3.51E+04	0/19	1.78E-01	0/19	8.91E-03	0.346 - 4.15
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.32E+00	0/19	6.96E+01	0/19	5.16E-03	0/19	2.58E-04	0.346 - 4.15
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.19E+01	0/19	2.76E+03	0/19	3.70E-01	0/19	1.85E-02	0.0346 - 0.415
SVOC	2-Methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.45E+03	0/19	4.35E+04	0/19	1.51E+00	0/19	7.53E-02	0.346 - 4.15
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.87E+02	0/19	8.61E+03	0/19	1.60E-01	0/19	8.01E-03	0.346 - 4.15
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.80E+01	0/19	1.74E+03	0/19	8.72E-02	0/19	4.36E-03	0.346 - 4.15
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.80E+00	0/19	1.80E+02	0/19	1.65E-02	0/19	8.24E-04	0.346 - 4.15
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+00	0/19	2.61E+02	0/19	4.90E-03	0/19	2.45E-04	0.346 - 4.15
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.41E+01	0/19	4.23E+02	0/19	6.84E-03	0/19	3.42E-04	0.346 - 4.15
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.90E+03	0/19	8.70E+04	0/19	3.42E+00	0/19	1.71E-01	0.346 - 4.15
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.06E+00	0/19	4.06E+02	0/19	3.10E-03	0/19	1.55E-04	0.346 - 4.15
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.41E+01	0/19	4.23E+02	0/19	6.84E-03	0/19	3.42E-04	0.346 - 4.15
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.80E+01	0/19	1.74E+03	0/19	8.72E-02	0/19	4.36E-03	0.346 - 4.15
SVOC	Acenaphthene	mg/kg	9.15E-02	6.32E-01	2.53E-01	5/19	0/19	N/A	0/19	1.38E+03	0/19	4.14E+04	0/19	1.10E+01	1/19	5.49E-01	0.0346 - 0.415

Table 4.34. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 7 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOC	Acenaphthylene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.38E+03	0/19	4.14E+04	0/19	1.10E+01	0/19	5.49E-01	0.0346 - 0.415
SVOC	Acetophenone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.34E+04	0/19	7.02E+05	0/19	1.17E+00	0/19	5.84E-02	0.346 - 4.15
SVOC	Anthracene	mg/kg	1.40E-01	9.96E-01	4.23E-01	6/19	0/19	N/A	0/19	6.89E+03	0/19	1.00E+05	0/19	1.16E+02	0/19	5.81E+00	0.0346 - 0.415
SVOC	Atrazine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.53E+00	0/19	3.53E+02	0/19	3.92E-03	0/19	1.96E-04	0.346 - 4.15
SVOC	Benzaldehyde	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.64E+03	0/18	1.64E+05	0/18	8.30E-02	0/18	4.15E-03	0.346 - 4.15
SVOC	Benzo(ghi)perylene	mg/kg	3.15E-02	1.52E+00	7.26E-01	6/19	0/19	N/A	0/19	6.89E+02	0/19	2.07E+04	0/19	2.63E+01	1/19	1.32E+00	0.0346 - 0.415
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+01	0/19	2.61E+03	0/19	2.70E-02	0/19	1.35E-03	0.346 - 4.15
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.25E+00	0/19	1.25E+02	0/19	7.22E-05	0/19	3.61E-06	0.346 - 4.15
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.32E+01	0/19	9.32E+03	0/19	2.62E-03	0/19	1.31E-04	0.346 - 4.15
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.15E-02	1.11E-01	3.97E-02	4/19	0/19	N/A	0/19	5.80E+01	0/19	5.80E+03	0/19	2.66E+01	0/19	1.33E+00	0.0346 - 0.415
SVOC	Butyl benzyl phthalate	mg/kg	2.13E-01	6.17E+00	3.19E+00	2/19	0/19	N/A	0/19	4.27E+02	0/19	4.27E+04	1/19	4.72E+00	1/19	2.36E-01	0.0346 - 0.415
SVOC	Caprolactam	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.43E+04	0/19	4.29E+05	0/19	4.94E+00	0/19	2.47E-01	0.346 - 4.15
SVOC	Carbazole	mg/kg	1.21E-01	5.72E-01	2.81E-01	3/19	0/19	N/A	0/19	4.06E+01	0/19	4.06E+03	0/19	7.51E-01	3/19	3.76E-02	0.0346 - 0.415
SVOC	Dibenzofuran	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.34E+02	0/19	7.02E+03	0/19	2.92E-01	0/19	1.46E-02	0.346 - 4.15
SVOC	Diethyl phthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.32E+04	0/19	6.96E+05	0/19	1.22E+01	0/19	6.08E-01	0.0346 - 0.415
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.32E+04	0/19	6.96E+05	0/19	1.22E+01	0/19	6.08E-01	0.0346 - 0.415
SVOC	Di-n-butyl phthalate	mg/kg	1.34E-02	2.84E-02	1.97E-02	3/19	0/19	N/A	0/19	2.90E+03	0/19	8.70E+04	0/19	4.54E+00	0/19	2.27E-01	0.0346 - 0.415
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.90E+02	0/19	8.70E+03	0/19	1.13E+02	0/19	5.65E+00	0.0346 - 0.415
SVOC	Diphenylamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.90E+03	0/19	8.70E+04	0/19	4.66E+00	0/19	2.33E-01	0.346 - 4.15
SVOC	Fluoranthene	mg/kg	8.07E-02	6.37E+00	1.98E+00	10/19	0/19	N/A	0/19	9.19E+02	0/19	2.76E+04	0/19	1.78E+02	0/19	8.91E+00	0.0346 - 0.415
SVOC	Fluorene	mg/kg	6.50E-02	4.88E-01	2.19E-01	4/19	0/19	N/A	0/19	9.19E+02	0/19	2.76E+04	0/19	1.09E+01	0/19	5.45E-01	0.0346 - 0.415
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.26E+00	0/19	1.26E+02	0/19	2.46E-03	0/19	1.23E-04	0.346 - 4.15
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.61E+00	0/19	5.61E+02	0/19	5.34E-03	0/19	2.67E-04	0.346 - 4.15
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.45E-01	0/19	2.24E+01	0/19	2.56E-03	0/19	1.28E-04	0.346 - 4.15
SVOC	Hexachloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.46E+00	0/19	8.46E+02	0/19	4.00E-03	0/19	2.00E-04	0.346 - 4.15
SVOC	Isophorone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.55E+02	0/19	8.55E+04	0/19	5.16E-01	0/19	2.58E-02	0.346 - 4.15
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.80E+02	0/19	1.74E+04	0/19	5.94E-01	0/19	2.97E-02	0.346 - 4.15
SVOC	Naphthalene	mg/kg	1.40E-01	1.40E-01	1.40E-01	1/19	0/19	N/A	0/19	4.06E+00	0/19	4.06E+02	1/19	7.70E-03	1/19	3.85E-04	0.0346 - 0.415
SVOC	Nitrobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.24E+01	0/19	2.24E+03	0/19	1.83E-03	0/19	9.17E-05	0.346 - 4.15
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.16E-01	0/19	1.16E+01	0/19	1.62E-04	0/19	8.10E-06	0.346 - 4.15
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.77E-01	0/19	8.77E+01	0/19	1.14E-03	0/19	5.71E-05	0.346 - 4.15
SVOC	Phenanthrene	mg/kg	5.64E-02	5.33E+00	1.47E+00	9/19	0/19	N/A	0/19	1.38E+03	0/19	4.14E+04	0/19	1.10E+01	6/19	5.49E-01	0.0346 - 0.415
SVOC	Phenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+03	0/19	2.61E+05	0/19	6.62E+00	0/19	3.31E-01	0.346 - 4.15
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.06E+01	0/19	3.48E+03	0/19	3.16E-02	0/19	1.58E-03	0.346 - 4.15
SVOC	Pyrene	mg/kg	6.46E-02	5.66E+00	1.55E+00	10/19	0/19	N/A	0/19	6.89E+02	0/19	2.07E+04	0/19	2.63E+01	3/19	1.32E+00	0.0346 - 0.415
SVOC	Total PAH[d]	mg/kg	1.26E-02	3.39E+00	1.13E+00	10/19	0/19	N/A	5/19	6.43E-01	0/19	6.43E+01	5/19	5.89E-01	9/19	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	0/1	N/A	0/1	1.86E+01	0/1	1.86E+03	0/1	8.84E+00	0/1	4.42E-01	0.316 - 0.316
RADS	Americium-241	pCi/g	3.99E+00	3.99E+00	3.99E+00	1/20	0/20	N/A	0/20	6.01E+00	0/20	6.01E+02	0/20	1.92E+01	1/20	9.58E-01	0.373 - 1.07
RADS	Cesium-137	pCi/g	6.07E-02	2.93E+00	8.44E-01	14/20	7/20	4.90E-01	11/20	1.08E-01	0/20	1.08E+01	0/20	9.58E+00	7/20	4.79E-01	0.0292 - 0.117
RADS	Cobalt-60	pCi/g	--	--	--	0/1	0/1	N/A	0/1	5.67E-02	0/1	5.67E+00	0/1	3.19E-02	0/1	1.59E-03	0.0435 - 0.0435
RADS	Lead-210	pCi/g	--	--	--	0/1	0/1	N/A	0/1	7.33E+00	0/1	7.33E+02	0/1	1.78E-01	0/1	8.88E-03	7.71 - 7.71
RADS	Neptunium-237	pCi/g	9.74E-01	6.50E+00	3.60E+00	3/20	3/20	1.00E-01	3/20	2.49E-01	0/20	2.49E+01	2/20	1.07E+00	3/20	5.36E-02	0.337 - 1.03
RADS	Plutonium-238	pCi/g	4.56E-01	4.56E-01	4.56E-01	1/20	1/20	7.30E-02	0/20	2.65E+01	0/20	2.65E+03	0/20	4.38E+00	1/20	2.19E-01	0.178 - 1.34
RADS	Plutonium-239/240	pCi/g	1.39E+00	1.50E+01	3.84E+00	7/20	7/20	2.50E-02	0/20	2.27E+01	0/20	2.27E+03	1/20	4.26E+00	7/20	2.13E-01	0.302 - 0.849
RADS	Radium-226	pCi/g	1.33E+00	1.33E+00	1.33E+00	1/1	0/1	1.50E+00	1/1	2.48E-02	0/1	2.48E+00	1/1	3.26E-03	1/1	1.63E-04	0.76 - 0.76
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	1.03E+01	0/1	1.03E+03	0/1	2.24E-02	0/1	1.12E-03	1.67 - 1.67
RADS	Technetium-99	pCi/g	3.18E+00	1.63E+02	5.11E+01	14/20	14/20	2.50E+00	0/20	1.27E+03	0/20	1.00E+05	14/20	1.52E-01	14/20	7.60E-03	2.35 - 4.21
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	0/1	1.96E-04	0/1	9.80E-06	0.712 - 0.712

Table 4.34. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Thorium-230	pCi/g	7.01E-01	1.52E+02	1.14E+01	20/20	14/20	1.50E+00	1/20	3.13E+01	0/20	3.13E+03	1/20	3.66E+01	12/20	1.83E+00	0.394 - 1.13
RADS	Thorium-232	pCi/g	9.16E-01	9.16E-01	9.16E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	1/1	1.96E-01	1/1	9.80E-03	0.472 - 0.472
RADS	Uranium-233/234	pCi/g	9.11E-01	2.79E+01	8.28E+00	10/12	9/12	1.20E+00	0/12	5.01E+01	0/12	5.01E+03	9/12	9.90E-01	10/12	4.95E-02	0.453 - 0.896
RADS	Uranium-234	pCi/g	2.24E+00	8.67E+00	6.16E+00	8/8	8/8	1.20E+00	0/8	5.01E+01	0/8	5.01E+03	8/8	9.90E-01	8/8	4.95E-02	0.659 - 0.863
RADS	Uranium-235	pCi/g	7.77E-01	8.25E-01	8.01E-01	2/8	2/8	6.00E-02	2/8	4.08E-01	0/8	4.08E+01	0/8	9.76E-01	2/8	4.88E-02	0.24 - 0.608
RADS	Uranium-235/236	pCi/g	5.63E-01	1.12E+00	8.48E-01	4/12	4/12	6.00E-02	4/12	4.08E-01	0/12	4.08E+01	2/12	9.76E-01	4/12	4.88E-02	0.296 - 0.663
RADS	Uranium-238	pCi/g	1.10E+00	3.36E+01	8.93E+00	19/20	18/20	1.20E+00	16/20	1.66E+00	0/20	1.66E+02	19/20	8.05E-01	19/20	4.03E-02	0.247 - 0.802
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.58E+03	0/19	1.00E+05	0/19	5.62E+00	0/19	2.81E-01	0.000887 - 0.00129
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.91E+00	0/19	2.91E+02	0/19	5.92E-04	0/19	2.96E-05	0.000887 - 0.00129
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.81E+03	0/19	8.43E+04	0/19	5.13E+01	0/19	2.56E+00	0.00444 - 0.00647
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.32E-01	0/19	1.90E+01	0/19	2.69E-04	0/19	1.35E-05	0.000887 - 0.00129
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.58E+01	0/19	1.58E+03	0/19	1.56E-02	0/19	7.82E-04	0.000887 - 0.00129
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.00E+02	0/19	3.00E+03	0/19	2.04E-01	0/19	1.02E-02	0.000887 - 0.00129
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.87E+02	0/19	5.61E+03	0/19	4.18E-02	0/19	2.09E-03	0.000887 - 0.00129
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.59E+01	0/19	7.77E+02	0/19	2.32E-02	0/19	1.16E-03	0.000887 - 0.00129
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.49E-02	0/19	6.49E+00	0/19	2.88E-06	0/19	1.44E-07	0.000887 - 0.00129
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.68E-01	0/19	1.68E+01	0/19	4.20E-05	0/19	2.10E-06	0.000887 - 0.00129
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.76E+02	0/19	2.93E+04	0/19	5.90E-01	0/19	2.95E-02	0.000887 - 0.00129
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.09E+00	0/19	2.09E+02	0/19	9.69E-04	0/19	4.84E-05	0.000887 - 0.00129
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.63E+00	0/19	1.99E+02	0/19	5.48E-03	0/19	2.74E-04	0.000887 - 0.00129
VOC	1,2-Dimethylbenzene	mg/kg	4.74E-03	4.74E-03	4.74E-03	1/19	0/19	N/A	0/19	2.81E+02	0/19	8.43E+03	0/19	3.81E-01	0/19	1.90E-02	0.000887 - 0.00129
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.76E+02	0/19	2.93E+04	0/19	5.90E-01	0/19	2.95E-02	0.000887 - 0.00129
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.15E+01	0/19	1.15E+03	0/19	9.24E-03	0/19	4.62E-04	0.000887 - 0.00129
VOC	1,4-Dioxane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.91E+01	0/19	3.91E+03	0/19	1.88E-03	0/19	9.42E-05	0.0444 - 0.0647
VOC	2-Butanone	mg/kg	1.89E-03	2.96E-03	2.43E-03	2/19	0/19	N/A	0/19	2.24E+04	0/19	6.72E+05	0/19	2.32E+00	0/19	1.16E-01	0.00444 - 0.00647
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.15E-02	0/19	9.15E+00	0/19	2.76E-05	0/19	1.38E-06	0.00444 - 0.00647
VOC	2-Hexanone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.52E+02	0/19	4.56E+03	0/19	1.75E-02	0/19	8.75E-04	0.00444 - 0.00647
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.17E+02	0/19	2.17E+04	0/19	6.44E-02	0/19	3.22E-03	0.000887 - 0.00129
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.97E+03	0/19	2.39E+05	0/19	5.62E-01	0/19	2.81E-02	0.00444 - 0.00647
VOC	Acetone	mg/kg	1.84E-03	2.02E-02	6.31E-03	12/19	0/19	N/A	0/19	2.10E+05	0/19	6.30E+06	0/19	7.36E+00	0/19	3.68E-01	0.00444 - 0.00647
VOC	Acrolein	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.05E-02	0/19	1.82E+00	0/19	1.68E-05	0/19	8.41E-07	0.00444 - 0.00647
VOC	Acrylonitrile	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.24E+00	0/19	1.24E+02	0/19	2.28E-04	0/19	1.14E-05	0.00444 - 0.00647
VOC	Benzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.31E+00	0/19	5.31E+02	0/19	4.66E-03	0/19	2.33E-04	0.000887 - 0.00129
VOC	Bromochloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.28E+01	0/19	1.88E+03	0/19	4.16E-02	0/19	2.08E-03	0.000887 - 0.00129
VOC	Bromodichloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.30E+00	0/19	1.30E+02	0/19	7.30E-04	0/19	3.65E-05	0.000887 - 0.00129
VOC	Bromoform	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.56E+01	0/19	9.56E+03	0/19	1.75E-02	0/19	8.73E-04	0.000887 - 0.00129
VOC	Bromomethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.03E+00	0/19	9.09E+01	0/19	3.82E-03	0/19	1.91E-04	0.000887 - 0.00129
VOC	Carbon disulfide	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.52E+02	0/19	1.06E+04	0/19	4.80E-01	0/19	2.40E-02	0.00444 - 0.00647
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.96E+00	0/19	2.96E+02	0/19	3.54E-03	0/19	1.77E-04	0.000887 - 0.00129
VOC	Chlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.37E+02	0/19	4.11E+03	0/19	1.06E-01	0/19	5.28E-03	0.000887 - 0.00129
VOC	Chloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.27E+03	0/19	6.81E+04	0/19	4.74E+00	0/19	2.37E-01	0.000887 - 0.00129
VOC	Chloroform	mg/kg	3.94E-04	8.72E-04	6.17E-04	4/19	0/19	N/A	0/19	1.39E+00	0/19	1.39E+02	0/19	1.22E-03	4/19	6.12E-05	0.000887 - 0.00129
VOC	Chloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.63E+01	0/19	1.39E+03	0/19	1.05E-02	0/19	5.26E-04	0.000887 - 0.00129
VOC	*cis* -1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.67E+02	0/19	1.40E+04	0/19	2.12E-02	0/19	1.06E-03	0.000887 - 0.00129
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.34E+00	0/19	9.30E+02	0/19	3.36E-03	0/19	1.68E-04	0.000887 - 0.00129
VOC	Cumene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.04E+03	0/19	3.12E+04	0/19	1.48E+00	0/19	7.38E-02	0.000887 - 0.00129
VOC	Cyclohexane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.74E+03	0/19	8.22E+04	0/19	2.60E+01	0/19	1.30E+00	0.000887 - 0.00129
VOC	Dibromochloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.79E+01	0/19	7.79E+03	0/19	4.64E-03	0/19	2.32E-04	0.000887 - 0.00129

Table 4.34. Surface (0–1 ft) Soil Data Summary and Industrial Worker/Groundwater Protection Screening: Sector 7 (Continued)

			Detected Results			Freq. of	Provisional Background		Industrial Worker		Industrial Worker		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.68E+01	0/19	1.10E+03	0/19	6.08E-01	0/19	3.04E-02	0.000887 - 0.00129
VOC	Ethylbenzene	mg/kg	2.32E-03	2.32E-03	2.32E-03	1/19	0/19	N/A	0/19	2.66E+01	0/19	2.66E+03	0/19	3.36E-02	1/19	1.68E-03	0.000887 - 0.00129
VOC	m,p-Xylene	mg/kg	1.09E-02	1.09E-02	1.09E-02	1/19	0/19	N/A	0/19	2.50E+02	0/19	7.50E+03	0/19	3.82E-01	0/19	1.91E-02	0.00177 - 0.00259
VOC	Methyl acetate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.34E+05	0/19	7.02E+06	0/19	8.22E+00	0/19	4.11E-01	0.00444 - 0.00647
VOC	Methylcyclohexane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.30E+03	0/19	3.90E+04	0/19	2.80E+01	0/19	1.40E+00	0.000887 - 0.00129
VOC	Methylene chloride	mg/kg	2.46E-03	4.22E-03	3.01E-03	7/19	0/19	N/A	0/19	4.08E+02	0/19	1.22E+04	0/19	5.44E-02	2/19	2.72E-03	0.00444 - 0.00647
VOC	Styrene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.76E+03	0/19	1.13E+05	0/19	2.66E+00	0/19	1.33E-01	0.000887 - 0.00129
VOC	Tetrachloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.00E+01	0/19	1.20E+03	0/19	3.69E-02	0/19	1.84E-03	0.000887 - 0.00129
VOC	Toluene	mg/kg	5.00E-04	8.26E-03	3.16E-03	3/19	0/19	N/A	0/19	6.25E+03	0/19	1.00E+05	0/19	1.52E+00	0/19	7.62E-02	0.000887 - 0.00129
VOC	Total Xylene	mg/kg	1.56E-02	1.56E-02	1.56E-02	1/19	0/19	N/A	0/19	2.50E+02	0/19	7.50E+03	0/19	3.82E-01	0/19	1.91E-02	0.00266 - 0.00388
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.54E+01	0/19	1.36E+03	0/19	5.83E-02	0/19	2.91E-03	0.000887 - 0.00129
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.34E+00	0/19	9.30E+02	0/19	3.36E-03	0/19	1.68E-04	0.000887 - 0.00129
VOC	Trichloroethene	mg/kg	3.40E-03	3.40E-03	3.40E-03	1/19	0/19	N/A	0/19	1.90E+00	0/19	5.70E+01	1/19	2.02E-03	1/19	1.01E-04	0.000887 - 0.00129
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.16E+02	0/19	9.48E+03	0/19	1.46E+00	0/19	7.31E-02	0.000887 - 0.00129
VOC	Vinyl chloride	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.06E+00	0/19	2.06E+02	0/19	1.29E-04	0/19	6.47E-06	0.000887 - 0.00129

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

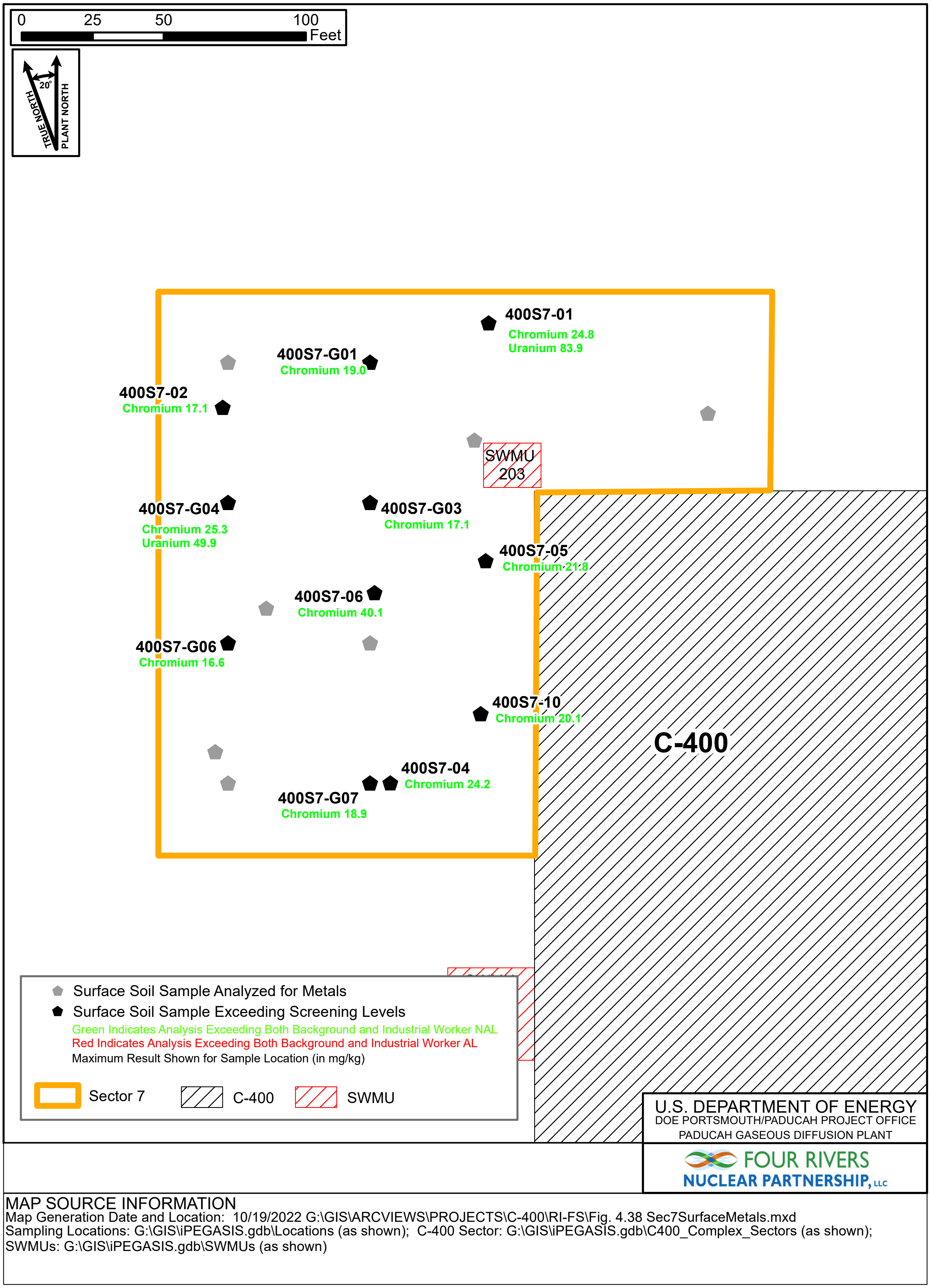


Figure 4.38. Sector 7 Surface Soil Sampling Exceeding Screening Levels for Metals

SVOCs

Several SVOCs were detected in surface soil with Total PAHs exceeding the industrial worker NAL at five locations out of 19 samples (Figure 4.39). SVOCs that exceeded the SSLs for protection of groundwater, with a DAF of 1, included acenaphthene, benzo(ghi)perylene, butyl benzyl phthalate (a potential lab contaminant), carbazole, naphthalene, phenanthrene, pyrene, and Total PAHs. Butyl benzyl phthalate (a potential lab contaminant), naphthalene, and Total PAHs also exceeded the DAF of 20 SSLs.

VOCs

Several VOCs were detected in Sector 7 surface soil with no exceedances of the industrial worker NALs. VOCs at concentrations above the SSLs for the protection of groundwater for a DAF of 1 include chloroform, ethylbenzene, methylene chloride (a potential lab contaminant), and TCE. TCE was the only VOC at concentrations above the DAF of 20 SSL.

Radionuclides

Radionuclides that were above both the background screening levels and the industrial worker NALs in Sector 7 surface soil include cesium-137, neptunium-237, thorium-230, uranium-235, uranium-235/236 and uranium-238. Locations where these radionuclides exceeded both criteria are shown in Figure 4.40. Technetium-99 was detected in 14 of 20 samples (all above background) but did not exceed the industrial worker NAL. Radionuclides that were detected above both the background screening levels and SSLs for the protection of groundwater for a DAF of 1 include cesium-137, neptunium-237, plutonium-238, plutonium-239/240, technetium-99, thorium-230, uranium-233/234, uranium-234, uranium-235, uranium-235/236, and uranium-238. All of these radionuclides also exceeded the DAF of 20 SSLs, with the exception of cesium-137, plutonium-238, and uranium-235. Americium-241, which does not have a site-specific background, also exceeded the groundwater protection SSL for a DAF of 1 in 1 out of 20 samples.

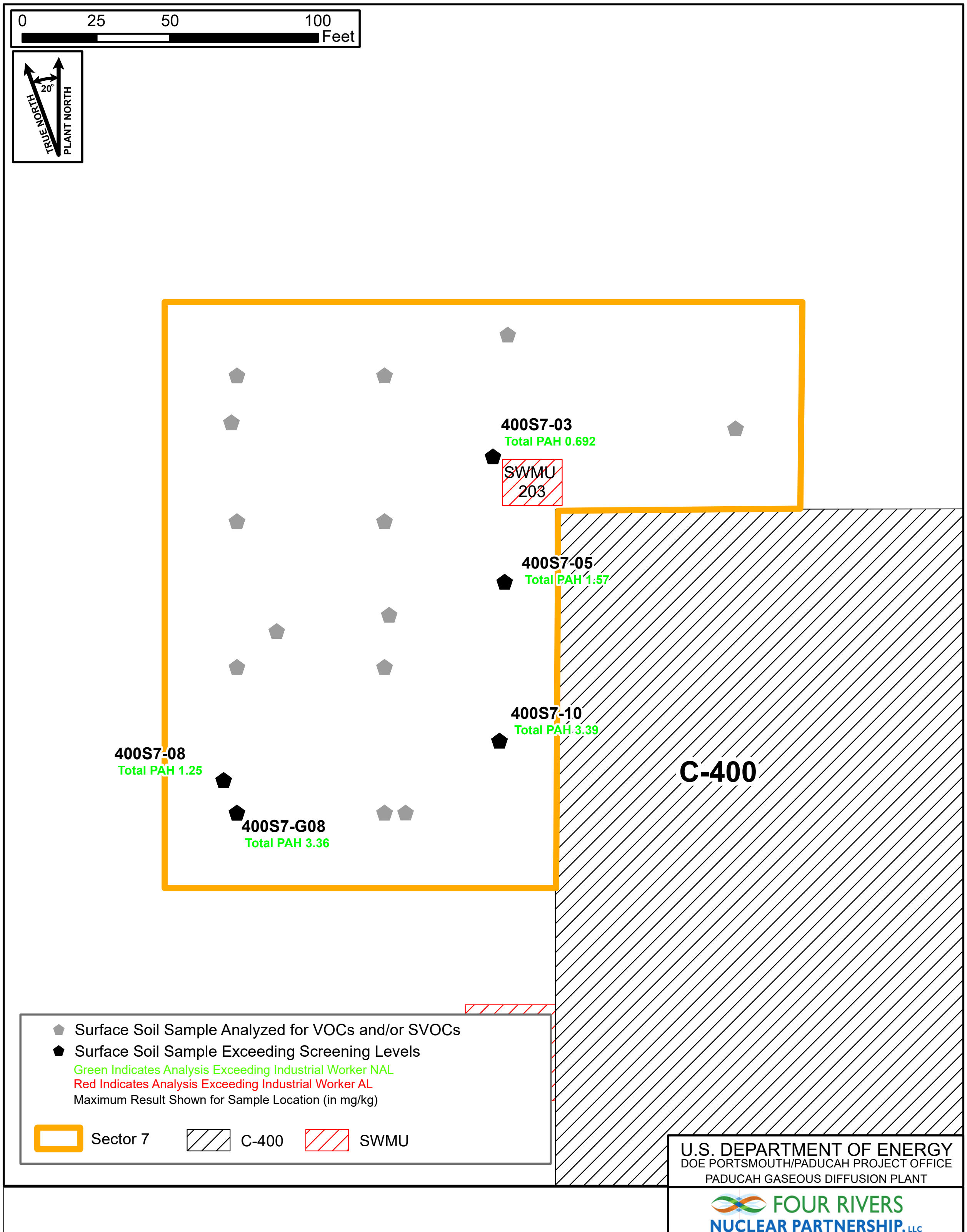
4.3.7.3 Nature and extent of contamination—surface and subsurface soils

A summary of the analytical results for Sector 7 surface and subsurface soil and the screening results are provided in Tables 4.35 through 4.38. The results of the screening for surface and subsurface soil are discussed below.

Metals and Inorganics

Metals that were detected in the surface and subsurface soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, cobalt, manganese, and uranium. The metals most frequently detected above its background values and excavation worker NALs in Sector 7 soil are chromium and uranium. Locations where metals exceeded both background and excavation worker NALs are shown in Figure 4.41.

Metals that were detected in the Sector 7 subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 include aluminum, antimony*, arsenic*, barium, cadmium, cobalt*, lead, manganese*, mercury*, nickel*, selenium*, uranium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs). In the deep soil interval (16 ft bgs to the bottom of the RGA) the metals exceeding both the background screening levels and the SSLs for the protection of groundwater at a DAF of 1 are aluminum, antimony*, arsenic*, barium*, beryllium, cadmium, cobalt*, iron*, lead, manganese*, selenium*, vanadium, and zinc (metals with an asterisk also exceeded the DAF of 20 SSLs).



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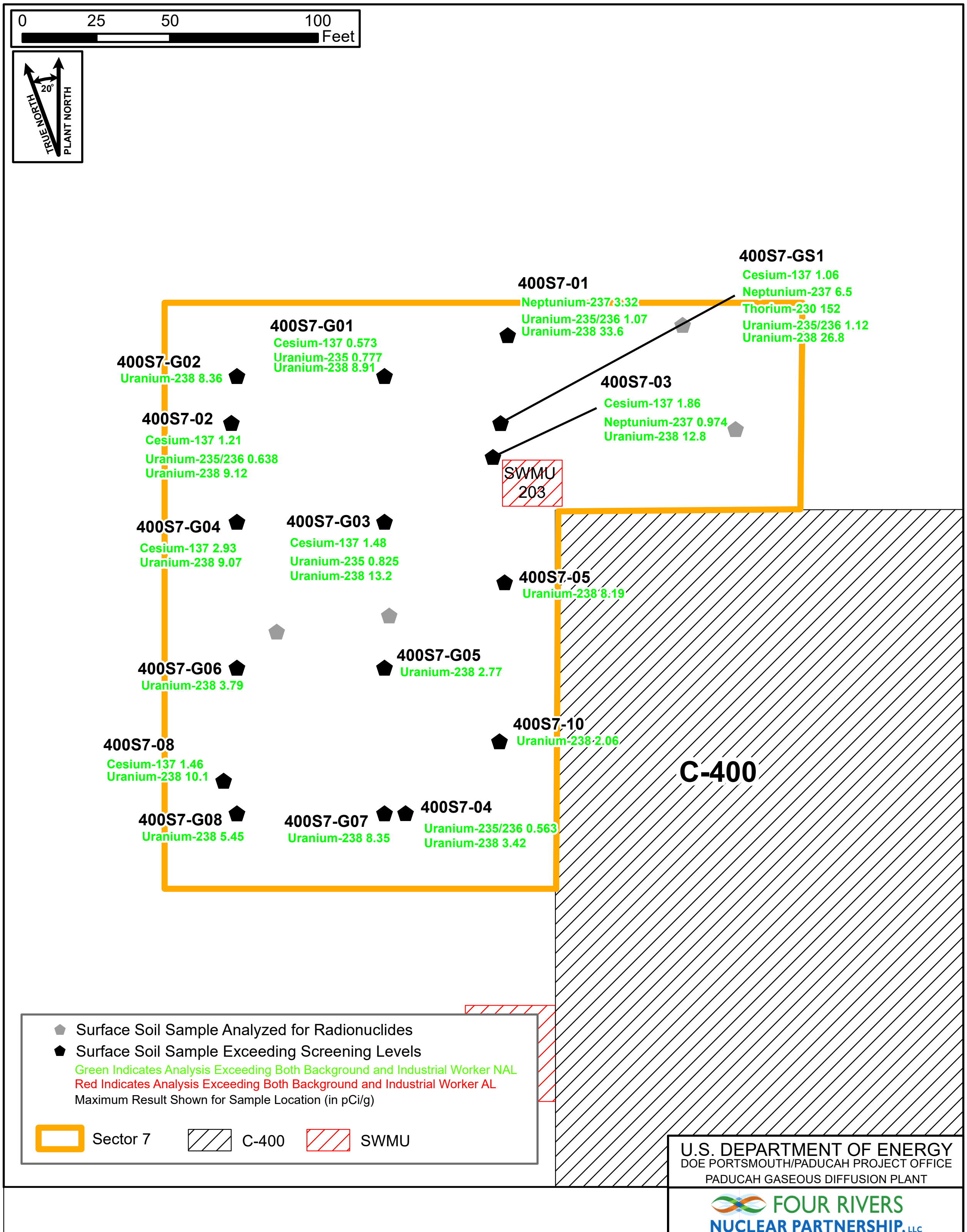
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.39. Sector 7 Surface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs



MAP SOURCE INFORMATION
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SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.40. Sector 7 Surface Soil Sampling Exceeding Screening Levels for Radionuclides

Table 4.35. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 7

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	3.16E+03	1.57E+04	1.03E+04	39/39	11/39	1.20E+04	0/39	3.26E+04	0/39	1.00E+05	9.87 - 120
METAL	Antimony	mg/kg	3.56E-01	2.34E+00	8.48E-01	21/39	21/39	2.10E-01	0/39	1.32E+01	0/39	3.96E+02	1.92 - 2.46
METAL	Arsenic	mg/kg	2.28E+00	9.52E+00	5.59E+00	39/39	5/39	7.90E+00	32/39	3.74E+00	0/39	3.60E+02	0.998 - 4.94
METAL	Barium	mg/kg	1.10E+01	2.81E+02	9.34E+01	39/39	3/39	1.70E+02	0/39	6.47E+03	0/39	1.00E+05	0.79 - 9.51
METAL	Beryllium	mg/kg	1.22E-01	9.13E-01	4.79E-01	39/39	5/39	6.70E-01	0/39	6.55E+01	0/39	1.97E+03	0.0987 - 0.124
METAL	Boron	mg/kg	9.68E-01	4.26E+00	1.84E+00	32/39	N/A	N/A	0/39	6.57E+03	0/39	1.00E+05	2.96 - 3.72
METAL	Cadmium	mg/kg	2.88E-02	1.70E+00	1.94E-01	33/39	7/39	2.10E-01	0/39	2.53E+01	0/39	7.59E+02	0.2 - 0.987
METAL	Chromium	mg/kg	9.08E+00	4.01E+01	1.85E+01	39/39	23/39	1.60E+01	38/39	9.14E+00	0/39	9.14E+02	0.592 - 0.745
METAL	Cobalt	mg/kg	1.88E+00	1.42E+01	6.61E+00	39/39	2/39	1.30E+01	2/39	9.84E+00	0/39	2.95E+02	0.197 - 0.248
METAL	Copper	mg/kg	2.84E+00	2.61E+02	1.68E+01	39/39	4/39	1.90E+01	0/39	1.32E+03	0/39	3.96E+04	0.395 - 4.23
METAL	Iron	mg/kg	3.88E+03	2.69E+04	1.66E+04	39/39	0/39	2.80E+04	4/39	2.30E+04	0/39	1.00E+05	19.7 - 248
METAL	Lead	mg/kg	3.58E+00	5.65E+01	1.18E+01	39/39	2/39	2.30E+01	0/39	8.00E+02	0/39	8.00E+02	0.395 - 0.496
METAL	Manganese	mg/kg	1.07E+02	1.58E+03	3.66E+02	39/39	1/39	8.20E+02	3/39	7.74E+02	0/39	2.32E+04	0.987 - 12.4
METAL	Mercury	mg/kg	1.19E-02	7.55E+00	5.40E-01	37/39	10/39	1.30E-01	0/39	9.86E+00	0/39	2.96E+02	0.0223 - 0.521
METAL	Molybdenum	mg/kg	1.08E-01	1.62E+00	4.89E-01	39/39	N/A	N/A	0/39	1.64E+02	0/39	4.92E+03	0.2 - 0.987
METAL	Nickel	mg/kg	4.85E+00	2.31E+02	2.12E+01	39/39	7/39	2.10E+01	0/39	6.52E+02	0/39	1.96E+04	0.395 - 3.99
METAL	Selenium	mg/kg	4.75E-01	2.34E+00	1.22E+00	37/39	34/39	7.00E-01	0/39	1.64E+02	0/39	4.92E+03	0.998 - 4.94
METAL	Silver	mg/kg	1.24E-01	1.93E+00	5.61E-01	14/39	0/39	2.30E+00	0/39	1.64E+02	0/39	4.92E+03	0.48 - 6.11
METAL	Thallium	mg/kg	1.45E-01	2.05E-01	1.77E-01	12/39	0/39	2.10E-01	0/39	3.29E-01	0/39	9.87E+00	0.395 - 0.496
METAL	Uranium[a]	mg/kg	5.53E-01	8.39E+01	1.21E+01	39/39	21/39	4.60E+00	18/39	6.58E+00	0/39	1.97E+02	0.0395 - 0.0496
METAL	Vanadium	mg/kg	8.44E+00	4.92E+01	2.55E+01	39/39	3/39	3.70E+01	0/39	1.65E+02	0/39	4.95E+03	3.95 - 4.96
METAL	Zinc	mg/kg	1.25E+01	1.38E+02	4.02E+01	39/39	5/39	6.00E+01	0/39	9.86E+03	0/39	1.00E+05	3.99 - 21.4
ANION	Fluoride	mg/kg	4.81E-01	3.68E+01	1.16E+01	39/39	N/A	N/A	0/39	1.32E+03	0/39	3.96E+04	1.06 - 1.26
DI/FURA	Total Dioxin/Furans[b]	mg/kg	5.80E-06	6.40E-06	6.10E-06	2/2	N/A	N/A	0/2	1.89E-05	0/2	5.67E-04	-
PPCB	Total PCB[c]	mg/kg	2.13E-03	1.27E-02	7.11E-03	10/37	N/A	N/A	0/37	1.12E+00	0/37	1.12E+02	0.00351 - 0.733
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/37	N/A	N/A	0/37	2.69E+01	0/37	8.07E+02	0.346 - 4.15
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.90E+03	0/37	5.70E+04	0.346 - 4.15
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.90E+01	0/37	5.70E+02	0.346 - 4.15
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.69E+01	0/37	1.71E+03	0.346 - 4.15
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E+02	0/37	1.14E+04	0.346 - 4.15
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E+01	0/37	1.14E+03	0.693 - 8.29
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	8.49E+00	0/37	8.49E+02	0.346 - 4.15
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.78E+00	0/37	1.71E+02	0.346 - 4.15
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.35E+03	0/37	4.05E+04	0.0346 - 0.415
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.64E+02	0/37	4.92E+03	0.346 - 4.15
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.52E+00	0/37	4.56E+01	0.346 - 4.15
SVOC	2-Methylnaphthalene	mg/kg	2.26E-02	2.26E-02	2.26E-02	1/37	N/A	N/A	0/37	6.73E+01	0/37	2.02E+03	0.0346 - 0.415
SVOC	2-Methylphenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	9.48E+02	0/37	2.84E+04	0.346 - 4.15
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.89E+02	0/37	5.67E+03	0.346 - 4.15
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E+01	0/37	1.14E+03	0.346 - 4.15
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.90E+00	0/37	5.90E+02	0.346 - 4.15
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.69E+00	0/37	1.71E+02	0.346 - 4.15
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.91E+01	0/37	5.73E+02	0.346 - 4.15
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.90E+03	0/37	5.70E+04	0.346 - 4.15
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	9.48E+00	0/37	2.84E+02	0.346 - 4.15

Table 4.35. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.91E+01	0/37	5.73E+02	0.346 - 4.15
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E+01	0/37	1.14E+03	0.346 - 4.15
SVOC	Acenaphthene	mg/kg	1.90E-02	6.32E-01	1.68E-01	8/37	N/A	N/A	0/37	1.01E+03	0/37	3.03E+04	0.0346 - 0.415
SVOC	Acenaphthylene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.01E+03	0/37	3.03E+04	0.0346 - 0.415
SVOC	Acetophenone	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.29E+03	0/37	9.87E+04	0.346 - 4.15
SVOC	Anthracene	mg/kg	1.91E-02	9.96E-01	2.71E-01	10/37	N/A	N/A	0/37	5.05E+03	0/37	1.00E+05	0.0346 - 0.415
SVOC	Atrazine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.15E+01	0/37	1.15E+03	0.346 - 4.15
SVOC	Benzaldehyde	mg/kg	--	--	--	0/36	N/A	N/A	0/36	1.15E+03	0/36	9.87E+04	0.346 - 4.15
SVOC	Benzo(ghi)perylene	mg/kg	3.15E-02	1.52E+00	4.97E-01	9/37	N/A	N/A	0/37	5.05E+02	0/37	1.52E+04	0.0346 - 0.415
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.69E+01	0/37	1.71E+03	0.346 - 4.15
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.01E+00	0/37	3.01E+02	0.346 - 4.15
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/37	N/A	N/A	0/37	6.58E+01	0/37	6.58E+03	0.346 - 4.15
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.15E-02	1.11E-01	3.97E-02	4/37	N/A	N/A	0/37	1.90E+02	0/37	1.14E+04	0.0346 - 0.415
SVOC	Butyl benzyl phthalate	mg/kg	2.13E-01	6.17E+00	3.19E+00	2/37	N/A	N/A	0/37	1.40E+03	0/37	1.14E+05	0.0346 - 0.415
SVOC	Caprolactam	mg/kg	--	--	--	0/37	N/A	N/A	0/37	9.43E+03	0/37	2.83E+05	0.346 - 4.15
SVOC	Carbazole	mg/kg	1.33E-02	5.72E-01	1.29E-01	7/37	N/A	N/A	0/37	1.33E+02	0/37	1.33E+04	0.0346 - 0.415
SVOC	Dibenzofuran	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.29E+01	0/37	9.87E+02	0.346 - 4.15
SVOC	Diethyl phthalate	mg/kg	1.89E-02	1.92E-02	1.91E-02	2/37	N/A	N/A	0/37	1.52E+04	0/37	4.56E+05	0.0346 - 0.415
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.52E+04	0/37	4.56E+05	0.0346 - 0.415
SVOC	Di-n-butyl phthalate	mg/kg	1.28E-02	2.84E-02	1.70E-02	7/37	N/A	N/A	0/37	1.90E+03	0/37	5.70E+04	0.0346 - 0.415
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.90E+02	0/37	5.70E+03	0.0346 - 0.415
SVOC	Diphenylamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.90E+03	0/37	5.70E+04	0.346 - 4.15
SVOC	Fluoranthene	mg/kg	1.71E-02	6.37E+00	1.32E+00	16/37	N/A	N/A	0/37	6.73E+02	0/37	2.02E+04	0.0346 - 0.415
SVOC	Fluorene	mg/kg	1.49E-02	4.88E-01	1.40E-01	7/37	N/A	N/A	0/37	6.73E+02	0/37	2.02E+04	0.0346 - 0.415
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	2.33E+00	0/37	2.33E+02	0.346 - 4.15
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	2.41E+01	0/37	9.87E+02	0.346 - 4.15
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.00E+00	0/37	3.00E+01	0.346 - 4.15
SVOC	Hexachloroethane	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.98E+01	0/37	5.94E+02	0.346 - 4.15
SVOC	Isophorone	mg/kg	--	--	--	0/37	N/A	N/A	0/37	2.79E+03	0/37	1.14E+05	0.346 - 4.15
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E+02	0/37	1.14E+04	0.346 - 4.15
SVOC	Naphthalene	mg/kg	1.40E-02	1.40E-01	5.93E-02	3/37	N/A	N/A	0/37	1.67E+01	0/37	1.67E+03	0.0346 - 0.415
SVOC	Nitrobenzene	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.63E+01	0/37	1.69E+03	0.346 - 4.15
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	3.79E-01	0/37	3.79E+01	0.346 - 4.15
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	4.06E+00	0/37	4.06E+02	0.346 - 4.15
SVOC	Phenanthrene	mg/kg	5.64E-02	5.33E+00	1.09E+00	13/37	N/A	N/A	0/37	1.01E+03	0/37	3.03E+04	0.0346 - 0.415
SVOC	Phenol	mg/kg	--	--	--	0/37	N/A	N/A	0/37	5.69E+03	0/37	1.71E+05	0.346 - 4.15
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/37	N/A	N/A	0/37	7.58E+01	0/37	2.27E+03	0.346 - 4.15
SVOC	Pyrene	mg/kg	1.40E-02	5.66E+00	1.02E+00	16/37	N/A	N/A	0/37	5.05E+02	0/37	1.52E+04	0.0346 - 0.415
SVOC	Total PAH[d]	mg/kg	2.48E-03	3.39E+00	7.34E-01	16/37	N/A	N/A	2/37	2.35E+00	0/37	1.51E+02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.18E+01	0/1	1.18E+03	0.316 - 0.316
RADS	Americium-241	pCi/g	3.99E+00	3.99E+00	3.99E+00	1/40	N/A	N/A	0/40	1.64E+01	0/40	1.64E+03	0.294 - 1.21
RADS	Cesium-137	pCi/g	5.04E-02	3.03E+00	9.16E-01	20/40	12/40	2.80E-01	9/40	5.82E-01	0/40	5.82E+01	0.0292 - 0.117
RADS	Cobalt-60	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.53E-01	0/1	1.53E+01	0.0435 - 0.0435
RADS	Lead-210	pCi/g	--	--	--	0/1	N/A	N/A	0/1	4.04E+00	0/1	4.04E+02	7.71 - 7.71
RADS	Neptunium-237	pCi/g	8.73E-01	6.50E+00	2.92E+00	4/40	4/40	1.00E-01	2/40	1.63E+00	0/40	1.63E+02	0.337 - 1.03

Table 4.35. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Plutonium-238	pCi/g	4.56E-01	4.56E-01	4.56E-01	1/40	1/40	7.30E-02	0/40	1.94E+01	0/40	1.94E+03	0.178 - 1.34
RADS	Plutonium-239/240	pCi/g	9.49E-01	1.50E+01	3.21E+00	10/40	10/40	2.50E-02	0/40	1.83E+01	0/40	1.83E+03	0.302 - 1.14
RADS	Radium-226	pCi/g	1.33E+00	1.33E+00	1.33E+00	1/1	0/1	1.50E+00	1/1	1.64E-01	0/1	1.64E+01	0.76 - 0.76
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	2.49E+01	0/1	2.49E+03	1.67 - 1.67
RADS	Technetium-99	pCi/g	3.18E+00	1.63E+02	4.32E+01	22/42	22/42	2.50E+00	0/42	1.55E+03	0/42	1.00E+05	2.35 - 4.41
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	6.34E+01	0/1	6.34E+03	0.712 - 0.712
RADS	Thorium-230	pCi/g	6.73E-01	1.52E+02	7.33E+00	38/40	20/40	1.40E+00	1/40	2.82E+01	0/40	2.82E+03	0.373 - 1.13
RADS	Thorium-232	pCi/g	9.16E-01	9.16E-01	9.16E-01	1/1	0/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.472 - 0.472
RADS	Uranium-233/234	pCi/g	7.90E-01	2.79E+01	6.52E+00	18/23	12/23	1.20E+00	0/23	4.30E+01	0/23	4.30E+03	0.453 - 1.2
RADS	Uranium-234	pCi/g	1.04E+00	8.67E+00	4.35E+00	17/17	16/17	1.20E+00	0/17	4.30E+01	0/17	4.30E+03	0.482 - 1.09
RADS	Uranium-235	pCi/g	7.77E-01	8.25E-01	8.01E-01	2/17	2/17	6.00E-02	0/17	2.62E+00	0/17	2.62E+02	0.232 - 0.731
RADS	Uranium-235/236	pCi/g	5.63E-01	1.12E+00	8.19E-01	6/23	6/23	6.00E-02	0/23	2.62E+00	0/23	2.62E+02	0.28 - 0.863
RADS	Uranium-238	pCi/g	8.89E-01	3.36E+01	7.08E+00	34/40	29/40	1.20E+00	9/40	8.98E+00	0/40	8.98E+02	0.247 - 1.15
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.54E+03	0/39	1.00E+05	0.000887 - 0.00163
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.11E+01	0/39	1.11E+03	0.000887 - 0.00163
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	3.24E-03	1.15E-02	7.37E-03	2/39	N/A	N/A	0/39	3.79E+03	0/39	1.00E+05	0.00444 - 0.00817
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.49E-01	0/39	2.55E+01	0.000887 - 0.00163
VOC	1,1-Dichloroethane	mg/kg	6.81E-04	6.81E-04	6.81E-04	1/39	N/A	N/A	0/39	9.52E+01	0/39	9.52E+03	0.000887 - 0.00163
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.26E+02	0/39	3.78E+03	0.000887 - 0.00163
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.63E+01	0/39	7.89E+02	0.000887 - 0.00163
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.20E+01	0/39	9.60E+02	0.000887 - 0.00163
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.10E-01	0/39	4.10E+01	0.000887 - 0.00163
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.86E-01	0/39	7.86E+01	0.000887 - 0.00163
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.43E+02	0/39	2.83E+04	0.000887 - 0.00163
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.13E+01	0/39	5.19E+02	0.000887 - 0.00163
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.91E+00	0/39	2.67E+02	0.000887 - 0.00163
VOC	1,2-Dimethylbenzene	mg/kg	7.68E-04	4.74E-03	2.75E-03	2/39	N/A	N/A	0/39	3.61E+02	0/39	1.08E+04	0.000887 - 0.00163
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.43E+02	0/39	2.83E+04	0.000887 - 0.00163
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.20E+01	0/39	7.20E+03	0.000887 - 0.00163
VOC	1,4-Dioxane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.30E+01	0/39	4.30E+03	0.0444 - 0.0817
VOC	2-Butanone	mg/kg	1.89E-03	1.41E-02	5.52E-03	6/39	N/A	N/A	0/39	1.28E+04	0/39	3.84E+05	0.00444 - 0.00817
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.80E-01	0/39	4.80E+01	0.00444 - 0.00817
VOC	2-Hexanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.69E+01	0/39	2.91E+03	0.00444 - 0.00817
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	9.70E+02	0/39	9.70E+04	0.000887 - 0.00163
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.31E+03	0/39	6.93E+04	0.00444 - 0.00817
VOC	Acetone	mg/kg	1.84E-03	6.54E-02	1.24E-02	24/39	N/A	N/A	0/39	2.96E+04	0/39	8.88E+05	0.00444 - 0.00817
VOC	Acrolein	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.14E-02	0/39	2.44E+00	0.00444 - 0.00817
VOC	Acrylonitrile	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.46E+00	0/39	2.71E+02	0.00444 - 0.00817
VOC	Benzene	mg/kg	5.41E-04	5.41E-04	5.41E-04	1/39	N/A	N/A	0/39	2.59E+01	0/39	1.28E+03	0.000887 - 0.00163
VOC	Bromochloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.48E+01	0/39	2.54E+03	0.000887 - 0.00163
VOC	Bromodichloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.93E+00	0/39	7.93E+02	0.000887 - 0.00163
VOC	Bromoform	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.24E+02	0/39	1.97E+04	0.000887 - 0.00163
VOC	Bromomethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.80E+00	0/39	1.14E+02	0.000887 - 0.00163
VOC	Carbon disulfide	mg/kg	5.44E-03	5.44E-03	5.44E-03	1/39	N/A	N/A	0/39	4.21E+02	0/39	1.26E+04	0.00444 - 0.00817
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.57E+01	0/39	1.57E+03	0.000887 - 0.00163

Table 4.35. Surface and Subsurface (0–16 ft) Soil Data Summary and Excavation Worker Protection Screening: Sector 7 (Continued)

			Detected Results			Freq. of	Provisional Background		Excavation Worker		Excavation Worker		
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**FOE**	**NAL**	**FOE**	**AL**	**DL Range**
VOC	Chlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.48E+02	0/39	4.44E+03	0.000887 - 0.00163
VOC	Chloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.07E+03	0/39	9.21E+04	0.000887 - 0.00163
VOC	Chloroform	mg/kg	3.94E-04	1.08E-03	7.10E-04	5/39	N/A	N/A	0/39	8.90E+00	0/39	8.90E+02	0.000887 - 0.00163
VOC	Chloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.26E+01	0/39	1.88E+03	0.000887 - 0.00163
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.09E-03	3.09E-03	3.09E-03	1/39	N/A	N/A	0/39	6.58E+01	0/39	1.97E+03	0.000887 - 0.00163
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.83E+01	0/39	1.21E+03	0.000887 - 0.00163
VOC	Cumene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.02E+03	0/39	3.06E+04	0.000887 - 0.00163
VOC	Cyclohexane	mg/kg	7.93E-04	7.93E-04	7.93E-04	1/39	N/A	N/A	0/39	3.70E+03	0/39	1.11E+05	0.000887 - 0.00163
VOC	Dibromochloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.48E+01	0/39	5.48E+03	0.000887 - 0.00163
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.94E+01	0/39	1.48E+03	0.000887 - 0.00163
VOC	Ethylbenzene	mg/kg	4.66E-04	2.32E-03	1.39E-03	2/39	N/A	N/A	0/39	1.30E+02	0/39	1.30E+04	0.000887 - 0.00163
VOC	m,p-Xylene	mg/kg	1.85E-03	1.09E-02	6.38E-03	2/39	N/A	N/A	0/39	3.23E+02	0/39	9.69E+03	0.00177 - 0.00327
VOC	Methyl acetate	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.29E+04	0/39	9.87E+05	0.00444 - 0.00817
VOC	Methylcyclohexane	mg/kg	1.33E-03	1.33E-03	1.33E-03	1/39	N/A	N/A	0/39	1.76E+03	0/39	5.28E+04	0.000887 - 0.00163
VOC	Methylene chloride	mg/kg	2.20E-03	8.15E-03	3.51E-03	18/39	N/A	N/A	0/39	1.57E+02	0/39	4.71E+03	0.00444 - 0.00817
VOC	Styrene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.00E+03	0/39	9.00E+04	0.000887 - 0.00163
VOC	Tetrachloroethene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.34E+01	0/39	1.30E+03	0.000887 - 0.00163
VOC	Toluene	mg/kg	5.00E-04	8.26E-03	1.90E-03	8/39	N/A	N/A	0/39	2.18E+03	0/39	6.54E+04	0.000887 - 0.00163
VOC	Total Xylene	mg/kg	2.62E-03	1.56E-02	9.11E-03	2/39	N/A	N/A	0/39	3.23E+02	0/39	9.69E+03	0.00266 - 0.0049
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.67E+01	0/39	1.70E+03	0.000887 - 0.00163
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.83E+01	0/39	1.21E+03	0.000887 - 0.00163
VOC	Trichloroethene	mg/kg	4.66E-04	3.40E-03	1.30E-03	6/39	N/A	N/A	0/39	2.26E+00	0/39	6.78E+01	0.000887 - 0.00163
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.11E+02	0/39	1.23E+04	0.000887 - 0.00163
VOC	Vinyl chloride	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.72E+00	0/39	4.72E+02	0.000887 - 0.00163

One or more samples exceed NAL value

One or more samples exceed background value

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.36. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 7

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	7.36E+03	1.57E+04	1.12E+04	20/20	8/20	1.20E+04	0/20	5.99E+04	20/20	3.00E+03	9.98 - 120
METAL	Antimony	mg/kg	4.00E-01	2.34E+00	8.34E-01	7/20	7/20	2.10E-01	2/20	7.04E-01	7/20	3.52E-02	2.08 - 2.44
METAL	Arsenic	mg/kg	2.28E+00	9.52E+00	5.71E+00	20/20	3/20	7.90E+00	20/20	3.02E-02	20/20	1.51E-03	0.998 - 1.24
METAL	Barium	mg/kg	4.71E+01	2.81E+02	1.15E+02	20/20	3/20	1.70E+02	0/20	3.11E+02	20/20	1.55E+01	0.798 - 9.51
METAL	Beryllium	mg/kg	3.29E-01	9.13E-01	5.21E-01	20/20	2/20	6.90E-01	0/20	3.89E+01	0/20	1.95E+00	0.0998 - 0.124
METAL	Boron	mg/kg	9.68E-01	3.79E+00	1.70E+00	15/20	0/20	N/A	0/20	2.56E+01	8/20	1.28E+00	2.99 - 3.71
METAL	Cadmium	mg/kg	2.88E-02	5.64E-01	9.69E-02	17/20	1/20	2.10E-01	0/20	1.39E+00	7/20	6.93E-02	0.2 - 0.247
METAL	Chromium	mg/kg	1.12E+01	3.74E+01	1.87E+01	20/20	0/20	4.30E+01	0/20	3.60E+06	0/20	1.80E+05	0.599 - 0.742
METAL	Cobalt	mg/kg	3.38E+00	1.42E+01	6.68E+00	20/20	2/20	1.30E+01	20/20	5.43E-01	20/20	2.71E-02	0.2 - 0.247
METAL	Copper	mg/kg	5.94E+00	2.49E+01	9.84E+00	20/20	0/20	2.50E+01	0/20	5.62E+01	20/20	2.81E+00	0.399 - 0.494
METAL	Iron	mg/kg	1.01E+04	2.69E+04	1.73E+04	20/20	0/20	2.80E+04	20/20	7.04E+02	20/20	3.52E+01	21.1 - 240
METAL	Lead	mg/kg	6.99E+00	2.34E+01	1.13E+01	20/20	1/20	2.30E+01	0/20	2.70E+02	4/20	1.35E+01	0.399 - 0.494
METAL	Manganese	mg/kg	1.73E+02	1.58E+03	4.16E+02	20/20	1/20	8.20E+02	20/20	5.65E+01	20/20	2.83E+00	1.05 - 12
METAL	Mercury	mg/kg	1.22E-02	7.09E+00	4.81E-01	19/20	5/20	1.30E-01	2/20	5.91E-01	8/20	2.95E-02	0.0239 - 0.521
METAL	Molybdenum	mg/kg	1.08E-01	1.18E+00	4.46E-01	20/20	0/20	N/A	0/20	4.03E+00	17/20	2.02E-01	0.2 - 0.247
METAL	Nickel	mg/kg	5.92E+00	2.31E+02	2.25E+01	20/20	2/20	2.20E+01	1/20	5.12E+01	20/20	2.56E+00	0.412 - 3.99
METAL	Selenium	mg/kg	8.81E-01	2.34E+00	1.41E+00	20/20	20/20	7.00E-01	17/20	1.04E+00	20/20	5.19E-02	0.998 - 1.24
METAL	Silver	mg/kg	1.26E-01	1.93E+00	7.76E-01	4/20	0/20	2.70E+00	1/20	1.60E+00	4/20	7.99E-02	0.521 - 6.11
METAL	Thallium	mg/kg	1.59E-01	2.05E-01	1.84E-01	7/20	0/20	3.40E-01	7/20	2.84E-02	7/20	1.42E-03	0.399 - 0.494
METAL	Uranium[a]	mg/kg	5.53E-01	4.90E+01	6.63E+00	20/20	8/20	4.60E+00	8/20	3.60E+00	20/20	1.80E-01	0.0399 - 0.0494
METAL	Vanadium	mg/kg	1.94E+01	4.92E+01	2.81E+01	20/20	2/20	3.70E+01	0/20	1.73E+02	20/20	8.64E+00	3.99 - 4.94
METAL	Zinc	mg/kg	1.90E+01	6.41E+01	3.33E+01	20/20	2/20	6.00E+01	0/20	7.46E+02	5/20	3.73E+01	3.99 - 21.1
ANION	Fluoride	mg/kg	2.49E+00	1.72E+01	9.51E+00	20/20	0/20	N/A	0/20	2.40E+02	6/20	1.20E+01	1.08 - 1.26
DI/FURA	Total Dioxin/Furans[b]	mg/kg	6.40E-06	6.40E-06	6.40E-06	1/1	0/1	N/A	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB[c]	mg/kg	2.13E-03	1.27E-02	7.15E-03	7/18	0/18	N/A	0/18	1.36E-01	4/18	6.82E-03	0.00388 - 0.0197
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.74E-02	0/18	8.72E-04	0.38 - 2.12
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.04E+00	0/18	4.02E-01	0.38 - 2.12
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.32E-02	0/18	1.16E-03	0.38 - 2.12
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.52E-02	0/18	2.26E-03	0.38 - 2.12
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.42E-01	0/18	4.21E-02	0.38 - 2.12
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.72E-02	0/18	4.36E-03	0.761 - 4.25
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	6.42E-03	0/18	3.21E-04	0.38 - 2.12
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.33E-03	0/18	6.67E-05	0.38 - 2.12
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	7.70E+00	0/18	3.85E-01	0.038 - 0.212
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.78E-01	0/18	8.91E-03	0.38 - 2.12
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	5.16E-03	0/18	2.58E-04	0.38 - 2.12
SVOC	2-Methylnaphthalene	mg/kg	2.26E-02	2.26E-02	2.26E-02	1/18	0/18	N/A	0/18	3.70E-01	1/18	1.85E-02	0.038 - 0.212
SVOC	2-Methylphenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.51E+00	0/18	7.53E-02	0.38 - 2.12
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.60E-01	0/18	8.01E-03	0.38 - 2.12
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.72E-02	0/18	4.36E-03	0.38 - 2.12
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.65E-02	0/18	8.24E-04	0.38 - 2.12
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.90E-03	0/18	2.45E-04	0.38 - 2.12
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	0/18	N/A	0/18	6.84E-03	0/18	3.42E-04	0.38 - 2.12
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	3.42E+00	0/18	1.71E-01	0.38 - 2.12
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	3.10E-03	0/18	1.55E-04	0.38 - 2.12

Table 4.36. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	0/18	N/A	0/18	6.84E-03	0/18	3.42E-04	0.38 - 2.12
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.72E-02	0/18	4.36E-03	0.38 - 2.12
SVOC	Acenaphthene	mg/kg	1.90E-02	3.40E-02	2.74E-02	3/18	0/18	N/A	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212
SVOC	Acenaphthylene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212
SVOC	Acetophenone	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.17E+00	0/18	5.84E-02	0.38 - 2.12
SVOC	Anthracene	mg/kg	1.91E-02	5.38E-02	4.18E-02	4/18	0/18	N/A	0/18	1.16E+02	0/18	5.81E+00	0.038 - 0.212
SVOC	Atrazine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	3.92E-03	0/18	1.96E-04	0.38 - 2.12
SVOC	Benzaldehyde	mg/kg	--	--	--	0/18	0/18	N/A	0/18	8.30E-02	0/18	4.15E-03	0.38 - 2.12
SVOC	Benzo(ghi)perylene	mg/kg	3.29E-02	4.61E-02	3.94E-02	3/18	0/18	N/A	0/18	2.63E+01	0/18	1.32E+00	0.038 - 0.212
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.70E-02	0/18	1.35E-03	0.38 - 2.12
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	0/18	N/A	0/18	7.22E-05	0/18	3.61E-06	0.38 - 2.12
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.62E-03	0/18	1.31E-04	0.38 - 2.12
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.66E+01	0/18	1.33E+00	0.038 - 0.212
SVOC	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.72E+00	0/18	2.36E-01	0.038 - 0.212
SVOC	Caprolactam	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.94E+00	0/18	2.47E-01	0.38 - 2.12
SVOC	Carbazole	mg/kg	1.33E-02	1.84E-02	1.52E-02	4/18	0/18	N/A	0/18	7.51E-01	0/18	3.76E-02	0.038 - 0.212
SVOC	Dibenzofuran	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.92E-01	0/18	1.46E-02	0.38 - 2.12
SVOC	Diethyl phthalate	mg/kg	1.89E-02	1.92E-02	1.91E-02	2/18	0/18	N/A	0/18	1.22E+01	0/18	6.08E-01	0.038 - 0.212
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.22E+01	0/18	6.08E-01	0.038 - 0.212
SVOC	Di-n-butyl phthalate	mg/kg	1.28E-02	1.68E-02	1.49E-02	4/18	0/18	N/A	0/18	4.54E+00	0/18	2.27E-01	0.038 - 0.212
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.13E+02	0/18	5.65E+00	0.038 - 0.212
SVOC	Diphenylamine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.66E+00	0/18	2.33E-01	0.38 - 2.12
SVOC	Fluoranthene	mg/kg	1.71E-02	3.83E-01	2.10E-01	6/18	0/18	N/A	0/18	1.78E+02	0/18	8.91E+00	0.038 - 0.212
SVOC	Fluorene	mg/kg	1.49E-02	5.83E-02	3.50E-02	3/18	0/18	N/A	0/18	1.09E+01	0/18	5.45E-01	0.038 - 0.212
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.46E-03	0/18	1.23E-04	0.38 - 2.12
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	5.34E-03	0/18	2.67E-04	0.38 - 2.12
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	2.56E-03	0/18	1.28E-04	0.38 - 2.12
SVOC	Hexachloroethane	mg/kg	--	--	--	0/18	0/18	N/A	0/18	4.00E-03	0/18	2.00E-04	0.38 - 2.12
SVOC	Isophorone	mg/kg	--	--	--	0/18	0/18	N/A	0/18	5.16E-01	0/18	2.58E-02	0.38 - 2.12
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	5.94E-01	0/18	2.97E-02	0.38 - 2.12
SVOC	Naphthalene	mg/kg	1.40E-02	2.38E-02	1.89E-02	2/18	0/18	N/A	2/18	7.70E-03	2/18	3.85E-04	0.038 - 0.212
SVOC	Nitrobenzene	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.83E-03	0/18	9.17E-05	0.38 - 2.12
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.62E-04	0/18	8.10E-06	0.38 - 2.12
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.14E-03	0/18	5.71E-05	0.38 - 2.12
SVOC	Phenanthrene	mg/kg	1.31E-01	3.57E-01	2.30E-01	4/18	0/18	N/A	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212
SVOC	Phenol	mg/kg	--	--	--	0/18	0/18	N/A	0/18	6.62E+00	0/18	3.31E-01	0.38 - 2.12
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/18	0/18	N/A	0/18	3.16E-02	0/18	1.58E-03	0.38 - 2.12
SVOC	Pyrene	mg/kg	1.40E-02	2.99E-01	1.51E-01	6/18	0/18	N/A	0/18	2.63E+01	0/18	1.32E+00	0.038 - 0.212
SVOC	Total PAH[d]	mg/kg	2.48E-03	1.62E-01	7.21E-02	6/18	0/18	N/A	0/18	5.89E-01	3/18	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/20	0/20	N/A	0/20	1.92E+01	0/20	9.58E-01	0.294 - 1.21
RADS	Cesium-137	pCi/g	5.04E-02	3.03E+00	1.09E+00	6/20	4/20	2.80E-01	0/20	9.58E+00	4/20	4.79E-01	0.0369 - 0.0733
RADS	Neptunium-237	pCi/g	8.73E-01	8.73E-01	8.73E-01	1/20	0/20	N/A	0/20	1.07E+00	1/20	5.36E-02	0.421 - 1
RADS	Plutonium-238	pCi/g	--	--	--	0/20	0/20	N/A	0/20	4.38E+00	0/20	2.19E-01	0.345 - 1.14
RADS	Plutonium-239/240	pCi/g	9.49E-01	3.16E+00	1.72E+00	3/20	0/20	N/A	0/20	4.26E+00	3/20	2.13E-01	0.362 - 1.14
RADS	Technetium-99	pCi/g	4.28E+00	1.29E+02	2.94E+01	8/22	8/22	2.80E+00	8/22	1.52E-01	8/22	7.60E-03	2.51 - 4.41

Table 4.36. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**Detect.**	**FOE**	**Bkgd**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
RADS	Thorium-230	pCi/g	6.73E-01	1.32E+01	2.84E+00	18/20	6/20	1.40E+00	0/20	3.66E+01	6/20	1.83E+00	0.373 - 0.91
RADS	Uranium-233/234	pCi/g	7.90E-01	1.44E+01	4.32E+00	8/11	3/11	1.20E+00	3/11	9.90E-01	8/11	4.95E-02	0.496 - 1.2
RADS	Uranium-234	pCi/g	1.04E+00	5.79E+00	2.75E+00	9/9	8/9	1.20E+00	9/9	9.90E-01	9/9	4.95E-02	0.482 - 1.09
RADS	Uranium-235	pCi/g	--	--	--	0/9	0/9	6.00E-02	0/9	9.76E-01	0/9	4.88E-02	0.232 - 0.731
RADS	Uranium-235/236	pCi/g	7.48E-01	7.73E-01	7.61E-01	2/11	2/11	6.00E-02	0/11	9.76E-01	2/11	4.88E-02	0.28 - 0.863
RADS	Uranium-238	pCi/g	8.89E-01	1.78E+01	4.75E+00	15/20	11/20	1.20E+00	15/20	8.05E-01	15/20	4.03E-02	0.346 - 1.15
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.62E+00	0/20	2.81E-01	0.000901 - 0.00163
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.92E-04	0/20	2.96E-05	0.000901 - 0.00163
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	3.24E-03	1.15E-02	7.37E-03	2/20	0/20	N/A	0/20	5.13E+01	0/20	2.56E+00	0.00451 - 0.00817
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.69E-04	0/20	1.35E-05	0.000901 - 0.00163
VOC	1,1-Dichloroethane	mg/kg	6.81E-04	6.81E-04	6.81E-04	1/20	0/20	N/A	0/20	1.56E-02	0/20	7.82E-04	0.000901 - 0.00163
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.04E-01	0/20	1.02E-02	0.000901 - 0.00163
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	4.18E-02	0/20	2.09E-03	0.000901 - 0.00163
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.32E-02	0/20	1.16E-03	0.000901 - 0.00163
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.88E-06	0/20	1.44E-07	0.000901 - 0.00163
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	4.20E-05	0/20	2.10E-06	0.000901 - 0.00163
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.90E-01	0/20	2.95E-02	0.000901 - 0.00163
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	9.69E-04	0/20	4.84E-05	0.000901 - 0.00163
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.48E-03	0/20	2.74E-04	0.000901 - 0.00163
VOC	1,2-Dimethylbenzene	mg/kg	7.68E-04	7.68E-04	7.68E-04	1/20	0/20	N/A	0/20	3.81E-01	0/20	1.90E-02	0.000901 - 0.00163
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.90E-01	0/20	2.95E-02	0.000901 - 0.00163
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	9.24E-03	0/20	4.62E-04	0.000901 - 0.00163
VOC	1,4-Dioxane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.88E-03	0/20	9.42E-05	0.0451 - 0.0817
VOC	2-Butanone	mg/kg	1.99E-03	1.41E-02	7.06E-03	4/20	0/20	N/A	0/20	2.32E+00	0/20	1.16E-01	0.00451 - 0.00817
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.76E-05	0/20	1.38E-06	0.00451 - 0.00817
VOC	2-Hexanone	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.75E-02	0/20	8.75E-04	0.00451 - 0.00817
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	6.44E-02	0/20	3.22E-03	0.000901 - 0.00163
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.62E-01	0/20	2.81E-02	0.00451 - 0.00817
VOC	Acetone	mg/kg	2.53E-03	6.54E-02	1.85E-02	12/20	0/20	N/A	0/20	7.36E+00	0/20	3.68E-01	0.00451 - 0.00817
VOC	Acrolein	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.68E-05	0/20	8.41E-07	0.00451 - 0.00817
VOC	Acrylonitrile	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.28E-04	0/20	1.14E-05	0.00451 - 0.00817
VOC	Benzene	mg/kg	5.41E-04	5.41E-04	5.41E-04	1/20	0/20	N/A	0/20	4.66E-03	1/20	2.33E-04	0.000901 - 0.00163
VOC	Bromochloromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	4.16E-02	0/20	2.08E-03	0.000901 - 0.00163
VOC	Bromodichloromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	7.30E-04	0/20	3.65E-05	0.000901 - 0.00163
VOC	Bromoform	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.75E-02	0/20	8.73E-04	0.000901 - 0.00163
VOC	Bromomethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	3.82E-03	0/20	1.91E-04	0.000901 - 0.00163
VOC	Carbon disulfide	mg/kg	5.44E-03	5.44E-03	5.44E-03	1/20	0/20	N/A	0/20	4.80E-01	0/20	2.40E-02	0.00451 - 0.00817
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/20	0/20	N/A	0/20	3.54E-03	0/20	1.77E-04	0.000901 - 0.00163
VOC	Chlorobenzene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.06E-01	0/20	5.28E-03	0.000901 - 0.00163
VOC	Chloroethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	4.74E+00	0/20	2.37E-01	0.000901 - 0.00163
VOC	Chloroform	mg/kg	1.08E-03	1.08E-03	1.08E-03	1/20	0/20	N/A	0/20	1.22E-03	1/20	6.12E-05	0.000901 - 0.00163
VOC	Chloromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.05E-02	0/20	5.26E-04	0.000901 - 0.00163
VOC	*cis* -1,2-Dichloroethene	mg/kg	3.09E-03	3.09E-03	3.09E-03	1/20	0/20	N/A	0/20	2.12E-02	1/20	1.06E-03	0.000901 - 0.00163
VOC	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	3.36E-03	0/20	1.68E-04	0.000901 - 0.00163
VOC	Cumene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.48E+00	0/20	7.38E-02	0.000901 - 0.00163

Table 4.36. Subsurface (1–16 ft) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Cyclohexane	mg/kg	7.93E-04	7.93E-04	7.93E-04	1/20	0/20	N/A	0/20	2.60E+01	0/20	1.30E+00	0.000901 - 0.00163
VOC	Dibromochloromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	4.64E-03	0/20	2.32E-04	0.000901 - 0.00163
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	6.08E-01	0/20	3.04E-02	0.000901 - 0.00163
VOC	Ethylbenzene	mg/kg	4.66E-04	4.66E-04	4.66E-04	1/20	0/20	N/A	0/20	3.36E-02	0/20	1.68E-03	0.000901 - 0.00163
VOC	m,p-Xylene	mg/kg	1.85E-03	1.85E-03	1.85E-03	1/20	0/20	N/A	0/20	3.82E-01	0/20	1.91E-02	0.0018 - 0.00327
VOC	Methyl acetate	mg/kg	--	--	--	0/20	0/20	N/A	0/20	8.22E+00	0/20	4.11E-01	0.00451 - 0.00817
VOC	Methylcyclohexane	mg/kg	1.33E-03	1.33E-03	1.33E-03	1/20	0/20	N/A	0/20	2.80E+01	0/20	1.40E+00	0.000901 - 0.00163
VOC	Methylene chloride	mg/kg	2.20E-03	8.15E-03	3.83E-03	11/20	0/20	N/A	0/20	5.44E-02	8/20	2.72E-03	0.00451 - 0.00817
VOC	Styrene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	2.66E+00	0/20	1.33E-01	0.000901 - 0.00163
VOC	Tetrachloroethene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	3.69E-02	0/20	1.84E-03	0.000901 - 0.00163
VOC	Toluene	mg/kg	5.05E-04	2.00E-03	1.14E-03	5/20	0/20	N/A	0/20	1.52E+00	0/20	7.62E-02	0.000901 - 0.00163
VOC	Total Xylene	mg/kg	2.62E-03	2.62E-03	2.62E-03	1/20	0/20	N/A	0/20	3.82E-01	0/20	1.91E-02	0.0027 - 0.0049
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	5.83E-02	0/20	2.91E-03	0.000901 - 0.00163
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	0/20	N/A	0/20	3.36E-03	0/20	1.68E-04	0.000901 - 0.00163
VOC	Trichloroethene	mg/kg	4.66E-04	1.38E-03	8.80E-04	5/20	0/20	N/A	0/20	2.02E-03	5/20	1.01E-04	0.000901 - 0.00163
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.46E+00	0/20	7.31E-02	0.000901 - 0.00163
VOC	Vinyl chloride	mg/kg	--	--	--	0/20	0/20	N/A	0/20	1.29E-04	0/20	6.47E-06	0.000901 - 0.00163

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total Dioxin and Furans calculated using TEF Values in RMD 2021.

[c] Total PCBs calculated by laboratory.

[d] Total PAHs calculated using TEF values in RMD 2021.

Table 4.37. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 7

			Detected Results			Freq. of	Provisional Background		GW Protection Screen				
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	2.25E+03	2.67E+04	1.09E+04	37/37	16/37	1.20E+04	0/37	5.99E+04	36/37	3.00E+03	10.1 - 125
METAL	Antimony	mg/kg	3.95E-01	2.23E+00	1.17E+00	5/37	5/37	2.10E-01	4/37	7.04E-01	5/37	3.52E-02	1.97 - 22.5
METAL	Arsenic	mg/kg	5.79E-01	2.23E+01	4.32E+00	36/37	6/37	7.90E+00	36/37	3.02E-02	36/37	1.51E-03	1.01 - 1.26
METAL	Barium	mg/kg	8.05E+00	1.33E+03	9.16E+01	37/37	2/37	1.70E+02	1/37	3.11E+02	31/37	1.55E+01	0.81 - 9.48
METAL	Beryllium	mg/kg	1.37E-01	2.13E+00	8.90E-01	37/37	21/37	6.90E-01	0/37	3.89E+01	2/37	1.95E+00	0.101 - 0.126
METAL	Boron	mg/kg	9.63E-01	2.53E+00	1.42E+00	14/37	N/A	N/A	0/37	2.56E+01	8/37	1.28E+00	3.04 - 3.77
METAL	Cadmium	mg/kg	2.52E-02	2.84E-01	6.80E-02	20/37	2/37	2.10E-01	0/37	1.39E+00	2/37	6.93E-02	0.203 - 0.251
METAL	Chromium	mg/kg	3.89E+00	5.36E+01	1.50E+01	37/37	1/37	4.30E+01	0/37	3.60E+06	0/37	1.80E+05	0.608 - 0.753
METAL	Cobalt	mg/kg	7.94E-01	5.20E+01	9.51E+00	37/37	8/37	1.30E+01	37/37	5.43E-01	37/37	2.71E-02	0.203 - 0.251
METAL	Copper	mg/kg	1.57E+00	1.44E+01	6.39E+00	37/37	0/37	2.50E+01	0/37	5.62E+01	31/37	2.81E+00	0.405 - 0.502
METAL	Iron	mg/kg	2.99E+03	7.12E+04	2.43E+04	37/37	15/37	2.80E+04	37/37	7.04E+02	37/37	3.52E+01	21.1 - 250
METAL	Lead	mg/kg	1.18E+00	2.80E+01	6.50E+00	37/37	1/37	2.30E+01	0/37	2.70E+02	3/37	1.35E+01	0.405 - 0.499
METAL	Manganese	mg/kg	2.04E+01	7.23E+03	3.92E+02	37/37	3/37	8.20E+02	24/37	5.65E+01	37/37	2.83E+00	1.01 - 109
METAL	Mercury	mg/kg	9.74E-03	4.50E-02	2.11E-02	13/37	0/37	1.30E-01	0/37	5.91E-01	3/37	2.95E-02	0.0229 - 0.0291
METAL	Molybdenum	mg/kg	1.27E-01	1.89E+00	4.91E-01	30/37	N/A	N/A	0/37	4.03E+00	26/37	2.02E-01	0.203 - 0.25
METAL	Nickel	mg/kg	1.46E+00	2.11E+01	9.39E+00	37/37	0/37	2.20E+01	0/37	5.12E+01	34/37	2.56E+00	0.405 - 0.502
METAL	Selenium	mg/kg	4.18E-01	4.22E+00	1.54E+00	33/37	25/37	7.00E-01	18/37	1.04E+00	33/37	5.19E-02	1.01 - 1.26
METAL	Silver	mg/kg	1.79E-01	1.39E+00	4.31E-01	12/37	0/37	2.70E+00	0/37	1.60E+00	12/37	7.99E-02	0.492 - 22.5
METAL	Thallium	mg/kg	1.64E-01	2.97E-01	2.23E-01	17/37	0/37	3.40E-01	17/37	2.84E-02	17/37	1.42E-03	0.405 - 0.502
METAL	Uranium[a]	mg/kg	2.64E-01	1.91E+00	9.06E-01	37/37	0/37	4.60E+00	0/37	3.60E+00	37/37	1.80E-01	0.0405 - 0.0502
METAL	Vanadium	mg/kg	5.02E+00	3.78E+01	2.14E+01	37/37	1/37	3.70E+01	0/37	1.73E+02	32/37	8.64E+00	4.05 - 5.02
METAL	Zinc	mg/kg	3.90E+00	7.88E+01	3.34E+01	37/37	6/37	6.00E+01	0/37	7.46E+02	16/37	3.73E+01	4.05 - 24.2
ANION	Fluoride	mg/kg	1.05E+00	8.53E+00	2.47E+00	37/37	N/A	N/A	0/37	2.40E+02	0/37	1.20E+01	0.946 - 2.19
PPCB	Total PCB[b]	mg/kg	6.92E-03	6.92E-03	6.92E-03	1/39	N/A	N/A	0/39	1.36E-01	1/39	6.82E-03	0.00357 - 0.00437
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.74E-02	0/39	8.72E-04	0.361 - 0.432
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.04E+00	0/39	4.02E-01	0.361 - 0.432
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.32E-02	0/39	1.16E-03	0.361 - 0.432
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.52E-02	0/39	2.26E-03	0.361 - 0.432
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.42E-01	0/39	4.21E-02	0.361 - 0.432
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.72E-02	0/39	4.36E-03	0.721 - 0.864
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.42E-03	0/39	3.21E-04	0.361 - 0.432
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.33E-03	0/39	6.67E-05	0.361 - 0.432
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.70E+00	0/39	3.85E-01	0.0361 - 0.0432
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.78E-01	0/39	8.91E-03	0.361 - 0.432
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.16E-03	0/39	2.58E-04	0.361 - 0.432
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.70E-01	0/39	1.85E-02	0.0361 - 0.0432
SVOC	2-Methylphenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.51E+00	0/39	7.53E-02	0.361 - 0.432
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.60E-01	0/39	8.01E-03	0.361 - 0.432
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.72E-02	0/39	4.36E-03	0.361 - 0.432
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.65E-02	0/39	8.24E-04	0.361 - 0.432
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.90E-03	0/39	2.45E-04	0.361 - 0.432
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.84E-03	0/39	3.42E-04	0.361 - 0.432
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.42E+00	0/39	1.71E-01	0.361 - 0.432
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.10E-03	0/39	1.55E-04	0.361 - 0.432
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.84E-03	0/39	3.42E-04	0.361 - 0.432

Table 4.37. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.72E-02	0/39	4.36E-03	0.361 - 0.432
SVOC	Acenaphthene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432
SVOC	Acenaphthylene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432
SVOC	Acetophenone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.17E+00	0/39	5.84E-02	0.361 - 0.432
SVOC	Anthracene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.16E+02	0/39	5.81E+00	0.0361 - 0.0432
SVOC	Atrazine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.92E-03	0/39	1.96E-04	0.361 - 0.432
SVOC	Benzaldehyde	mg/kg	--	--	--	0/37	N/A	N/A	0/37	8.30E-02	0/37	4.15E-03	0.361 - 0.432
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.63E+01	0/39	1.32E+00	0.0361 - 0.0432
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.70E-02	0/39	1.35E-03	0.361 - 0.432
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.22E-05	0/39	3.61E-06	0.361 - 0.432
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.62E-03	0/39	1.31E-04	0.361 - 0.432
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	1.51E-02	3.35E-02	2.09E-02	5/39	N/A	N/A	0/39	2.66E+01	0/39	1.33E+00	0.0361 - 0.0432
SVOC	Butyl benzyl phthalate	mg/kg	2.67E-02	4.91E-01	2.59E-01	2/39	N/A	N/A	0/39	4.72E+00	1/39	2.36E-01	0.0361 - 0.0432
SVOC	Caprolactam	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.94E+00	0/39	2.47E-01	0.361 - 0.432
SVOC	Carbazole	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.51E-01	0/39	3.76E-02	0.0361 - 0.0432
SVOC	Dibenzofuran	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.92E-01	0/39	1.46E-02	0.361 - 0.432
SVOC	Diethyl phthalate	mg/kg	1.15E-02	5.36E-02	2.57E-02	4/39	N/A	N/A	0/39	1.22E+01	0/39	6.08E-01	0.0361 - 0.0432
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.22E+01	0/39	6.08E-01	0.0361 - 0.0432
SVOC	Di-n-butyl phthalate	mg/kg	1.22E-02	2.96E-02	1.86E-02	23/39	N/A	N/A	0/39	4.54E+00	0/39	2.27E-01	0.0361 - 0.0429
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.13E+02	0/39	5.65E+00	0.0361 - 0.0432
SVOC	Diphenylamine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.66E+00	0/39	2.33E-01	0.361 - 0.432
SVOC	Fluoranthene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.78E+02	0/39	8.91E+00	0.0361 - 0.0432
SVOC	Fluorene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.09E+01	0/39	5.45E-01	0.0361 - 0.0432
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.46E-03	0/39	1.23E-04	0.361 - 0.432
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.34E-03	0/39	2.67E-04	0.361 - 0.432
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.56E-03	0/39	1.28E-04	0.361 - 0.432
SVOC	Hexachloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.00E-03	0/39	2.00E-04	0.361 - 0.432
SVOC	Isophorone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.16E-01	0/39	2.58E-02	0.361 - 0.432
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.94E-01	0/39	2.97E-02	0.361 - 0.432
SVOC	Naphthalene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	7.70E-03	0/39	3.85E-04	0.0361 - 0.0432
SVOC	Nitrobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.83E-03	0/39	9.17E-05	0.361 - 0.432
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.62E-04	0/39	8.10E-06	0.361 - 0.432
SVOC	Pentachlorophenol	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.14E-03	0/39	5.71E-05	0.361 - 0.432
SVOC	Phenanthrene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432
SVOC	Phenol	mg/kg	1.41E-01	1.41E-01	1.41E-01	1/39	N/A	N/A	0/39	6.62E+00	0/39	3.31E-01	0.361 - 0.432
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.16E-02	0/39	1.58E-03	0.361 - 0.432
SVOC	Pyrene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.63E+01	0/39	1.32E+00	0.0361 - 0.0432
SVOC	Total PAH[c]	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.89E-01	0/39	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/37	N/A	N/A	0/37	1.92E+01	0/37	9.58E-01	0.206 - 0.817
RADS	Cesium-137	pCi/g	--	--	--	0/37	0/37	2.80E-01	0/37	9.58E+00	0/37	4.79E-01	0.0258 - 0.0652
RADS	Neptunium-237	pCi/g	--	--	--	0/37	N/A	N/A	0/37	1.07E+00	0/37	5.36E-02	0.348 - 1.05
RADS	Plutonium-238	pCi/g	--	--	--	0/37	N/A	N/A	0/37	4.38E+00	0/37	2.19E-01	0.312 - 0.945
RADS	Plutonium-239/240	pCi/g	--	--	--	0/37	N/A	N/A	0/37	4.26E+00	0/37	2.13E-01	0.169 - 0.983
RADS	Technetium-99	pCi/g	5.26E+00	5.26E+00	5.26E+00	1/41	1/41	2.80E+00	1/41	1.52E-01	1/41	7.60E-03	2.22 - 4.18
RADS	Thorium-230	pCi/g	5.19E-01	1.71E+00	1.09E+00	27/37	4/37	1.40E+00	0/37	3.66E+01	0/37	1.83E+00	0.342 - 1.39

Table 4.37. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Uranium-233/234	pCi/g	7.79E-01	2.01E+00	1.20E+00	20/37	9/37	1.20E+00	13/37	9.90E-01	20/37	4.95E-02	0.351 - 1.04
RADS	Uranium-235/236	pCi/g	--	--	--	0/37	0/37	6.00E-02	0/37	9.76E-01	0/37	4.88E-02	0.245 - 0.864
RADS	Uranium-238	pCi/g	4.50E-01	1.55E+00	9.34E-01	25/37	5/37	1.20E+00	15/37	8.05E-01	25/37	4.03E-02	0.225 - 0.914
VOC	1,1,1-Trichloroethane	mg/kg	1.04E-03	1.04E-03	1.04E-03	1/42	N/A	N/A	0/42	5.62E+00	0/42	2.81E-01	0.000948 - 0.00179
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.92E-04	0/42	2.96E-05	0.000948 - 0.00179
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.13E+01	0/42	2.56E+00	0.00474 - 0.00894
VOC	1,1,2-Trichloroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.69E-04	0/42	1.35E-05	0.000948 - 0.00179
VOC	1,1-Dichloroethane	mg/kg	5.30E-04	5.30E-04	5.30E-04	1/42	N/A	N/A	0/42	1.56E-02	0/42	7.82E-04	0.000948 - 0.00179
VOC	1,1-Dichloroethene	mg/kg	6.96E-04	2.83E-03	1.50E-03	3/42	N/A	N/A	0/42	2.04E-01	0/42	1.02E-02	0.000948 - 0.00179
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.18E-02	0/42	2.09E-03	0.000948 - 0.00179
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.32E-02	0/42	1.16E-03	0.000948 - 0.00179
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.88E-06	0/42	1.44E-07	0.000948 - 0.00179
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.20E-05	0/42	2.10E-06	0.000948 - 0.00179
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.90E-01	0/42	2.95E-02	0.000948 - 0.00179
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	9.69E-04	0/42	4.84E-05	0.000948 - 0.00179
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.48E-03	0/42	2.74E-04	0.000948 - 0.00179
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.81E-01	0/42	1.90E-02	0.000948 - 0.00179
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.90E-01	0/42	2.95E-02	0.000948 - 0.00179
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	9.24E-03	0/42	4.62E-04	0.000948 - 0.00179
VOC	1,4-Dioxane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.88E-03	0/42	9.42E-05	0.0474 - 0.0894
VOC	2-Butanone	mg/kg	2.36E-03	2.36E-03	2.36E-03	1/42	N/A	N/A	0/42	2.32E+00	0/42	1.16E-01	0.00474 - 0.00894
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.76E-05	0/42	1.38E-06	0.00474 - 0.00894
VOC	2-Hexanone	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.75E-02	0/42	8.75E-04	0.00474 - 0.00894
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.44E-02	0/42	3.22E-03	0.000948 - 0.00179
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.62E-01	0/42	2.81E-02	0.00474 - 0.00894
VOC	Acetone	mg/kg	1.87E-03	1.74E-02	4.87E-03	18/42	N/A	N/A	0/42	7.36E+00	0/42	3.68E-01	0.00474 - 0.00894
VOC	Acrolein	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.68E-05	0/42	8.41E-07	0.00474 - 0.00894
VOC	Acrylonitrile	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.28E-04	0/42	1.14E-05	0.00474 - 0.00894
VOC	Benzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.66E-03	0/42	2.33E-04	0.000948 - 0.00179
VOC	Bromochloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.16E-02	0/42	2.08E-03	0.000948 - 0.00179
VOC	Bromodichloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	7.30E-04	0/42	3.65E-05	0.000948 - 0.00179
VOC	Bromoform	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.75E-02	0/42	8.73E-04	0.000948 - 0.00179
VOC	Bromomethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.82E-03	0/42	1.91E-04	0.000948 - 0.00179
VOC	Carbon disulfide	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.80E-01	0/42	2.40E-02	0.00474 - 0.00894
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.54E-03	0/42	1.77E-04	0.000948 - 0.00179
VOC	Chlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.06E-01	0/42	5.28E-03	0.000948 - 0.00179
VOC	Chloroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.74E+00	0/42	2.37E-01	0.000948 - 0.00179
VOC	Chloroform	mg/kg	4.42E-04	4.99E-04	4.71E-04	2/42	N/A	N/A	0/42	1.22E-03	2/42	6.12E-05	0.000948 - 0.00179
VOC	Chloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.05E-02	0/42	5.26E-04	0.000948 - 0.00179
VOC	*cis*-1,2-Dichloroethene	mg/kg	5.37E-04	7.69E-04	6.55E-04	5/42	N/A	N/A	0/42	2.12E-02	0/42	1.06E-03	0.000948 - 0.00179
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.36E-03	0/42	1.68E-04	0.000948 - 0.00179
VOC	Cumene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.48E+00	0/42	7.38E-02	0.000948 - 0.00179
VOC	Cyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.60E+01	0/42	1.30E+00	0.000948 - 0.00179
VOC	Dibromochloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.64E-03	0/42	2.32E-04	0.000948 - 0.00179
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.08E-01	0/42	3.04E-02	0.000948 - 0.00179

Table 4.37. Deep (16 ft to Bottom of RGA) Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	Provisional Background		GW Protection Screen				DL Range
			Min	Max	Avg	Detect.	FOE	Bkgd	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOC	Ethylbenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.36E-02	0/42	1.68E-03	0.000948 - 0.00179
VOC	m,p-Xylene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.82E-01	0/42	1.91E-02	0.0019 - 0.00358
VOC	Methyl acetate	mg/kg	--	--	--	0/42	N/A	N/A	0/42	8.22E+00	0/42	4.11E-01	0.00474 - 0.00894
VOC	Methylcyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.80E+01	0/42	1.40E+00	0.000948 - 0.00179
VOC	Methylene chloride	mg/kg	2.58E-03	1.01E-02	5.20E-03	4/42	N/A	N/A	0/42	5.44E-02	3/42	2.72E-03	0.00474 - 0.00894
VOC	Styrene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.66E+00	0/42	1.33E-01	0.000948 - 0.00179
VOC	Tetrachloroethene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.69E-02	0/42	1.84E-03	0.000948 - 0.00179
VOC	Toluene	mg/kg	7.33E-04	1.60E-03	1.24E-03	3/42	N/A	N/A	0/42	1.52E+00	0/42	7.62E-02	0.000948 - 0.00179
VOC	Total Xylene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.82E-01	0/42	1.91E-02	0.00284 - 0.00536
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.83E-02	0/42	2.91E-03	0.000948 - 0.00179
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.36E-03	0/42	1.68E-04	0.000948 - 0.00179
VOC	Trichloroethene	mg/kg	4.74E-04	4.40E-01	3.31E-02	24/42	N/A	N/A	15/42	2.02E-03	24/42	1.01E-04	0.000948 - 0.112
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.46E+00	0/42	7.31E-02	0.000948 - 0.00179
VOC	Vinyl chloride	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.29E-04	0/42	6.47E-06	0.000948 - 0.00179

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

Table 4.38. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 7

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	7.80E+02	1.77E+04	5.77E+03	16/16	11/16	3.00E+03	10.5 - 130
METAL	Antimony	mg/kg	2.98E+00	2.98E+00	2.98E+00	1/16	1/16	3.52E-02	2.16 - 27.5
METAL	Arsenic	mg/kg	1.10E+00	4.02E+01	9.36E+00	16/16	16/16	1.51E-03	1.05 - 1.46
METAL	Barium	mg/kg	2.43E+00	2.44E+02	4.28E+01	16/16	8/16	1.55E+01	0.841 - 9.16
METAL	Beryllium	mg/kg	1.26E-01	2.11E+00	6.74E-01	16/16	1/16	1.95E+00	0.105 - 0.146
METAL	Boron	mg/kg	1.26E+00	4.45E+01	8.50E+00	16/16	14/16	1.28E+00	3.15 - 4.37
METAL	Cadmium	mg/kg	2.97E-02	2.81E-01	1.33E-01	9/16	7/16	6.93E-02	0.21 - 0.291
METAL	Chromium	mg/kg	2.86E+00	1.00E+02	3.04E+01	16/16	0/16	1.80E+05	0.631 - 0.874
METAL	Cobalt	mg/kg	6.54E-01	1.86E+01	6.89E+00	16/16	16/16	2.71E-02	0.21 - 0.291
METAL	Copper	mg/kg	2.83E-01	7.75E+00	4.00E+00	16/16	10/16	2.81E+00	0.42 - 0.583
METAL	Iron	mg/kg	2.29E+03	2.18E+05	3.85E+04	16/16	16/16	3.52E+01	21 - 2910
METAL	Lead	mg/kg	8.83E-01	2.54E+01	7.35E+00	16/16	2/16	1.35E+01	0.42 - 0.583
METAL	Manganese	mg/kg	8.89E+00	2.60E+03	3.19E+02	16/16	16/16	2.83E+00	1.05 - 57.2
METAL	Mercury	mg/kg	8.80E-03	3.49E-02	1.70E-02	8/16	1/16	2.95E-02	0.0247 - 0.0344
METAL	Molybdenum	mg/kg	1.43E-01	2.22E+00	6.90E-01	13/16	10/16	2.02E-01	0.21 - 0.291
METAL	Nickel	mg/kg	8.03E-01	2.34E+01	9.74E+00	16/16	13/16	2.56E+00	0.42 - 0.583
METAL	Selenium	mg/kg	6.51E-01	3.31E+00	1.71E+00	13/16	13/16	5.19E-02	1.05 - 1.46
METAL	Silver	mg/kg	1.59E-01	1.82E+00	9.90E-01	2/16	2/16	7.99E-02	0.54 - 6.87
METAL	Thallium	mg/kg	1.71E-01	1.71E-01	1.71E-01	1/16	1/16	1.42E-03	0.42 - 0.583
METAL	Uranium[a]	mg/kg	7.53E-02	3.38E+00	1.15E+00	16/16	15/16	1.80E-01	0.042 - 0.0583
METAL	Vanadium	mg/kg	6.34E+00	7.52E+01	2.47E+01	16/16	15/16	8.64E+00	4.2 - 5.83
METAL	Zinc	mg/kg	3.68E+00	8.84E+01	3.54E+01	16/16	6/16	3.73E+01	4.2 - 5.83
ANION	Fluoride	mg/kg	6.88E-01	6.13E+00	2.29E+00	14/16	0/16	1.20E+01	1.09 - 1.51
PPCB	Total PCB[b]	mg/kg	--	--	--	0/16	0/16	6.82E-03	0.0039 - 0.00574
SVOC	1,1-biphenyl	mg/kg	--	--	--	0/16	0/16	8.72E-04	0.385 - 0.568
SVOC	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/16	0/16	4.02E-01	0.385 - 0.568
SVOC	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/16	0/16	1.16E-03	0.385 - 0.568
SVOC	2,4-Dichlorophenol	mg/kg	--	--	--	0/16	0/16	2.26E-03	0.385 - 0.568
SVOC	2,4-Dimethylphenol	mg/kg	--	--	--	0/16	0/16	4.21E-02	0.385 - 0.568
SVOC	2,4-Dinitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.77 - 1.14
SVOC	2,4-Dinitrotoluene	mg/kg	--	--	--	0/16	0/16	3.21E-04	0.385 - 0.568
SVOC	2,6-Dinitrotoluene	mg/kg	--	--	--	0/16	0/16	6.67E-05	0.385 - 0.568
SVOC	2-Chloronaphthalene	mg/kg	--	--	--	0/16	0/16	3.85E-01	0.0385 - 0.0568
SVOC	2-Chlorophenol	mg/kg	--	--	--	0/16	0/16	8.91E-03	0.385 - 0.568
SVOC	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/16	0/16	2.58E-04	0.385 - 0.568
SVOC	2-Methylnaphthalene	mg/kg	--	--	--	0/16	0/16	1.85E-02	0.0385 - 0.0568
SVOC	2-Methylphenol	mg/kg	--	--	--	0/16	0/16	7.53E-02	0.385 - 0.568
SVOC	2-Nitrobenzenamine	mg/kg	--	--	--	0/16	0/16	8.01E-03	0.385 - 0.568
SVOC	2-Nitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.385 - 0.568
SVOC	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/16	0/16	8.24E-04	0.385 - 0.568
SVOC	3-Nitrobenzenamine	mg/kg	--	--	--	0/16	0/16	2.45E-04	0.385 - 0.568
SVOC	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/16	0/16	3.42E-04	0.385 - 0.568
SVOC	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/16	0/16	1.71E-01	0.385 - 0.568
SVOC	4-Chlorobenzenamine	mg/kg	--	--	--	0/16	0/16	1.55E-04	0.385 - 0.568
SVOC	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/16	0/16	3.42E-04	0.385 - 0.568

Table 4.38. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
SVOC	4-Nitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.385 - 0.568
SVOC	Acenaphthene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOC	Acenaphthylene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOC	Acetophenone	mg/kg	--	--	--	0/16	0/16	5.84E-02	0.385 - 0.568
SVOC	Anthracene	mg/kg	--	--	--	0/16	0/16	5.81E+00	0.0385 - 0.0568
SVOC	Atrazine	mg/kg	--	--	--	0/16	0/16	1.96E-04	0.385 - 0.568
SVOC	Benzaldehyde	mg/kg	--	--	--	0/16	0/16	4.15E-03	0.385 - 0.568
SVOC	Benzo(ghi)perylene	mg/kg	--	--	--	0/16	0/16	1.32E+00	0.0385 - 0.0568
SVOC	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/16	0/16	1.35E-03	0.385 - 0.568
SVOC	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/16	0/16	3.61E-06	0.385 - 0.568
SVOC	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/16	0/16	1.31E-04	0.385 - 0.568
SVOC	Bis(2-ethylhexyl)phthalate	mg/kg	2.15E-02	2.15E-02	2.15E-02	1/16	0/16	1.33E+00	0.0385 - 0.0568
SVOC	Butyl benzyl phthalate	mg/kg	2.22E-02	2.22E-02	2.22E-02	1/16	0/16	2.36E-01	0.0385 - 0.0568
SVOC	Caprolactam	mg/kg	--	--	--	0/16	0/16	2.47E-01	0.385 - 0.568
SVOC	Carbazole	mg/kg	--	--	--	0/16	0/16	3.76E-02	0.0385 - 0.0568
SVOC	Dibenzofuran	mg/kg	--	--	--	0/16	0/16	1.46E-02	0.385 - 0.568
SVOC	Diethyl phthalate	mg/kg	1.51E-02	6.05E-02	3.78E-02	2/16	0/16	6.08E-01	0.0385 - 0.0568
SVOC	Dimethyl phthalate	mg/kg	--	--	--	0/16	0/16	6.08E-01	0.0385 - 0.0568
SVOC	Di-n-butyl phthalate	mg/kg	1.45E-02	4.10E-02	2.74E-02	12/16	0/16	2.27E-01	0.0385 - 0.0568
SVOC	Di-n-octylphthalate	mg/kg	--	--	--	0/16	0/16	5.65E+00	0.0385 - 0.0568
SVOC	Diphenylamine	mg/kg	--	--	--	0/16	0/16	2.33E-01	0.385 - 0.568
SVOC	Fluoranthene	mg/kg	2.60E-02	2.60E-02	2.60E-02	1/16	0/16	8.91E+00	0.0385 - 0.0568
SVOC	Fluorene	mg/kg	--	--	--	0/16	0/16	5.45E-01	0.0385 - 0.0568
SVOC	Hexachlorobenzene	mg/kg	--	--	--	0/16	0/16	1.23E-04	0.385 - 0.568
SVOC	Hexachlorobutadiene	mg/kg	--	--	--	0/16	0/16	2.67E-04	0.385 - 0.568
SVOC	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/16	0/16	1.28E-04	0.385 - 0.568
SVOC	Hexachloroethane	mg/kg	--	--	--	0/16	0/16	2.00E-04	0.385 - 0.568
SVOC	Isophorone	mg/kg	--	--	--	0/16	0/16	2.58E-02	0.385 - 0.568
SVOC	m+p Methylphenol	mg/kg	--	--	--	0/16	0/16	2.97E-02	0.385 - 0.568
SVOC	Naphthalene	mg/kg	--	--	--	0/16	0/16	3.85E-04	0.0385 - 0.0568
SVOC	Nitrobenzene	mg/kg	--	--	--	0/16	0/16	9.17E-05	0.385 - 0.568
SVOC	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/16	0/16	8.10E-06	0.385 - 0.568
SVOC	Pentachlorophenol	mg/kg	3.13E-01	3.13E-01	3.13E-01	1/16	1/16	5.71E-05	0.385 - 0.568
SVOC	Phenanthrene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOC	Phenol	mg/kg	--	--	--	0/16	0/16	3.31E-01	0.385 - 0.568
SVOC	p-Nitroaniline	mg/kg	--	--	--	0/16	0/16	1.58E-03	0.385 - 0.568
SVOC	Pyrene	mg/kg	--	--	--	0/16	0/16	1.32E+00	0.0385 - 0.0568
SVOC	Total PAH[c]	mg/kg	--	--	--	0/16	0/16	2.94E-02	-
RADS	Americium-241	pCi/g	7.89E-01	7.89E-01	7.89E-01	1/16	0/16	9.58E-01	0.212 - 0.861
RADS	Cesium-137	pCi/g	--	--	--	0/16	0/16	4.79E-01	0.0256 - 0.0664
RADS	Neptunium-237	pCi/g	--	--	--	0/16	0/16	5.36E-02	0.252 - 1.02
RADS	Plutonium-238	pCi/g	--	--	--	0/16	0/16	2.19E-01	0.373 - 1.23
RADS	Plutonium-239/240	pCi/g	--	--	--	0/16	0/16	2.13E-01	0.38 - 1.05
RADS	Technetium-99	pCi/g	--	--	--	0/19	0/19	7.60E-03	2.56 - 4.3
RADS	Thorium-230	pCi/g	6.76E-01	1.79E+00	1.12E+00	15/16	0/16	1.83E+00	0.493 - 1.26

Table 4.38. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
RADS	Uranium-233/234	pCi/g	5.77E-01	1.89E+00	1.08E+00	9/16	9/16	4.95E-02	0.357 - 1.09
RADS	Uranium-235/236	pCi/g	1.54E-01	2.91E-01	2.23E-01	2/16	2/16	4.88E-02	0.116 - 0.733
RADS	Uranium-238	pCi/g	4.21E-01	1.39E+00	8.69E-01	14/16	14/16	4.03E-02	0.294 - 0.825
VOC	1,1,1-Trichloroethane	mg/kg	--	--	--	0/19	0/19	2.81E-01	0.00105 - 0.165
VOC	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/19	0/19	2.96E-05	0.00105 - 0.165
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.43E-03	4.43E-03	4.43E-03	1/19	0/19	2.56E+00	0.00523 - 0.823
VOC	1,1,2-Trichloroethane	mg/kg	7.95E-04	7.95E-04	7.95E-04	1/19	1/19	1.35E-05	0.00105 - 0.165
VOC	1,1-Dichloroethane	mg/kg	--	--	--	0/19	0/19	7.82E-04	0.00105 - 0.165
VOC	1,1-Dichloroethene	mg/kg	--	--	--	0/19	0/19	1.02E-02	0.00105 - 0.165
VOC	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.09E-03	0.00105 - 0.165
VOC	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	1.16E-03	0.00105 - 0.165
VOC	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/19	0/19	1.44E-07	0.00105 - 0.165
VOC	1,2-Dibromoethane	mg/kg	--	--	--	0/19	0/19	2.10E-06	0.00105 - 0.165
VOC	1,2-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.95E-02	0.00105 - 0.165
VOC	1,2-Dichloroethane	mg/kg	--	--	--	0/19	0/19	4.84E-05	0.00105 - 0.165
VOC	1,2-Dichloropropane	mg/kg	--	--	--	0/19	0/19	2.74E-04	0.00105 - 0.165
VOC	1,2-Dimethylbenzene	mg/kg	--	--	--	0/19	0/19	1.90E-02	0.00105 - 0.165
VOC	1,3-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.95E-02	0.00105 - 0.165
VOC	1,4-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	4.62E-04	0.00105 - 0.165
VOC	1,4-Dioxane	mg/kg	--	--	--	0/13	0/13	9.42E-05	0.0523 - 8.23
VOC	2-Butanone	mg/kg	--	--	--	0/19	0/19	1.16E-01	0.00523 - 0.823
VOC	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/19	0/19	1.38E-06	0.00523 - 0.823
VOC	2-Hexanone	mg/kg	--	--	--	0/19	0/19	8.75E-04	0.00523 - 0.823
VOC	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/19	0/19	3.22E-03	0.00105 - 0.165
VOC	4-Methyl-2-pentanone	mg/kg	--	--	--	0/19	0/19	2.81E-02	0.00523 - 0.823
VOC	Acetone	mg/kg	3.57E-03	5.21E-02	1.43E-02	8/19	0/19	3.68E-01	0.00523 - 0.823
VOC	Acrolein	mg/kg	--	--	--	0/19	0/19	8.41E-07	0.00523 - 0.823
VOC	Acrylonitrile	mg/kg	--	--	--	0/19	0/19	1.14E-05	0.00523 - 0.823
VOC	Benzene	mg/kg	--	--	--	0/19	0/19	2.33E-04	0.00105 - 0.165
VOC	Bromochloromethane	mg/kg	--	--	--	0/19	0/19	2.08E-03	0.00105 - 0.165
VOC	Bromodichloromethane	mg/kg	--	--	--	0/19	0/19	3.65E-05	0.00105 - 0.165
VOC	Bromoform	mg/kg	--	--	--	0/19	0/19	8.73E-04	0.00105 - 0.165
VOC	Bromomethane	mg/kg	--	--	--	0/19	0/19	1.91E-04	0.00105 - 0.165
VOC	Carbon disulfide	mg/kg	--	--	--	0/19	0/19	2.40E-02	0.00523 - 0.823
VOC	Carbon tetrachloride	mg/kg	--	--	--	0/19	0/19	1.77E-04	0.00105 - 0.165
VOC	Chlorobenzene	mg/kg	--	--	--	0/19	0/19	5.28E-03	0.00105 - 0.165
VOC	Chloroethane	mg/kg	--	--	--	0/19	0/19	2.37E-01	0.00105 - 0.165
VOC	Chloroform	mg/kg	7.95E-04	7.95E-04	7.95E-04	1/19	1/19	6.12E-05	0.00105 - 0.165
VOC	Chloromethane	mg/kg	--	--	--	0/19	0/19	5.26E-04	0.00105 - 0.165
VOC	*cis*-1,2-Dichloroethene	mg/kg	1.38E-02	1.38E-02	1.38E-02	1/19	1/19	1.06E-03	0.00105 - 0.208
VOC	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	1.68E-04	0.00105 - 0.165
VOC	Cumene	mg/kg	--	--	--	0/19	0/19	7.38E-02	0.00105 - 0.165
VOC	Cyclohexane	mg/kg	--	--	--	0/19	0/19	1.30E+00	0.00105 - 0.165
VOC	Dibromochloromethane	mg/kg	--	--	--	0/19	0/19	2.32E-04	0.00105 - 0.165
VOC	Dichlorodifluoromethane	mg/kg	--	--	--	0/19	0/19	3.04E-02	0.00105 - 0.165

Table 4.38. McNairy Soil Data Summary and Groundwater Protection Screening: Sector 7 (Continued)

Type	Analysis	Unit	Detected Results			Freq. of	GW Protection Screen		DL Range
			Min	Max	Avg	Detect.	DAF 1	DAF 1 SSL	
VOC	Ethylbenzene	mg/kg	--	--	--	0/19	0/19	1.68E-03	0.00105 - 0.165
VOC	m,p-Xylene	mg/kg	--	--	--	0/19	0/19	1.91E-02	0.00209 - 0.329
VOC	Methyl acetate	mg/kg	--	--	--	0/19	0/19	4.11E-01	0.00523 - 0.823
VOC	Methylcyclohexane	mg/kg	--	--	--	0/19	0/19	1.40E+00	0.00105 - 0.165
VOC	Methylene chloride	mg/kg	2.28E-03	3.13E-03	2.71E-03	2/19	1/19	2.72E-03	0.00523 - 0.823
VOC	Styrene	mg/kg	--	--	--	0/19	0/19	1.33E-01	0.00105 - 0.165
VOC	Tetrachloroethene	mg/kg	3.10E-03	3.10E-03	3.10E-03	1/19	1/19	1.84E-03	0.00105 - 0.165
VOC	Toluene	mg/kg	--	--	--	0/19	0/19	7.62E-02	0.00105 - 0.165
VOC	Total Xylene	mg/kg	--	--	--	0/19	0/19	1.91E-02	0.00314 - 0.494
VOC	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	2.91E-03	0.00105 - 0.165
VOC	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	1.68E-04	0.00105 - 0.165
VOC	Trichloroethene	mg/kg	5.36E-04	6.22E+00	1.56E+00	7/19	7/19	1.01E-04	0.00105 - 0.208
VOC	Trichlorofluoromethane	mg/kg	--	--	--	0/19	0/19	7.31E-02	0.00105 - 0.165
VOC	Vinyl chloride	mg/kg	--	--	--	0/19	0/19	6.47E-06	0.00105 - 0.165

One or more samples exceed groundwater protection screening

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

-- = No calculation completed, analyte not detected

[a] Screened against Uranium (Soluble Salts).

[b] Total PCBs calculated by laboratory.

[c] Total PAHs calculated using TEF values in RMD 2021.

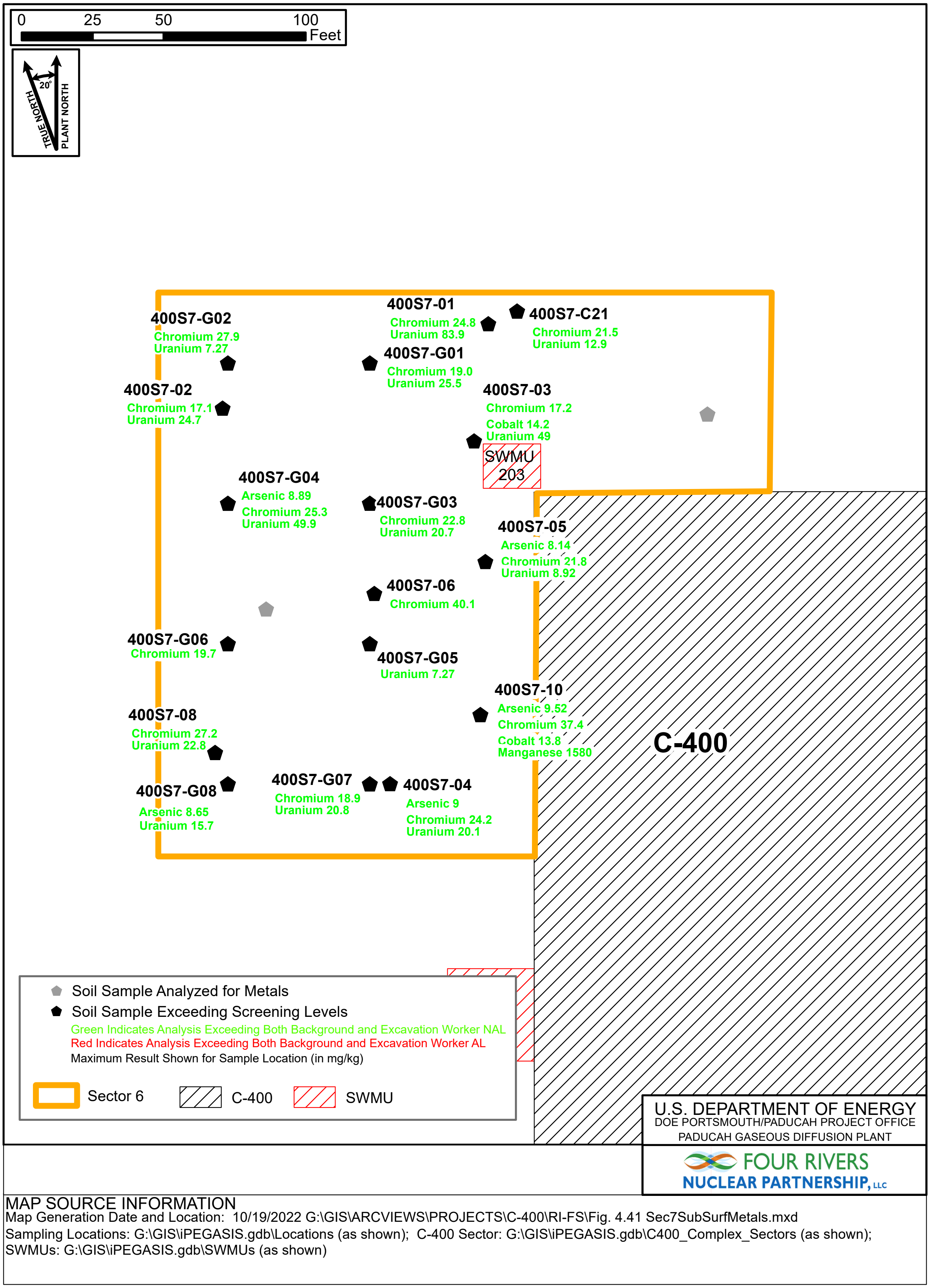


Figure 4.41. Sector 7 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Metals

In the McNairy soils, there is no background for comparison and the data were screened against the SSLs for protection of groundwater at a DAF of 1 only. Metals that exceeded these SSLs included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc

PCBs

Total PCBs were detected in 7 of 18 samples in Sector 7 subsurface soil (1–16 ft bgs). The maximum result in the 1–16 ft bgs horizon, 0.00127 mg/kg, did not exceed the excavation worker NAL. Total PCBs exceeded the SSL for the protection of groundwater for a DAF of 1 in 4 of the 18 samples analyzed. There was one detected result of Total PCBs (with a maximum of 0.00692 mg/kg) out of 39 samples in the deep soil interval (16 ft bgs to the bottom of the RGA) that exceeded the screening criteria for protection of groundwater for a DAF of 1. That detection occurred in a sample collected at a depth of 58.5–59.5 ft bgs at location 400S7-05.

SVOCs

A few SVOCs were detected in Sector 7 surface and subsurface soil (0–16 ft bgs) with results of Total PAHs exceeding the excavation worker NAL. The exceedances of Total PAHs occurred at two sampling locations (out of 37 samples) as shown in Figure 4.42. SVOCs exceeding the SSLs for protection of groundwater for a DAF of 1 in Sector 7 subsurface soil (1–16 ft bgs) include 2-methylnaphthalene, naphthalene, and Total PAHs. Naphthalene also exceeded the DAF of 20 SSL in this interval. SVOCs did not exceed any of the screening criteria in the interval from 16 ft bgs to the bottom of the RGA with the exception of butyl benzyl phthalate, a potential laboratory contaminant, exceeding the DAF of 1 SSL in 1 out of 39 samples. There was one detection of pentachlorophenol in the McNairy soil, out of 16 samples, that also exceeded the groundwater protection SSL at a DAF of 1.

VOCs

Several VOCs were detected in Sector 7 surface and subsurface soil (0–16 ft bgs) with none exceeding the excavation worker NALs. VOCs in Sector 7 subsurface soil (1–16 ft bgs) exceeding the protection of groundwater SSLs at a DAF of 1 include *cis*-1,2-dichloroethene, benzene, chloroform, methylene chloride (a potential lab contaminant), and TCE (TCE was detected in 5 out of 20 samples with a maximum result of 0.00138 mg/kg). In the deep soil interval (16 ft bgs to the bottom of the RGA) chloroform, methylene chloride (a potential lab contaminant), and TCE exceeded the protection of groundwater SSLs at a DAF of 1. For TCE in the deep soil interval, with a maximum concentration of 0.44 mg/kg, there were 24 exceedances of the DAF of 1 value out of 42 samples and 15 exceedances of the DAF of 20 value out of 42 samples.

In the screening of the McNairy Formation soil, 1,1,2-trichloroethane, chloroform, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), tetrachloroethene, and TCE exceeded the groundwater protection SSLs for a DAF of 1.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, TCE was detected in 29 of 62 samples with a maximum concentration 0.44 mg/kg. The maximum result was from a sample collected from 54–55 ft bgs in boring 400S7-10. Many of the TCE detections in this sector were in the 45-60 ft bgs interval. The maximum for TCE in McNairy Formation soil was 6.22 mg/kg from a sample in the uppermost McNairy at contingency location 400S7-C21.

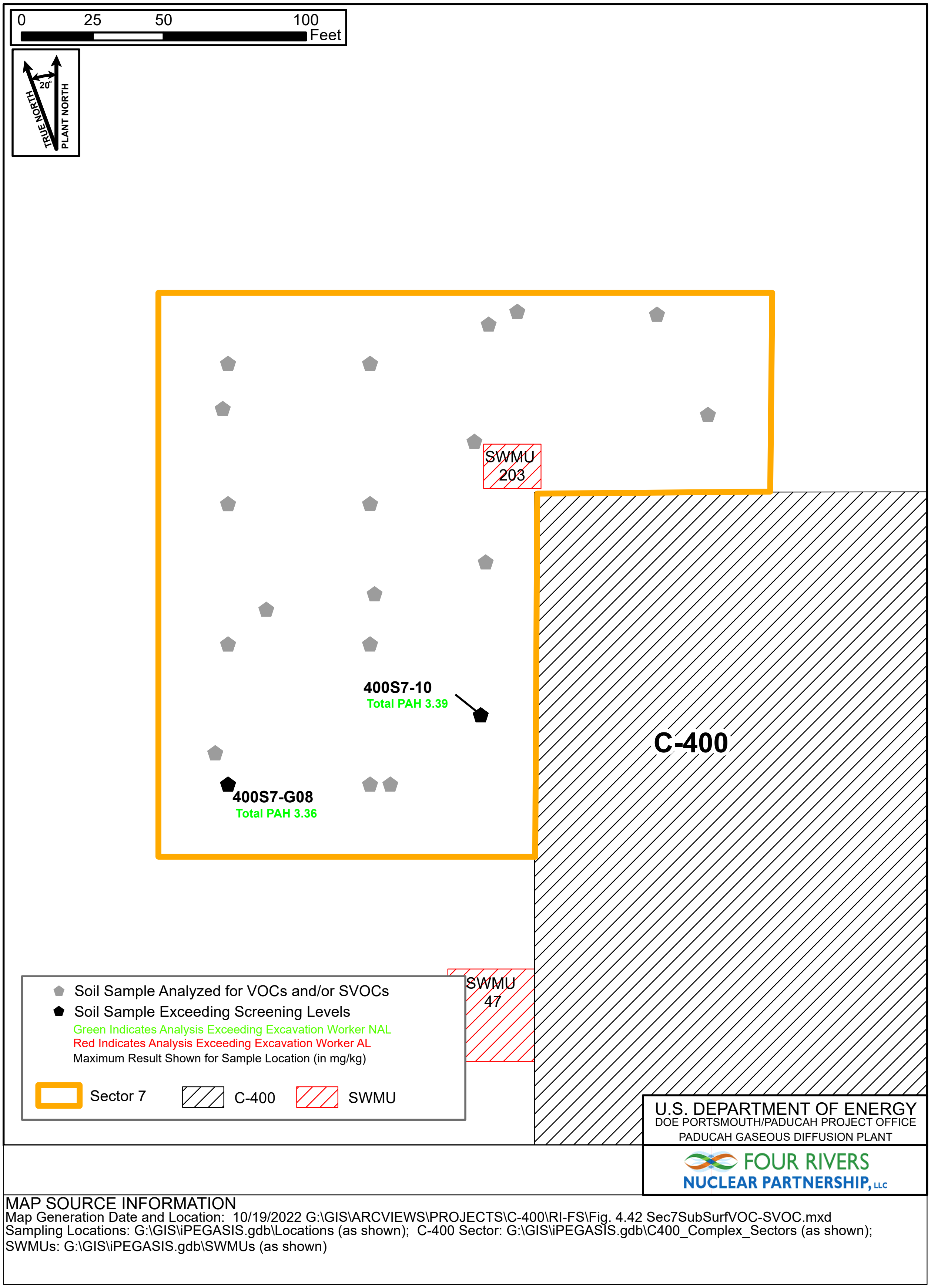


Figure 4.42. Sector 7 Surface and Subsurface Soil Sampling Exceeding Screening Levels for VOCs and SVOCs

Radionuclides

Radionuclides detected above both the background screening level and the excavation worker NAL in Sector 7 surface and subsurface soil (0–16 ft bgs) included cesium-137, neptunium-237, thorium-230, and uranium-238 (Figure 4.43). Radionuclides that were detected in the Sector 7 subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater at a DAF of 1 include cesium-137, technetium-99*, thorium-230, uranium-233/234*, uranium-234*, uranium-235/236, and uranium-238* (radionuclides with an asterisk also exceeded the DAF of 20 SSLs). Neptunium-237 and plutonium-239/240, which do not have site-specific backgrounds, also exceeded the groundwater protection SSLs for a DAF of 1. In the deep soil interval (16 ft bgs to the bottom of the RGA), technetium-99, uranium-233/234, and uranium-238 exceeded both the background criteria and the SSLs for protection of groundwater for both a DAF of 1 and a DAF of 20. In the screening of the McNairy Formation soil, uranium-233/234, uranium-235/236, and uranium-238 exceeded the groundwater protection SSLs for a DAF of 1.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, technetium-99 was detected in 9 of 63 samples with a maximum activity of 129 pCi/g. There was only one detection in the deep soil interval out of 41 samples.

The source for the VOCs and radionuclides may be the Discard Waste Sump, but the lack of VOCs at shallow depths near the sump suggests a different source. As noted in Table 4.3, the sludge sampled from the Discard Waste Sump contained elevated concentrations of VOCs and radionuclides.

4.3.8 C-400 Complex Soils Summary

4.3.8.1 Nature and extent—surface soil

Metals and Inorganics

Metals that were most commonly detected in the surface soil across the C-400 Complex above both background screening levels and the industrial worker NALs were arsenic, chromium and uranium. While arsenic exceeded the industrial worker NAL in all sectors, it only exceeded background in six samples across the complex.

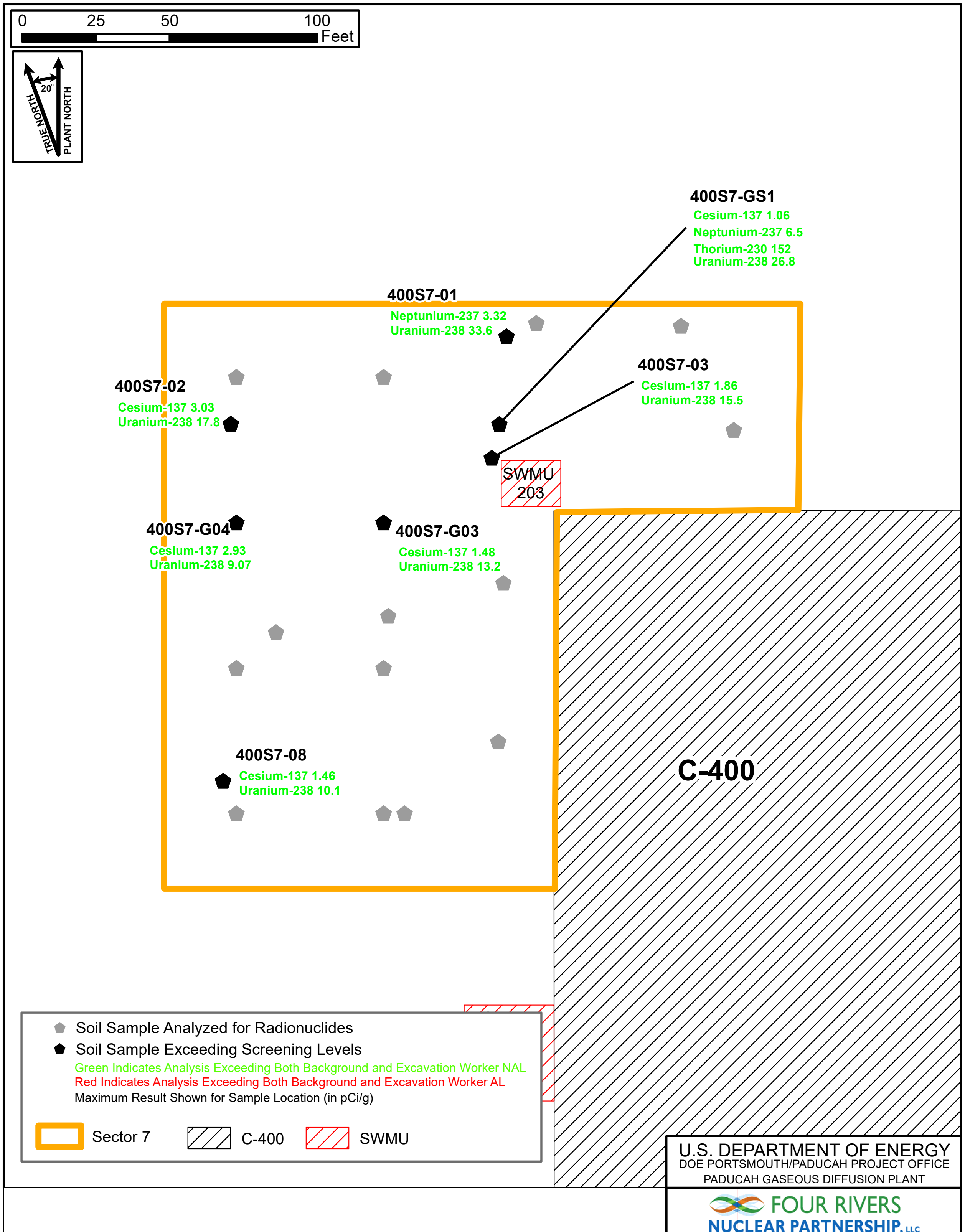
Metals detected in C-400 Complex surface soil that commonly (i.e., in four or more sectors) exceeded both the background screening levels and the SSLs for the protection of groundwater for a DAF of 20 included antimony, arsenic, barium, nickel, selenium, thallium, and uranium.

PCBs

Total PCBs exceeded the industrial worker NAL criteria in three sectors (Sectors 1, 4, and 6). Detected PCB concentrations in the 0–1 ft bgs interval ranged from 0.00119 to 19 mg/kg.

SVOCs

Several SVOCs were detected in C-400 Complex surface soil with Total PAHs exceeding the industrial worker NAL in five sectors (Sectors 1, 3, 5, 6, and 7).



MAP SOURCE INFORMATION
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Sampling Locations: G:\GIS\iPEGASIS.gdb\Locations (as shown); C-400 Sector: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors (as shown);
SWMUs: G:\GIS\iPEGASIS.gdb\SWMUs (as shown)

Figure 4.43. Sector 7 Surface and Subsurface Soil Sampling Exceeding Screening Levels for Radionuclides

VOCs

The only VOC to exceed industrial worker NALs was TCE in Sectors 3 and 5. There were other VOCs, in addition to TCE, that exceeded the SSLs for protection of groundwater for both a DAF of 1 and a DAF of 20, but TCE was the most common exceedance.

Radionuclides

In C-400 Complex surface soils, the radionuclides more commonly (i.e., in four or more sectors) above both the background screening levels and the industrial worker NALs include cesium-137, neptunium-237, thorium-230, and uranium isotopes. Technetium-99 was detected above background in all sectors but only exceeded the industrial worker NAL in two sectors (Sectors 1 and 6). Cesium-137, neptunium-237, radium-226, thorium-230, uranium-235/236, and uranium-238 exceeded the industrial worker ALs in some instances. Uranium-238 exceeded the industrial worker ALs in Sectors 1, 2, 4, 5, and 6, while uranium-235/236 exceeded the industrial worker ALs in Sector 5.

4.3.8.2 Nature and extent—surface and subsurface concrete/soil

Metals and Inorganics

Metals that most commonly (i.e., in four or more sectors) were detected in C-400 Complex surface and subsurface concrete/soil (0–16 ft bgs) above both background screening levels and the excavation worker NALs were arsenic, chromium, cobalt, iron, manganese, and uranium.

Uranium metal exceeded the excavation worker AL in four sectors (Sectors 1, 2, 4, and 6). All of the uranium metal results collected for this RI that are greater than the excavation worker AL (197 mg/kg) occur within the upper 10 ft of soil.

Metals most commonly detected in C-400 Complex subsurface soil (1–16 ft bgs) above both the background screening levels and the SSLs for the protection of groundwater at a DAF of 20 include antimony, arsenic, cobalt, iron, manganese, nickel, selenium, and uranium. In the deep soil interval (16 ft bgs to the bottom of the RGA) the metals most commonly exceeding both the background screening levels and the SSLs for the protection of groundwater at a DAF of 20 are antimony, arsenic, barium, cobalt, iron, manganese, and selenium.

Several metals, most commonly arsenic, chromium, manganese, and uranium, exceeded the industrial worker and/or excavation worker NALs in the surface soil and subsurface soil in the vicinity of the railroad tracks which, pass through Sectors 4 and 5. None of the metals exceeded the industrial worker or excavation worker ALs in the vicinity of the railroad tracks.

PCBs

Total PCBs only exceeded the industrial worker NAL in one sector (Sector 1) within the C-400 Complex. PCBs, when detected in subsurface soil, were typically at low concentrations. There were three samples where Total PCBs in shallow subsurface soil were detected at concentrations exceeding 0.050 mg/kg. At depths > 10 ft bgs, the maximum PCB detection was 0.0243 mg/kg in a sample collected in Sector 1B (boring 400S1B-41 at 59.9–60.9 ft bgs).

Total PCBs were detected in surface soil and subsurface soil in the vicinity of the railroad tracks, which pass through Sectors 4 and 5, but none of the results exceeded the industrial worker and/or excavation worker NALs.

There were two locations along the southernmost railroad track in Sector 4 where total dioxins/furans exceeded the excavation worker NAL.

SVOCs

SVOCs, mostly Total PAHs, were frequently detected in C-400 Complex surface and subsurface concrete/soil (0–16 ft bgs). Results of Total PAHs exceeded the excavation worker NAL in Sectors 1, 4, 5, 6, and 7. SVOCs exceeded the SSLs for protection of groundwater for a DAF of 20 in subsurface soil (1–16 ft bgs) in 6 sectors across the C-400 Complex (all except Sector 2); however, the exceedances were typically in one to two samples per sector.

VOCs

Several VOCs were detected in C-400 Complex surface and subsurface concrete/soil (0–16 ft bgs) but only TCE exceeded the excavation worker NALs, in three sectors (Sectors 3, 4, and 5), and excavation worker ALs, in two sectors (Sectors 4 and 5). VOCs in C-400 Complex subsurface soil (1–16 ft bgs) that exceed the protection of groundwater SSLs at a DAF of 20 in multiple sectors include acrolein, chloroform, *cis*-1,2-dichloroethene, TCE, and vinyl chloride. Most of the TCE exceedances occurred in Sector 4. In the deep soil interval (16 ft bgs to the bottom of the RGA) across the C-400 Complex, VOCs that exceeded the protection of groundwater SSLs for a DAF of 20 in multiple sectors include 1,1,2-trichloroethane, 1,4-dioxane, chloroform, *cis*-1,2-dichloroethene, and TCE.

Several VOCs have been detected at elevated concentrations in C-400 Complex soil and groundwater. Concentrations of TCE and its degradation products are indicative of the presence of TCE as a DNAPL in both the vadose zone and the saturated zone. Figure 4.44 provides a plan view and several cross-sectional views showing the distribution of TCE in soil. This figure shows that areas with TCE soil concentrations > 10,000 µg/kg are found in the southern end of the C-400 Complex. This figure also shows that most of the elevated TCE concentrations are also in the upper few feet of the McNairy Formation with the exception of the shallow subsurface area near the southwest corner of the C-400 Cleaning Building. Previous interim remedial actions have removed more than 3,570 gal of VOCs (primarily TCE) from the subsurface. Section 4.7 provides additional discussion on the extent of VOC contamination in the subsurface at the C-400 Complex.

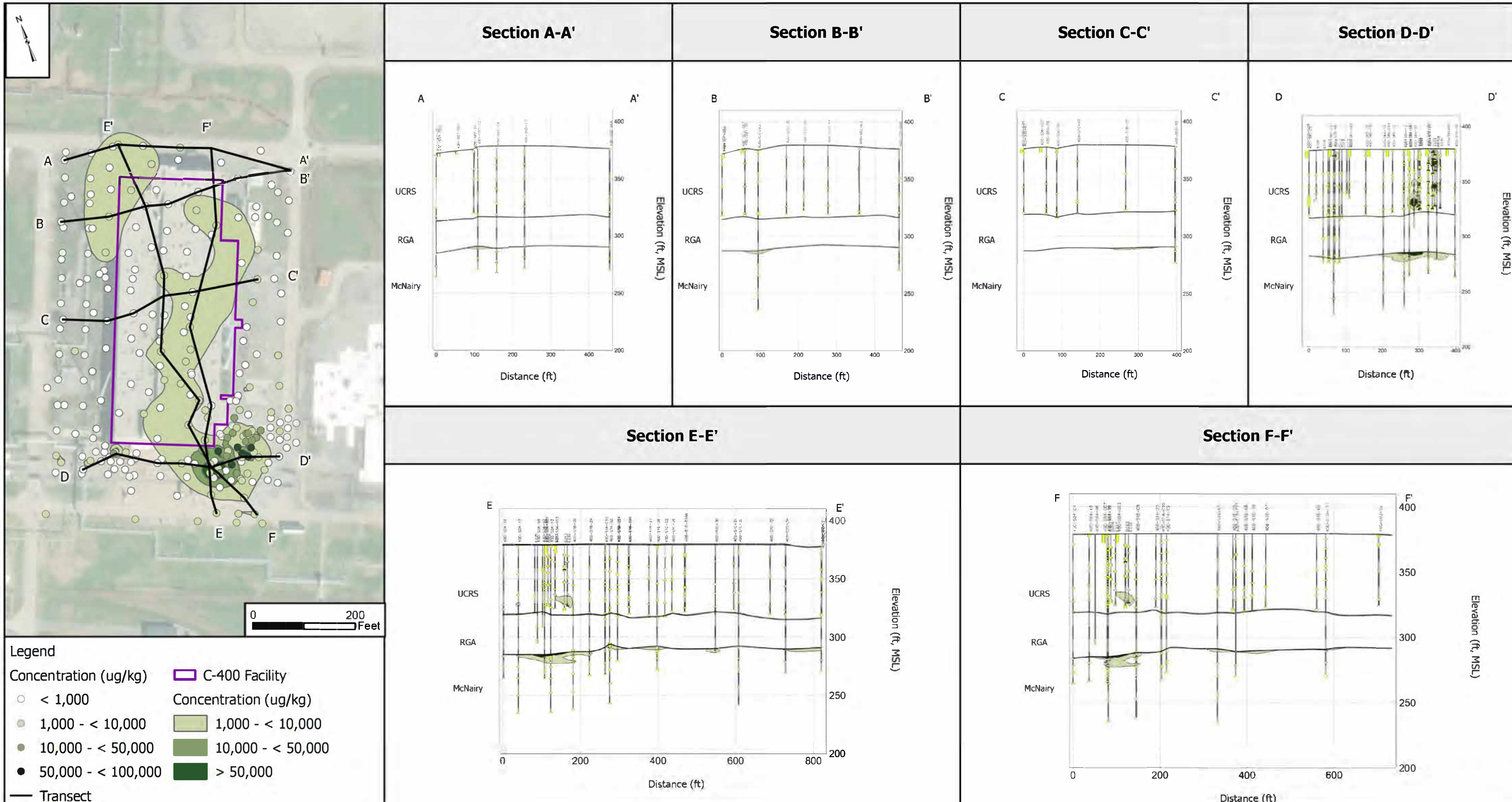
Radionuclides

In C-400 Complex surface and subsurface concrete/soils, the radionuclides more commonly (i.e., in four or more sectors) above both the background screening levels and the excavation worker NALs include cesium-137, neptunium-237, thorium-230, and uranium isotopes. Technetium-99 was detected above background in all sectors but only exceeded the excavation worker NAL in two sectors (Sectors 1 and 6).

Thorium-230 and uranium-238 exceeded the excavation worker ALs in one sample each—in Sector 6 and Sector 5, respectively.

Radionuclides most commonly detected in C-400 Complex subsurface soil (1–16 ft bgs) above both the background screening levels and SSLs for the protection of groundwater (for a DAF of 20) include technetium-99 and uranium isotopes. In the deep soil interval (16 ft bgs to the bottom of the RGA) only uranium-233/234 and uranium-238 exceeded both the background criteria and the SSLs for protection of groundwater (for a DAF of 20) in four or more sectors.

Uranium-238 exceeded either the industrial worker ALs or excavation worker ALs in 5 sectors (Sectors 1, 2, 4, 5, and 6). Uranium-235/236 also exceeded the industrial worker ALs in Sector 5. The location of



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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Plume extent estimated using 1/10 screening level for non-detects.
2. Post samples set to 50 foot search distance from section line.

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

Figure 4.44. Cross Sections of Estimated Extent of Trichloroethene in Soils

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uranium isotope exceedances was shallow, with all of the estimated volume above the industrial worker and/or excavation worker ALs located within the upper 10 ft of soil (or other shallow media).

A few radionuclides, most commonly uranium-235/236 and uranium-238, exceeded the industrial worker and/or excavation worker NALs in the surface soil and subsurface soil in the vicinity of the railroad tracks, which pass through Sectors 4 and 5. None of the radionuclides exceeded the industrial worker or excavation worker ALs in the area of the railroad tracks.

There is an area of technetium-99 subsurface soil contamination in the southern end of Sector 1C near borings 400S1C-29, 400S1C-40, 400S1C-C01, 400S1C-C02, 400S1C-C03, and 400S1C-C18A that indicates the presence of a soil source of technetium-99 below the C-400 Cleaning Building (Figure 4.45). Technetium-99 activity in soil > 35.7 pCi/g is the site-specific soil activity calculated to result in groundwater contamination to the RGA of 900 pCi/L or greater. Technetium-99 was detected at 1,390 pCi/g in boring 400S1C-C01 in a sample collected from 3–4 ft bgs. Also, in this area technetium-99 is present in the zone from depths of 20–55 ft bgs, with a maximum detection of 1,020 pCi/g and an average activity of approximately 285 pCi/g within this depth interval. In addition to this source zone in Sector 1C, there are smaller technetium-99 source zones within the upper 5 ft of soil in Sectors 1B, 6, and 7 (Figure 4.45).

4.4 C-400 COMPLEX GROUNDWATER

4.4.1 Area Description

Groundwater within the C-400 Complex consists of a shallow saturated zone (the UCRS), the shallow aquifer (the RGA), and the underlying McNairy Formation. This section focuses on the characterization and analytical data for the UCRS, RGA, and the McNairy groundwater at the C-400 Complex.

Groundwater collected from the UCRS MWs is considered transient water. The water found in the UCRS represents water that has percolated through the UCRS, occasionally becoming trapped above the semi-confining layers above the underlying RGA. As previously discussed in Section 2.6.2, groundwater flow in the UCRS is primarily downward towards the RGA. The UCRS water, while transitory, flows through contaminated UCRS soil and serves as an effective carrier for the migration of contaminants from shallow subsurface soils into the RGA.

Shallow groundwater was not encountered in soil borings that were drilled during the C-400 Complex RI. UCRS data for evaluation in this RI are available from existing MWs MW212, MW219, MW406-PRT1, and MW407-PRT1.

Groundwater contaminant plumes in the RGA, primarily of TCE and technetium-99, have extended off-site to the north of PGDP. The areal extent of the plumes has been modified since the inception of groundwater pump-and-treat activities beginning in late summer 1995.

4.4.2 Investigation Results

Relevant groundwater data for the UCRS, RGA, and the McNairy groundwater systems at the C-400 Complex are summarized and screened in Tables 4.39 through 4.41, respectively. The data summarized in these tables are from MWs. The RI also collected groundwater grab samples from the RGA and McNairy. These groundwater grab samples were evaluated qualitatively and used for nature and extent; not for fate and transport modeling or risk assessment, consistent with the C-400 Complex OU RI/FS Work Plan (DOE 2020). Groundwater grab samples were not collected from the UCRS due to no, or low, groundwater yield.

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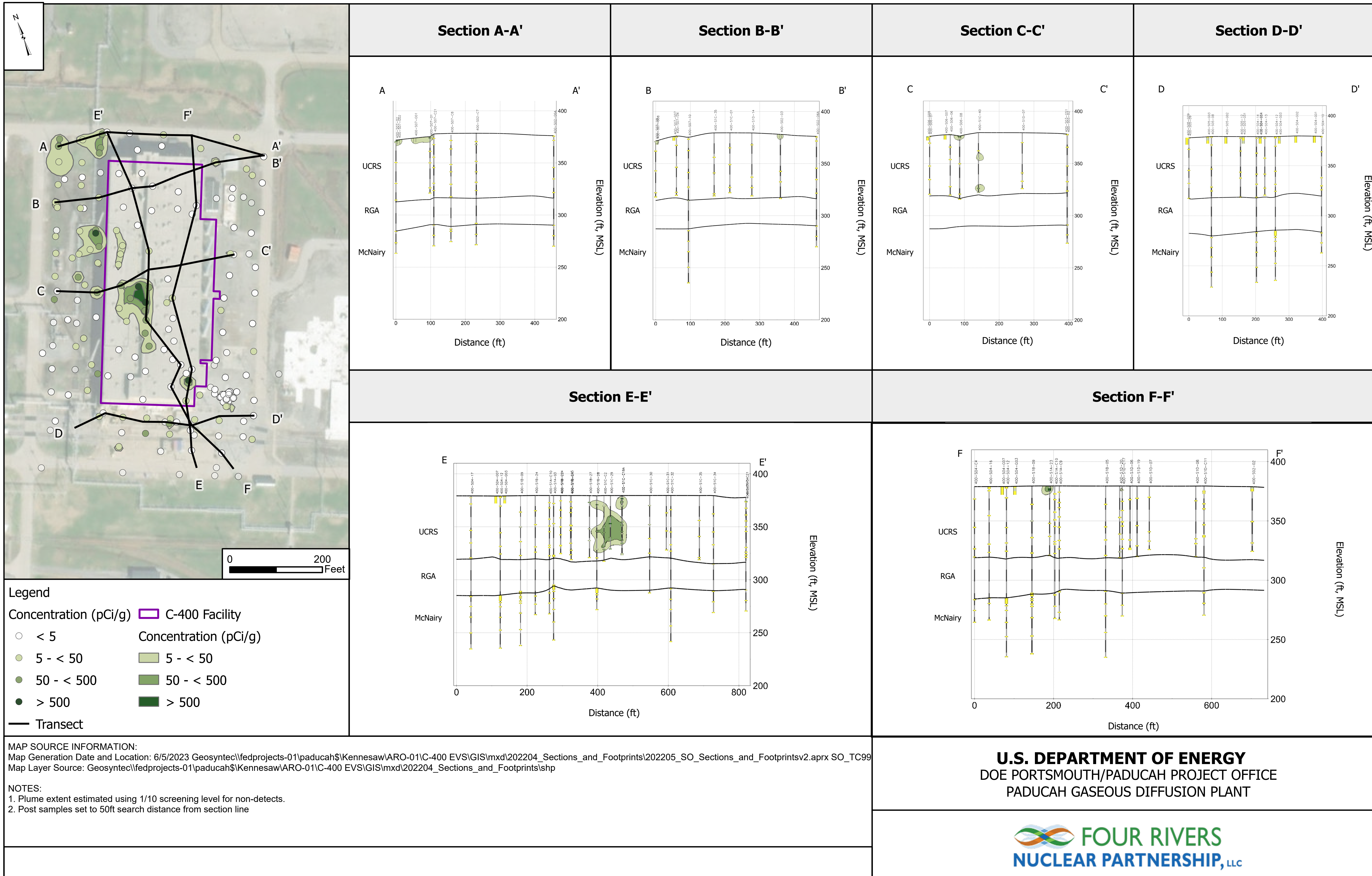

Figure 4.45. Cross Sections of Estimated Extent of Technetium-99 in Soils

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Table 4.39. Groundwater Data Summary and Screening: UCRS

Type	Analysis	Unit	Detected Results			Frequ. of	Resident		Resident		MCL		DL Range
			Min	Max	Avg	Detect.	FOE	NAL	FOE	AL	FOE	MCL	
METAL	Aluminum	mg/L	4.01E-02	8.10E-01	3.75E-01	11/13	0/13	2.00E+00	0/13	6.00E+01	N/A	N/A	0.05 - 0.05
METAL	Antimony	mg/L	1.03E-03	1.07E-03	1.05E-03	2/13	2/13	7.79E-04	0/13	2.34E-02	0/13	6.00E-03	0.003 - 0.003
METAL	Arsenic	mg/L	2.00E-03	2.73E-03	2.48E-03	6/13	6/13	5.17E-05	0/13	5.17E-03	0/13	1.00E-02	0.005 - 0.005
METAL	Barium	mg/L	7.79E-02	1.73E-01	1.11E-01	13/13	0/13	3.77E-01	0/13	1.13E+01	0/13	2.00E+00	0.004 - 0.004
METAL	Beryllium	mg/L	--	--	--	0/13	0/13	2.46E-03	0/13	7.38E-02	0/13	4.00E-03	0.0005 - 0.0005
METAL	Boron	mg/L	5.38E-03	2.13E-02	1.12E-02	11/13	0/13	3.99E-01	0/13	1.20E+01	N/A	N/A	0.015 - 0.015
METAL	Cadmium	mg/L	4.08E-04	4.08E-04	4.08E-04	1/13	0/13	9.22E-04	0/13	2.77E-02	0/13	5.00E-03	0.001 - 0.001
METAL	Calcium	mg/L	1.23E+01	6.68E+01	2.97E+01	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 2
METAL	Chromium	mg/L	3.23E-03	1.14E-02	6.07E-03	7/13	7/13	3.50E-05	6/13	3.50E-03	0/13	1.00E-01	0.01 - 0.01
METAL	Cobalt	mg/L	3.80E-04	3.50E-03	1.27E-03	13/13	11/13	6.01E-04	0/13	1.80E-02	N/A	N/A	0.001 - 0.001
METAL	Copper	mg/L	3.39E-04	4.92E-03	1.83E-03	13/13	0/13	7.99E-02	0/13	2.40E+00	0/13	1.30E+00	0.002 - 0.002
METAL	Iron	mg/L	5.49E-02	1.17E+00	6.08E-01	11/13	0/13	1.40E+00	0/13	4.20E+01	N/A	N/A	0.1 - 0.1
METAL	Lead	mg/L	5.89E-04	2.41E-03	1.15E-03	10/13	0/13	1.50E-02	0/13	3.00E-02	0/13	1.50E-02	0.002 - 0.002
METAL	Magnesium	mg/L	5.48E+00	1.06E+01	8.46E+00	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.03 - 0.03
METAL	Manganese	mg/L	1.09E-02	5.14E-01	1.14E-01	13/13	5/13	4.34E-02	0/13	1.30E+00	N/A	N/A	0.005 - 0.005
METAL	Mercury	mg/L	9.50E-05	2.36E-04	1.66E-04	2/13	0/13	5.66E-04	0/13	1.70E-02	0/13	2.00E-03	0.0002 - 0.0002
METAL	Molybdenum	mg/L	2.62E-04	1.03E-03	5.87E-04	8/13	0/13	9.98E-03	0/13	2.99E-01	N/A	N/A	0.001 - 0.001
METAL	Nickel	mg/L	6.61E-04	3.09E-03	1.94E-03	13/13	0/13	3.92E-02	0/13	1.18E+00	N/A	N/A	0.002 - 0.002
METAL	Potassium	mg/L	4.11E-01	3.35E+00	1.87E+00	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.3 - 0.3
METAL	Selenium	mg/L	--	--	--	0/13	0/13	9.98E-03	0/13	2.99E-01	0/13	5.00E-02	0.005 - 0.005
METAL	Silver	mg/L	--	--	--	0/13	0/13	9.41E-03	0/13	2.82E-01	N/A	N/A	0.001 - 0.001
METAL	Sodium	mg/L	1.26E+01	1.49E+02	7.09E+01	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.25 - 2.5
METAL	Thallium	mg/L	--	--	--	0/13	0/13	2.00E-05	0/13	6.00E-04	0/13	2.00E-03	0.002 - 0.002
METAL	Uranium[a]	mg/L	1.23E-04	1.26E-03	3.14E-04	12/13	1/13	3.99E-04	0/13	1.20E-02	0/13	3.00E-02	0.0002 - 0.0002
METAL	Vanadium	mg/L	3.52E-03	4.76E-03	4.40E-03	4/13	0/13	8.64E-03	0/13	2.59E-01	N/A	N/A	0.02 - 0.02
METAL	Zinc	mg/L	3.46E-03	2.59E-02	9.20E-03	11/13	0/13	6.00E-01	0/13	1.80E+01	N/A	N/A	0.02 - 0.02
ANION	Chloride	mg/L	4.56E+00	1.33E+02	4.61E+01	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 5
ANION	Fluoride	mg/L	6.17E-02	2.29E-01	1.63E-01	13/13	12/13	7.99E-02	0/13	2.40E+00	0/13	4.00E+00	0.1 - 0.1
ANION	Nitrate as Nitrogen	mg/L	5.98E-02	1.73E+00	1.14E+00	3/4	0/4	3.19E+00	0/4	9.57E+01	0/4	1.00E+01	0.1 - 0.1
ANION	Sulfate	mg/L	2.25E+01	5.16E+01	3.37E+01	4/4	N/A	N/A	N/A	N/A	N/A	N/A	0.8 - 10
PPCB	Total PCB[b]	mg/L	--	--	--	0/13	0/13	4.36E-05	0/13	4.36E-03	0/13	5.00E-04	0.000106
RADS	Americium-241	pCi/L	--	--	--	0/13	0/13	5.04E-01	0/13	5.04E+01	0/13	1.50E+01	0.239 - 0.832
RADS	Cesium-137	pCi/L	--	--	--	0/13	0/13	1.71E+00	0/13	1.71E+02	0/13	2.00E+02	5.41 - 12.9
RADS	Neptunium-237	pCi/L	--	--	--	0/13	0/13	7.63E-01	0/13	7.63E+01	0/13	1.50E+01	0.449 - 0.931
RADS	Plutonium-238	pCi/L	--	--	--	0/13	0/13	3.98E-01	0/13	3.98E+01	0/13	1.50E+01	0.325 - 1.17
RADS	Plutonium-239/240[c]	pCi/L	--	--	--	0/13	0/13	3.87E-01	0/13	3.87E+01	0/13	1.50E+01	0.275 - 1.06
RADS	Technetium-99	pCi/L	1.96E+01	5.77E+01	3.42E+01	8/13	8/13	1.90E+01	0/13	1.90E+03	0/13	9.00E+02	2.92 - 4.17
RADS	Thorium-230	pCi/L	--	--	--	0/13	0/13	5.72E-01	0/13	5.72E+01	0/13	1.50E+01	0.368 - 1.2
RADS	Uranium-233/234[d]	pCi/L	--	--	--	0/13	0/13	7.39E-01	0/13	7.39E+01	N/A	N/A	0.549 - 1.21
RADS	Uranium-235/236[e]	pCi/L	--	--	--	0/13	0/13	7.28E-01	0/13	7.28E+01	0/13	4.66E-01	0.143 - 0.811
RADS	Uranium-238	pCi/L	--	--	--	0/13	0/13	6.01E-01	0/13	6.01E+01	0/13	9.99E+00	0.279 - 1.04
SVOC	1,1-biphenyl	mg/L	--	--	--	0/13	0/13	8.34E-05	0/13	2.50E-03	N/A	N/A	0.0116
SVOC	2,4,5-Trichlorophenol	mg/L	--	--	--	0/13	0/13	1.18E-01	0/13	3.54E+00	N/A	N/A	0.0116
SVOC	2,4,6-Trichlorophenol	mg/L	--	--	--	0/13	0/13	1.21E-03	0/13	3.63E-02	N/A	N/A	0.0116
SVOC	2,4-Dichlorophenol	mg/L	--	--	--	0/13	0/13	4.57E-03	0/13	1.37E-01	N/A	N/A	0.0116

Table 4.39. Groundwater Data Summary and Screening: UCRS (Continued)

			Detected Results			Frequ. of	Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	Detect.	FOE	NAL	FOE	AL	FOE	MCL	DL Range
SVOC	2,4-Dimethylphenol	mg/L	--	--	--	0/13	0/13	3.55E-02	0/13	1.07E+00	N/A	N/A	0.0116
SVOC	2,4-Dinitrophenol	mg/L	--	--	--	0/13	0/13	3.88E-03	0/13	1.16E-01	N/A	N/A	0.019 - 0.0232
SVOC	2,4-Dinitrotoluene	mg/L	--	--	--	0/13	0/13	2.37E-04	0/13	2.37E-02	N/A	N/A	0.0116
SVOC	2,6-Dinitrotoluene	mg/L	--	--	--	0/13	0/13	4.85E-05	0/13	4.85E-03	N/A	N/A	0.0116
SVOC	2-Chloronaphthalene	mg/L	--	--	--	0/13	0/13	7.47E-02	0/13	2.24E+00	N/A	N/A	0.00116
SVOC	2-Chlorophenol	mg/L	--	--	--	0/13	0/13	9.13E-03	0/13	2.74E-01	N/A	N/A	0.0116
SVOC	2-Methyl-4,6-dinitrophenol	mg/L	--	--	--	0/13	0/13	1.51E-04	0/13	4.53E-03	N/A	N/A	0.0116
SVOC	2-Methylnaphthalene	mg/L	--	--	--	0/13	0/13	3.59E-03	0/13	1.08E-01	N/A	N/A	0.00116
SVOC	2-Methylphenol	mg/L	--	--	--	0/13	0/13	9.26E-02	0/13	2.78E+00	N/A	N/A	0.0116
SVOC	2-Nitrobenzenamine	mg/L	--	--	--	0/13	0/13	1.89E-02	0/13	5.67E-01	N/A	N/A	0.0116
SVOC	2-Nitrophenol	mg/L	--	--	--	0/13	0/13	3.88E-03	0/13	1.16E-01	N/A	N/A	0.0116
SVOC	3,3'-Dichlorobenzidine	mg/L	--	--	--	0/13	0/13	1.25E-04	0/13	1.25E-02	N/A	N/A	0.0116
SVOC	3-Nitrobenzenamine	mg/L	--	--	--	0/13	0/13	5.85E-04	0/13	1.76E-02	N/A	N/A	0.0116
SVOC	4-Bromophenyl phenyl ether	mg/L	--	--	--	0/13	0/13	8.34E-05	0/13	2.50E-03	N/A	N/A	0.0116
SVOC	4-Chloro-3-methylphenol	mg/L	--	--	--	0/13	0/13	1.45E-01	0/13	4.35E+00	N/A	N/A	0.0116
SVOC	4-Chlorobenzenamine	mg/L	--	--	--	0/13	0/13	3.65E-04	0/13	2.84E-02	N/A	N/A	0.0116
SVOC	4-Chlorophenyl phenyl ether	mg/L	--	--	--	0/13	0/13	8.34E-05	0/13	2.50E-03	N/A	N/A	0.0116
SVOC	4-Nitrophenol	mg/L	--	--	--	0/13	0/13	3.88E-03	0/13	1.16E-01	N/A	N/A	0.0116
SVOC	Acenaphthene	mg/L	--	--	--	0/13	0/13	5.35E-02	0/13	1.61E+00	N/A	N/A	0.00116
SVOC	Acenaphthylene	mg/L	--	--	--	0/13	0/13	5.35E-02	0/13	1.61E+00	N/A	N/A	0.00116
SVOC	Acetophenone	mg/L	--	--	--	0/13	0/13	1.92E-01	0/13	5.76E+00	N/A	N/A	0.0116
SVOC	Anthracene	mg/L	--	--	--	0/13	0/13	1.77E-01	0/13	5.31E+00	N/A	N/A	0.00116
SVOC	Atrazine	mg/L	--	--	--	0/13	0/13	3.02E-04	0/13	3.02E-02	0/13	3.00E-03	0.0116
SVOC	Benzaldehyde	mg/L	--	--	--	0/13	0/13	1.86E-02	0/13	1.86E+00	N/A	N/A	0.0116
SVOC	Benzo(ghi)perylene	mg/L	--	--	--	0/13	0/13	1.21E-02	0/13	3.63E-01	N/A	N/A	0.00116
SVOC	Bis(2-chloroethoxy)methane	mg/L	--	--	--	0/13	0/13	5.90E-03	0/13	1.77E-01	N/A	N/A	0.0116
SVOC	Bis(2-chloroethyl) ether	mg/L	--	--	--	0/13	0/13	1.37E-05	0/13	1.37E-03	N/A	N/A	0.0116
SVOC	Bis(2-chloroisopropyl) ether	mg/L	--	--	--	0/13	0/13	3.57E-04	0/13	3.57E-02	N/A	N/A	0.0116
SVOC	Bis(2-ethylhexyl)phthalate	mg/L	3.20E-04	7.24E-04	4.95E-04	3/13	0/13	5.56E-03	0/13	5.56E-01	0/13	6.00E-03	0.00116
SVOC	Butyl benzyl phthalate	mg/L	6.20E-04	6.20E-04	6.20E-04	1/13	0/13	1.63E-02	0/13	1.63E+00	N/A	N/A	0.0116
SVOC	Caprolactam	mg/L	--	--	--	0/13	0/13	9.92E-01	0/13	2.98E+01	N/A	N/A	0.0116
SVOC	Carbazole	mg/L	--	--	--	0/13	0/13	2.03E-03	0/13	2.03E-01	N/A	N/A	0.00116
SVOC	Dibenzofuran	mg/L	--	--	--	0/13	0/13	7.86E-04	0/13	2.36E-02	N/A	N/A	0.0116
SVOC	Diethyl phthalate	mg/L	--	--	--	0/13	0/13	1.48E+00	0/13	4.44E+01	N/A	N/A	0.0116
SVOC	Dimethyl phthalate	mg/L	--	--	--	0/13	0/13	1.48E+00	0/13	4.44E+01	N/A	N/A	0.0116
SVOC	Di-n-butyl phthalate	mg/L	9.10E-04	9.10E-04	9.10E-04	1/13	0/13	9.02E-02	0/13	2.71E+00	N/A	N/A	0.0116
SVOC	Di-n-octylphthalate	mg/L	6.38E-04	1.07E-03	8.54E-04	2/13	0/13	2.01E-02	0/13	6.03E-01	N/A	N/A	0.0116
SVOC	Diphenylamine	mg/L	--	--	--	0/13	0/13	1.26E-01	0/13	3.78E+00	N/A	N/A	0.0116
SVOC	Fluoranthene	mg/L	--	--	--	0/13	0/13	8.02E-02	0/13	2.41E+00	N/A	N/A	0.00116
SVOC	Fluorene	mg/L	--	--	--	0/13	0/13	2.94E-02	0/13	8.82E-01	N/A	N/A	0.00116
SVOC	Hexachlorobenzene	mg/L	--	--	--	0/13	0/13	9.76E-06	0/13	9.76E-04	0/13	1.00E-03	0.0116
SVOC	Hexachlorobutadiene	mg/L	--	--	--	0/13	0/13	1.39E-04	0/13	1.39E-02	N/A	N/A	0.0116
SVOC	Hexachlorocyclopentadiene	mg/L	--	--	--	0/13	0/13	4.12E-05	0/13	1.24E-03	0/13	5.00E-02	0.0116
SVOC	Hexachloroethane	mg/L	--	--	--	0/13	0/13	3.28E-04	0/13	1.87E-02	N/A	N/A	0.0116
SVOC	Isophorone	mg/L	--	--	--	0/13	0/13	7.81E-02	0/13	7.81E+00	N/A	N/A	0.0116

Table 4.39. Groundwater Data Summary and Screening: UCRS (Continued)

Type	Analysis	Unit	Detected Results			Frequ. of	Resident		Resident		MCL		
			Min	Max	Avg	Detect.	FOE	NAL	FOE	AL	FOE	MCL	DL Range
SVOC	m+p Methylphenol	mg/L	--	--	--	0/13	0/13	3.71E-02	0/13	1.11E+00	N/A	N/A	0.0116
SVOC	Naphthalene	mg/L	3.30E-04	3.30E-04	3.30E-04	1/13	1/13	1.17E-04	0/13	1.17E-02	N/A	N/A	0.00116
SVOC	Nitrobenzene	mg/L	--	--	--	0/13	0/13	1.40E-04	0/13	1.40E-02	N/A	N/A	0.0116
SVOC	N-Nitroso-di-n-propylamine	mg/L	--	--	--	0/13	0/13	1.08E-05	0/13	1.08E-03	N/A	N/A	0.0116
SVOC	Pentachlorophenol	mg/L	--	--	--	0/13	0/13	4.13E-05	0/13	4.13E-03	0/13	1.00E-03	0.0116
SVOC	Phenanthrene	mg/L	--	--	--	0/13	0/13	5.35E-02	0/13	1.61E+00	N/A	N/A	0.00116
SVOC	Phenol	mg/L	--	--	--	0/13	0/13	5.77E-01	0/13	1.73E+01	N/A	N/A	0.0116
SVOC	p-Nitroaniline	mg/L	5.10E-03	5.10E-03	5.10E-03	1/13	1/13	3.78E-03	0/13	2.34E-01	N/A	N/A	0.0116
SVOC	Pyrene	mg/L	--	--	--	0/13	0/13	1.21E-02	0/13	3.63E-01	N/A	N/A	0.00116
SVOC	Total PAH[f]	mg/L	--	--	--	0/13	0/13	2.51E-05	0/13	2.51E-03	0/13	2.00E-04	-
VOC	1,1,1-Trichloroethane	mg/L	--	--	--	0/13	0/13	8.01E-01	0/13	2.40E+01	0/13	2.00E-01	0.001 - 50
VOC	1,1,2,2-Tetrachloroethane	mg/L	--	--	--	0/13	0/13	7.57E-05	0/13	7.57E-03	N/A	N/A	0.001 - 50
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	--	--	--	0/13	0/13	1.02E+00	0/13	3.06E+01	N/A	N/A	0.005 - 250
VOC	1,1,2-Trichloroethane	mg/L	2.16E-03	2.16E-03	2.16E-03	1/13	1/13	4.15E-05	1/13	1.25E-03	0/13	5.00E-03	0.001 - 50
VOC	1,1-Dichloroethane	mg/L	--	--	--	0/13	0/13	2.75E-03	0/13	2.75E-01	N/A	N/A	0.001 - 50
VOC	1,1-Dichloroethene	mg/L	1.70E-02	1.70E-02	1.70E-02	1/13	0/13	2.85E-02	0/13	8.55E-01	1/13	7.00E-03	0.001 - 50
VOC	1,2,3-Trichlorobenzene	mg/L	--	--	--	0/13	0/13	7.04E-04	0/13	2.11E-02	N/A	N/A	0.001 - 50
VOC	1,2,4-Trichlorobenzene	mg/L	--	--	--	0/13	0/13	3.99E-04	0/13	1.20E-02	0/13	7.00E-02	0.001 - 50
VOC	1,2-Dibromo-3-chloropropane	mg/L	--	--	--	0/13	0/13	3.34E-07	0/13	3.34E-05	0/13	2.00E-04	0.001 - 50
VOC	1,2-Dibromoethane	mg/L	--	--	--	0/13	0/13	7.47E-06	0/13	7.47E-04	0/13	5.00E-05	0.001 - 50
VOC	1,2-Dichlorobenzene	mg/L	--	--	--	0/13	0/13	3.04E-02	0/13	9.12E-01	0/13	6.00E-01	0.001 - 50
VOC	1,2-Dichloroethane	mg/L	3.90E-04	3.90E-04	3.90E-04	1/13	1/13	1.71E-04	0/13	1.71E-02	0/13	5.00E-03	0.001 - 50
VOC	1,2-Dichloropropane	mg/L	--	--	--	0/13	0/13	8.25E-04	0/13	2.48E-02	0/13	5.00E-03	0.001 - 50
VOC	1,2-Dimethylbenzene	mg/L	--	--	--	0/13	0/13	1.93E-02	0/13	5.79E-01	N/A	N/A	0.001 - 50
VOC	1,3-Dichlorobenzene	mg/L	--	--	--	0/13	0/13	3.04E-02	0/13	9.12E-01	0/13	6.00E-01	0.001 - 50
VOC	1,4-Dichlorobenzene	mg/L	--	--	--	0/13	0/13	4.82E-04	0/13	4.82E-02	0/13	7.50E-02	0.001 - 50
VOC	1,4-Dioxane	mg/L	2.33E+05	2.33E+05	2.33E+05	1/10	1/10	4.59E-04	1/10	4.59E-02	N/A	N/A	0.05 - 2500
VOC	2-Butanone	mg/L	--	--	--	0/13	0/13	5.57E-01	0/13	1.67E+01	N/A	N/A	0.005 - 250
VOC	2-Chloroethyl vinyl ether	mg/L	--	--	--	0/13	0/13	6.50E-06	0/13	6.50E-04	N/A	N/A	0.005 - 250
VOC	2-Hexanone	mg/L	--	--	--	0/13	0/13	3.80E-03	0/13	1.14E-01	N/A	N/A	0.005 - 250
VOC	2-Methoxy-2-methylpropane	mg/L	--	--	--	0/13	0/13	1.43E-02	0/13	1.43E+00	N/A	N/A	0.001 - 50
VOC	4-Methyl-2-pentanone	mg/L	--	--	--	0/13	0/13	1.24E-01	0/13	3.72E+00	N/A	N/A	0.005 - 250
VOC	Acetone	mg/L	2.16E+02	2.16E+02	2.16E+02	1/13	1/13	1.80E+00	1/13	5.40E+01	N/A	N/A	0.005 - 250
VOC	Acrolein	mg/L	--	--	--	0/13	0/13	4.15E-06	0/13	1.25E-04	N/A	N/A	0.005 - 250
VOC	Acrylonitrile	mg/L	--	--	--	0/13	0/13	5.23E-05	0/13	5.23E-03	N/A	N/A	0.005 - 250
VOC	Benzene	mg/L	8.50E-04	8.50E-04	8.50E-04	1/13	1/13	4.55E-04	0/13	4.55E-02	0/13	5.00E-03	0.001 - 50
VOC	Bromochloromethane	mg/L	--	--	--	0/13	0/13	8.34E-03	0/13	2.50E-01	N/A	N/A	0.001 - 50
VOC	Bromodichloromethane	mg/L	--	--	--	0/13	0/13	1.34E-04	0/13	1.34E-02	0/13	8.00E-02	0.001 - 50
VOC	Bromoform	mg/L	--	--	--	0/13	0/13	3.29E-03	0/13	3.29E-01	0/13	8.00E-02	0.001 - 50
VOC	Bromomethane	mg/L	--	--	--	0/13	0/13	7.55E-04	0/13	2.27E-02	N/A	N/A	0.001 - 50
VOC	Carbon disulfide	mg/L	--	--	--	0/13	0/13	8.11E-02	0/13	2.43E+00	N/A	N/A	0.005 - 250
VOC	Carbon tetrachloride	mg/L	5.60E-04	5.60E-04	5.60E-04	1/13	1/13	4.55E-04	0/13	4.55E-02	0/13	5.00E-03	0.001 - 50
VOC	Chlorobenzene	mg/L	--	--	--	0/13	0/13	7.77E-03	0/13	2.33E-01	0/13	1.00E-01	0.001 - 50
VOC	Chloroethane	mg/L	--	--	--	0/13	0/13	8.34E-01	0/13	2.50E+01	N/A	N/A	0.001 - 50
VOC	Chloroform	mg/L	6.90E-04	6.90E-04	6.90E-04	1/13	1/13	2.21E-04	0/13	2.21E-02	0/13	8.00E-02	0.001 - 50

Table 4.39. Groundwater Data Summary and Screening: UCRS (Continued)

Type	Analysis	Unit	Detected Results			Frequ. of	Resident		Resident		MCL		DL Range
			Min	Max	Avg	Detect.	FOE	NAL	FOE	AL	FOE	MCL	
VOC	Chloromethane	mg/L	--	--	--	0/13	0/13	2.03E-03	0/13	2.03E-01	N/A	N/A	0.001 - 50
VOC	*cis* -1,2-Dichloroethene	mg/L	5.70E-02	7.37E+00	1.94E+00	4/13	4/13	3.61E-03	3/13	1.08E-01	3/13	7.00E-02	0.001 - 50
VOC	*cis* -1,3-Dichloropropene	mg/L	--	--	--	0/13	0/13	4.71E-04	0/13	4.71E-02	N/A	N/A	0.001 - 50
VOC	Cumene	mg/L	--	--	--	0/13	0/13	4.51E-02	0/13	1.35E+00	N/A	N/A	0.001 - 50
VOC	Cyclohexane	mg/L	--	--	--	0/13	0/13	1.25E+00	0/13	3.75E+01	N/A	N/A	0.001 - 50
VOC	Dibromochloromethane	mg/L	--	--	--	0/13	0/13	8.71E-04	0/13	8.71E-02	0/13	8.00E-02	0.001 - 50
VOC	Dichlorodifluoromethane	mg/L	--	--	--	0/13	0/13	1.97E-02	0/13	5.91E-01	N/A	N/A	0.001 - 50
VOC	Ethylbenzene	mg/L	--	--	--	0/13	0/13	1.50E-03	0/13	1.50E-01	0/13	7.00E-01	0.001 - 50
VOC	m,p-Xylene	mg/L	--	--	--	0/13	0/13	1.93E-02	0/13	5.79E-01	N/A	N/A	0.002 - 100
VOC	Methyl acetate	mg/L	--	--	--	0/13	0/13	1.99E+00	0/13	5.97E+01	N/A	N/A	0.005 - 250
VOC	Methylcyclohexane	mg/L	--	--	--	0/13	0/13	6.26E-01	0/13	1.88E+01	N/A	N/A	0.001 - 50
VOC	Methylene chloride	mg/L	5.20E-03	5.20E-03	5.20E-03	1/13	0/13	1.07E-02	0/13	3.21E-01	1/13	5.00E-03	0.005 - 250
VOC	Styrene	mg/L	--	--	--	0/13	0/13	1.21E-01	0/13	3.63E+00	0/13	1.00E-01	0.001 - 50
VOC	Tetrachloroethene	mg/L	3.90E-03	3.90E-03	3.90E-03	1/13	0/13	4.06E-03	0/13	1.22E-01	0/13	5.00E-03	0.001 - 50
VOC	Toluene	mg/L	--	--	--	0/13	0/13	1.10E-01	0/13	3.30E+00	0/13	1.00E+00	0.001 - 50
VOC	Total Xylene	mg/L	--	--	--	0/13	0/13	1.93E-02	0/13	5.79E-01	0/13	1.00E+01	0.003 - 150
VOC	*trans* -1,2-Dichloroethene	mg/L	4.15E-03	4.15E-03	4.15E-03	1/13	0/13	9.29E-03	0/13	2.79E-01	0/13	1.00E-01	0.001 - 50
VOC	*trans* -1,3-Dichloropropene	mg/L	--	--	--	0/13	0/13	4.71E-04	0/13	4.71E-02	N/A	N/A	0.001 - 50
VOC	Trichloroethene	mg/L	1.86E-03	6.45E+02	5.34E+01	13/13	13/13	2.83E-04	10/13	8.49E-03	12/13	5.00E-03	0.001 - 50
VOC	Trichlorofluoromethane	mg/L	--	--	--	0/13	0/13	1.14E-01	0/13	3.42E+00	N/A	N/A	0.001 - 50
VOC	Vinyl chloride	mg/L	2.71E-02	2.71E-02	2.71E-02	1/13	1/13	1.88E-05	1/13	1.88E-03	1/13	2.00E-03	0.001 - 50

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(blue)	One or more samples exceed groundwater MCL

-- = No calculation completed, analyte not detected

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

[a] Uranium screened against Soluble Salts.

[b] Total PCB calculated by laboratory.

[c] Plutonium 239/240 is screened against Plutonium 239.

[d] Uranium 233/234 is screened against Uranium 234.

[e] Uranium 235/236 is screened against Uranium 235.

[f] Total PAHs calculated using TEF values in RMD 2021.

Table 4.40. Groundwater Data Summary and Screening: RGA

			Detected Results				Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
METAL	Aluminum	mg/L	1.94E-02	4.17E+00	4.46E-01	130/258	6/258	2.19E+00	7/258	2.00E+00	0/258	6.00E+01	N/A	N/A	0.05 - 0.2
METAL	Antimony	mg/L	1.02E-03	1.47E-03	1.14E-03	24/258	0/258	6.00E-02	24/258	7.79E-04	0/258	2.34E-02	0/258	6.00E-03	0.003 - 0.005
METAL	Arsenic	mg/L	1.47E-03	8.97E-03	3.06E-03	89/258	6/258	5.00E-03	89/258	5.17E-05	5/258	5.17E-03	0/258	1.00E-02	0.001 - 0.005
METAL	Barium	mg/L	3.62E-02	9.11E-01	2.61E-01	258/258	141/258	2.35E-01	45/258	3.77E-01	0/258	1.13E+01	0/258	2.00E+00	0.002 - 0.005
METAL	Beryllium	mg/L	2.00E-04	8.91E-04	3.54E-04	21/258	0/258	4.00E-03	0/258	2.46E-03	0/258	7.38E-02	0/258	4.00E-03	0.0005 - 0.001
METAL	Boron	mg/L	7.11E-03	5.61E-02	1.80E-02	256/256	N/A	N/A	0/256	3.99E-01	0/256	1.20E+01	N/A	N/A	0.015 - 0.015
METAL	Cadmium	mg/L	3.06E-04	6.84E-04	3.81E-04	11/258	0/258	1.00E-02	0/258	9.22E-04	0/258	2.77E-02	0/258	5.00E-03	0.001 - 0.001
METAL	Calcium	mg/L	1.08E+01	7.28E+01	3.68E+01	64/64	17/64	4.12E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 2
METAL	Chromium	mg/L	3.10E-03	2.72E+00	1.11E-01	160/258	34/258	1.44E-01	160/258	3.50E-05	152/258	3.50E-03	44/258	1.00E-01	0.01 - 0.1
METAL	Cobalt	mg/L	3.17E-04	2.68E-02	3.07E-03	181/258	0/258	4.50E-02	164/258	6.01E-04	2/258	1.80E-02	N/A	N/A	0.001 - 0.001
METAL	Copper	mg/L	3.29E-04	3.30E-02	3.76E-03	246/258	0/258	3.60E-02	0/258	7.99E-02	0/258	2.40E+00	0/258	1.30E+00	0.001 - 0.02
METAL	Iron	mg/L	3.34E-02	2.76E+01	2.07E+00	237/258	28/258	5.03E+00	73/258	1.40E+00	0/258	4.20E+01	N/A	N/A	0.1 - 1
METAL	Iron (2+)	mg/L	--	--	--	0/1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.28 - 0.28
METAL	Lead	mg/L	5.15E-04	1.80E-02	1.98E-03	63/258	0/258	1.29E-01	1/258	1.50E-02	0/258	3.00E-02	1/258	1.50E-02	0.0013 - 0.002
METAL	Magnesium	mg/L	3.88E+00	2.95E+01	1.39E+01	64/64	14/64	1.63E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.025 - 0.03
METAL	Manganese	mg/L	1.19E-03	7.29E+00	2.73E-01	251/258	89/258	1.19E-01	131/258	4.34E-02	11/258	1.30E+00	N/A	N/A	0.005 - 0.1
METAL	Mercury	mg/L	7.00E-05	2.59E-04	1.31E-04	22/256	6/256	2.00E-04	0/256	5.66E-04	0/256	1.70E-02	0/256	2.00E-03	0.0002 - 0.0002
METAL	Molybdenum	mg/L	2.06E-04	6.04E-02	5.46E-03	169/258	2/258	5.00E-02	29/258	9.98E-03	0/258	2.99E-01	N/A	N/A	0.0005 - 0.001
METAL	Nickel	mg/L	7.13E-04	4.30E-01	4.82E-02	258/258	0/258	6.82E-01	96/258	3.92E-02	0/258	1.18E+00	N/A	N/A	0.002 - 0.005
METAL	Potassium	mg/L	8.20E-01	3.36E+00	2.22E+00	64/64	0/64	5.20E+00	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 0.3
METAL	Selenium	mg/L	1.61E-03	5.28E-03	2.39E-03	25/258	1/258	5.00E-03	0/258	9.98E-03	0/258	2.99E-01	0/258	5.00E-02	0.005 - 0.005
METAL	Silver	mg/L	3.26E-04	5.34E-03	1.20E-03	14/258	0/258	1.10E-02	0/258	9.41E-03	0/258	2.82E-01	N/A	N/A	0.001 - 0.001
METAL	Sodium	mg/L	1.27E+01	1.14E+02	4.91E+01	64/64	16/64	5.95E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.25 - 2.5
METAL	Thallium	mg/L	6.01E-04	6.99E-04	6.45E-04	4/256	0/256	5.60E-02	4/256	2.00E-05	4/256	6.00E-04	0/256	2.00E-03	0.002 - 0.002
METAL	Uranium[a]	mg/L	6.90E-05	3.12E-02	1.37E-03	107/303	16/303	2.00E-03	49/303	3.99E-04	2/303	1.20E-02	1/303	3.00E-02	0.0002 - 0.005
METAL	Vanadium	mg/L	3.30E-03	2.97E-02	7.79E-03	54/256	0/256	1.34E-01	20/256	8.64E-03	0/256	2.59E-01	N/A	N/A	0.02 - 0.02
METAL	Zinc	mg/L	3.30E-03	2.02E-01	1.56E-02	213/258	11/258	5.40E-02	0/258	6.00E-01	0/258	1.80E+01	N/A	N/A	0.01 - 0.02
ANION	Chloride	mg/L	3.25E+00	2.19E+02	7.02E+01	474/474	96/474	9.10E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 20
ANION	Fluoride	mg/L	3.45E-02	2.49E+00	2.20E-01	256/258	22/258	2.70E-01	238/258	7.99E-02	1/258	2.40E+00	0/258	4.00E+00	0.1 - 0.2
ANION	Nitrate as Nitrogen	mg/L	5.02E-02	8.35E+01	1.04E+01	59/64	9/64	1.56E+01	20/64	3.19E+00	0/64	9.57E+01	12/64	1.00E+01	0.1 - 5
ANION	Sulfate	mg/L	3.94E+00	8.18E+01	2.20E+01	64/64	27/64	1.99E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.4 - 20
PPCB	Total PCB[b]	mg/L	6.08E-05	4.73E-04	2.03E-04	5/256	N/A	N/A	5/256	4.36E-05	0/256	4.36E-03	0/256	5.00E-04	0.0000938 - 0.000497
RADS	Americium-241	pCi/L	--	--	--	0/256	N/A	N/A	0/256	5.04E-01	0/256	5.04E+01	0/256	1.50E+01	0.211 - 1.41
RADS	Cesium-137	pCi/L	--	--	--	0/255	N/A	N/A	0/255	1.71E+00	0/255	1.71E+02	0/255	2.00E+02	4.22 - 14.3
RADS	Neptunium-237	pCi/L	9.23E-01	3.85E+00	1.91E+00	8/256	8/256	8.00E-01	8/256	7.63E-01	0/256	7.63E+01	0/256	1.50E+01	0.253 - 1.42
RADS	Plutonium-238	pCi/L	--	--	--	0/256	N/A	N/A	0/256	3.98E-01	0/256	3.98E+01	0/256	1.50E+01	0.181 - 1.42
RADS	Plutonium-239/240	pCi/L	--	--	--	0/256	0/256	1.00E-01	0/256	3.87E-01	0/256	3.87E+01	0/256	1.50E+01	0.293 - 1.38
RADS	Technetium-99	pCi/L	3.12E+00	3.17E+04	2.05E+03	697/805	651/805	2.23E+01	661/805	1.90E+01	146/805	1.90E+03	192/805	9.00E+02	1.82 - 46.9
RADS	Thorium-230	pCi/L	6.58E-01	6.58E-01	6.58E-01	1/256	0/256	1.10E+00	1/256	5.72E-01	0/256	5.72E+01	0/256	1.50E+01	0.315 - 1.44
RADS	Uranium-233/234[c]	pCi/L	4.29E-01	8.10E+01	1.74E+01	5/256	4/256	7.00E-01	4/256	7.39E-01	1/256	7.39E+01	N/A	N/A	0.222 - 1.42
RADS	Uranium-235/236[d]	pCi/L	3.88E-01	4.68E+00	2.53E+00	2/256	2/256	3.00E-01	1/256	7.28E-01	0/256	7.28E+01	1/256	4.66E-01	0.127 - 1.26
RADS	Uranium-238	pCi/L	2.09E-01	8.51E+01	5.43E+00	22/256	12/256	7.00E-01	16/256	6.01E-01	1/256	6.01E+01	2/256	9.99E+00	0.102 - 1.25
SVOC	1,1-biphenyl	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.34E-05	0/256	2.50E-03	N/A	N/A	0.00909 - 0.0129
SVOC	2,4,5-Trichlorophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.18E-01	0/256	3.54E+00	N/A	N/A	0.00909 - 0.0129
SVOC	2,4,6-Trichlorophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.21E-03	0/256	3.63E-02	N/A	N/A	0.00909 - 0.0129
SVOC	2,4-Dichlorophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.57E-03	0/256	1.37E-01	N/A	N/A	0.00909 - 0.0129
SVOC	2,4-Dimethylphenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.55E-02	0/256	1.07E+00	N/A	N/A	0.00909 - 0.0129
SVOC	2,4-Dinitrophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.88E-03	0/256	1.16E-01	N/A	N/A	0.0182 - 0.0257
SVOC	2,4-Dinitrotoluene	mg/L	--	--	--	0/256	N/A	N/A	0/256	2.37E-04	0/256	2.37E-02	N/A	N/A	0.00909 - 0.0129
SVOC	2,6-Dinitrotoluene	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.85E-05	0/256	4.85E-03	N/A	N/A	0.00909 - 0.0129

Table 4.40. Groundwater Data Summary and Screening: RGA (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		Resident		Resident		MCL		DL Range
			Min	Max	Avg		FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	
SVOC	2-Chloronaphthalene	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.47E-02	0/256	2.24E+00	N/A	N/A	0.000909 - 0.00129
SVOC	2-Chlorophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	9.13E-03	0/256	2.74E-01	N/A	N/A	0.00909 - 0.0129
SVOC	2-Methyl-4,6-dinitrophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.51E-04	0/256	4.53E-03	N/A	N/A	0.00909 - 0.0129
SVOC	2-Methylnaphthalene	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.59E-03	0/256	1.08E-01	N/A	N/A	0.000909 - 0.00129
SVOC	2-Methylphenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	9.26E-02	0/256	2.78E+00	N/A	N/A	0.00909 - 0.0129
SVOC	2-Nitrobenzenamine	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.89E-02	0/256	5.67E-01	N/A	N/A	0.00909 - 0.0129
SVOC	2-Nitrophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.88E-03	0/256	1.16E-01	N/A	N/A	0.00909 - 0.0129
SVOC	3,3'-Dichlorobenzidine	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.25E-04	0/256	1.25E-02	N/A	N/A	0.00909 - 0.0129
SVOC	3-Nitrobenzenamine	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.85E-04	0/256	1.76E-02	N/A	N/A	0.00909 - 0.0129
SVOC	4-Bromophenyl phenyl ether	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.34E-05	0/256	2.50E-03	N/A	N/A	0.00909 - 0.0129
SVOC	4-Chloro-3-methylphenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.45E-01	0/256	4.35E+00	N/A	N/A	0.00909 - 0.0129
SVOC	4-Chlorobenzenamine	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.65E-04	0/256	2.84E-02	N/A	N/A	0.00909 - 0.0129
SVOC	4-Chlorophenyl phenyl ether	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.34E-05	0/256	2.50E-03	N/A	N/A	0.00909 - 0.0129
SVOC	4-Nitrophenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.88E-03	0/256	1.16E-01	N/A	N/A	0.00909 - 0.0129
SVOC	Acenaphthene	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.35E-02	0/256	1.61E+00	N/A	N/A	0.000909 - 0.00129
SVOC	Acenaphthylene	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.35E-02	0/256	1.61E+00	N/A	N/A	0.000909 - 0.00129
SVOC	Acetophenone	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.92E-01	0/256	5.76E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Anthracene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.77E-01	0/256	5.31E+00	N/A	N/A	0.000909 - 0.00129
SVOC	Atrazine	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.02E-04	0/256	3.02E-02	0/256	3.00E-03	0.00909 - 0.0129
SVOC	Benzaldehyde	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.86E-02	0/256	1.86E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Benzo(ghi)perylene	mg/L	4.52E-04	9.26E-04	7.34E-04	3/256	N/A	N/A	0/256	1.21E-02	0/256	3.63E-01	N/A	N/A	0.000909 - 0.00129
SVOC	Bis(2-chloroethoxy)methane	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.90E-03	0/256	1.77E-01	N/A	N/A	0.00909 - 0.0129
SVOC	Bis(2-chloroethyl) ether	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.37E-05	0/256	1.37E-03	N/A	N/A	0.00909 - 0.0129
SVOC	Bis(2-chloroisopropyl) ether	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.57E-04	0/256	3.57E-02	N/A	N/A	0.00909 - 0.0129
SVOC	Bis(2-ethylhexyl)phthalate	mg/L	3.08E-04	7.01E-02	2.53E-03	41/256	N/A	N/A	1/256	5.56E-03	0/256	5.56E-01	1/256	6.00E-03	0.000909 - 0.00129
SVOC	Butyl benzyl phthalate	mg/L	3.51E-04	5.85E-04	5.11E-04	5/256	N/A	N/A	0/256	1.63E-02	0/256	1.63E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Caprolactam	mg/L	--	--	--	0/256	N/A	N/A	0/256	9.92E-01	0/256	2.98E+01	N/A	N/A	0.00909 - 0.0129
SVOC	Carbazole	mg/L	--	--	--	0/256	N/A	N/A	0/256	2.03E-03	0/256	2.03E-01	N/A	N/A	0.000909 - 0.00129
SVOC	Dibenzofuran	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.86E-04	0/256	2.36E-02	N/A	N/A	0.00909 - 0.0129
SVOC	Diethyl phthalate	mg/L	4.17E-04	4.50E-04	4.34E-04	2/256	N/A	N/A	0/256	1.48E+00	0/256	4.44E+01	N/A	N/A	0.00909 - 0.0129
SVOC	Dimethyl phthalate	mg/L	3.51E-04	3.51E-04	3.51E-04	1/256	N/A	N/A	0/256	1.48E+00	0/256	4.44E+01	N/A	N/A	0.00909 - 0.0129
SVOC	Di-n-butyl phthalate	mg/L	3.20E-04	2.71E-03	6.87E-04	12/256	N/A	N/A	0/256	9.02E-02	0/256	2.71E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Di-n-octylphthalate	mg/L	3.23E-04	1.56E-03	7.95E-04	14/256	N/A	N/A	0/256	2.01E-02	0/256	6.03E-01	N/A	N/A	0.00909 - 0.0129
SVOC	Diphenylamine	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.26E-01	0/256	3.78E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Fluoranthene	mg/L	3.51E-04	5.54E-04	4.53E-04	2/256	N/A	N/A	0/256	8.02E-02	0/256	2.41E+00	N/A	N/A	0.000909 - 0.00129
SVOC	Fluorene	mg/L	--	--	--	0/256	N/A	N/A	0/256	2.94E-02	0/256	8.82E-01	N/A	N/A	0.000909 - 0.00129
SVOC	Hexachlorobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	9.76E-06	0/256	9.76E-04	0/256	1.00E-03	0.00909 - 0.0129
SVOC	Hexachlorobutadiene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.39E-04	0/256	1.39E-02	N/A	N/A	0.00909 - 0.0129
SVOC	Hexachlorocyclopentadiene	mg/L	4.44E-03	4.74E-03	4.59E-03	2/256	N/A	N/A	2/256	4.12E-05	2/256	1.24E-03	0/256	5.00E-02	0.00909 - 0.0129
SVOC	Hexachloroethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.28E-04	0/256	1.87E-02	N/A	N/A	0.00909 - 0.0129
SVOC	Isophorone	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.81E-02	0/256	7.81E+00	N/A	N/A	0.00909 - 0.0129
SVOC	m+p Methylphenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.71E-02	0/256	1.11E+00	N/A	N/A	0.00909 - 0.0129
SVOC	Naphthalene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.17E-04	0/256	1.17E-02	N/A	N/A	0.000909 - 0.00129
SVOC	Nitrobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.40E-04	0/256	1.40E-02	N/A	N/A	0.00909 - 0.0129
SVOC	N-Nitroso-di-n-propylamine	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.08E-05	0/256	1.08E-03	N/A	N/A	0.00909 - 0.0129
SVOC	Pentachlorophenol	mg/L	6.10E-03	6.41E-03	6.26E-03	2/256	N/A	N/A	2/256	4.13E-05	2/256	4.13E-03	2/256	1.00E-03	0.00909 - 0.0129
SVOC	Phenanthrene	mg/L	3.95E-04	3.95E-04	3.95E-04	1/256	N/A	N/A	0/256	5.35E-02	0/256	1.61E+00	N/A	N/A	0.000909 - 0.00129
SVOC	Phenol	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.77E-01	0/256	1.73E+01	N/A	N/A	0.00909 - 0.0129
SVOC	p-Nitroaniline	mg/L	3.69E-03	5.45E-03	4.64E-03	8/256	N/A	N/A	7/256	3.78E-03	0/256	2.34E-01	N/A	N/A	0.00909 - 0.0129
SVOC	Pyrene	mg/L	3.51E-04	4.13E-04	3.82E-04	2/256	N/A	N/A	0/256	1.21E-02	0/256	3.63E-01	N/A	N/A	0.000909 - 0.00129

Table 4.40. Groundwater Data Summary and Screening: RGA (Continued)

			Detected Results				Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
SVOC	Total PAH[e]	mg/L	4.54E-06	1.55E-03	6.92E-04	7/256	N/A	N/A	6/256	2.51E-05	0/256	2.51E-03	5/256	2.00E-04	-
VOC	1,1,1-Trichloroethane	mg/L	3.90E-04	2.61E-03	1.27E-03	11/271	N/A	N/A	0/271	8.01E-01	0/271	2.40E+01	0/271	2.00E-01	0.001 - 2
VOC	1,1,2,2-Tetrachloroethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.57E-05	0/256	7.57E-03	N/A	N/A	0.001 - 2
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	3.02E-03	6.25E-02	1.35E-02	37/256	N/A	N/A	0/256	1.02E+00	0/256	3.06E+01	N/A	N/A	0.005 - 10
VOC	1,1,2-Trichloroethane	mg/L	3.40E-04	9.70E-03	1.66E-03	78/271	N/A	N/A	78/271	4.15E-05	29/271	1.25E-03	2/271	5.00E-03	0.001 - 2
VOC	1,1-Dichloroethane	mg/L	3.30E-04	3.02E-03	9.53E-04	19/271	N/A	N/A	1/271	2.75E-03	0/271	2.75E-01	N/A	N/A	0.001 - 2
VOC	1,1-Dichloroethene	mg/L	1.80E-04	1.70E-01	1.74E-02	142/827	N/A	N/A	20/827	2.85E-02	0/827	8.55E-01	64/827	7.00E-03	0.001 - 20
VOC	1,2,3-Trichlorobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.04E-04	0/256	2.11E-02	N/A	N/A	0.001 - 2
VOC	1,2,4-Trichlorobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.99E-04	0/256	1.20E-02	0/256	7.00E-02	0.001 - 2
VOC	1,2-Dibromo-3-chloropropane	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.34E-07	0/256	3.34E-05	0/256	2.00E-04	0.001 - 2
VOC	1,2-Dibromoethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.47E-06	0/256	7.47E-04	0/256	5.00E-05	0.001 - 2
VOC	1,2-Dichlorobenzene	mg/L	3.50E-04	4.40E-04	3.97E-04	3/256	N/A	N/A	0/256	3.04E-02	0/256	9.12E-01	0/256	6.00E-01	0.001 - 2
VOC	1,2-Dichloroethane	mg/L	3.50E-04	1.46E-03	7.86E-04	7/271	N/A	N/A	7/271	1.71E-04	0/271	1.71E-02	0/271	5.00E-03	0.001 - 2
VOC	1,2-Dichloropropane	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.25E-04	0/256	2.48E-02	0/256	5.00E-03	0.001 - 2
VOC	1,2-Dimethylbenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.93E-02	0/256	5.79E-01	N/A	N/A	0.001 - 2
VOC	1,3-Dichlorobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.04E-02	0/256	9.12E-01	0/256	6.00E-01	0.001 - 2
VOC	1,4-Dichlorobenzene	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.82E-04	0/256	4.82E-02	0/256	7.50E-02	0.001 - 2
VOC	1,4-Dioxane	mg/L	3.94E+00	3.94E+00	3.94E+00	1/191	N/A	N/A	1/191	4.59E-04	1/191	4.59E-02	N/A	N/A	0.05 - 50
VOC	2-Butanone	mg/L	1.10E-03	1.12E-01	1.28E-02	31/391	N/A	N/A	0/391	5.57E-01	0/391	1.67E+01	N/A	N/A	0.001 - 10
VOC	2-Chloroethyl vinyl ether	mg/L	--	--	--	0/256	N/A	N/A	0/256	6.50E-06	0/256	6.50E-04	N/A	N/A	0.005 - 10
VOC	2-Hexanone	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.80E-03	0/256	1.14E-01	N/A	N/A	0.005 - 10
VOC	2-Methoxy-2-methylpropane	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.43E-02	0/256	1.43E+00	N/A	N/A	0.001 - 2
VOC	4-Methyl-2-pentanone	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.24E-01	0/256	3.72E+00	N/A	N/A	0.005 - 10
VOC	Acetone	mg/L	2.00E-03	6.41E-03	3.63E-03	3/256	N/A	N/A	0/256	1.80E+00	0/256	5.40E+01	N/A	N/A	0.005 - 10
VOC	Acrolein	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.15E-06	0/256	1.25E-04	N/A	N/A	0.005 - 10
VOC	Acrylonitrile	mg/L	--	--	--	0/256	N/A	N/A	0/256	5.23E-05	0/256	5.23E-03	N/A	N/A	0.005 - 10
VOC	Benzene	mg/L	4.70E-04	6.90E-04	5.34E-04	5/406	N/A	N/A	5/406	4.55E-04	0/406	4.55E-02	0/406	5.00E-03	0.001 - 10
VOC	Bromochloromethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.34E-03	0/256	2.50E-01	N/A	N/A	0.001 - 2
VOC	Bromodichloromethane	mg/L	4.30E-04	1.79E-03	8.73E-04	10/271	N/A	N/A	10/271	1.34E-04	0/271	1.34E-02	0/271	8.00E-02	0.001 - 2
VOC	Bromoform	mg/L	--	--	--	0/256	N/A	N/A	0/256	3.29E-03	0/256	3.29E-01	0/256	8.00E-02	0.001 - 2
VOC	Bromomethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	7.55E-04	0/256	2.27E-02	N/A	N/A	0.001 - 2
VOC	Carbon disulfide	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.11E-02	0/256	2.43E+00	N/A	N/A	0.005 - 10
VOC	Carbon tetrachloride	mg/L	4.30E-04	8.80E-02	7.91E-03	56/406	N/A	N/A	55/406	4.55E-04	3/406	4.55E-02	8/406	5.00E-03	0.001 - 10
VOC	Chlorobenzene	mg/L	--	--	--	0/391	N/A	N/A	0/391	7.77E-03	0/391	2.33E-01	0/391	1.00E-01	0.001 - 10
VOC	Chloroethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.34E-01	0/256	2.50E+01	N/A	N/A	0.001 - 2
VOC	Chloroform	mg/L	3.40E-04	8.28E-03	2.78E-03	105/271	N/A	N/A	105/271	2.21E-04	0/271	2.21E-02	0/271	8.00E-02	0.001 - 2
VOC	Chloromethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	2.03E-03	0/256	2.03E-01	N/A	N/A	0.001 - 2
VOC	*cis* -1,2-Dichloroethene	mg/L	3.80E-04	7.50E+01	1.94E+00	667/816	N/A	N/A	641/816	3.61E-03	316/816	1.08E-01	408/816	7.00E-02	0.001 - 10
VOC	*cis* -1,3-Dichloropropene	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.71E-04	0/256	4.71E-02	N/A	N/A	0.001 - 2
VOC	Cumene	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.51E-02	0/256	1.35E+00	N/A	N/A	0.001 - 2
VOC	Cyclohexane	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.25E+00	0/256	3.75E+01	N/A	N/A	0.001 - 2
VOC	Dibromochloromethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	8.71E-04	0/256	8.71E-02	0/256	8.00E-02	0.001 - 2
VOC	Dichlorodifluoromethane	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.97E-02	0/256	5.91E-01	N/A	N/A	0.001 - 2
VOC	Ethylbenzene	mg/L	--	--	--	0/271	N/A	N/A	0/271	1.50E-03	0/271	1.50E-01	0/271	7.00E-01	0.001 - 2
VOC	m,p-Xylene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.93E-02	0/256	5.79E-01	N/A	N/A	0.002 - 4
VOC	Methyl acetate	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.99E+00	0/256	5.97E+01	N/A	N/A	0.005 - 10
VOC	Methylcyclohexane	mg/L	--	--	--	0/256	N/A	N/A	0/256	6.26E-01	0/256	1.88E+01	N/A	N/A	0.001 - 2
VOC	Methylene chloride	mg/L	6.00E-04	2.60E-01	3.74E-02	43/256	N/A	N/A	17/256	1.07E-02	0/256	3.21E-01	20/256	5.00E-03	0.005 - 10
VOC	Styrene	mg/L	--	--	--	0/256	N/A	N/A	0/256	1.21E-01	0/256	3.63E+00	0/256	1.00E-01	0.001 - 2
VOC	Tetrachloroethene	mg/L	3.00E-04	8.60E-02	4.47E-03	110/406	N/A	N/A	32/406	4.06E-03	0/406	1.22E-01	27/406	5.00E-03	0.001 - 10

Table 4.40. Groundwater Data Summary and Screening: RGA (Continued)

			Detected Results				Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
VOC	Toluene	mg/L	3.50E-04	1.25E-03	7.37E-04	7/271	N/A	N/A	0/271	1.10E-01	0/271	3.30E+00	0/271	1.00E+00	0.001 - 2
VOC	Total Xylene	mg/L	--	--	--	0/271	N/A	N/A	0/271	1.93E-02	0/271	5.79E-01	0/271	1.00E+01	0.003 - 6
VOC	*trans* -1,2-Dichloroethene	mg/L	1.20E-04	1.05E-02	1.31E-03	90/816	N/A	N/A	1/816	9.29E-03	0/816	2.79E-01	0/816	1.00E-01	0.001 - 10
VOC	*trans* -1,3-Dichloropropene	mg/L	--	--	--	0/256	N/A	N/A	0/256	4.71E-04	0/256	4.71E-02	N/A	N/A	0.001 - 2
VOC	Trichloroethene	mg/L	3.60E-04	1.40E+03	1.76E+01	825/827	N/A	N/A	825/827	2.83E-04	816/827	8.49E-03	821/827	5.00E-03	0.001 - 20
VOC	Trichlorofluoromethane	mg/L	4.20E-04	1.09E-03	7.70E-04	4/256	N/A	N/A	0/256	1.14E-01	0/256	3.42E+00	N/A	N/A	0.001 - 2
VOC	Vinyl chloride	mg/L	1.20E-04	1.80E-01	2.49E-02	28/816	N/A	N/A	28/816	1.88E-05	10/816	1.88E-03	10/816	2.00E-03	0.001 - 20

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater MCL

Notes: FOE = Frequency of Exceedance, -- = No calculation completed, analyte not detected

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

[a] Uranium screened against Soluble Salts.

[b] Total PCBs calculated by laboratory.

[c] Uranium 233/234 is screened against Uranium 234.

[d] Uranium 235/236 is screened against Uranium 235.

[e] Total PAHs calculated using TEF values in RMD 2021.

Table 4.41. Groundwater Data Summary and Screening: McNairy

			Detected Results			Freq.	Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	of Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
METAL	Aluminum	mg/L	4.08E-02	6.37E-01	3.20E-01	3/4	0/4	6.87E-01	0/4	2.00E+00	0/4	6.00E+01	N/A	N/A	0.05 - 0.05
METAL	Antimony	mg/L	1.22E-03	1.22E-03	1.22E-03	1/4	0/4	6.00E-02	1/4	7.79E-04	0/4	2.34E-02	0/4	6.00E-03	0.003 - 0.003
METAL	Arsenic	mg/L	2.52E-03	2.52E-03	2.52E-03	1/4	0/4	5.00E-03	1/4	5.17E-05	0/4	5.17E-03	0/4	1.00E-02	0.005 - 0.005
METAL	Barium	mg/L	9.04E-02	9.88E-02	9.31E-02	4/4	0/4	2.96E-01	0/4	3.77E-01	0/4	1.13E+01	0/4	2.00E+00	0.004 - 0.004
METAL	Beryllium	mg/L	--	--	--	0/4	0/4	1.70E-02	0/4	2.46E-03	0/4	7.38E-02	0/4	4.00E-03	0.0005 - 0.0005
METAL	Boron	mg/L	1.39E-02	1.70E-02	1.56E-02	4/4	N/A	N/A	0/4	3.99E-01	0/4	1.20E+01	N/A	N/A	0.015 - 0.015
METAL	Cadmium	mg/L	--	--	--	0/4	0/4	1.00E-02	0/4	9.22E-04	0/4	2.77E-02	0/4	5.00E-03	0.001 - 0.001
METAL	Calcium	mg/L	1.63E+01	1.63E+01	1.63E+01	1/1	0/1	3.89E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 0.2
METAL	Chromium	mg/L	3.30E-03	2.00E-02	1.17E-02	2/4	0/4	6.00E-02	2/4	3.50E-05	1/4	3.50E-03	0/4	1.00E-01	0.01 - 0.01
METAL	Cobalt	mg/L	1.01E-03	5.95E-03	2.37E-03	4/4	0/4	9.60E-02	4/4	6.01E-04	0/4	1.80E-02	N/A	N/A	0.001 - 0.001
METAL	Copper	mg/L	5.75E-04	1.46E-03	9.78E-04	3/4	0/4	5.70E-02	0/4	7.99E-02	0/4	2.40E+00	0/4	1.30E+00	0.002 - 0.002
METAL	Iron	mg/L	6.12E-02	5.91E-01	3.35E-01	3/4	0/4	1.84E+01	0/4	1.40E+00	0/4	4.20E+01	N/A	N/A	0.1 - 0.1
METAL	Lead	mg/L	1.04E-03	1.04E-03	1.04E-03	1/4	0/4	5.00E-02	0/4	1.50E-02	0/4	3.00E-02	0/4	1.50E-02	0.002 - 0.002
METAL	Magnesium	mg/L	8.29E+00	8.29E+00	8.29E+00	1/1	0/1	1.34E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.03 - 0.03
METAL	Manganese	mg/L	1.76E-01	2.51E-01	2.01E-01	4/4	0/4	9.41E-01	4/4	4.34E-02	0/4	1.30E+00	N/A	N/A	0.005 - 0.005
METAL	Mercury	mg/L	--	--	--	0/4	0/4	2.00E-04	0/4	5.66E-04	0/4	1.70E-02	0/4	2.00E-03	0.0002 - 0.0002
METAL	Molybdenum	mg/L	3.41E-04	2.01E-03	1.18E-03	2/4	0/4	5.00E-02	0/4	9.98E-03	0/4	2.99E-01	N/A	N/A	0.001 - 0.001
METAL	Nickel	mg/L	1.36E-03	8.23E-03	3.53E-03	4/4	0/4	1.09E-01	0/4	3.92E-02	0/4	1.18E+00	N/A	N/A	0.002 - 0.002
METAL	Potassium	mg/L	2.83E+00	2.83E+00	2.83E+00	1/1	0/1	5.58E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.3 - 0.3
METAL	Selenium	mg/L	--	--	--	0/4	0/4	5.00E-03	0/4	9.98E-03	0/4	2.99E-01	0/4	5.00E-02	0.005 - 0.005
METAL	Silver	mg/L	--	--	--	0/4	0/4	5.00E-02	0/4	9.41E-03	0/4	2.82E-01	N/A	N/A	0.001 - 0.001
METAL	Sodium	mg/L	1.45E+01	1.45E+01	1.45E+01	1/1	0/1	2.92E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.25 - 0.25
METAL	Thallium	mg/L	--	--	--	0/4	0/4	6.44E-01	0/4	2.00E-05	0/4	6.00E-04	0/4	2.00E-03	0.002 - 0.002
METAL	Uranium[a]	mg/L	8.10E-05	3.85E-04	2.72E-04	4/4	0/4	1.00E-03	0/4	3.99E-04	0/4	1.20E-02	0/4	3.00E-02	0.0002 - 0.0002
METAL	Vanadium	mg/L	4.25E-03	4.25E-03	4.25E-03	1/4	0/4	1.26E-01	0/4	8.64E-03	0/4	2.59E-01	N/A	N/A	0.02 - 0.02
METAL	Zinc	mg/L	5.17E-03	3.12E-02	1.44E-02	4/4	0/4	1.42E-01	0/4	6.00E-01	0/4	1.80E+01	N/A	N/A	0.02 - 0.02
ANION	Chloride	mg/L	6.51E+00	6.51E+00	6.51E+00	1/1	0/1	1.97E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.2 - 0.2
ANION	Fluoride	mg/L	1.65E-01	2.23E-01	2.00E-01	4/4	0/4	3.30E-01	4/4	7.99E-02	0/4	2.40E+00	0/4	4.00E+00	0.1 - 0.1
ANION	Nitrate as Nitrogen	mg/L	--	--	--	0/1	0/1	1.47E+00	0/1	3.19E+00	0/1	9.57E+01	0/1	1.00E+01	0.1 - 0.1
ANION	Sulfate	mg/L	2.40E+01	2.40E+01	2.40E+01	1/1	0/1	2.89E+01	N/A	N/A	N/A	N/A	N/A	N/A	0.8 - 0.8
PPCB	Total PCB[b]	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.36E-05	0/4	4.36E-03	0/4	5.00E-04	0.0000984 - 0.000109
RADS	Americium-241	pCi/L	--	--	--	0/4	N/A	N/A	0/4	5.04E-01	0/4	5.04E+01	0/4	1.50E+01	0.33 - 0.904
RADS	Cesium-137	pCi/L	--	--	--	0/4	N/A	N/A	0/4	1.71E+00	0/4	1.71E+02	0/4	2.00E+02	8.4 - 12.4
RADS	Neptunium-237	pCi/L	--	--	--	0/4	0/4	5.00E-01	0/4	7.63E-01	0/4	7.63E+01	0/4	1.50E+01	0.411 - 1.09
RADS	Plutonium-238	pCi/L	--	--	--	0/4	N/A	N/A	0/4	3.98E-01	0/4	3.98E+01	0/4	1.50E+01	0.381 - 0.675
RADS	Plutonium-239/240[c]	pCi/L	--	--	--	0/4	0/4	2.00E-01	0/4	3.87E-01	0/4	3.87E+01	0/4	1.50E+01	0.515 - 0.644
RADS	Technetium-99	pCi/L	--	--	--	0/4	0/4	2.06E+01	0/4	1.90E+01	0/4	1.90E+03	0/4	9.00E+02	3.37 - 3.82
RADS	Thorium-230	pCi/L	--	--	--	0/4	0/4	1.50E+00	0/4	5.72E-01	0/4	5.72E+01	0/4	1.50E+01	0.508 - 0.716
RADS	Uranium-233/234[d]	pCi/L	--	--	--	0/4	0/4	3.00E-01	0/4	7.39E-01	0/4	7.39E+01	N/A	N/A	0.504 - 0.652
RADS	Uranium-235/236[e]	pCi/L	--	--	--	0/4	0/4	2.00E-01	0/4	7.28E-01	0/4	7.28E+01	0/4	4.66E-01	0.25 - 0.438
RADS	Uranium-238	pCi/L	6.92E-01	6.92E-01	6.92E-01	1/4	1/4	3.00E-01	1/4	6.01E-01	0/4	6.01E+01	0/4	9.99E+00	0.354 - 0.555
SVOC	1,1-biphenyl	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.34E-05	0/4	2.50E-03	N/A	N/A	0.00997 - 0.0108
SVOC	2,4,5-Trichlorophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.18E-01	0/4	3.54E+00	N/A	N/A	0.00997 - 0.0108

Table 4.41. Groundwater Data Summary and Screening: McNairy (Continued)

Type	Analysis	Unit	Detected Results			Freq.	Provisional Background		Resident		Resident		MCL		DL Range
			Min	Max	Avg	of Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	
SVOC	2,4,6-Trichlorophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.21E-03	0/4	3.63E-02	N/A	N/A	0.00997 - 0.0108
SVOC	2,4-Dichlorophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.57E-03	0/4	1.37E-01	N/A	N/A	0.00997 - 0.0108
SVOC	2,4-Dimethylphenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.55E-02	0/4	1.07E+00	N/A	N/A	0.00997 - 0.0108
SVOC	2,4-Dinitrophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.88E-03	0/4	1.16E-01	N/A	N/A	0.0199 - 0.0215
SVOC	2,4-Dinitrotoluene	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.37E-04	0/4	2.37E-02	N/A	N/A	0.00997 - 0.0108
SVOC	2,6-Dinitrotoluene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.85E-05	0/4	4.85E-03	N/A	N/A	0.00997 - 0.0108
SVOC	2-Chloronaphthalene	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.47E-02	0/4	2.24E+00	N/A	N/A	0.000997 - 0.00108
SVOC	2-Chlorophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	9.13E-03	0/4	2.74E-01	N/A	N/A	0.00997 - 0.0108
SVOC	2-Methyl-4,6-dinitrophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.51E-04	0/4	4.53E-03	N/A	N/A	0.00997 - 0.0108
SVOC	2-Methylnaphthalene	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.59E-03	0/4	1.08E-01	N/A	N/A	0.000997 - 0.00108
SVOC	2-Methylphenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	9.26E-02	0/4	2.78E+00	N/A	N/A	0.00997 - 0.0108
SVOC	2-Nitrobenzenamine	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.89E-02	0/4	5.67E-01	N/A	N/A	0.00997 - 0.0108
SVOC	2-Nitrophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.88E-03	0/4	1.16E-01	N/A	N/A	0.00997 - 0.0108
SVOC	3,3'-Dichlorobenzidine	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.25E-04	0/4	1.25E-02	N/A	N/A	0.00997 - 0.0108
SVOC	3-Nitrobenzenamine	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.85E-04	0/4	1.76E-02	N/A	N/A	0.00997 - 0.0108
SVOC	4-Bromophenyl phenyl ether	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.34E-05	0/4	2.50E-03	N/A	N/A	0.00997 - 0.0108
SVOC	4-Chloro-3-methylphenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.45E-01	0/4	4.35E+00	N/A	N/A	0.00997 - 0.0108
SVOC	4-Chlorobenzenamine	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.65E-04	0/4	2.84E-02	N/A	N/A	0.00997 - 0.0108
SVOC	4-Chlorophenyl phenyl ether	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.34E-05	0/4	2.50E-03	N/A	N/A	0.00997 - 0.0108
SVOC	4-Nitrophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.88E-03	0/4	1.16E-01	N/A	N/A	0.00997 - 0.0108
SVOC	Acenaphthene	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.35E-02	0/4	1.61E+00	N/A	N/A	0.000997 - 0.00108
SVOC	Acenaphthylene	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.35E-02	0/4	1.61E+00	N/A	N/A	0.000997 - 0.00108
SVOC	Acetophenone	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.92E-01	0/4	5.76E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Anthracene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.77E-01	0/4	5.31E+00	N/A	N/A	0.000997 - 0.00108
SVOC	Atrazine	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.02E-04	0/4	3.02E-02	0/4	3.00E-03	0.00997 - 0.0108
SVOC	Benzaldehyde	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.86E-02	0/4	1.86E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Benzo(ghi)perylene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.21E-02	0/4	3.63E-01	N/A	N/A	0.000997 - 0.00108
SVOC	Bis(2-chloroethoxy)methane	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.90E-03	0/4	1.77E-01	N/A	N/A	0.00997 - 0.0108
SVOC	Bis(2-chloroethyl) ether	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.37E-05	0/4	1.37E-03	N/A	N/A	0.00997 - 0.0108
SVOC	Bis(2-chloroisopropyl) ether	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.57E-04	0/4	3.57E-02	N/A	N/A	0.00997 - 0.0108
SVOC	Bis(2-ethylhexyl)phthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.56E-03	0/4	5.56E-01	0/4	6.00E-03	0.000997 - 0.00108
SVOC	Butyl benzyl phthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.63E-02	0/4	1.63E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Caprolactam	mg/L	--	--	--	0/4	N/A	N/A	0/4	9.92E-01	0/4	2.98E+01	N/A	N/A	0.00997 - 0.0108
SVOC	Carbazole	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.03E-03	0/4	2.03E-01	N/A	N/A	0.000997 - 0.00108
SVOC	Dibenzofuran	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.86E-04	0/4	2.36E-02	N/A	N/A	0.00997 - 0.0108
SVOC	Diethyl phthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.48E+00	0/4	4.44E+01	N/A	N/A	0.00997 - 0.0108
SVOC	Dimethyl phthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.48E+00	0/4	4.44E+01	N/A	N/A	0.00997 - 0.0108
SVOC	Di-n-butyl phthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	9.02E-02	0/4	2.71E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Di-n-octylphthalate	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.01E-02	0/4	6.03E-01	N/A	N/A	0.00997 - 0.0108
SVOC	Diphenylamine	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.26E-01	0/4	3.78E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Fluoranthene	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.02E-02	0/4	2.41E+00	N/A	N/A	0.000997 - 0.00108
SVOC	Fluorene	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.94E-02	0/4	8.82E-01	N/A	N/A	0.000997 - 0.00108
SVOC	Hexachlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	9.76E-06	0/4	9.76E-04	0/4	1.00E-03	0.00997 - 0.0108

Table 4.41. Groundwater Data Summary and Screening: McNairy (Continued)

Type	Analysis	Unit	Detected Results			Freq.	Provisional Background		Resident		Resident		MCL		DL Range
			Min	Max	Avg	of Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	
SVOC	Hexachlorobutadiene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.39E-04	0/4	1.39E-02	N/A	N/A	0.00997 - 0.0108
SVOC	Hexachlorocyclopentadiene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.12E-05	0/4	1.24E-03	0/4	5.00E-02	0.00997 - 0.0108
SVOC	Hexachloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.28E-04	0/4	1.87E-02	N/A	N/A	0.00997 - 0.0108
SVOC	Isophorone	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.81E-02	0/4	7.81E+00	N/A	N/A	0.00997 - 0.0108
SVOC	m+p Methylphenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.71E-02	0/4	1.11E+00	N/A	N/A	0.00997 - 0.0108
SVOC	Naphthalene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.17E-04	0/4	1.17E-02	N/A	N/A	0.000997 - 0.00108
SVOC	Nitrobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.40E-04	0/4	1.40E-02	N/A	N/A	0.00997 - 0.0108
SVOC	N-Nitroso-di-n-propylamine	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.08E-05	0/4	1.08E-03	N/A	N/A	0.00997 - 0.0108
SVOC	Pentachlorophenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.13E-05	0/4	4.13E-03	0/4	1.00E-03	0.00997 - 0.0108
SVOC	Phenanthrene	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.35E-02	0/4	1.61E+00	N/A	N/A	0.000997 - 0.00108
SVOC	Phenol	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.77E-01	0/4	1.73E+01	N/A	N/A	0.00997 - 0.0108
SVOC	p-Nitroaniline	mg/L	6.03E-03	6.03E-03	6.03E-03	1/4	N/A	N/A	1/4	3.78E-03	0/4	2.34E-01	N/A	N/A	0.00997 - 0.0108
SVOC	Pyrene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.21E-02	0/4	3.63E-01	N/A	N/A	0.000997 - 0.00108
SVOC	Total PAH[f]	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.51E-05	0/4	2.51E-03	0/4	2.00E-04	-
VOC	1,1,1-Trichloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.01E-01	0/4	2.40E+01	0/4	2.00E-01	0.001 - 0.05
VOC	1,1,2,2-Tetrachloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.57E-05	0/4	7.57E-03	N/A	N/A	0.001 - 0.05
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.02E+00	0/4	3.06E+01	N/A	N/A	0.005 - 0.25
VOC	1,1,2-Trichloroethane	mg/L	5.10E-04	5.10E-04	5.10E-04	1/4	N/A	N/A	1/4	4.15E-05	0/4	1.25E-03	0/4	5.00E-03	0.001 - 0.05
VOC	1,1-Dichloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.75E-03	0/4	2.75E-01	N/A	N/A	0.001 - 0.05
VOC	1,1-Dichloroethene	mg/L	1.19E-03	1.19E-03	1.19E-03	1/4	N/A	N/A	0/4	2.85E-02	0/4	8.55E-01	0/4	7.00E-03	0.001 - 0.05
VOC	1,2,3-Trichlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.04E-04	0/4	2.11E-02	N/A	N/A	0.001 - 0.05
VOC	1,2,4-Trichlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.99E-04	0/4	1.20E-02	0/4	7.00E-02	0.001 - 0.05
VOC	1,2-Dibromo-3-chloropropane	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.34E-07	0/4	3.34E-05	0/4	2.00E-04	0.001 - 0.05
VOC	1,2-Dibromoethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.47E-06	0/4	7.47E-04	0/4	5.00E-05	0.001 - 0.05
VOC	1,2-Dichlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.04E-02	0/4	9.12E-01	0/4	6.00E-01	0.001 - 0.05
VOC	1,2-Dichloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.71E-04	0/4	1.71E-02	0/4	5.00E-03	0.001 - 0.05
VOC	1,2-Dichloropropane	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.25E-04	0/4	2.48E-02	0/4	5.00E-03	0.001 - 0.05
VOC	1,2-Dimethylbenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.93E-02	0/4	5.79E-01	N/A	N/A	0.001 - 0.05
VOC	1,3-Dichlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.04E-02	0/4	9.12E-01	0/4	6.00E-01	0.001 - 0.05
VOC	1,4-Dichlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.82E-04	0/4	4.82E-02	0/4	7.50E-02	0.001 - 0.05
VOC	1,4-Dioxane	mg/L	--	--	--	0/3	N/A	N/A	0/3	4.59E-04	0/3	4.59E-02	N/A	N/A	2.5 - 2.5
VOC	2-Butanone	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.57E-01	0/4	1.67E+01	N/A	N/A	0.005 - 0.25
VOC	2-Chloroethyl vinyl ether	mg/L	--	--	--	0/4	N/A	N/A	0/4	6.50E-06	0/4	6.50E-04	N/A	N/A	0.005 - 0.25
VOC	2-Hexanone	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.80E-03	0/4	1.14E-01	N/A	N/A	0.005 - 0.25
VOC	2-Methoxy-2-methylpropane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.43E-02	0/4	1.43E+00	N/A	N/A	0.001 - 0.05
VOC	4-Methyl-2-pentanone	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.24E-01	0/4	3.72E+00	N/A	N/A	0.005 - 0.25
VOC	Acetone	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.80E+00	0/4	5.40E+01	N/A	N/A	0.005 - 0.25
VOC	Acrolein	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.15E-06	0/4	1.25E-04	N/A	N/A	0.005 - 0.25
VOC	Acrylonitrile	mg/L	--	--	--	0/4	N/A	N/A	0/4	5.23E-05	0/4	5.23E-03	N/A	N/A	0.005 - 0.25
VOC	Benzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.55E-04	0/4	4.55E-02	0/4	5.00E-03	0.001 - 0.05
VOC	Bromochloromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.34E-03	0/4	2.50E-01	N/A	N/A	0.001 - 0.05
VOC	Bromodichloromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.34E-04	0/4	1.34E-02	0/4	8.00E-02	0.001 - 0.05
VOC	Bromoform	mg/L	--	--	--	0/4	N/A	N/A	0/4	3.29E-03	0/4	3.29E-01	0/4	8.00E-02	0.001 - 0.05

Table 4.41. Groundwater Data Summary and Screening: McNairy (Continued)

			Detected Results			Freq.	Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	of Detect.	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
VOC	Bromomethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.55E-04	0/4	2.27E-02	N/A	N/A	0.001 - 0.05
VOC	Carbon disulfide	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.11E-02	0/4	2.43E+00	N/A	N/A	0.005 - 0.25
VOC	Carbon tetrachloride	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.55E-04	0/4	4.55E-02	0/4	5.00E-03	0.001 - 0.05
VOC	Chlorobenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	7.77E-03	0/4	2.33E-01	0/4	1.00E-01	0.001 - 0.05
VOC	Chloroethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.34E-01	0/4	2.50E+01	N/A	N/A	0.001 - 0.05
VOC	Chloroform	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.21E-04	0/4	2.21E-02	0/4	8.00E-02	0.001 - 0.05
VOC	Chloromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	2.03E-03	0/4	2.03E-01	N/A	N/A	0.001 - 0.05
VOC	*cis* -1,2-Dichloroethene	mg/L	6.95E-02	2.76E-01	1.53E-01	4/4	N/A	N/A	4/4	3.61E-03	2/4	1.08E-01	3/4	7.00E-02	0.05 - 0.05
VOC	*cis* -1,3-Dichloropropene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.71E-04	0/4	4.71E-02	N/A	N/A	0.001 - 0.05
VOC	Cumene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.51E-02	0/4	1.35E+00	N/A	N/A	0.001 - 0.05
VOC	Cyclohexane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.25E+00	0/4	3.75E+01	N/A	N/A	0.001 - 0.05
VOC	Dibromochloromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	8.71E-04	0/4	8.71E-02	0/4	8.00E-02	0.001 - 0.05
VOC	Dichlorodifluoromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.97E-02	0/4	5.91E-01	N/A	N/A	0.001 - 0.05
VOC	Ethylbenzene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.50E-03	0/4	1.50E-01	0/4	7.00E-01	0.001 - 0.05
VOC	m,p-Xylene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.93E-02	0/4	5.79E-01	N/A	N/A	0.002 - 0.1
VOC	Methyl acetate	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.99E+00	0/4	5.97E+01	N/A	N/A	0.005 - 0.25
VOC	Methylcyclohexane	mg/L	--	--	--	0/4	N/A	N/A	0/4	6.26E-01	0/4	1.88E+01	N/A	N/A	0.001 - 0.05
VOC	Methylene chloride	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.07E-02	0/4	3.21E-01	0/4	5.00E-03	0.005 - 0.25
VOC	Styrene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.21E-01	0/4	3.63E+00	0/4	1.00E-01	0.001 - 0.05
VOC	Tetrachloroethene	mg/L	1.96E-03	1.96E-03	1.96E-03	1/4	N/A	N/A	0/4	4.06E-03	0/4	1.22E-01	0/4	5.00E-03	0.001 - 0.05
VOC	Toluene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.10E-01	0/4	3.30E+00	0/4	1.00E+00	0.001 - 0.05
VOC	Total Xylene	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.93E-02	0/4	5.79E-01	0/4	1.00E+01	0.003 - 0.15
VOC	*trans* -1,2-Dichloroethene	mg/L	8.40E-04	8.40E-04	8.40E-04	1/4	N/A	N/A	0/4	9.29E-03	0/4	2.79E-01	0/4	1.00E-01	0.001 - 0.05
VOC	*trans* -1,3-Dichloropropene	mg/L	--	--	--	0/4	N/A	N/A	0/4	4.71E-04	0/4	4.71E-02	N/A	N/A	0.001 - 0.05
VOC	Trichloroethene	mg/L	4.40E+00	6.80E+00	5.15E+00	4/4	N/A	N/A	4/4	2.83E-04	4/4	8.49E-03	4/4	5.00E-03	0.05 - 0.1
VOC	Trichlorofluoromethane	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.14E-01	0/4	3.42E+00	N/A	N/A	0.001 - 0.05
VOC	Vinyl chloride	mg/L	--	--	--	0/4	N/A	N/A	0/4	1.88E-05	0/4	1.88E-03	0/4	2.00E-03	0.001 - 0.05

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed groundwater MCL

-- = No calculation completed, analyte not detected

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

[a] Uranium screened against Soluble Salts.

[b] Total PCBs calculated by laboratory.

[c] Plutonium 239/240 is screened against Plutonium 239.

[d] Uranium 233/234 is screened against Uranium 234.

[e] Uranium 235/236 is screened against Uranium 235.

[f] Total PAHs calculated using TEF values in RMD 2021.

Metals and Inorganics

The site does not have groundwater background values established for the UCRS. There were no metals exceeding MCLs and the metals that exceeded resident NALs included antimony, arsenic, chromium, cobalt, manganese, and uranium. The concentration of chromium exceeded the resident ALs in 6 out of 13 samples.

Several metals and inorganics exceeded the RGA provisional background values. Analytes that also exceeded MCLs include chromium, uranium metal, and nitrate. Lead in the RGA exceeded the MCL but all detections were less than the provisional background value (DOE 1996).[15] Analytes that exceeded background and resident NALs include aluminum, arsenic, barium, chromium, iron, manganese, molybdenum, uranium metal, fluoride, and nitrate (as nitrogen). Several constituents also exceeded both background and the resident AL including arsenic, chromium, manganese, uranium metal, and fluoride.

No metals or inorganics exceeded the McNairy provisional background values or MCLs. Metals and/or inorganics that exceeded the resident NALs include antimony, arsenic, chromium, cobalt, manganese, and fluoride. The concentration of chromium exceeded the resident AL in one out of four samples, but it was below the provisional background value.

PCBs

Total PCBs were not detected in UCRS groundwater samples (out of 13 samples). Total PCBs were detected in 5 of 256 samples of RGA groundwater, which exceeded the resident NAL but not the AL or MCL. The maximum detection was 0.000473 mg/L. Total PCBs were not detected in the four samples from the McNairy groundwater. Total PCBs were not widely detected in groundwater, but their presence may have been masked by the high concentrations of VOCs.

SVOCs

A few SVOCs, mostly phthalates, p-nitroaniline, and naphthalene, were detected in UCRS groundwater but none exceeded MCLs. Naphthalene and p-nitroaniline in UCRS groundwater exceeded the resident NAL screening values. A few SVOCs, mostly PAHs and phthalates, were also detected in RGA groundwater. The SVOCs that exceeded MCLs include bis(2-ethylhexyl)phthalate, pentachlorophenol, and Total PAHs. Phthalates are considered potential laboratory contaminants. Bis(2-ethylhexyl)phthalate, hexachlorocyclopentadiene, pentachlorophenol, p-nitroaniline, and Total PAHs exceeded the resident NALs, with hexachlorocyclopentadiene and pentachlorophenol also exceeding the resident AL screening values. The only SVOC detected in the McNairy groundwater was p-nitroaniline which exceeded the resident NAL.

VOCs

VOCs detected above MCLs in UCRS groundwater include 1,1-dichloroethene, *cis*-1,2-dichloroethene, methylene chloride (a potential lab contaminant), TCE, and vinyl chloride. The maximum concentration of TCE in the UCRS from MWs was 645 mg/L in MW407-PRT1. VOCs detected above resident NALs in UCRS groundwater include 1,1,2-trichloroethane*, 1,2-dichloroethane, 1,4-dioxane*, acetone*, benzene,

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[15] EPA conditionally approved the revised *Background Concentrations and Human Health Risk-based Screening Criteria for Metals in Soil at the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1417&D2 on March 22, 1996. The Commonwealth of Kentucky accepted the revised document on March 21, 1996.

carbon tetrachloride, chloroform, *cis*-1,2-dichloroethene*, TCE*, and vinyl chloride* (VOCs with an asterisk also exceeded the resident AL screening values).

VOCs detected above MCLs in the RGA groundwater include 1,1,2-trichloroethane, 1,1-dichloroethene, carbon tetrachloride, *cis*-1,2-dichloroethene, tetrachloroethene, TCE, and vinyl chloride. Methylene chloride also was detected above MCLs, but this is a potential laboratory contaminant. VOCs detected above resident NALs in RGA groundwater include 1,1,2-trichloroethane*, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,4-dioxane*, benzene, bromodichloromethane, carbon tetrachloride*, chloroform, *cis*-1,2-dichloroethene*, methylene chloride, tetrachloroethene, *trans*-1,2-dichloroethene, TCE*, and vinyl chloride* (VOCs with an asterisk also exceeded the resident AL screening values).

The maximum TCE concentration detected in RGA groundwater was 1,400 mg/L from MW408-PRT5 (MRGA). Figure 4.46 provides cross-sections that show the estimated extent of TCE in groundwater in the C-400 Complex area. Most of the occurrences of TCE in groundwater > 33 mg/L from MWs within the C-400 Complex are in Sectors 1A, 1B, and 4. The exceptions to this are TCE concentrations in MWs (MW343, MW421, MW422, and MW423) immediately north of the C-400 Complex. The highest concentration of TCE from groundwater grab samples collected during this investigation was 81.3 mg/L from boring 400S1B-24 in the URGA (63.2–64 ft bgs). Figures 4.47 through 4.50 show the extent of 1,1,2-trichloroethane, 1,1-dichloroethene, *cis*-1,2-dichloroethene, and vinyl chloride, respectively, in groundwater. The extent of contamination for these other VOCs was smaller than that for TCE.

Figure 4.51 shows TCE trends in a transect of three well clusters located along the center of the C-400 Cleaning Building in Sector 1. The URGA MWs in the southern and central cluster (MW557 and MW563) show significantly higher TCE concentrations than the URGA MW (MW569) farther north suggesting any UCRS TCE sources are in the southern portion of the C-400 Complex. Conversely, the LRGA MW with the highest concentration TCE is MW571 in the northern cluster. The trends over the latter three quarters of sampling have been relatively consistent in all MWs shown in the figure.

Several VOCs were also detected in the McNairy groundwater, but not as many compounds were detected, or at concentrations comparable to what was observed in the RGA. VOCs exceeding MCLs in the McNairy include *cis*-1,2-dichloroethene and TCE. The maximum concentration of TCE from MWs in the McNairy in the C-400 Complex was 6,800 μg/L from MW406-PRT7 screened at depths from 106–108 ft bgs. The highest concentration of TCE from groundwater grab samples collected during this investigation from the McNairy was 57,600 μg/L from boring 400S1A-03 (98.2–99 ft bgs).

Radionuclides

The only radionuclide detected in UCRS groundwater was technetium-99 (detected in 8 of 13 samples). The maximum activity of technetium-99 in the UCRS was 57.7 pCi/L. Radionuclides that exceeded the RGA provisional background values and at least one other screening criteria include neptunium-237, technetium-99, uranium-233/234, uranium-235/236, and uranium-238. The maximum activity for technetium-99 in RGA groundwater collected from MWs was 31,700 pCi/L from a sample in MW423-PRT1. This MW is located just north of the C-400 Complex boundary. High activities of technetium-99 were also detected in RGA grab samples in contingency borings 400S1C-C01 (155,000 pCi/L) and 400S1C-C03 (96,800 pCi/L). Figure 4.52 shows the technetium-99 plume in the C-400 Complex area emanating from the technetium-99 soil source identified beneath the C-400 Cleaning Building. Shallow technetium-99 soil sources in Sectors 6 and 7 may also contribute to the groundwater plume migrating to the northwest. Uranium-238 is the only radionuclide detected in the McNairy groundwater. It was detected (0.692 pCi/L) in one of four samples.

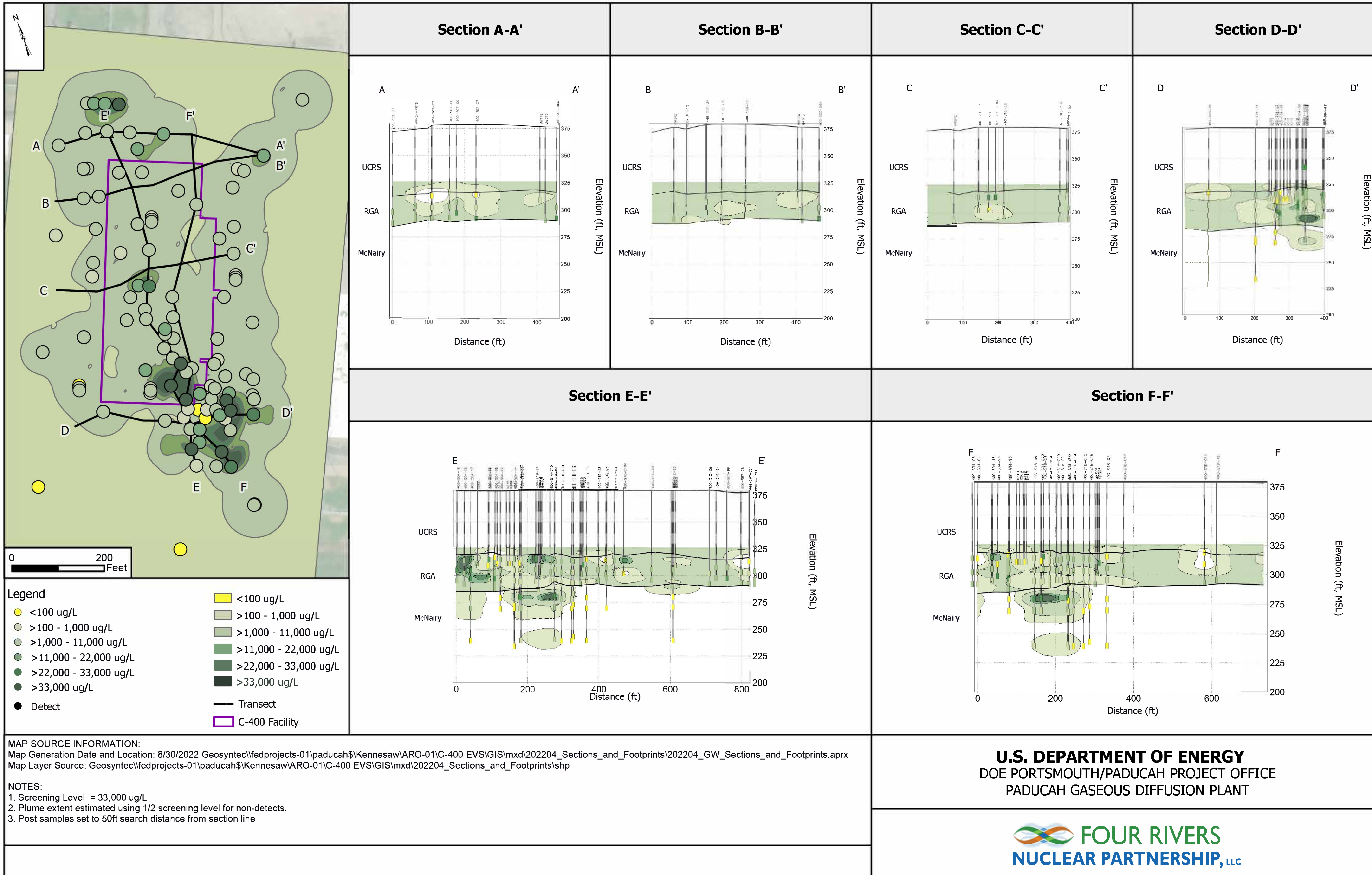
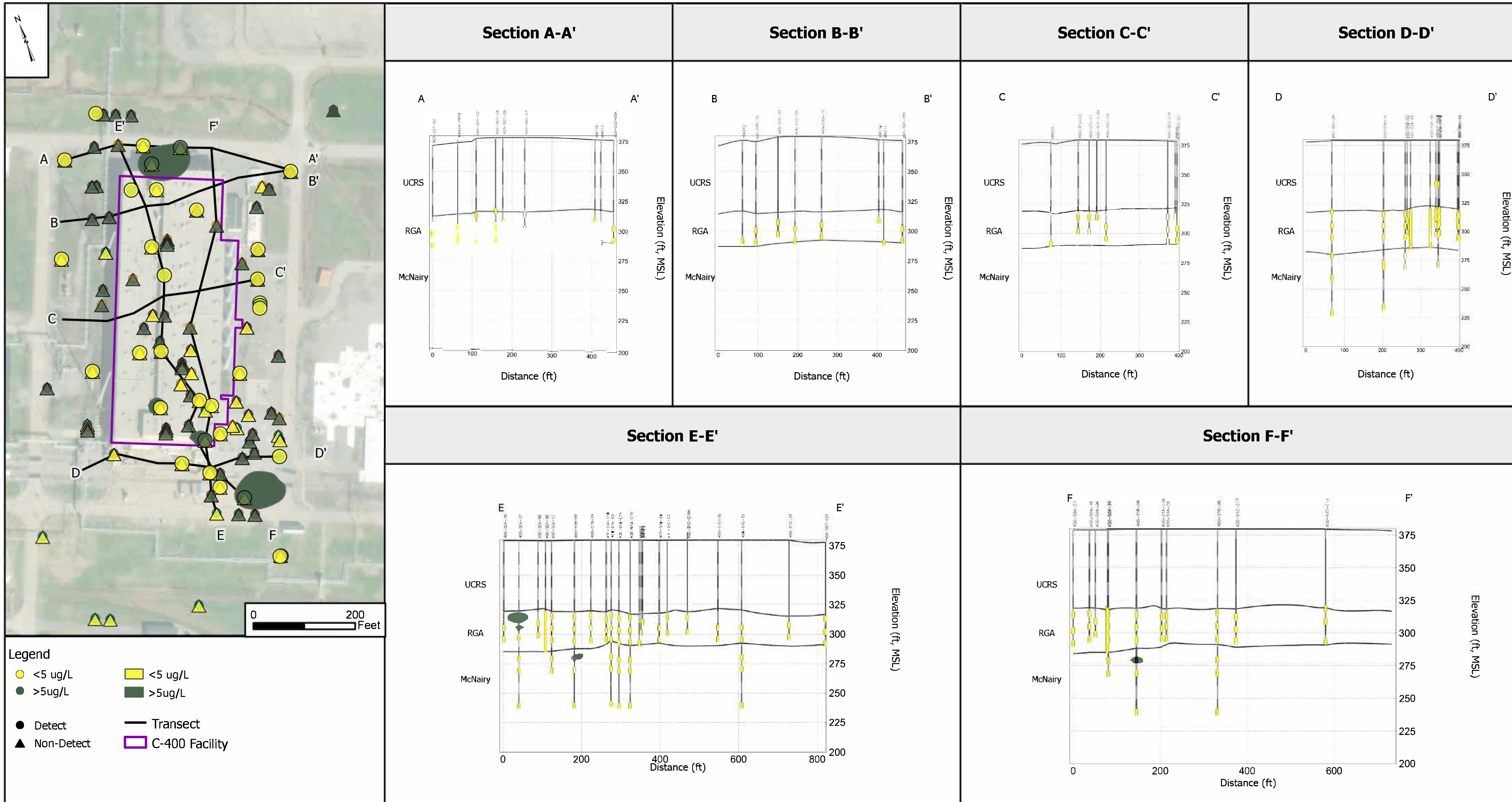


Figure 4.46. Cross Sections of Estimated Extent of Trichloroethene in Groundwater



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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Screening Level = 5.0 ug/L
2. Plume extent estimated using 1/2 screening level for non-detects.
3. Post samples set to 50ft search distance from section line

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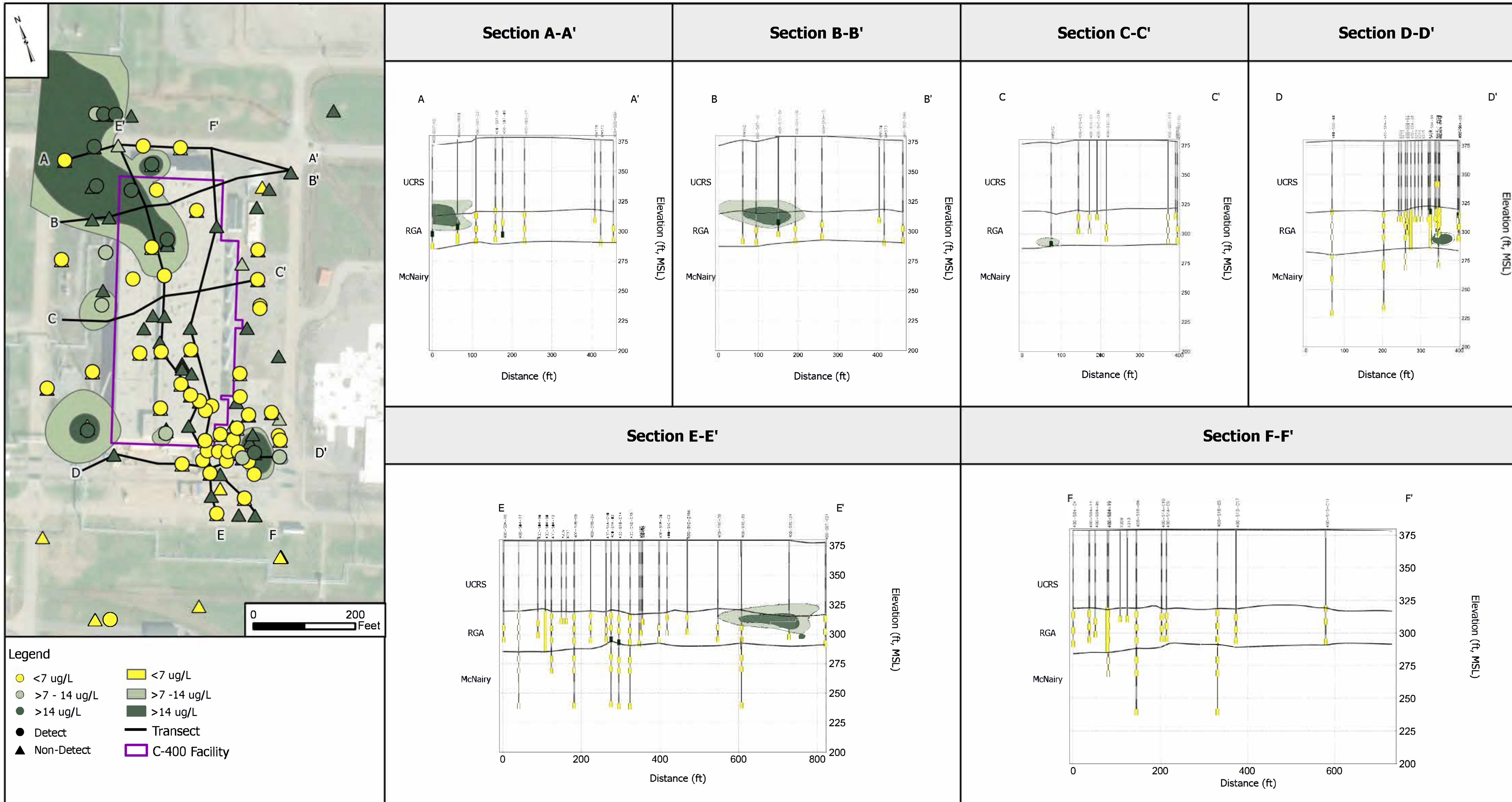
Figure 4.47. Cross Sections of Estimated Extent of 1,1,2-Trichloroethane in Groundwater



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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Screening Level = 7.0 ug/L
2. Plume extent estimated using 1/2 screening level for non-detects.
3. Post samples set to 50ft search distance from section line

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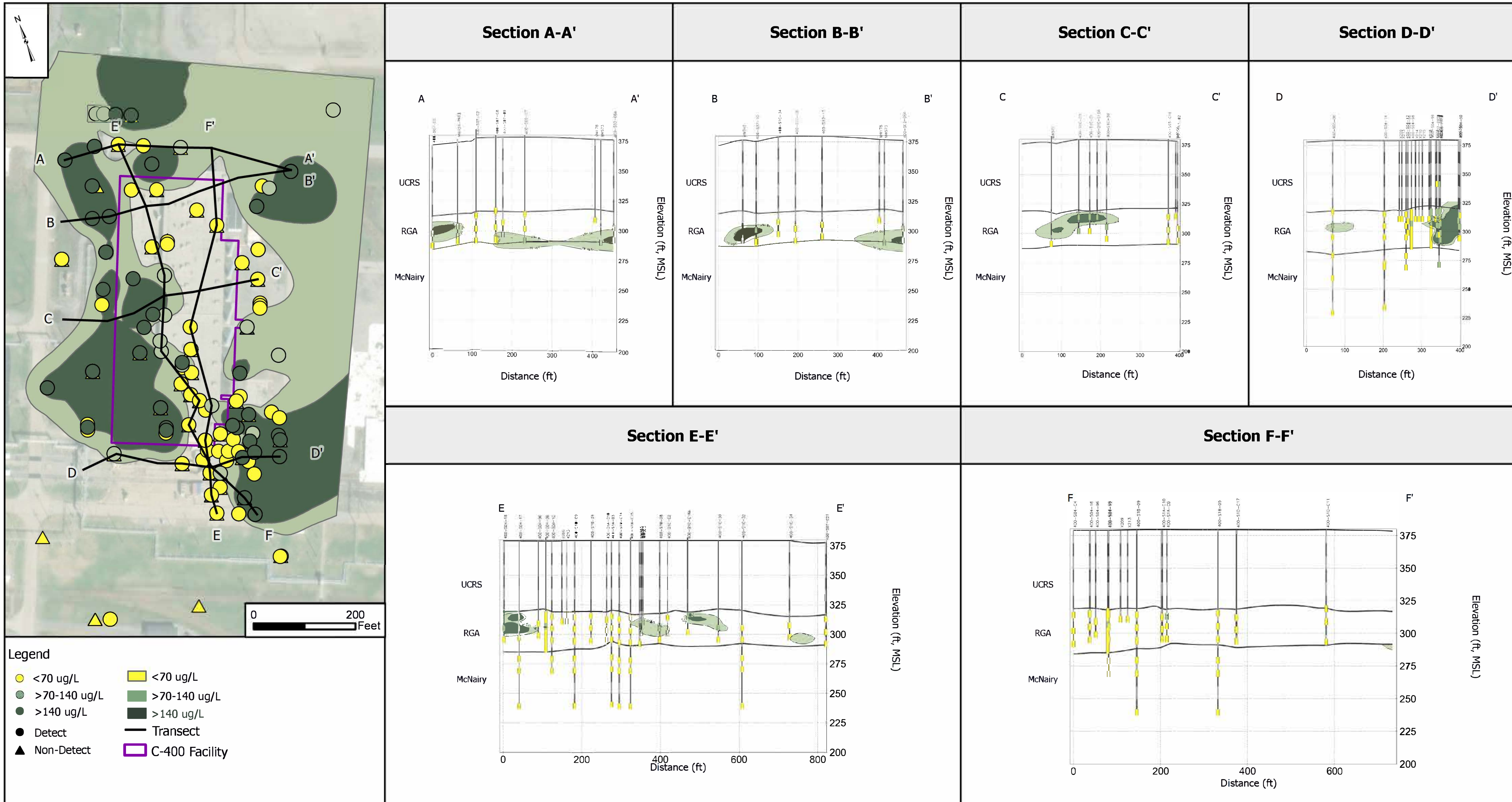
Figure 4.48. Cross Sections of Estimated Extent of 1,1-Dichloroethene in Groundwater



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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Screening Level = 70 ug/L
2. Plume extent estimated using 1/2 screening level for non-detects.
3. Post samples set to 50ft search distance from section line

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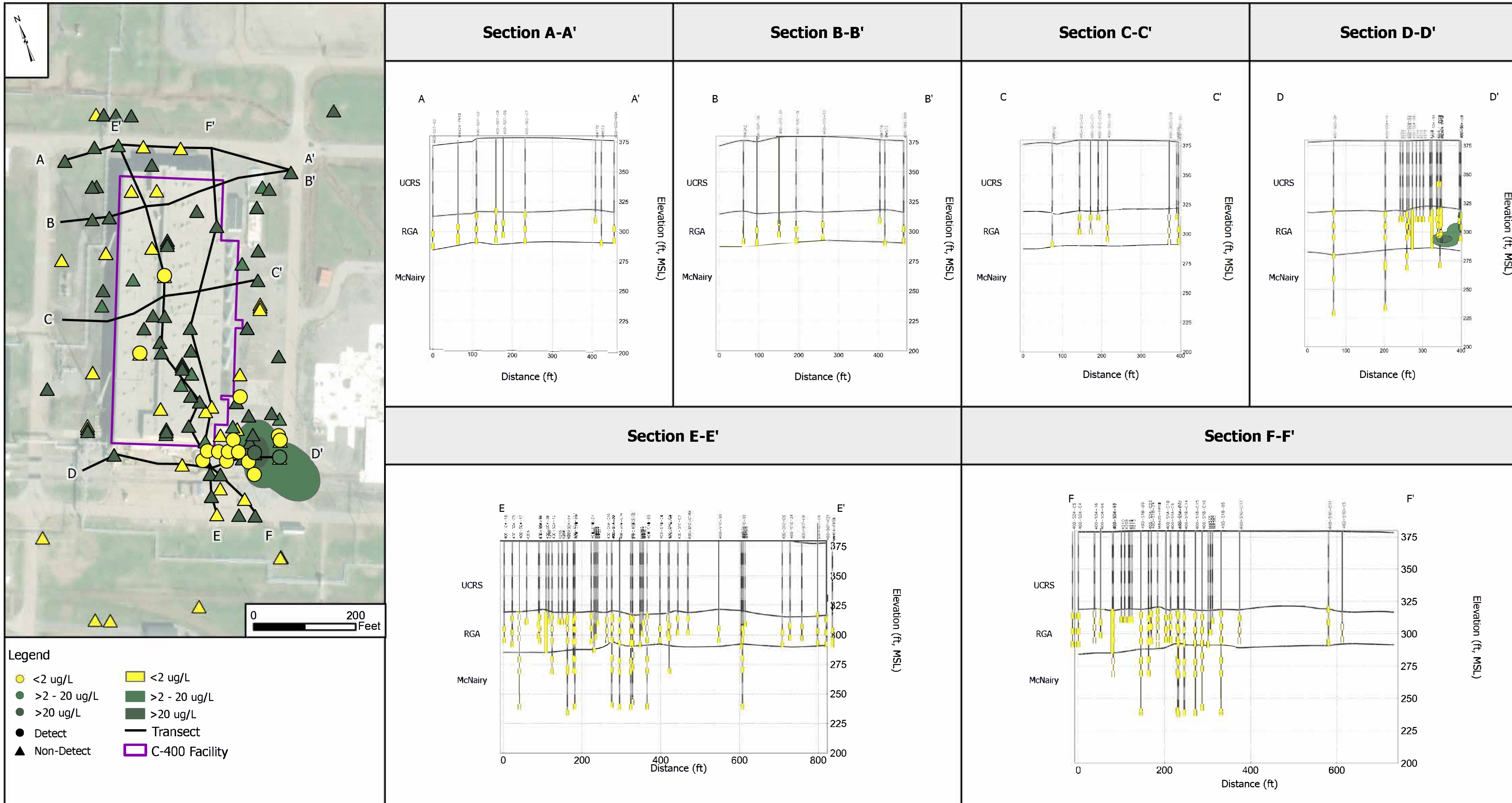
Figure 4.49. Cross Sections of Estimated Extent of *cis*-1,2-Dichloroethene in Groundwater



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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Screening Level = 2 ug/L
2. Plume extent estimated using 1/2 screening level for non-detects.
3. Post samples set to 50ft search distance from section line

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Figure 4.50. Cross Sections of Estimated Extent of Vinyl Chloride in Groundwater

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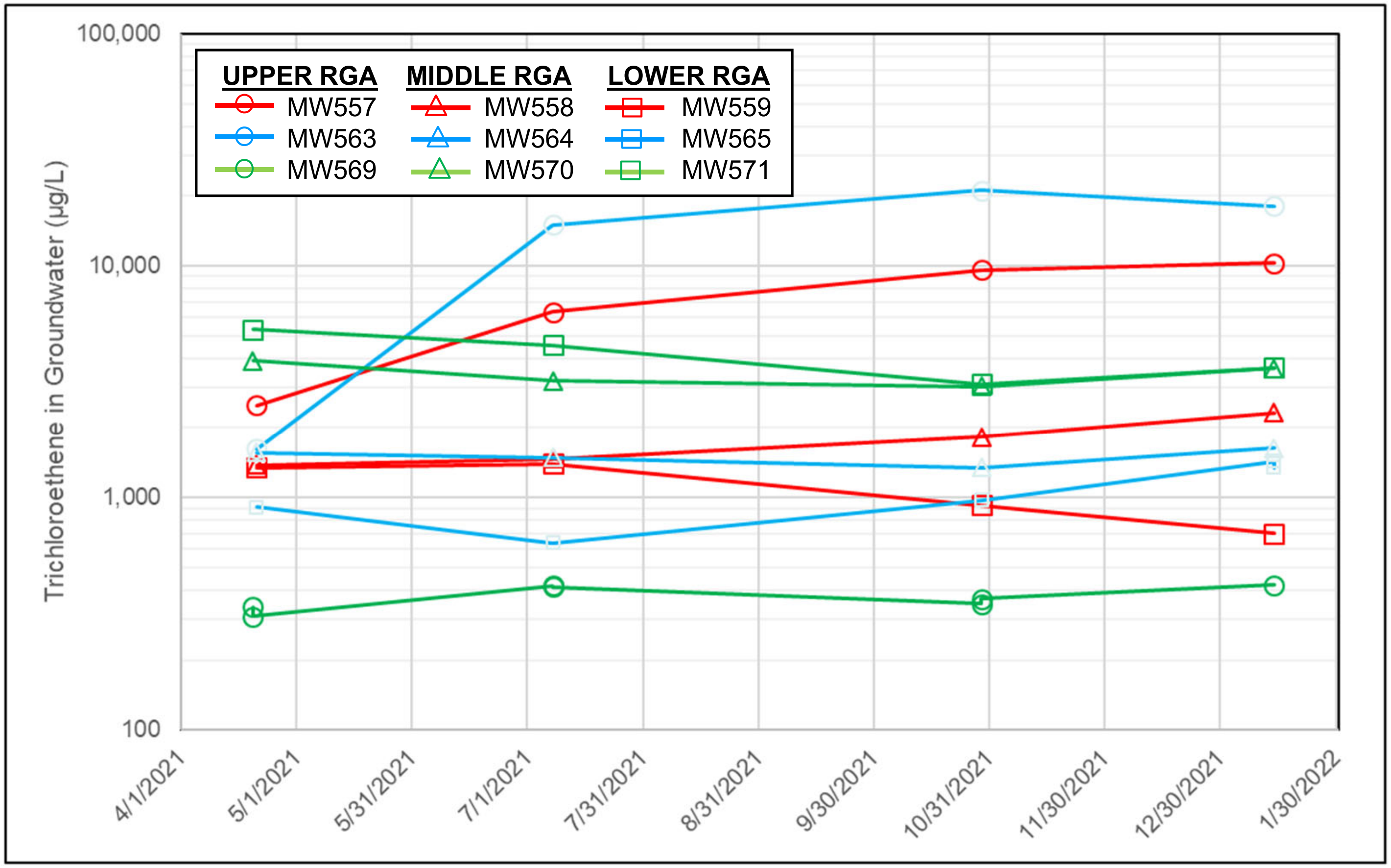

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Figure 4.51. TCE Trends in Sector 1 Monitoring Wells

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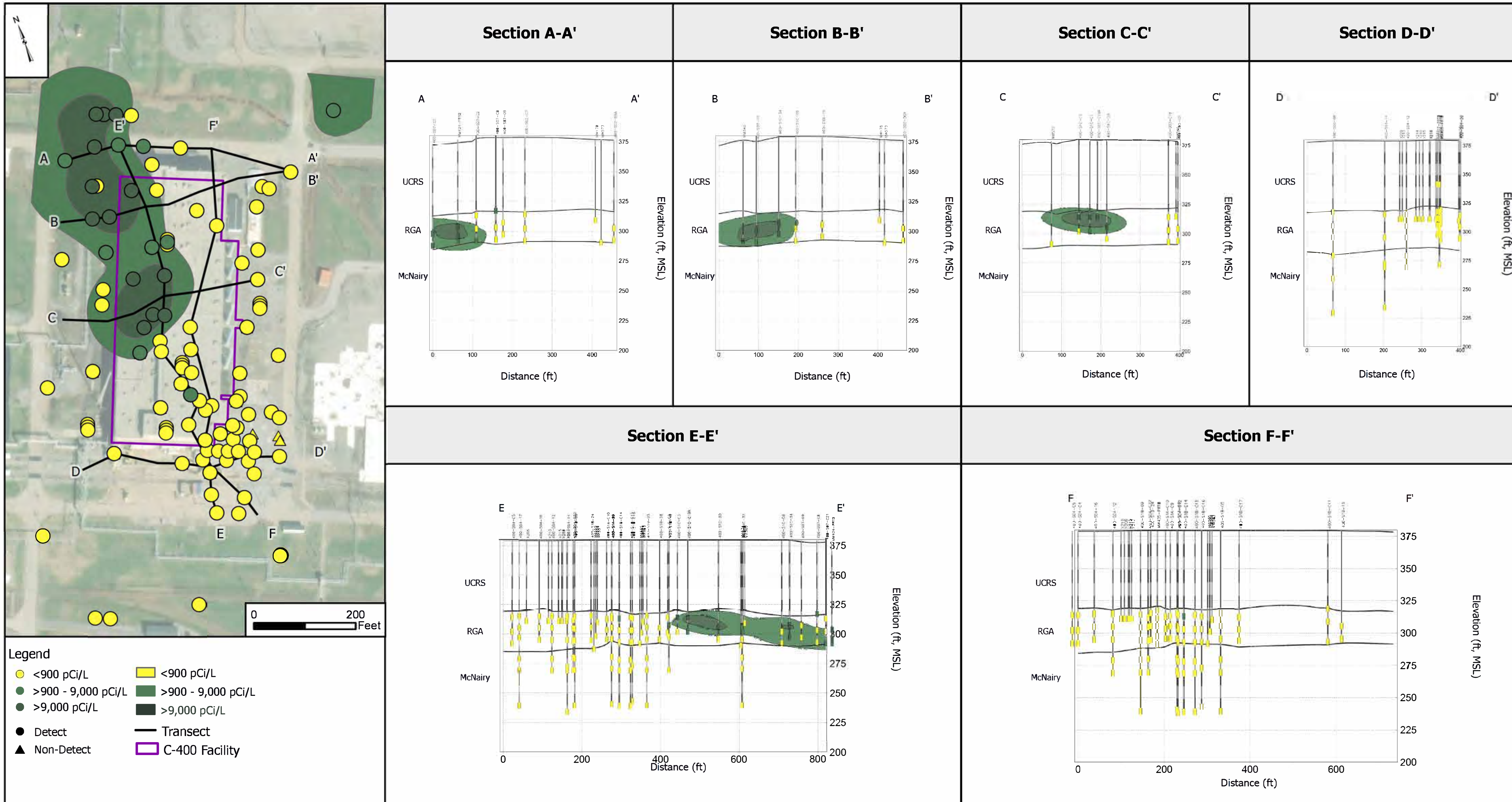

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Map Layer Source: Geosyntec\\fedprojects-01\paducah$\Kennesaw\ARO-01\C-400 EVS\GIS\mxd\202204_Sections_and_Footprints\shp

NOTES:
1. Screening Level = 900 pCi/L
2. Plume extent estimated using 1/2 screening level for non-detects.
3. Post samples set to 50ft search distance from section line

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Figure 4.52. Cross Sections of Estimated Extent of Technetium-99 in Groundwater

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4.5 C-400 COMPLEX SURFACE WATER

The plant is drained by Bayou Creek, Little Bayou Creek, their tributaries, and man-made drainage ditches that flow northward to the Ohio River. The NSDD flows through the WAG 6 area. The northern portion of the NSDD continues to receive storm water. The southern section of the NSDD that is located due north of the C-400 Complex is dry except during precipitation events due to the NSDD Remedial Action. Consequently, no surface water samples were collected for this RI. Runoff from the C-400 area goes to the storm sewer system. The storm sewer system was previously investigated with borescopes where accessible and soil samples were collected adjacent to the storm sewer system in several locations (DOE 2007b). Additionally, video borescoping of the storm sewer from outside the building was conducted during the RI and is included in Appendix A. This video borescope characterization is also discussed in Section 2.2 of this RI report.

4.6 C-400 COMPLEX AIR

Air pathways were not specifically investigated during this RI. A VI study was previously conducted for the C-400 Cleaning Building. The VI report was submitted on May 29, 2018, (*Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-1289&D2/R1/A3/R1) and approved by KDEP and EPA on November 21, 2018, and December 4, 2018, respectively (DOE 2018a). During the C-400 VI study, air samples were collected from sub-slab locations, floor cracks, and in the breathing zone. The samples were analyzed for TCE and its degradation products (DOE 2018a). Additionally, several sampling events supported operations and deactivation of the facility for the time frame 1988–2018. Examples of these sampling events are samplings from the C-400 Plenum Exhaust Fan Gasket Material (collected during 2017); C-400 Plenum Room Residue (collected during 2016); and C-400 Plenum Exhaust Fans Holdup Material (collected during 2017).

The spatial association between elevated indoor air and sub-slab soil gas concentrations is consistent with a conclusion that the VI pathway is complete, particularly in the southern portion of the building. The presence of *cis*-1,2-dichloroethene in sub-slab vapor shows there is an underlying groundwater source of TCE. *cis*-1,2-dichloroethene is a common breakdown product of TCE dissolved in groundwater, where groundwater conditions support reductive dechlorination. It is rarely present in commercial products, and it generally is not associated with TCE off-gassing from contaminated vadose zone soil because soils typically are sufficiently oxygenated to preclude reductive dechlorination of TCE (Rivett et al. 2011). In the northern portion of the C-400 Cleaning Building, *cis*-1,2-dichloroethene was not detected in sub-slab soil gas, and TCE concentrations in sub-slab soil gas ranged from 14 to 200 $\mu g/m^3$, which is consistent with an absence of subsurface sources of TCE (in groundwater) that are significant to the VI pathway. In the southern portion of the C-400 Cleaning Building, TCE concentrations in sub-slab soil gas ranged from 75 to 77,000 $\mu g/m^3$, and *cis*-1,2-dichloroethene was detected in sub-slab soil gas, consistent with a groundwater source of TCE and a complete VI pathway. Data from the VI investigation can be found in the *Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2018a).

Vapor migration from subsurface groundwater and soil sources through the vadose zone is promoted by the presence of sand in the UCRS in the vicinity of the C-400 Complex, as well as the presence of gravel immediately beneath the building. The presence of gravel under the slab was documented by the drilling of sub-slab soil gas ports, which encountered gravel at six of the seven sub-slab probe locations. A possible explanation for why TCE vapors were not present in the North Fan Basement area is that material beneath the slab is clay, rather than the anticipated gravel that was present at the other probe locations. The large number of utilities present in the vicinity of the building also may serve as preferential pathways for vapor migration.

TCE-contaminated groundwater and soil adjacent to and under the C-400 Cleaning Building are considered sources of vapors. Sub-slab vapor sampling at the C-400 Cleaning Building detected primarily TCE, but also detected *cis*-1,2-dichloroethene. Subsurface conditions in the C-400 Complex are considered to allow vapor transport toward the building. Although TCE concentrations in the RGA near the C-400 Cleaning Building have decreased, groundwater concentrations still exceed EPA's groundwater VISL values. Similarly, remedial actions have achieved greater than 95% reduction in soil concentrations, though post-remedial residual concentrations remain. Vapor concentrations associated with the remaining TCE contamination in groundwater and soil are expected to be orders of magnitude higher than the EPA commercial soil gas and sub-slab TCE VISL value of 100 $\mu g/m^3$.

A preliminary risk evaluation showed the calculated cumulative ELCRs are within EPA's acceptable cancer risk range of 1.0E-06 to 1.0E-04. All individual location ELCRs are at or below 5.7E-06. The cumulative building ELCR for the fan off, doors closed scenario is 5.7E-06. For the fan on, doors open scenario, all ELCRs are below 1.0E-06 and for the fan on, doors closed scenario, the cumulative building ELCR is 1.3E-06. The cumulative ELCR considering all the data is 1.6E-06. The building HI for the fan off, doors closed scenario is 1.9, due to the measured concentration at Location 5. For the fan on, doors open and fan on, doors closed scenarios, all HIs are less than 1.0. Considering all the data, the cumulative HI is 0.53. The lowest risks are presented by the fan on, doors open scenario. The highest risks are presented by the fan off, doors closed scenario.

A recommendation of the VI study was that, based on the presence of TCE in sub-slab soil gas above the EPA sub-slab soil gas screening level, periodic air monitoring be conducted and worker access be restricted. Additionally, increased ventilation may be appropriate if it is anticipated workers will spend substantial time in the C-400 east basement area or former southeast office area until the building is decommissioned or the source is remediated.

4.7 C-400 COMPLEX NONAQUEOUS PHASE LIQUID SOURCE ZONES

The C-400 Complex OU will address all sources of contamination including, but not limited to, principal threat waste (e.g., TCE DNAPL, high-concentration TCE contamination) (DOE 2017a). Source zones for COCs and Priority COCs also were evaluated against risk-based values and other EPA guidance, as appropriate.

Past processes performed at the C-400 Cleaning Building, and the extent and persistence of the groundwater contamination suggest that DNAPL is present in the subsurface. As discussed earlier in this section, several VOCs have been detected in C-400 Complex soil and groundwater. Dissolved concentrations of VOCs in the C-400 Complex are indicative of the presence of TCE as a DNAPL—in both the vadose zone and the saturated zone. Data from this investigation, as well as other investigations and studies, indicate that DNAPL in the southeast area of the C-400 Cleaning Building account for the majority of the known mass of DNAPL at PGDP.

In the WAG 6 RI, concentrations above 225 mg/kg in shallow soils were considered to indicate that DNAPL existed at the southeast corner of the C-400 Cleaning Building. Due to the chemical's greater density and low solubility in water, DNAPL movement is gravity-driven, largely independent of groundwater flow, and often directed by subtle textural changes in soils. Where spill volumes are sufficiently large, DNAPL has penetrated to significant depths. The WAG 6 RI also noted high TCE concentrations in Sector 5 soils, which suggested TCE is present as DNAPL in that area.

As discussed earlier in this report, interim remedial actions have been previously implemented in the source zone areas. A field scale treatability study was conducted in 2003 and included the installation and operation of one SPH treatment array and a vapor recovery system. Approximately 1,900 gal of TCE was removed from the subsurface, and the SPH treatability study achieved an estimated 98% reduction of TCE concentrations in UCRS soils and an estimated 99.1% reduction of TCE concentration in RGA groundwater (DOE 2004a). ERH was implemented below 20 ft bgs in two phases: Phase I and Phase II (Figure 1.5). During Phase I, temperature goals were not attained in the LRGA below 70 ft bgs (DOE 2011a). Because of the inability of ERH to reach target temperatures in the LRGA, FFA parties agreed to divide Phase II into Phase IIa (using ERH to address the UCRS and URGA to a depth of 60 ft bgs) and Phase IIb (using a technology to address the LRGA). Phase IIa operations were completed in the fall of 2014. Phase IIb has been incorporated into the C-400 Complex OU response action.

Phase I operations were completed in December 2010. Approximately 535 gal of VOCs (primarily TCE) were removed. Phase I ERH reduced soil TCE concentrations by 95% in the East Treatment Area and by 99% in the Southwest Treatment Area. The residual contaminant levels averaged 29 µg/kg, with a maximum of 315 µg/kg, in the East Treatment Area and averaged 15 µg/kg, with a maximum of 228 µg/kg, in the Southwest Treatment Area. Phase IIa operations removed approximately 1,137 gal of VOCs (primarily TCE). The median of TCE concentration reductions in collocated preoperational versus post operational soil samples of Phase IIa was 99.8%. The residual contaminant levels averaged 200 µg/kg, with a maximum of 10,000 µg/kg in the Phase IIa treatment area.

A dissolved phase zone of contamination containing dissolved-phase constituents, primarily TCE, results from groundwater flowing past and contacting the residual and pooled DNAPL (Figure 4.46). The contaminants in the dissolved phase plume are subject to advection, dispersion, sorption, decay, biodegradation, and matrix diffusion. Dissolved-phase plumes can be sustained by back diffusion from low permeability regions in the absence of DNAPL. Dissolved-phase groundwater contamination will be addressed as part of the Dissolved-Phase Plumes Remedial OU.

Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites defines a DNAPL source zone as the overall volume of the subsurface containing residual and/or pooled DNAPL (EPA 2009). Not all portions (e.g., lenses, laminations, fractures) of the DNAPL source zone will contain residual and/or pooled DNAPL. A confirmed/probable DNAPL source zone is the part of the source zone where it is known or highly likely for DNAPL to exist. The potential DNAPL source zone is the part of the source zone where it is possible that DNAPL exists, but the lines of evidence indicating DNAPL presence are either fewer or are not as strong as those associated with a confirmed/probable DNAPL source zone. EPA suggests a 1% rule of thumb as a generality that sampled groundwater concentrations in excess of 1% effective solubility (TCE = 11,000 µg/L) indicate that DNAPL may be present in the vicinity of any direction of the monitoring point of interest (EPA 2009). This RI follows EPA's terminology and uses the terms confirmed/probable and potential in discussing DNAPL source zones.

For the purposes of this RI, source zones composed of TCE DNAPL and high concentration TCE contamination at the C-400 Complex have been defined using multiple lines of evidence including, but not limited to, areas with TCE concentrations in groundwater exceeding 33,000 µg/L, TCE concentrations in soil exceeding 100,000 µg/kg, MIP PID responses > 700,000 µV, and DyeLIF responses > 5% RE. TCE groundwater concentrations > 33,000 µg/L (3% effective solubility) are considered one line of evidence of a confirmed/probable source zone and TCE groundwater concentrations between 11,000 and 33,000 µg/L (1% and 3% effective solubility) are considered one line of evidence to support the presence of a potential source zone. The use of TCE groundwater concentrations > 11,000 µg/L to indicate a potential source zone is consistent with EPA's terminology. The use of TCE groundwater concentrations > 33,000 µg/L to indicate a confirmed/probable source zone is based on multiple lines of evidence, such as the coincidence of areas exceeding 33,000 µg/L of TCE in groundwater, with areas where the MIP PID and DyeLIF RE responses also exceed their respective threshold. Other VOCs (e.g., TCE degradation products) identified in soil and groundwater, if present as potential sources, likely occur within the TCE source zones delineated using these lines of evidence.

4.7.1 Extents of Confirmed/Probable Source Zones

The confirmed/probable and potential source zones in the southeastern portion of the C-400 Complex occur in the UCRS, RGA, and the Upper McNairy. Previous interim actions have removed portions of these areas. The UCRS portion of the source is mostly located beneath the southeastern corner of the building (southeastern portion of Sector 1); however, a couple of smaller zones in the UCRS are also present in Sector 4. The smaller confirmed/probable source zone near the southwestern portion of the C-400 Complex in Sector 5 was particularly shallow, occurring at depths less than 20 ft bgs. This appears to be a small area that was located above the treatment volume in the previous interim action (e.g., Phase I Southwest Treatment Area). TCE was reported in UCRS, RGA, and McNairy groundwater across the C-400 Complex at levels typically ranging from trace amounts to as high as 645,000 μg/L [MW407-PRT1 (UCRS)] in Sector 4. The maximum detections of TCE in soils occurred in Sector 4, with 6,940,000 μg/kg [400S4-12 (Upper McNairy at 94–95 ft bgs)], and in Sector 5, with 144,000 μg/kg [400S5-08 (upper UCRS at 5.5–6.5 ft bgs)].

4.7.1.1 Upper Continental Recharge System

As shown in Figure 4.53, there are four UCRS areas (UCRS Area 1 through UCRS Area 4) with data that exceed at least one of the lines of evidence; these areas would be delineated as either confirmed/probable or potential source zones. The assumed source area depth interval in UCRS Areas 1, 2, and 3 is 20–60 ft bgs. For UCRS Area 4, the source zone depth interval is 0–15 ft bgs. As shown in Figure 4.53, the area between the proposed UCRS Areas 1, 2, and 3 does not require treatment based on the data collected during the RI. This area was treated during the Phase I and IIa Electrical Resistance Heating Thermal Remediation in the UCRS that was operated at the C-400 Complex OU.

The following items summarize the data from soil and MIP borings used to estimate the extents of the confirmed/probable source zones in the UCRS.

- UCRS Area 1 is located beneath the southeast corner of the C-400 Cleaning Building (Figure 4.53). MIP borings 400-S1B-MIP10, 400-S1B-MIP12, and 400-S1B-MIP13 have PID readings above the 700,000 μV line of evidence. The PID readings exceeding the criteria in these borings were generally located at the bottom of the UCRS 55–60 ft bgs. Because these exceedances were detected near the UCRS and RGA interface, the RGA confirmed/probable source zones were extended beneath these MIP borings also, as shown in Figure 4.53.

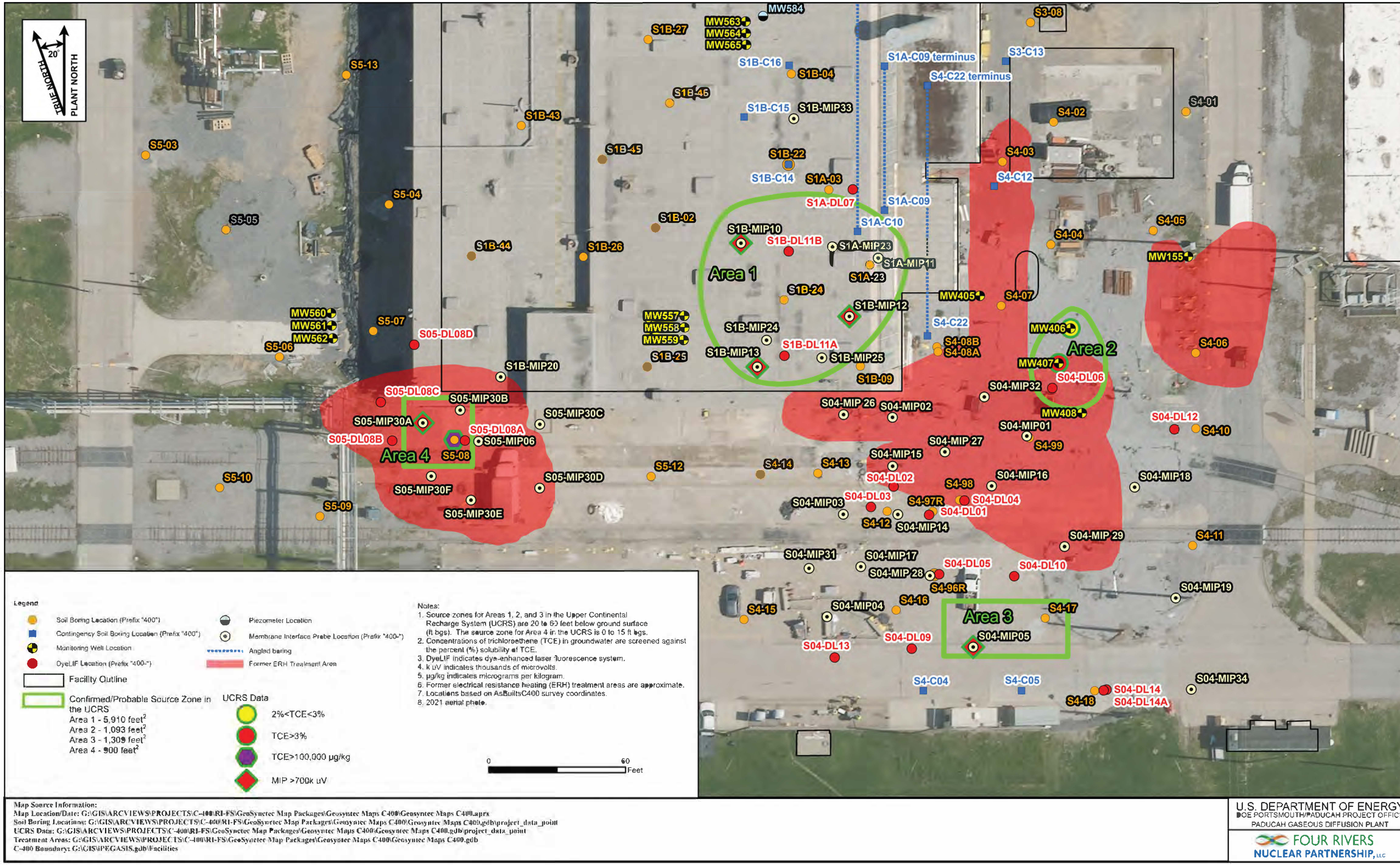

Figure 4.53. C-400 Confirmed/Probable Source Zone in the UCRS

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- UCRS Area 2 is generally located around MW407 and extends to the north to MW406. The concentration of TCE in groundwater samples collected from MW407 Ports 1 and 2 (36 ft bgs and 60 ft bgs, respectively) exceeded the 33,000 μg/L line of evidence. Because MW407 Port 2 is located at the UCRS and RGA interface, the RGA source zone was extended around this MW also, as shown in Figure 4.53.

- UCRS Area 3 is located on the south side of the C-400 Complex, generally around MIP boring 400-S04-MIP05 and soil boring 400S4-17. The PID readings exceeded the 700,000 μV line of evidence in the depth interval approximately 55–61 ft bgs. In addition, elevated concentrations of TCE (1–3% effective solubility) were also present in groundwater samples collected from 400S4-17 in the RGA. At 35 ft bgs in soil boing 400S4-17, the concentration of TCE in the soil sample was 5,600 μg/kg, which is the highest TCE soil concentration detected below 15 ft bgs in the UCRS.

- UCRS Area 4 is located near the southwest corner of the C-400 Cleaning Building. At soil boring 400S5-08, the concentration of TCE in the soil sample collected from 10 ft bgs was 144,000 μg/kg, which is above the 100,000 μg/kg line of evidence. At a depth of 5.6 ft bgs in 400-S05-MIP30A, the PID reading exceeded the 700,000 μV line of evidence. MIP Boring 400-S05-MIP30A is approximately 15 ft from soil boring 400S5-08. Based on the data, it was assumed that Area 4 is 30 ft × 30 ft and extends to a depth of 15 ft bgs.

4.7.1.2. Regional Gravel Aquifer

Based on the data collected during the RI, the confirmed/probable source zones in the RGA are shown in Figure 4.54. The refined confirmed/probable source zones in the RGA, which includes most of the previously defined Phase IIb area, are also shown in Figure 4.54. The following observations summarize the lines of evidence used to estimate the extent in the RGA.

Beneath the C-400 Cleaning Building, the concentration of TCE in the groundwater sample collected at 65 ft bgs from soil boring 400S1B-24 was 81,300 μg/L. At a depth of 100 ft bgs in the McNairy, the groundwater samples collected from 400S1A-03 and 400S1B-09 had TCE concentrations of 57,600 μg/L and 33,100 μg/L, respectively. MIP boring 400-S1B-MIP33 had PID readings greater than the 700,000 μV line of evidence at a depth of 100 ft bgs in the Upper McNairy Formation. The groundwater and PID data in the Upper McNairy Formation indicate that DNAPL TCE may have migrated through the RGA near these borings; therefore, soil borings 400S1A-03 and 400S1B-09 and MIP boring 400-S1B-MIP33 were included in the RGA confirmed/probable source zone. As noted above, MIP borings 400-S1B-MIP10, 400-S1B-MIP12, and 400-S1B-MIP13 had PID readings exceeding the 700,000 μV line of evidence at the UCRS and RGA interface; therefore, these MIP borings were included in the RGA confirmed/probable source zone.

- Outside of the southeast corner of the C-400 Cleaning Building, MIP borings 400-S04-MIP01, 400-S04-MIP02, 400-S04-MIP14, 400-S04-MIP15, 400-S04-MIP16, and 400-S04-MIP27 had PID readings exceeding the 700,000 μV line of evidence at depths 94–103 ft bgs in the McNairy. The elevated PID readings in the McNairy indicate that DNAPL TCE may have migrated through the RGA near these soil borings. At the RGA/McNairy interface (94 ft bgs), the soil sample collected from soil boring 400S4-12 had a TCE concentration of 6,940,000 μg/kg, which exceeds the 100,000 μg/kg line of evidence. The soil concentration indicates DNAPL is present at the RGA/McNairy interface at this location; therefore, the locations of these borings were included in the extent of the RGA confirmed/probable source zone.

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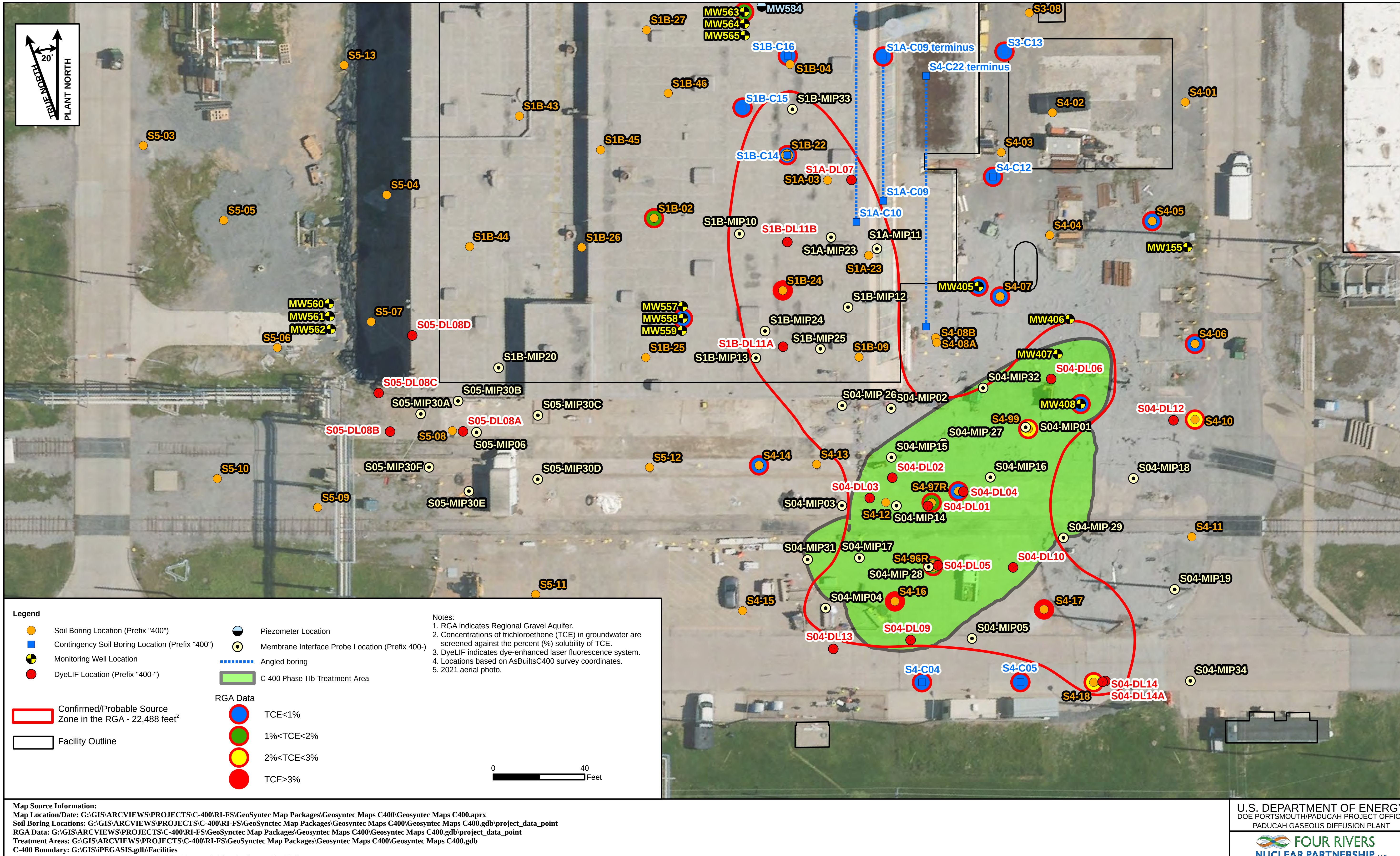

Figure 4.54. C-400 Confirmed/Probable Source Zone in the RGA

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- On the southeast portion of the C-400 block near Tennessee Avenue, soil borings 400S4-16 and 400S4-17 had TCE concentrations in groundwater > 33,000 µg/L at a depth of 65 ft bgs. MIP boring 400-S04-MIP05 had PID readings exceeding the 700,000 µV line of evidence at the UCRS and RGA interface; therefore, this MIP boring was included in the RGA source zone. MIP boring 400-S04-MIP28 had PID readings greater than the 700,000 µV line of evidence at a depth of 70 ft bgs in the RGA. MIP boring 400-S04-MIP04 also had PID readings exceeding the 700,000 µV line of evidence at a depth of 100 ft bgs in the McNairy. DyeLIF boring 400-S04-DyLF-06 had a response of > 5% RE at of a depth of 70 ft bgs in the RGA. DyeLIF boring 400-S04-DyLF-14 had a response of > 5% RE at a depth of 100 ft bgs in the McNairy. The 400-S04-MIP14 and 400-S04-DyLF-14 data indicate that DNAPL TCE may have migrated through the RGA into the McNairy near these locations.

4.7.1.3 Upper McNairy Formation

Based on the data collected during the RI, the confirmed/probable source zones in the Upper McNairy are shown in Figure 4.55. The following items summarize the data from groundwater, MIP, and DyeLIF borings used to estimate the extents of TCE source areas in the Upper McNairy formation.

- Upper McNairy Area 1 is beneath the southeast corner of the C-400 Cleaning Building and outside of the southeast corner of the C-400 Cleaning Building (Figure 4.55).

  - At a depth of approximately 100 ft bgs in the McNairy, the groundwater samples collected from 400S1A-03 and 400S1B-09 had TCE concentrations of 57,600 µg/L and 33,100 µg/L, respectively.

  - On the north side, MIP boring 400-S1B-MIP33 had PID readings exceeding the 700,000 µV line of evidence at a depth of 120 ft bgs in the McNairy.

  - Outside of the southeast corner of the C-400 Cleaning Building, MIP borings 400-S04-MIP01, 400-S04-MIP02, 400-S04-MIP14, 400-S04-MIP15, 400-S04-MIP16 and 400-S04-MIP27 had PID readings exceeding the 700,000 µV line of evidence at depths 94–103 ft bgs in the McNairy.

  - At a depth of 94 ft bgs in the McNairy, the soil sample collected from soil boring 400-S04-12 had a TCE concentration of 6,940,000 µg/kg, which exceeds the 100,000 µg/kg line of evidence.

Upper McNairy Area 2 is located south of the C-400 Cleaning Building. MIP boring 400-S04-MIP04 had PID readings greater than the 700,000 µV line of evidence at a depth of 100 ft bgs in the McNairy. 400-S04-MIP04 is the only point with a line of evidence in this area.

- Upper McNairy Area 3 is located southeast of the C-400 Cleaning Building. DyeLIF boring 400-S04-DyeLF-14 had a response of > 5% RE at a depth of 100 ft in the McNairy. DyeLIF boring 400-S04-DyeLF-14 is the only point with a line of evidence in this area.

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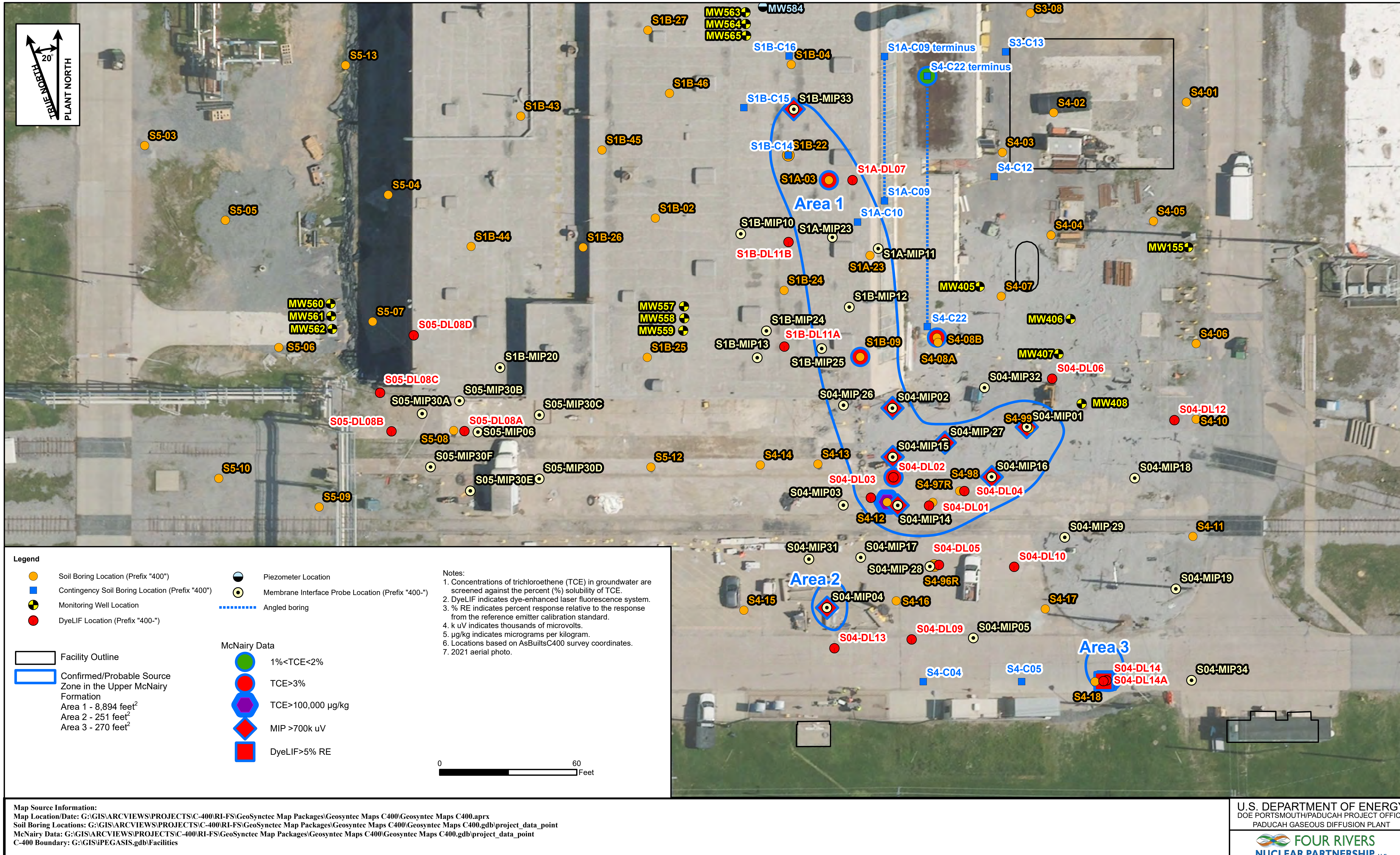

Figure 4.55. C-400 Confirmed/Probable Source Zone in the Upper McNairy Formation

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4.7.1.4 Volumes of Confirmed/Probable Source Zones

Table 4.42 presents the estimated volumes of the confirmed/probable source zones, based on the areal extent of the confirmed/probable source zones defined in Figure 4.56 and the estimated thickness of the zones.

Table 4.42. Areas and Volumes of the Confirmed/Probable Source Zones

Unit	Area	Thickness of the Source Zone (ft)	Aerial Extent (ft^2)	Volume (ft^3)	Volume (yd^3)
UCRS	1	40	5,910	236,400	8,756
	2	40	1,093	43,720	1,619
	3	40	1,309	52,360	1,939
	4	15	900	13,500	500
	UCRS Total	-	9,212	345,980	12,814
RGA	RGA Total	30	22,488	674,640	24,987
Upper McNairy	1 (North Side)	30	889	26,682	988
	1 (Central and South Side)	15	8,005	120,069	4,447
	2	15	251	3,765	139
	3	15	270	4,050	150
	Upper McNairy Total	-	9,415	154,566	5,725
		C-400 Totals	**41,115**	**1,175,186**	**43,525**

4.7.2 Extents of Potential Source Zones

This section includes estimates of the volumes of the potential source zones in the UCRS, RGA and Upper McNairy Formation—excluding the confirmed/probable source zones. As shown in Figure 4.57, there are multiple isolated confirmed/probable and potential source zones in addition to the larger areas under the southeast and southwest corners of the C-400 Cleaning Building.

4.7.2.1 Upper Continental Recharge System

The TCE concentrations in groundwater samples collected from MW406 Port 1 (36 ft bgs) were > 11,000 µg/L. This MW location is included in the larger confirmed/probable and potential source zones under the southeast corner of the C-400 Cleaning Building.

4.7.2.2 Regional Gravel Aquifer

There are six confirmed/probable and potential source zones within the RGA (shown in Figure 4.57). It is assumed that the potential source zones in the RGA extend from 60 to 70 ft bgs in RGA Areas 1 through 4. In RGA Areas 5 and 6 located generally on the north side of the C-400 Cleaning Building, the potential source zones in the RGA extend from 80 to 90 ft bgs.

The potential source zones are summarized as follows:

- RGA Area 1—the TCE concentration detected in 400S1C-C18A and 400S1C-C01 at 65 ft bgs was 25,000 µg/L and 19,200 µg/L, respectively;

- RGA Area 2—the TCE concentration detected in MW563 at 65 ft bgs was 21,100 µg/L;

- RGA Area 3—the TCE concentration detected in 400S1B-02 at a depth of approximately 65 ft bgs was 11,700 µg/L;

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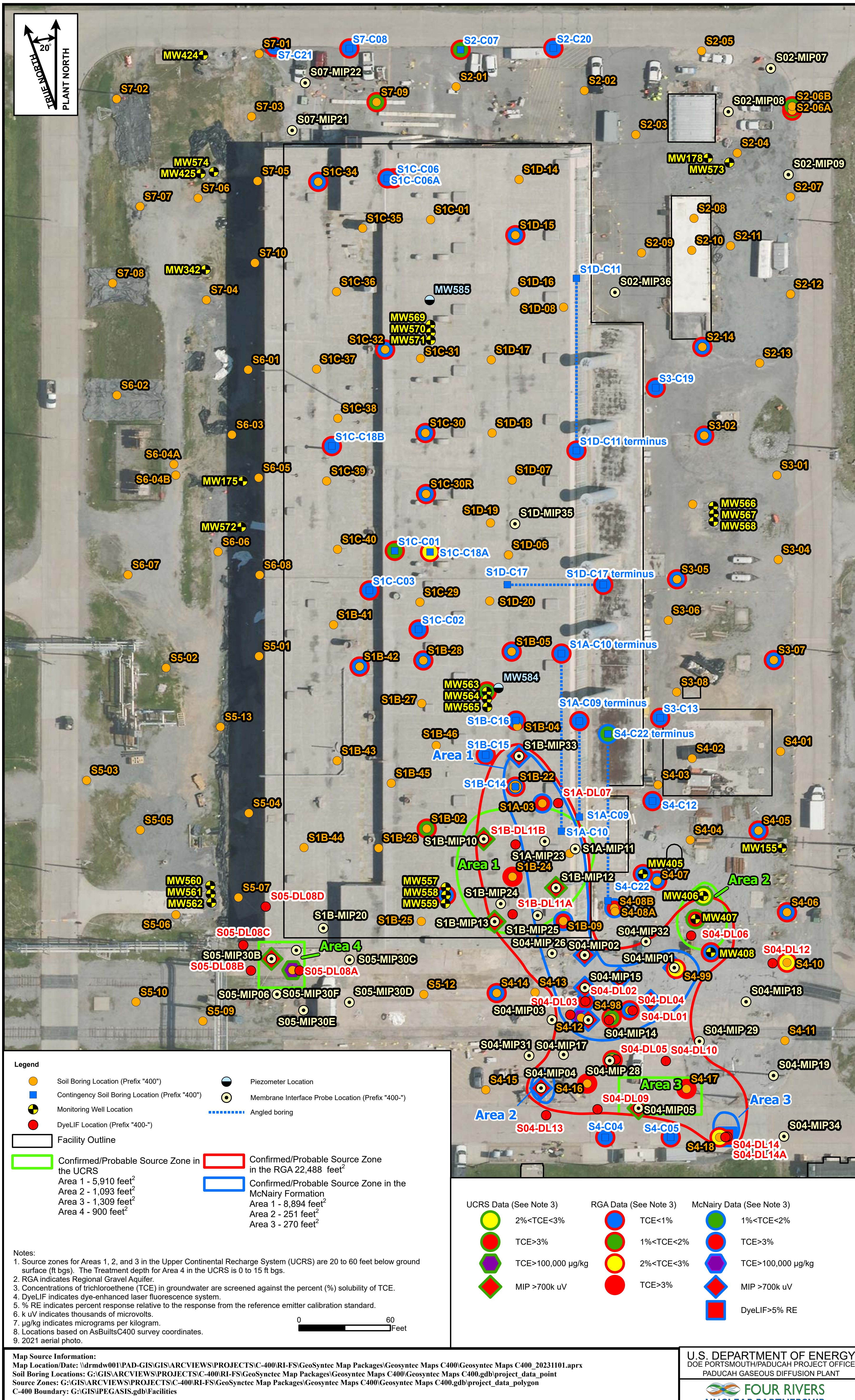
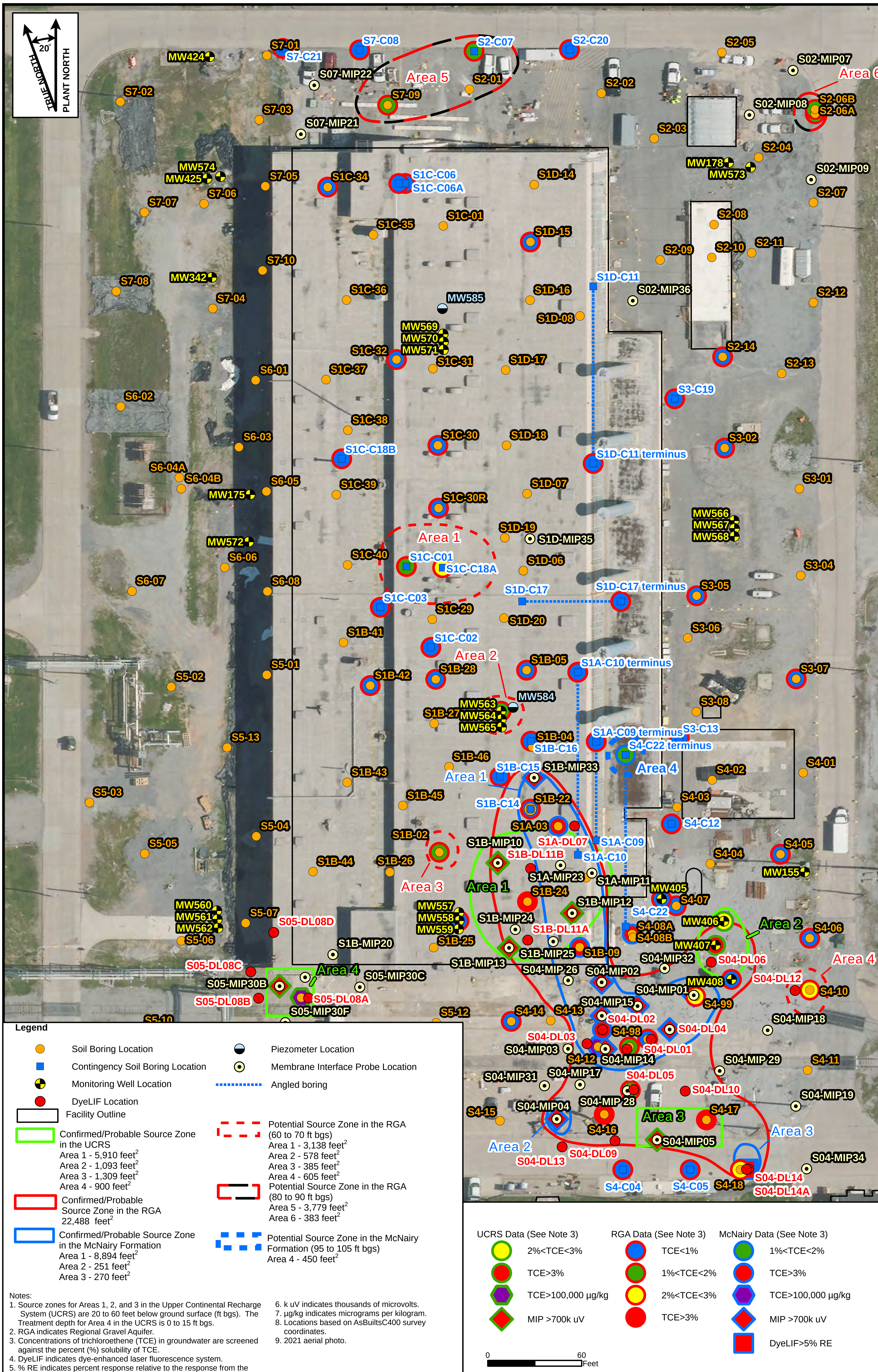


Figure 4.56. C-400 Confirmed/Probable Source Zones



Map Source Information:
Map Location/Date: G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\GeoSyntec Map Packages\Geosyntec Maps C400\Geosyntec Maps C400.aprx
Soil Boring Locations: G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\GeoSynctec Map Packages\Geosyntec Maps C400\Geosyntec Maps C400.gdb\project_data_point
Source Zones: G:\GIS\ARCVIEWS\PROJECTS\C-400\RI-FS\GeoSynctec Map Packages\Geosyntec Maps C400\Geosyntec Maps C400.gdb\project_data_polygon
C-400 Boundary: G:\GIS\iPEGASIS.gdb\Facilities

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

Figure 4.57. C-400 Confirmed/Probable and Potential Source Zones

- RGA Area 4—the TCE concentration detected in 400S4-10 at a depth of approximately 66.5 ft bgs was 27,800 µg/L;

- RGA Area 5—the TCE concentrations detected in S07-09 at a depth of approximately 81.5 ft bgs and S02-CB07 at a depth of approximately 86.5 ft bgs were 11,300 µg/L and 19,600 µg/L; and

- RGA Area 6—the TCE concentration detected in S02-06 at a depth of approximately 83.5 ft bgs was 20,000 µg/L.

4.7.2.3 Upper McNairy Formation

McNairy Area 1 shown in Figure 4.57 is the only potential source zone in the McNairy. Soil boring S04-CB22 had a TCE concentration of 12,100 µg/L at a depth of 98 ft bgs in McNairy Area 1. It is assumed that the potential source zone extends from 95–105 ft bgs in this area.

4.7.2.4 Volumes of Potential Source Zones

The estimated volumes of the potential source zones based on the areal extents and thicknesses are summarized in Table 4.43. The volumes shown in Table 4.43 are only those for "potential source zones" that were not already encompassed by the "confirmed/probable source zone" volumes shown in Table 4.42.

Table 4.43. Areas and Volumes of Potential Source Zones

Unit	Area	Thickness of the Source Zone (ft)	Aerial Extent (ft^2)	Volume (ft^3)	Volume (yd^3)
RGA	1	10	3,138	31,380	1,162
	2	10	578	5,780	214
	3	10	385	3,850	143
	4	10	605	6,050	224
	5	10	3,779	37,790	1,400
	6	10	383	3,830	142
	RGA Total	10	8,868	88,680	3,284
Upper McNairy	Upper McNairy Total	10	450	4,500	167
		C-400 Totals	**9,318**	**93,180**	**3,451**

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5. CONTAMINANT FATE AND TRANSPORT

The fate and transport of site-related chemicals is important in assessing the potential for contaminant exposure as well as potential changes in concentration or migration if no action is taken. This section presents an overview of potential routes of contaminant migration, chemical-specific factors that influence contaminant migration, and an evaluation of UCRS soils for leachability.

In addition, this section provides a summary of contaminant fate and transport modeling conducted to support the future FS report. Groundwater flow modeling was developed from the framework used in the *2016 Update of the Paducah Gaseous Diffusion Plant Sitewide Groundwater Flow Model*, DOE/LX/07-2415&D2 (2016 Sitewide Groundwater Flow Model), and was conducted to estimate design specifications for a pump-and-treat remedial scenario (DOE 2017b).[16] To evaluate the restoration time frames for a future FS report, the analytical fate and transport model REMChlor-MD,[17] which includes effects of back diffusion of contaminant mass from lower-permeability soils (recognized as an important factor in attenuation processes), was used (Falta and Wang 2017). The REMChlor-MD model simulates groundwater flow and transport in the higher-permeability, advection-dominated RGA aquifer and back diffusion from the lower-permeability, diffusion-dominated McNairy Formation.

5.1 POTENTIAL ROUTES OF MIGRATION

The C-400 Complex CSM for groundwater flow and contaminant migration, described in Section 2.6.6, represents the current understanding of known site conditions and provides the basis for evaluating contaminant fate and transport. Transport processes likely to be active at the site include vertical infiltration in soil, lateral and vertical migration in groundwater, soil erosion and surface runoff, volatilization/vapor transport, and mobilization of dust particles. Detections of chemicals in soil and groundwater confirm the potential for media-specific chemical transport. The migration pathways discussed in Section 2.6.6 include the potential for the following: migration of vapors to on-site receptors, leaching of contaminants from soil to groundwater, and migration of groundwater to downgradient receptors.

Migration of vapors to on-site receptors was assessed by a VI study conducted for the C-400 Cleaning Building (DOE 2018a). Sub-slab vapor sampling at the C-400 Cleaning Building primarily detected TCE but also detected *cis*-1,2-dichloroethene. Based on subsurface conditions in the C-400 Complex and TCE groundwater concentrations exceeding the EPA groundwater VISL, VI is considered a complete pathway.

Leaching of contaminants through UCRS soil to RGA groundwater, and subsequent migration of groundwater to downgradient receptors, is a primary migration pathway of concern and also the focus of the fate and transport evaluation described in this section. Releases of high concentrations of TCE and lower concentrations of other contaminants have impacted shallow and subsurface UCRS soil, providing possible sources for impacts to RGA groundwater. Modeling and risk analyses performed as part of the WAG 6 RI and subsequent decision documents show that TCE migration from C-400 source areas would result in risks to groundwater users (i.e., residents) greater than the EPA risk range in areas beyond the DOE property boundary.

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[16] Although EPA has not concurred on the use of the updated model and the model report identifies several uncertainties, the 2016 groundwater flow model best represents the current site conditions and understanding of groundwater flow at PGDP (DOE 2017b). The framework from the 2016 model update is used for near-field assessment (inside the C-400 Complex OU), where the model uncertainties have lower potential impact on the modeling results; far-field assessment is performed qualitatively.
[17] REMChlor-MD is a Microsoft Excel©-based tool developed for the Environmental Security Technology Certification Program.

5.2 FACTORS AFFECTING CONTAMINANT MIGRATION

Several factors influence the dissolution of COPCs in soils and the rate of contaminant movement through soils. These include the physical/chemical properties of the contaminants (e.g., solubility, density, viscosity, K_d, volatility) and the physical/chemical properties of the environment (e.g., rainfall, percolation rate, soil permeability, porosity, particle size, amount of organic carbon). In the UCRS, contaminants migrate vertically downward as rainwater percolates to the RGA located approximately 60 ft bgs. The dominant process for chemical migration in the UCRS is diffusion.

The dominant process for chemical migration in the RGA is advection and dispersion due to saturated conditions in a high horizontal hydraulic conductivity aquifer. The rate of dissolved contaminant transport in the fine-grained sediments of the McNairy Formation via advective flow is much less than the rate of advective transport in the RGA due to the lower hydraulic conductivity of the McNairy Formation. Diffusion is a more important process promoting contaminant migration in the McNairy. As such, contaminants in the McNairy Formation will be a long-term source of dissolved TCE to the RGA via back diffusion.

When modeling organic solvents, such as TCE, the degradation rate of the organic solvent in the environment is an important factor in predicting the fate and transport of the organic solvent and daughter products. In TCE source areas, *cis*- and *trans*-1,2-dichloroethene is formed from the anaerobic biodegradation of TCE and subsequently degrades to ethene and/or ethane. The current data indicate that anaerobic biodegradation (e.g., TCE to *cis*- and *trans*-1,2-dichloroethene) is not a major process at the C-400 Complex.

A cosolvent effect may apply where there are two types of organic contaminants present: one type that is hydrophobic and sparingly soluble (e.g., PAHs, PCBs), and another type that may function as a cosolvent for the sparingly soluble contaminant (Huling 1989). A cosolvency effect at the C-400 Complex could be a higher than expected concentration of PCBs and/or PAHs (the cosolved constituent) in association with TCE.

5.3 UCRS LEACHABILITY EVALUATION

To evaluate sources in the UCRS with the potential to impact RGA groundwater, a process was developed to screen RI and historical UCRS soil data. This process identifies chemicals that should be further evaluated using remedial guide (RG) SSLs, which are based on site-specific geochemical parameters and the DAF for the C-400 Complex of 22 [identified from a deterministic calculation (Attachment B1, Dilution Attenuation Factor Evaluation)]. RG SSLs are site-specific screening levels that evaluate the potential of contaminants to leach to groundwater. The full details of the RG SSL determination process can be found in Attachment B.2, Section B.2.1.2. The steps for screening contaminants in soils are also described in Section B.2.1.1. Analytes that passed the screening process were further evaluated using environmental visualization system (EVS) modeling to assess their spatial distribution and to identify possible source areas for potential fate and transport modeling. The screening process is supplemented with a review of related information to ensure that concentrations that may be below background levels and/or infrequently detected/exceeded are not evaluated further. The full details of the screening process and EVS modeling are provided in Appendix B. The overall process included the following:

- Screening of sector-specific soil sampling results against the Paducah Site project-specific RG SSLs;

- Reviewing the soil constituents that are not screened from further modeling to identify possible source areas that could potentially impact RGA groundwater and evaluating spatial distribution using EVS modeling;

- Further analyzing possible source area constituent soil data laboratory detection limits and evaluating any uncertainty in the findings of the data screening and using EVS modeling; and

- Assessing the applicability of previous modeling efforts, documented in the WAG 6 Remedial Investigation Report (WAG 6 RI), to estimate current impacts to groundwater (DOE 1999).

The RG SSLs were calculated using EPA-established formulas for nonradionuclides and radionuclides. These formulas and inputs are consistent with those used in the Human Health RMD (DOE 2021). The RG SSLs were back-calculated from MCLs (or NAL values, if an MCL was not available) using the site-specific DAF of 22.

5.3.1 Soil Contaminant Screening

The screening process is described in detail in Appendix B and summarized in this section. Only soil constituents identified in the risk assessment as C-400 groundwater COCs (both current and historical) were included in the screening process. For each sector, soil analytical results for constituents identified in the source leachability screen (based on the risk assessment protection of groundwater screen using a DAF of 20) were compared to the RG SSL values and provisional background values (if available). If the sector average concentration for a COC was found to be above both the SSL and provisional background, then the number of soil chemistry detects exceeding the SSL and the number of detects exceeding the provisional background were counted for each sector. If the average soil constituent concentration was found to be above both background value and the RG SSL, and at least three detects in a sector were above both the background and the SSL, then the soil constituent was subsequently evaluated by examining the spatial distribution of soil analytical results in three dimensions using EVS modeling.

Soil screening was conducted using the EVS database, which is different from the database used for the risk assessment screening tables in Section 4 because the EVS database is tailored for spatial modeling of soil contaminants. The following are some key differences of the EVS database.

- Only soil samples were included (no concrete cores).

- Samples from the top 60 ft bgs are included, regardless of which HU they were collected from. This was done to exclude samples below the approximate depth of the water table.

- Grid samples (sample ID ending in "G##," where ## is a number) were included.

Because of these differences, sample counts in the screening tables in this section are different than those in Section 4 and Appendix C. The analyses in this section are intended as a complement to those in Section 4 but do not compare directly because the objectives of the two analyses are different (SRE vs. soil leachate screening).

A total of 17 sector and soil-constituent combinations were identified to have overall average concentrations of a soil constituent that exceeded both the respective RG SSL and the provisional background level and had at least one sector with at least three soil samples above both the RG SSL and the background level. A complete summary of the screening results for each sector are provided in Appendix B, Attachment B.2. The following COCs were identified in the possible source areas screening.

- 1,4-dioxane—2 sectors exceeded
- TCE—6 sectors exceeded
- vinyl chloride—2 sectors exceeded
- naphthalene—4 sectors exceeded
- technetium-99—3 sectors exceeded

5.3.2 Possible Source Areas Screening

The COCs retained in the screening process, with the exception of TCE and vinyl chloride, were further evaluated by modeling the spatial distribution of UCRS COCs using EVS modeling. Along with consideration of previous plume mapping, the results of previous fate and transport modeling efforts reported in the WAG 6 RI and the Soils OU RI were considered when deciding whether further fate and transport modeling was necessary (DOE 1999, DOE 2011b).

Two of the COCs retained from the screening process, TCE and technetium-99, have been delineated in the RGA as part of the sitewide plume evaluation (FRNP 2021). A review of these plumes indicates that a principal source(s) of both TCE and technetium-99 at PGDP originate at the C-400 Complex. The highest concentration portions of these plumes are co-located and migrate through the RGA from the C-400 Complex toward the northwest corner of the DOE Paducah Site controlled access area.

Three of the COCs retained from the screening process (i.e., technetium-99, TCE, vinyl chloride) were evaluated with fate and transport modeling as part of the WAG 6 RI (DOE 1999). Also, TCE fate and transport modeling for the SWMU 47 was conducted as part of the Soils OU RI (DOE 2011b). The results of these modeling efforts are discussed as part of the evaluations below for each individual COC.

Technetium-99

A review of the high fraction of exceedances for technetium-99 in Sector 1C (Appendix B) indicates the presence of a soil source of technetium-99 below the C-400 Complex. The impacts of this UCRS source to RGA groundwater are documented in the sitewide plume evaluation and mapping, which show that the existing technetium-99 plume at the site originates beneath the C-400 Complex (FRNP 2021). Modeling was previously conducted for the WAG 6 RI for Sectors 5, 6, and 7; however, it did not include the impacts below Sector 1 (DOE 1999). Furthermore, the "Technical Memorandum—Groundwater Plume Analytics™ Services Including a Ricker Method® Plume Stability Analysis and Well Sufficiency Analysis™ Paducah Gaseous Diffusion Plant, Paducah, Kentucky" determined the technetium-99 mass and average technetium-99 concentration were decreasing in the technetium-99 plume (EarthCon 2017). Consequently, fate and transport modeling for assessing the current or future levels of contaminant exposure originating from the C-400 Complex is not needed for decision making in a future FS.

TCE and Vinyl Chloride

Similar to technetium-99, the fraction of exceedances of the SSL for TCE (Appendix B) indicates soil sources of TCE at the C-400 Complex, with the largest fraction of exceedances in Sector 4. The impacts of this UCRS source to RGA groundwater is documented in the sitewide plume evaluation and mapping, which shows the existing TCE plume at the site originates beneath the C-400 Complex (FRNP 2021). Modeling for assessing the current or future levels of contaminant exposure originating from the C-400 Complex is not needed for decision making in a future FS for the following reasons.

- Modeling for TCE was previously conducted for the WAG 6 RI for Sectors 3–7 using concentrations generally representative of the current conditions (DOE 1999). The predicted time to reach maximum concentrations at the DOE property boundary was approximately 96–112 years. In the Soils OU RI, TCE modeling was conducted for SWMU 47, which represents only a small fraction of the soils at the C-400 Complex; the estimated time to reach maximum predicted groundwater concentration at the DOE property boundary was approximately 31 years (DOE 2011b).

- The TCE plume is fully delineated, and long-term monitoring of TCE indicates that the TCE plume is stable and has been fully developed for decades (FRNP 2021).

Vinyl chloride was also excluded from further fate and transport modeling because it is a degradation breakdown product of TCE and is, therefore, co-located with the TCE plume. Furthermore, high detection limits (up to 575 times the SSL) for vinyl chloride were observed in sectors with high TCE contamination. The TCE contamination in soil resulted in high detection limits for vinyl chloride due to dilution in samples with high TCE detects, precluding accurate delineation of vinyl chloride down to the SSL in TCE source areas. This was also the case in groundwater, with all vinyl chloride detection limits exceeding the residential groundwater NAL and with a detection frequency in groundwater of 3.5% (29 detects in 833 samples). Vinyl chloride was modeled for the WAG 6 RI, and the estimated time to reach maximum concentration at the DOE property boundary was approximately 61 years (DOE 1999).

1,4-Dioxane

Detection limits for 1,4-dioxane are 22 to 4,100 times higher than the SSL; conventional analytical methods can only detect the analyte at concentrations 100 times greater than the concentrations of other VOCs, resulting in exceedances in the screening process due to nondetects. The highest rate of detects per sector for 1,4-dioxane is 6.8% (6 detects in 88 samples in the EVS database) in Sector 2. Because of the low fraction of detects and high detection limits, in addition to the spatially discrete nature of detects, no 1,4-dioxane source areas could be delineated. Furthermore, the detection limit of 1,4-dioxane in groundwater was higher than the groundwater residential NAL, and the detection rate in groundwater in the RGA was 1 detection out of 191 samples—or 0.5%. Because of these factors, the presence of 1,4-dioxane in soils and groundwater at concentrations above the screening levels could not be fully assessed, and no possible source areas in soil could be quantitatively established; therefore, 1,4-dioxane was not considered for fate and transport modeling.

Naphthalene

Detection limits for naphthalene are 1.4 which is 47 times higher than the SSL, resulting in exceedances in the screening process that are due to nondetects. The highest rate of detects per sector for naphthalene is 4.3% (3 detects in 70 samples in the EVS database) in Sector 7. Because of the low fraction of detects and high detection limits, in addition to the spatially discrete nature of detects, no naphthalene source areas could be delineated. Furthermore, naphthalene detection limits in groundwater were higher than the groundwater residential NAL, and the detection rate in RGA groundwater was 0 detections out of 256 samples—or 0%. Naphthalene is not a current groundwater COC but was initially included because it is a historical groundwater COC; however, based on current evidence, naphthalene does not appear to be a risk driver to groundwater in the RGA at the C-400 Complex and was not considered for fate and transport modeling.

5.3.3 Summary

Screening was applied to RI and historical groundwater COCs at the C-400 Complex area to evaluate which COCs were likely to result in impacts to groundwater in the RGA. Five distinct COCs were identified based on this screening process; however, further evaluation of the data determined that none of the identified COCs required further fate and transport modeling.

Two compounds (naphthalene and 1,4-dioxane) did not require modeling because their detection limits were above the screening levels. The low frequency of detects for both compounds resulted in no possible source areas being identified for either COC and, therefore, they were not considered for further fate and transport modeling.

Technetium-99, TCE, and vinyl chloride were not considered for further fate and transport modeling because they represent stable soil sources with no change in plume characteristics, which have been previously modeled as part of the WAG 6 RI (DOE 1999). Results of the WAG 6 modeling area are accepted as representative for this RI and can be used for evaluations in a future FS.

5.4 MODFLOW PUMP-AND-TREAT ALTERNATIVE MODELING

To demonstrate hydraulic capture and estimate extraction rates to support a future FS report, modeling using a pump-and-treat system was performed to simulate groundwater flow conditions in the RGA. This modeling effort employs the most recent groundwater flow model for the site (last updated in 2016), with some updates, to reflect current site conditions and revisions to the flow system to reflect the desired evaluation conditions (DOE 2017b). The details of the modeling analysis are described in Appendix B and summarized in this section.

The 2016 Sitewide Groundwater Flow Model framework[18] served as the basis to simulate current site conditions for use in estimating groundwater flow conditions at the C-400 Complex under future remedial scenarios. The 2016 modeling was conducted using MODFLOW 2005, a widely used and accepted finite-difference code developed by the USGS (Harbaugh 2005). The 2016 model domain extended from the Terrace Deposits south of the site to the Ohio River north of the site. The model consisted of three layers, representing the RGA with a variable hydraulic conductivity field calibrated using pilot points. Consistent with the CSM, the Ohio River and the lower reaches of Bayou Creek and Little Bayou Creek were in direct communication with the RGA and acted as discharge boundaries. These surface water bodies were represented in the model with river boundary conditions. The model was calibrated to two stress periods: December 1997 prior to the implementation of the groundwater extraction systems, and September 2014 during active groundwater extraction in the Northeast Plume and Northwest Plume.

Model limitations of the 2016 Sitewide Groundwater Flow Model are summarized in the model update report and include the model formulation and calibration as a steady-state model, its regional scale, and its limited domain, which does not include the portion of the site that is south of the RGA (DOE 2017b). More specific limitations are summarized in Section 7.2 of the 2016 Sitewide Groundwater Flow Model update report.

As configured, the 2016 Sitewide Groundwater Flow Model provided a representation of the groundwater flow system within the PGDP hydrologic basin under steady-state site conditions, which typically occur during the drier months of the year (i.e., July–October). During wetter months of the year, the steady-state model is a less valid representation of site conditions, which is due primarily to transient conditions caused by more variable Ohio River stages.

The following updates and revisions to the 2016 Sitewide Groundwater Flow Model were implemented for this evaluation.

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[18] Although EPA has not concurred on the use of the updated model and the model report identifies several uncertainties, the 2016 groundwater flow model best represents the current site conditions and understanding of groundwater flow at PGDP (DOE 2017b). The framework from the 2016 model update is used for near-field assessment (inside the C-400 Complex OU), where the model uncertainties have lower potential impact on the modeling results; far-field assessment is performed qualitatively.

- Heads in the Ohio River and lower reaches of Bayou Creek and Little Bayou Creek were adjusted to reflect average steady-state Ohio River levels measured since the completion of the Olmsted Dam in 2018;

- Northeast Plume and Northwest Plume extraction well flow rates were set to zero to evaluate the effectiveness of potential remedial alternatives at the C-400 Complex OU in the absence of other remediation at the site;

- Ambient recharge rates due to precipitation were adjusted to simulate conditions during both seasonally dry and seasonally wet periods; and

- A new recharge zone was added to simulate recharge over a soil cap that may potentially be included at the C-400 Complex in a pump-and-treat remedial alternative.

In addition, particles were added along the C-400 Complex OU boundary to evaluate groundwater capture by a potential pump-and-treat scenario using MODPATH, a particle tracking post-processing package for MODFLOW (Pollock 1994).

The RI model simulated seasonally dry and seasonally wet conditions, with two extraction wells at the C-400 Complex with a total pumping rate of 30 gallons per minute (gpm) and 40 gpm, respectively. Potentiometric contours starting at the C-400 Complex boundary indicate that water levels in the vicinity of the C-400 Complex are approximately 5 ft higher than water levels simulated in the 2016 model Stress Period 2 due to a higher river stage and the pumping rates at the northeast and northwest extraction wells being reduced to zero. Water levels in the vicinity of the C-400 Complex were predicted to be approximately 5 ft higher during seasonally wet periods compared to seasonally dry periods, consistent with the seasonal variation observed at the C-400 Complex. The forward particle tracking demonstrated complete capture of groundwater beneath the C-400 Complex for both the seasonally dry and seasonally wet condition models.

The model results indicate that, under dry conditions, C-400 groundwater was captured with two fully-penetrating extraction wells—each pumping at 15 gpm. Under seasonally wet conditions, groundwater capture was accomplished with the extraction wells each pumping at 20 gpm.

5.5 MATRIX DIFFUSION MODELING

Groundwater fate and transport modeling was performed to estimate the restoration time frame for potential remedial actions and remedial alternatives being considered for a future C-400 FS. To include the effects of matrix diffusion on remediation time frames, the REMChlor-MD model was used. REMChlor-MD is a semi-analytical model that uses a conventional advection/dispersion formulation to simulate transport from an upgradient source zone to a homogeneous transmissive zone with a constant groundwater velocity field. With this method, only the transmissive zone is discretized in the numerical model, and the interaction with the low permeability zone is accounted for in a time-dependent source/sink term that is computed analytically. Due to model limitations, upgradient sources in the McNairy, barrier walls, and the period during which source removal occurs cannot be simulated. Consequently, the REMChlor model was used to simulate a relatively simple representation of a pump-and-treat remedy, and the results were used to infer conclusions regarding cleanup times for potential alternatives that may include a barrier wall as a component.

The objective of the matrix diffusion modeling is to estimate the restoration time frame, which is defined as the time required for TCE concentrations at an observation well located at the downgradient C-400 Complex boundary to decrease below the 5 μg/L MCL. The first step in the analysis was to compile measurements of soil characteristics, water quality, and geochemistry collected at the C-400 Complex. Next, each measurement was evaluated and incorporated as a model input to develop a model configuration representative of the C-400 Complex CSM. Finally, model results were processed and used to estimate the restoration time frame associated with a pump-and-treat scenario.

The configuration of the TCE source zone in the RGA in the model was based on the confirmed/probable source zone in Sector 4 of the C-400 Complex area (Figure 4.56). The assumed efficiency for targeted remediation within the source zone area was 95% TCE mass removal. The simulated hydraulic gradient across the C-400 Complex was based on a 40-gpm pumping rate estimated for a pump-and-treat scenario. Details of the model construction and input parameters are provided in Appendix B.

Fate and transport modeling performed for the Soils OU RI for SWMU 47 (within Sector 6) (DOE 2011b) and for the WAG 6 RI for sectors of the C-400 Complex (DOE 1999) predicted dissolved TCE concentrations at the downgradient DOE property boundary, which were derived from the then-existing TCE sources with no remediation, would continue to increase for approximately 31 to 112 years from the respective RI field investigations. The results of the baseline matrix diffusion model, presented in Figure 5.1, indicate TCE concentrations in the downgradient observation well at the C-400 Complex OU are characterized by a rapid decrease after source zone remediation (several orders of magnitude over a few years), followed by a longer period of flatter tailing. This trend emphasizes that low levels of TCE, above its MCL, will persist in RGA groundwater at the C-400 Complex OU for long periods of time, even with effective remediation of the source zone, with concentrations controlled by diffusion rather than advection forces. TCE concentrations within the C-400 Complex OU will decrease below the MCL (5 µg/L) approximately 280 years after source zone remediation is complete.

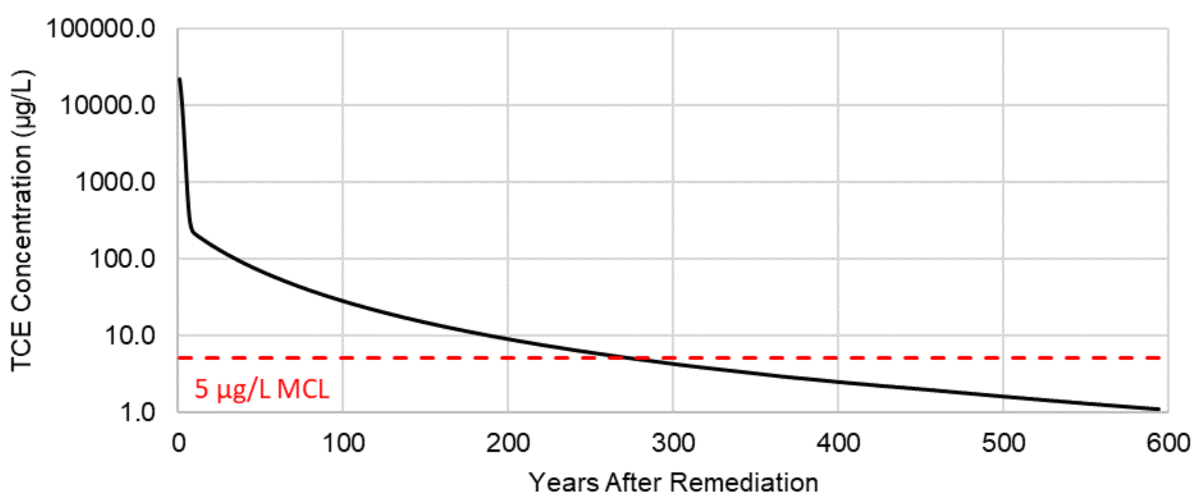

Figure 5.1. TCE Concentrations at the Downgradient Observation Well

A sensitivity analysis was performed to determine the relative influence of select model input parameters on the restoration time frame results. The number of years until TCE concentrations in the downgradient observation well reached 5 µg/L MCL was used as the metric for analysis of parameter influence. Model input parameters analyzed include the hydraulic gradient across the RGA, the soil K_d values, the RGA hydraulic conductivity, and initial source zone TCE concentration and mass. Each parameter was modified above and below its calibrated value while holding constant all other parameter values.

The results of the sensitivity analysis for the C-400 Complex indicated that the parameters with the strongest influence on the restoration time frame are the hydraulic gradient (227–392 years across its range of variation) and the hydraulic conductivity of the RGA soils (238–719 years across its range of variation), which together govern the rate of groundwater flow and TCE transport through the C-400 Complex. The initial groundwater concentration of TCE in the source zone also played an important role in the restoration time frame, as the rate of TCE mass loading to the downgradient McNairy Formation soils is also controlled by the concentration of TCE moving through the RGA soils. The K_d values of the RGA and McNairy Formation soils had a relatively low influence on the time to achieve the MCL, and the influence of the initial source zone TCE mass was negligible.

The modeling results indicate that the estimated restoration time frame to meet the MCL for TCE in RGA groundwater within the C-400 Complex area is approximately 280 years, following targeted source zone removal. Scenario 5 of the sensitivity analysis for matrix diffusion modeling shows that a near 50% increase in the gradient (with the same effect as a 50% increase in the pumping rate) reduces the time to achieve the TCE MCL from 280 to 227 years (a near 20% reduction in the restoration period.) The restoration time frame for other potential remedial scenarios being considered in a future FS, which include barrier walls for hydraulic containment, would likely be at least the time estimated for a pump-and-treat alternative because ambient hydraulic gradients within the barrier wall will likely be lower. (An increase in the pumping rate in alternatives that include barrier walls also would reduce the modeled restoration time frame for these scenarios.) Furthermore, the TCE source zone used in the REMChlor-MD model does not incorporate other smaller TCE source zones across the C-400 Complex, or the TCE source zone in the McNairy Formation, which would contribute additional TCE mass to the underlying McNairy Formation soils and potentially extend the restoration time frame. As a result, the calculated 280-year restoration time frame provides a minimum estimate of TCE cleanup time within the C-400 Complex boundary based on reasonable assumptions and site conditions for all remedial alternatives being considered in a future FS. Similar results expected for TCE breakdown products *cis*- and *trans*-1,2-dichloroethene can be used for decision making in a future FS. These estimated time frames begin at the completion of source removal, initiation of the pump-and-treat portion of the alternative, and do not account for the time to complete 95% TCE reduction in the source zone. The approximate time to complete targeted source zone removal will be discussed in a future FS report, if applicable.

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6. SCREENING RISK EVALUATION

Consistent with agreements reached during project scoping and because the C-400 Complex area already has been subjected to a full baseline risk assessment (BRA) that concluded action needed to be taken at the site, an SRE was conducted with the combined newly generated data and historical data to complement the previously performed BRA (Section 6.1) and an SERA (Section 6.2) was conducted (DOE 1999). Together the SRE, the SERA, and the previous risk assessments constitute a full BRA, as documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

6.1 HUMAN HEALTH SCREENING RISK EVALUATION

The purpose of this section is to summarize the results of the human health SRE and provide significant observations and interpretation of the results of the assessment for use by risk managers. Risk evaluations reflect the FFA parties' discussions during the scoping process, which are documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

6.1.1 Chemicals of Potential Concern

Data were examined to ensure that sampling methods were adequate for determining the nature and extent of contamination and were representative of current contaminant concentrations in surface and subsurface soil and groundwater at the C-400 Complex. Historical data (described in Section 3.9.3) along with collected samples as part of the C-400 Complex RI were combined to develop the SRE dataset. Additional steps used to evaluate the SRE dataset include:

- Evaluation of the analytical methods used to generate data;
- Evaluation of data qualifiers associated with data;
- Evaluation of the sample quantitation limits and detection limits;
- Removal of analytes not detected in SRE dataset;
- Examination of the toxicity using NALs;
- Examination of the protection of groundwater pathway using SSLs; and
- Removal of essential nutrients from SRE dataset (i.e., calcium, chloride, iodine, magnesium, potassium, sodium, phosphorus).

Soil data were segregated into seven exposure units referred to as sectors for the identification of COPCs and quantification of risk. Sector 1 encompassed the building footprint while Sector 2 through Sector 7 included soil surrounding the building. Data within each exposure unit were then screened for COPCs that progressed in the SRE.

Maximum detected concentrations were compared to direct contact NALs to identify COPCs for an exposure unit-media. NALs are the lesser of a hazard-based value, calculated using a target HI of 0.1 and a cancer-based value calculated using a target ELCR of 1E-06. The basis of the NALs used for comparison to sector-media pairs were as follows:

- Surface soil—Industrial worker NALs;
- Surface and Subsurface soil—Excavation worker NALs;
- Groundwater—Resident NALs.

Background concentrations for analytes were also used for comparison to site data. If an analyte had a detected concentration greater than the provisional background concentration and its respective NAL, then it was identified as a COPC for the exposure unit-media pair and progressed in the SRE. The analytes that exceeded their respective NAL but did not exceed provisional background concentrations are as follows:

Surface Soil

- Sector 1—arsenic
- Sector 4—arsenic
- Sector 5—radium-226
- Sector 7—arsenic and radium-226

Surface and Subsurface Soil

- Sector 2—cobalt
- Sector 3—iron
- Sector 4—cobalt
- Sector 5—radium-226
- Sector 7—iron and radium-226

Groundwater

- RGA—antimony, lead, nickel, thallium, vanadium, and thorium-230
- McNairy—antimony, arsenic, chromium, cobalt, fluoride, and manganese

The list of COPCs included the following analyte classes:

- Dioxin/Furans
- Metals
- PCBs
- Radionuclides
- SVOCs
- VOCs

Maximum detected concentrations were compared to the SSLs for the protection of groundwater based on the residential NALs that utilized the default DAFs of 1 and 20 as well as the site-specific DAF of 22 to identify which analytes would be further evaluated in the Fate and Transport section of the report. Additional evaluations of this pathway using site-specific SSLs based on site-specific geochemical parameters and a site-specific DAF of 22 are presented in Section 5 and Appendix B. Background concentrations were also included to determine which analytes would be further evaluated. Data in soil were segregated as follows:

- Surface soil (0–1 ft bgs)
- Subsurface soil (1–16 ft bgs)
- Deep soil (> 16 ft bgs to the bottom of RGA soil)
- McNairy soil

Maximum detected concentrations were compared to the resident NALs, ALs, and MCLs, to identify which analytes would be further evaluated in Section 5.3. Provisional background concentrations were also included to determine which analytes would be further evaluated. Data in groundwater were segregated as follows:

- RGA groundwater; and
- McNairy groundwater.

The list of soil and groundwater analytes that progressed to Section 5.3 included the following chemical classes.

- Radionuclides
- SVOCs
- VOCs

6.1.2 Exposure Assessment

Three steps are involved in the exposure assessment. Step 1 is characterization of the exposure setting which includes a description of the human population located on or near the site that may affect the extent of exposure and the physical characteristics of the site. Step 2 is identification of exposure pathways including the identification of complete exposure pathways with all the links between the source and the exposed population. A complete pathway consists of the source of release, a mechanism of release, a transport medium, a point of potential human contact, and an exposure route. Step 3 includes the quantification of the exposure which estimates exposures or representative concentrations for COPCs and quantifying intakes.

Human health risks are assessed by determining points of exposure (POEs) and exposure routes. POEs are locations where human receptors can contact contaminated media. Exposure routes are the processes by which human receptors contact contaminated media. The exposure routes evaluated quantitatively in this SRE were as follows:

- Current and future industrial workers were assumed to be exposed to surface soil, brick, and concrete located between 0–1 ft bgs. For these receptors, exposure to chemical COPCs in surface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Ingestion and inhalation of concrete is unlikely. Exposure to radionuclide COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

- Future excavation workers are the only receptors that are assumed to be exposed to surface and subsurface soil, brick, and concrete located between 0–16 ft bgs. For these receptors, exposure to chemical COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Exposure to radionuclide COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

- Future hypothetical residents are the only receptors that are assumed to be exposed to groundwater in the RGA and the McNairy. For these receptors, exposure to chemical COPCs in groundwater is assumed to occur via direct ingestion of groundwater, dermal absorption, and inhalation of vapors while using groundwater for household purposes (e.g., showering). Exposure to radionuclide COPCs in groundwater is assumed to occur via direct ingestion of groundwater.

Exposure point concentrations (EPCs) are concentration estimates of potential exposure that are selected to address uncertainty and variability in the dataset. EPCs are developed to represent an average exposure concentration for receptors over an exposure unit; therefore, EPCs were developed for each exposure unit-media combination. EPCs were developed/selected for surface soil and surface and subsurface soil by assigning a concentration to a grid located within a sector. The maximum detected concentration was assigned to the grid if multiple data points were available for a COPC and the minimum detection limit was assigned when the COPC was not detected. The concentration from each grid was then used to develop a 95% upper confidence limit of the mean (UCL95) which was selected as the EPC if there was sufficient data.

EPCs were also developed/selected for groundwater exposure units. Data deemed sufficient for use in the SRE were used to calculate the UCL95 that would be selected as the EPC. If data were insufficient, the maximum detected concentration was selected as the EPC.

The criteria for insufficient data included the following:

- Less than ten samples for a COPC in the exposure unit; or
- Less than four detections for a COPC in the exposure unit; or
- Less than two distinct values for a COPC in the exposure unit.

6.1.3 Toxicity Assessment

Toxicity values were obtained from the RAIS. This site also lists toxicity values (summarized in the Human Health RMD) taken from the following:

- EPA's Integrated Risk Information System database;

- EPA's Superfund Health Risk Technical Support Center Provisional Peer-Reviewed Toxicity Values (PPRTVs);

- EPA's Office of Pesticide Program, Human Health Benchmarks for Pesticides;

- The Agency for Toxic Substances and Disease Registry (ATSDR's) minimal risk levels (MRLs);

- California EPA Office of Environmental Health Hazard Assessment toxicity values;

- Screening toxicity values in an appendix to certain PPRTV assessments;

- National Center for Environmental Assessment, and Health Effects Assessment Summary Tables database; and

- ATSDR's draft MRLs.

Potential carcinogenic effects resulting from human exposure to chemicals are estimated quantitatively using cancer slope factors (CSFs), which represent the theoretical increased risk per milligram of contaminant intake per kilogram body weight per day, or cancer inhalation unit risk (IUR) factors, which are the theoretical increased risks at defined exposure concentrations. CSFs or IUR factors are used to estimate the theoretical upper-bound lifetime probability of an individual developing cancer as a result of exposure to a potential carcinogen (EPA 1989).

Potential non-carcinogenic effects resulting from human exposure to chemicals are generally estimated quantitatively using reference doses (RfDs) and reference concentrations (RfCs). The RfD, expressed in units of daily dose (mg/kg per day), is an estimate of the daily maximum level of exposure to human populations (including sensitive sub-populations) that is likely to be without an appreciable risk of deleterious effects (EPA 1989). For inhalation exposures, the EPA has derived RfCs for some chemicals. In concept, an inhalation RfC is similar to an RfD. If the concentration of a chemical in the air to which a human is exposed is lower than the RfC, then there is no appreciable risk for noncancer health effects from that exposure.

6.1.4 Risk Characterization

In this SRE, the numerical estimate of the potential for cancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as an ELCR. This value is calculated as shown in the following equation:

$$ELCR_{COPC} = \frac{EPC_{COPCi}}{Carcinogenic\ NAL_{COPCi}} \times 1 \times 10^{-6}$$

where:

ELCR is the ELCR for the COPC, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Carcinogenic NAL is the carcinogenic NAL for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

The numerical estimate of the potential for noncancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as a hazard quotient (HQ). This value is calculated as shown in the following equation:

$$HQ = \frac{EPC_{COPCi}}{Noncarcinogenic\ NAL_{COPCi}} \times 0.1$$

where:

HQ is the hazard quotient, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Noncarcinogenic NAL is the noncarcinogenic NAL for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs

The calculation for the carcinogenic and noncarcinogenic endpoints were performed on two scales for each soil sector, a calculation for each individual grid within a sector and the calculation for the sector.

The identification of COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, COPCs exceeding either an ELCR of

1 × 10^{-6} or a HQ of 0.1 were identified as COCs.[19] For the risk characterization of soil, an ELCR and HQ were developed for individual grids as well as a sector-wide ELCR and HQ. The sector-wide ELCR and HQ for COPCs were used to identify COCs for the sector; whereas, individual grid ELCR and HQ calculations were presented to provide information for risk managers. The individual grid quantification of risk and hazard were not used for identification of COCs.

The identification of priority COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, COPCs exceeding either an ELCR of 1 × 10^{-4} or a HQ of 1 were identified as priority COCs.

A summary of the receptor, identified COCs, and priority COCs for surface soil, surface and subsurface soil, and groundwater are provided in Table 6.1, Table 6.2, and Table 6.3, respectively.

Table 6.1. Industrial Worker Surface Soil COCs and Priority COCs

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 1	Chromium	47.4	3.9E-06	1.2%	0.0068	0.7%	No
Sector 1	Total PAH	2.11	3.3E-06	1%	0.031	3%	No
Sector 1	Total PCB	3.788	1.3E-05	4%	--	--	No
Sector 1	Uranium metal	409	--	--	0.88	88%	No
Sector 1	Cesium-137	4.61	4.3E-05	13%	--	--	No
Sector 1	Neptunium-237	17.2	6.9E-05	21%	--	--	No
Sector 1	Radium-226	2.54	1.0E-04	31%	--	--	No
Sector 1	Uranium-233/234	124	2.5E-06	0.8%	--	--	No
Sector 1	Uranium-235/236	7.51	1.8E-05	6%	--	--	No
Sector 1	Uranium-238	111	6.7E-05	21%	--	--	No
	Sector 1 Totals	**ELCR:**	**3.2E-04**	**HI:**	**0.96**		
Sector 2	Arsenic	7.54	5.0E-06	2%	0.029	2%	No
Sector 2	Chromium	24.8	2.0E-06	0.8%	0.0036	0.3%	No
Sector 2	Uranium metal	611	--	--	1.3	98%	Yes
Sector 2	Neptunium-237	1.15	5.0E-06	2%	--	--	No
Sector 2	Uranium-233/234	343	7.0E-06	3%	--	--	No
Sector 2	Uranium-235/236	10.4	3.0E-05	10%	--	--	No
Sector 2	Uranium-238	369	2.0E-04	83%	--	--	Yes
	Sector 2 Totals	**ELCR:**	**2.5E-04**	**HI:**	**2.3**		
Sector 3	Arsenic	8.44	5.0E-06	23%	0.033	17%	No
Sector 3	Chromium	18.3	1.5E-06	6%	0.0026	1%	No
Sector 3	Total PAH	0.81	1.3E-06	6%	0.012	6%	No
Sector 3	Trichloroethene	2.81	4.5E-07	2%	0.15	75%	No
Sector 3	Uranium-235/236	1.06	2.6E-06	11%	--	--	No
Sector 3	Uranium-238	19.5	1.2E-05	52%	--	--	No
	Sector 3 Totals	**ELCR:**	**2.3E-05**	**HI:**	**0.20**		

[19] The Human Health RMD indicates that use scenarios of concern, pathways of concern, and media of concern should not be identified when the risk analysis is based on screening methodology that utilizes calculated ratios of chemical- and radionuclide-specific media concentrations and NALs.

Table 6.1. Industrial Worker Surface Soil COCs and Priority COCs (Continued)

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 4	Chromium	26.2	2.1E-06	1%	0.0038	2%	No
Sector 4	Total PCB	0.42	1.4E-06	0.8%	--	--	No
Sector 4	Uranium metal	83.7	--	--	0.18	98%	No
Sector 4	Neptunium-237	4.5	1.8E-05	10%	--	--	No
Sector 4	Uranium-233/234	146	2.9E-06	2%	--	--	No
Sector 4	Uranium-235/236	6.8	1.7E-05	10%	--	--	No
Sector 4	Uranium-238	209	1.3E-04	75%	--	--	Yes
	Sector 4 Totals	**ELCR:**	**1.7E-04**	**HI:**	**0.18**		
Sector 4 Railroad	Chromium	40.7	3.3E-06	19%	0.0059	2%	No
Sector 4 Railroad	Uranium metal	154	--	--	0.33	97%	No
Sector 4 Railroad	Neptunium-237	0.93	3.7E-06	21%	--	--	No
Sector 4 Railroad	Uranium-235/236	0.44	1.1E-06	6.2%	--	--	No
Sector 4 Railroad	Uranium-238	15	9.3E-06	52%	--	--	No
	Sector 4 Railroad Totals	**ELCR:**	**1.8E-05**	**HI:**	**0.34**		
Sector 5	Arsenic	7.7	4.8E-06	0.6%	0.03	4%	No
Sector 5	Chromium	20	1.7E-06	0.2%	0.0029	0.4%	No
Sector 5	Total PAH	2.1	3.2E-06	0.4%	0.03	4%	No
Sector 5	Trichloroethene	13	2.1E-06	0.3%	0.7	84%	No
Sector 5	Cesium-137	3.1	2.9E-05	3%	--	--	No
Sector 5	Neptunium-237	3.5	1.4E-05	2%	--	--	No
Sector 5	Uranium-233/234	900	1.8E-05	2%	--	--	No
Sector 5	Uranium-235/236	82	2.0E-04	24%	--	--	Yes
Sector 5	Uranium-238	932	5.6E-04	67%	--	--	Yes
	Sector 5 Totals	**ELCR:**	**8.3E-04**	**HI:**	**0.83**		
Sector 5 Railroad	Arsenic	6.5	4.0E-06	35%	0.025	17%	No
Sector 5 Railroad	Chromium	18.25	1.5E-06	13%	0.0026	2%	No
Sector 5 Railroad	Uranium metal	57	--	--	0.12	80%	No
Sector 5 Railroad	Uranium-235/236	0.514	1.3E-06	11%	--	--	No
Sector 5 Railroad	Uranium-238	7	4.5E-06	39%	--	--	No
	Sector 5 Railroad Totals	**ELCR:**	**1.2E-05**	**HI:**	**0.15**		
Sector 6	Arsenic	10.97	6.9E-06	0.9%	0.043	8%	No
Sector 6	Chromium	53.23	4.3E-06	0.5%	0.0077	1%	No
Sector 6	Total PAH	3.435	5.3E-06	0.7%	0.05	9%	No
Sector 6	Total PCB	0.5	1.7E-06	0.2%	--	--	No
Sector 6	Uranium metal	175	--	--	0.38	68%	No
Sector 6	Americium-241	39.3	6.5E-06	0.8%	--	--	No
Sector 6	Cesium-137	1.94	1.8E-05	2%	--	--	No
Sector 6	Neptunium-237	18.6	7.5E-05	9%	--	--	No
Sector 6	Plutonium-239/240	239	1.1E-05	1%	--	--	No
Sector 6	Thorium-230	10,600	3.4E-04	42%	--	--	Yes
Sector 6	Uranium-233/234	413	8.2E-06	1%	--	--	No
Sector 6	Uranium-235/236	21.83	5.4E-05	7%	--	--	No
Sector 6	Uranium-238	440	2.7E-04	34%	--	--	Yes
	Sector 6 Totals	**ELCR:**	**8.0E-04**	**HI:**	**0.56**		

Table 6.1. Industrial Worker Surface Soil COCs and Priority COCs (Continued)

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 7	Chromium	24.13	2.0E-06	3%	0.0035	3%	No
Sector 7	Total PAH	1.473	2.3E-06	4%	0.022	20%	No
Sector 7	Cesium-137	1.27	1.2E-05	20%	--	--	No
Sector 7	Neptunium-237	6.5	2.6E-05	44%	--	--	No
Sector 7	Thorium-230	61.8	2.0E-06	3%	--	--	No
Sector 7	Uranium-235	0.821	2.0E-06	3%	--	--	No
Sector 7	Uranium-235/236	0.76	1.9E-06	3%	--	--	No
Sector 7	Uranium-238	18.05	1.1E-05	19%	--	--	No
	Sector 7 Totals	**ELCR:**	**5.9E-05**	**HI:**	**0.11**		

Table 6.2. Excavation Worker Surface and Subsurface Soils COCs and Priority COCs

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 1	Arsenic	7.38	2.0E-06	5%	0.061	1%	No
Sector 1	Chromium	55.7	6.1E-06	15%	0.057	1%	No
Sector 1	Cobalt	34.2	2.7E-09	< 0.1%	0.35	7%	No
Sector 1	Total PCB	3.56	3.2E-06	8%	--	--	No
Sector 1	Uranium metal	293	--	--	4.5	90%	Yes
Sector 1	Cesium-137	4.37	7.5E-06	18%	--	--	No
Sector 1	Neptunium-237	10.2	6.3E-06	15%	--	--	No
Sector 1	Radium-226	2.47	1.5E-05	36%	--	--	No
Sector 1	Uranium-233/234	93.5	2.2E-06	5%	--	--	No
Sector 1	Uranium-235/236	5.73	2.2E-06	5%	--	--	No
Sector 1	Uranium-238	109	1.2E-05	29%	--	--	No
	Sector 1 Totals	**ELCR:**	**6.0E-05**	**HI:**	**5.3**		
Sector 2	Arsenic	7.966	2.0E-06	4%	0.066	2%	No
Sector 2	Chromium	33.32	4.0E-06	6%	0.034	0.8%	No
Sector 2	Nickel	951	1.0E-08	< 0.1%	0.2	3%	No
Sector 2	Uranium metal	258	--	--	3.9	90%	Yes
Sector 2	Uranium-233/234	341.4	8.0E-06	13%	--	--	No
Sector 2	Uranium-235/236	10.43	4.0E-06	7%	--	--	No
Sector 2	Uranium-238	369	4.0E-05	70%	--	--	No
	Sector 2 Totals	**ELCR:**	**5.8E-05**	**HI:**	**4.4**		
Sector 3	Arsenic	9.49	2.5E-06	35%	0.079	8%	No
Sector 3	Chromium	21.2	2.3E-06	32%	0.021	2%	No
Sector 3	Cobalt	18	1.5E-09	<0.1%	0.19	19%	No
Sector 3	Manganese	1674	--	--	0.22	22%	No
Sector 3	Trichloroethene	3.18	1.0E-07	1%	0.14	14%	No
Sector 3	Uranium metal	18.4	--	--	0.28	28%	No
Sector 3	Uranium-238	19.8	2.2E-06	31%	--	--	No
	Sector 3 Totals	**ELCR:**	**7.1E-06**	**HI:**	**1.0**		

Table 6.2. Excavation Worker Surface and Subsurface Soils COCs and Priority COCs (Continued)

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 4	Arsenic	10.3	2.8E-06	6%	0.086	1%	No
Sector 4	Chromium	53.9	5.9E-06	13%	0.055	0.8%	No
Sector 4	Iron	28,009	--	--	0.12	2%	No
Sector 4	Manganese	1,501	--	--	0.19	3%	No
Sector 4	Trichloroethene	51.9	1.7E-06	4%	2.3	33%	Yes
Sector 4	Uranium metal	268	--	--	4.1	59%	Yes
Sector 4	Cesium-137	0.95	1.6E-06	4%	--	--	No
Sector 4	Neptunium-237	4.32	2.6E-06	6%	--	--	No
Sector 4	Uranium-233/234	146	3.4E-06	8%	--	--	No
Sector 4	Uranium-235/236	6.62	2.5E-06	6%	--	--	No
Sector 4	Uranium-238	207	2.3E-05	51%	--	--	No
	Sector 4 Totals	**ELCR:**	**4.5E-05**	**HI:**	**6.9**		
Sector 4 Railroad	Arsenic	12.1	3.2E-06	22%	0.1	3%	No
Sector 4 Railroad	Chromium	40.7	4.5E-06	30%	0.041	1%	No
Sector 4 Railroad	Iron	24,900	--	--	0.11	4%	No
Sector 4 Railroad	Total Dioxin/Furans	0.000054	1.9E-06	13%	0.28	9%	No
Sector 4 Railroad	Total PAH	4	1.5E-06	10%	0.071	2%	No
Sector 4 Railroad	Uranium metal	154	--	--	2.3	77%	Yes
Sector 4 Railroad	Neptunium-237	2.09	1.3E-06	9%	--	--	No
Sector 4 Railroad	Uranium-238	15.4	1.7E-06	11%	--	--	No
	Sector 4 Railroad Totals	**ELCR:**	**1.5E-05**	**HI:**	**3.0**		
Sector 5	Arsenic	9.76	2.6E-06	2%	0.081	2%	No
Sector 5	Chromium	27.1	3.0E-06	2%	0.028	1%	No
Sector 5	Cobalt	12	9.5E-10	< 0.1%	0.12	3%	No
Sector 5	Manganese	1143	--	--	0.15	3%	No
Sector 5	Trichloroethene	74	2.4E-06	1%	3.3	77%	Yes
Sector 5	Uranium metal	32.8	--	--	0.5	12%	No
Sector 5	Cesium-137	3.15	5.4E-06	3%	--	--	No
Sector 5	Neptunium-237	3.54	2.2E-06	1%	--	--	No
Sector 5	Uranium-233/234	900	2.1E-05	13%	--	--	No
Sector 5	Uranium-235/236	72.4	2.8E-05	17%	--	--	No
Sector 5	Uranium-238	932	1.0E-04	60%	--	--	No
	Sector 5 Totals	**ELCR:**	**1.7E-04**	**HI:**	**4.3**		
Sector 5 Railroad	Arsenic	7.84	2.1E-06	30%	0.065	6%	No
Sector 5 Railroad	Chromium	28.0	3.1E-06	45%	0.028	3%	No
Sector 5 Railroad	Cobalt	12.1	9.7E-10	< 0.1%	0.12	11%	No
Sector 5 Railroad	Manganese	1555	--	--	0.2	18%	No
Sector 5 Railroad	Uranium metal	34.9	--	--	0.53	48%	No
	Sector 5 Railroad Totals	**ELCR:**	**6.9E-06**	**HI:**	**1.1**		
Sector 6	Antimony	64	--	--	0.48	11%	No
Sector 6	Arsenic	11.2	3.0E-06	0.6%	0.093	2%	No
Sector 6	Chromium	55.1	6.0E-06	1%	0.056	1%	No
Sector 6	Cobalt	30.9	2.5E-09	< 0.1%	0.31	7%	No
Sector 6	Manganese	1,659	--	--	0.21	5%	No
Sector 6	Thallium	0.62	--	--	0.19	5%	No
Sector 6	Total PAH	3.44	1.5E-06	0.3%	0.068	2%	No
Sector 6	Uranium metal	177	--	--	2.7	64%	Yes

Table 6.2. Excavation Worker Surface and Subsurface Soils COCs and Priority COCs (Continued)

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
Sector 6	Americium-241	39.3	2.4E-06	0.5%	--	--	No
Sector 6	Cesium-137	1.94	3.3E-06	0.7%	--	--	No
Sector 6	Neptunium-237	18.6	1.1E-05	2%	--	--	No
Sector 6	Plutonium-239/240	239	1.3E-05	3%	--	--	No
Sector 6	Thorium-230	10,552	3.7E-04	77%	--	--	Yes
Sector 6	Uranium-233/234	413	9.6E-06	2%	--	--	No
Sector 6	Uranium-235/236	21.3	8.1E-06	2%	--	--	No
Sector 6	Uranium-238	440	4.9E-05	10%	--	--	No
	Sector 6 Totals	**ELCR:**	**4.8E-04**	**HI:**	**4.2**		
Sector 7	Arsenic	7.98	2.1E-06	13%	0.067	7%	No
Sector 7	Chromium	28.2	3.1E-06	19%	0.029	3%	No
Sector 7	Uranium metal	38.4	--	--	0.58	64%	No
Sector 7	Cesium-137	1.45	2.5E-06	15%	--	--	No
Sector 7	Neptunium-237	6.50	4.0E-06	25%	--	--	No
Sector 7	Thorium-230	61.5	2.2E-06	14%	--	--	No
Sector 7	Uranium-238	15.6	1.7E-06	11%	--	--	No
	Sector 7 Totals	**ELCR:**	**1.6E-05**	**HI:**	**0.90**		

Table 6.3. Resident Groundwater COCs and Priority COCs

Sector	COC	EPC (mg/kg or pCi/g)	ELCR	% Total	HQ	% Total	Priority COC?
RGA	Arsenic	0.00307	5.9E-05	< 0.1%	5.9	< 0.1%	Yes
RGA	Chromium	0.0667	1.9E-03	2.8%	190	2%	Yes
RGA	Fluoride	0.303	--	--	0.38	< 0.1%	No
RGA	Iron	2.82	--	--	0.2	< 0.1%	No
RGA	Manganese	0.452	--	--	1	< 0.1%	No
RGA	Nitrate as Nitrogen	20.2	--	--	0.63	< 0.1%	No
RGA	Uranium metal	0.00115	--	--	0.29	< 0.1%	No
RGA	Hexachlorocyclopentadiene	0.00474	--	--	12	< 0.1%	Yes
RGA	Pentachlorophenol	0.00641	1.6E-04	< 0.1%	16	< 0.1%	Yes
RGA	p-Nitroaniline	0.005	1.3E-06	< 0.1%	0.064	< 0.1%	No
RGA	Total PAH	0.00076	3.0E-05	< 0.1%	3	< 0.1%	Yes
RGA	Total PCB	0.0000668	1.5E-06	< 0.1%	0.15	< 0.1%	No
RGA	1,1,2-Trichloroethane	0.00177	6.4E-06	< 0.1%	4.3	< 0.1%	Yes
RGA	1,2-Dichloroethane	0.000718	4.2E-06	< 0.1%	0.42	< 0.1%	No
RGA	1,4-Dioxane	3.94	8.6E-03	13%	69	< 0.1%	Yes
RGA	Bromodichloromethane	0.01	7.5E-05	< 0.1%	7.5	< 0.1%	Yes
RGA	Carbon tetrachloride	0.0037	8.1E-06	< 0.1%	0.81	< 0.1%	No
RGA	Chloroform	0.003	1.4E-05	< 0.1%	1.4	< 0.1%	Yes
RGA	*cis*-1,2-Dichloroethene	2.71	--	--	75	< 0.1%	Yes
RGA	Methylene chloride	0.0204	1.8E-06	< 0.1%	0.19	< 0.1%	No
RGA	Trichloroethene	28.3	5.7E-02	84%	10,000	96%	Yes
RGA	Vinyl chloride	0.0034	1.8E-04	< 0.1%	18	< 0.1%	Yes
RGA	Technetium-99	2482	1.3E-04	< 0.1%	13	< 0.1%	Yes
RGA	Uranium-235/236	4.68	6.4E-06	< 0.1%	0.64	< 0.1%	No
	RGA Totals	**ELCR:**	**6.8E-02**	**HI:**	**10420**		

Table 6.3. Resident Groundwater COCs and Priority COCs (Continued)

Exposure Unit	***COC***	**EPC (mg/L or pCi/L)**	**ELCR**	**% Total**	**HQ**	% Total	Priority COC?
McNairy	p-Nitroaniline	0.00603	1.6E-06	< 0.1%	0.077	< 0.1%	No
McNairy	1,1,2-Trichloroethane	0.00051	1.9E-06	< 0.1%	1.2	< 0.1%	Yes
McNairy	*cis*-1,2-Dichloroethene	0.276	--	--	7.6	< 0.1%	Yes
McNairy	Trichloroethene	6.8	1.4E-02	100%	2400	100%	Yes
McNairy	Uranium-238	0.692	1.2E-06	< 0.1%	0.12	< 0.1%	No
	McNairy Totals	**ELCR:**	**1.4E-02**	**HI:**	**2409**		

6.1.5 Human Health Screening Risk Evaluation Uncertainty Assessment

A large number of assumptions were utilized in the SRE. Each assumption introduces uncertainties within the SRE; however, the majority of these uncertainties are likely to overestimate risk estimates for the receptor evaluated. Additionally, the potential effect on the risk estimates by these uncertainties is primarily classified as small (DOE 2021). A summary of these potential impact of the identified uncertainties is presented in Table 6.4.

Table 6.4. Human Health Uncertainty Analysis Summary

Description of Uncertainty	**Direction of Uncertainty**	**Estimated Effect***		
		Small	**Moderate**	**Large**
Data Analysis Uncertainties				
Potential Laboratory Contaminants—Soil	Overestimates	X		
Potential Laboratory Contaminants—Groundwater	Overestimates	X		
Retention of Infrequently Detected Analytes as COPCs—Soil	Overestimates	X		
Retention of Infrequently Detected Analytes as COPCs—Groundwater	Overestimates	X		
Lack of Consideration of Temporal Patterns in Data	Overestimates	X		
COPC Selection Uncertainties				
Surface Soil Detection Limits	Underestimates	X		
Surface and Subsurface Soil Detection Limits	Underestimates	X		
Groundwater Detection Limits	Underestimates	X		
Use of surrogates for chemicals without screening values	Over or Underestimates	X		
Exposure Assessment Uncertainties				
Grid Concentration Assignment Uncertainties	Over or Underestimates	X		
Inclusion of XRF Data—Uranium metal	Underestimates	X		
Inclusion of XRF Data—Antimony	Overestimates	X		
Groundwater UCL95 Data Selection	Over or Underestimates		X	
UCL95 Compared to the Maximum as the EPC	Underestimates		X	

Table 6.4. Human Health Uncertainty Analysis Summary, C-400 Complex (Continued)

Description of Uncertainty	Direction of Uncertainty	Estimated Effect*		
		Small	Moderate	Large
Risk Characterization Uncertainties				
Combination of Chemical and Pathway Risk Estimates—Noncarcinogenic	Overestimates	X		
Combination of Chemical and Pathway Risk Estimates—Carcinogenic	Overestimates	X		
Combining Chemical and Radionuclide Risk Estimates	Overestimates	X		

*The definitions of the effects on risk estimates are as follows:
Small—Uncertainty should not cause risk or hazard estimate to vary by more than one order of magnitude;
Moderate—Uncertainty may cause the risk or hazard estimate to vary between one and two orders of magnitude; and
Large—Uncertainty may cause the risk or hazard estimate to vary by more than two orders of magnitude.

The uncertainties related to data analysis are likely to result in overestimating the concentrations of the analytes in the C-400 Complex by including historical data from the past 20 years instead of limiting the SRE to more recent analytical data that are more representative of current conditions. Additionally, an evaluation of the analytical methods was performed and analytes that could potentially result in unacceptable risk were included as COPCs, even with uncertainties related to concentrations of those analytes in site media. Evaluation of the exposure uncertainties indicated the methods used for soil were protective and likely did not exclude COPCs that should have been identified as COCs. The use of the UCL95 as a groundwater EPC may underestimate concentrations for select COPCs; however, multiple lines of evidence discussed in the risk characterization conclusion indicate that those COPCs excluded as COCs are not risk drivers for the site, and the overall effect was minimal to cumulative risk and hazard estimates. The uncertainties related to toxicity are an inherent component of risk assessments. The toxicity values developed by EPA and other regulatory/public health agencies are intended to overestimate toxicity associated with analytes, and are likely to have minimal impacts on the SRE conclusions. Toxicity values were not available for a subset of chemicals represented in the SRE data sets. Finally, the uncertainties of the risk characterization stem from the streamlined methods used in the SRE to evaluate additivity of COPCs. The uncertainties are unlikely to greatly impact the conclusions of the SRE. Despite inevitable uncertainties associated with the steps used to derive potential risks, the use of numerous health-protective assumptions most likely results in a protective estimate of potential health risks for receptors that could be exposed to site contaminants at the C-400 Complex.

For a subset of chemicals, toxicity information is not available to determine toxicity associated with concentrations detected at the Paducah Site. For these chemicals, NALs were developed using toxicity information from surrogate chemicals (identified primarily based on structural similarity) and used in the COPC screening process. This introduces some uncertainty that could potentially overestimate or underestimate risk. However, the chemicals that needed toxicity values were not identified as COPCs, while risk is primarily driven by the chemicals with toxicity criteria, so the magnitude of the uncertainty is likely small.

6.1.6 Human Health Screening Risk Evaluation Observations

The risk characterization results were used to identify soil and groundwater COCs. The list of surface soil COCs and priority COCs across the C-400 Complex was based on risk characterization results for industrial worker NALs. The list of surface and subsurface soil COCs was based on risk characterization results for excavation worker NALs. The list of groundwater COCs was based on risk characterization results for residential NALs and provisional background levels.

The COCs identified as primary risk drivers for surface soil across the C-400 Complex OU were uranium metal and uranium-238. For soil, a "primary risk driver" refers to those COCs that contribute greater than 50% of the cumulative risk or hazard for the majority of soil sectors. Thorium-230, uranium metal, and uranium-235/236 were also identified as "priority COCs" in surface soil in certain sectors which indicates the EPC for these chemicals resulted in a calculated ELCR greater than 1×10^{-4} and/or a HQ greater than 1 in individual sectors but not throughout the C-400 Complex.

The COCs identified as primary risk drivers for combined surface and subsurface soil across the C-400 Complex OU were uranium metal and uranium-238. Thorium-230 and TCE were also identified as priority COCs in one sector, which indicates the EPC for these chemicals resulted in a calculated elevated ELCR greater than 1×10^{-4} in individual sectors investigated but not throughout the C-400 Complex. Thorium-230 was identified as a priority COC in Sector 6 and TCE was identified as a priority COC in Sectors 4 and 5.

There was a relatively large number of COCs identified as priority COCs in groundwater, specifically the RGA groundwater; however review of the data indicated that there were five primary risk drivers in groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. For RGA groundwater, "primary risk driver" refers to those COCs that have a frequency of exceedance (FOE) of the applicable AL above 10%. For McNairy groundwater, a "primary risk driver" refers to those COCs that contribute greater than 10% to the cumulative ELCR and noncancer hazard. The FOE of the AL was not used for McNairy groundwater due to the limited sample size in the exposure unit. TCE was identified as the primary risk driver for McNairy groundwater based on its contribution of approximately 100% of the total ELCR and noncancer hazard.

The evaluation of the potential for soil contaminants to leach into groundwater was evaluated in the SRE using SSLs based on default DAFs of 1 and 20, as well as a site-specific DAF of 22 to identify which analytes would be further evaluated in Section 5.3. Additional evaluations of this pathway using site-specific SSLs based on site-specific geochemical parameters and a site-specific DAF of 22 are presented in Section 5 and Appendix B.

6.2 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

6.2.1 SERA Problem Formulation

The problem formulation within a SERA provides information to support a risk management decision concerning the need for any additional evaluation of an ecological risk. The results of the problem formulation are the final list of chemicals of potential ecological concern (COPECs), assessment endpoints, and questions and hypotheses potentially requiring further evaluation in an ecological risk assessment (ERA). As part of the streamlined SERA, the problem formulation step began with a discussion of the preliminary CSM for the C-400 Complex. This discussion included the description of wildlife at the Paducah Site, relevant exposure media, the receptor groups, and relevant exposure routes.

Terrestrial wildlife commonly found at the Paducah Site consists of species indigenous to open grassland, thicket, and forest habitats. Small mammal surveys conducted on WKWMA documented the presence of southern short-tailed shrew, prairie vole, house mouse, rice rat, and deer mouse (KSNPC 1991). Large mammals commonly present in the area include coyote, eastern cottontail, opossum, groundhog, whitetail deer, raccoon, and gray squirrel. Mist netting activities in the area have captured red bats, little brown bats, Indiana bats, northern long-eared bats, evening bats, and eastern pipistrelles (KSNPC 1991). Typical birds of the area include European starling, cardinal, red-winged blackbird, mourning dove, bobwhite quail, turkey, killdeer, American robin, eastern meadowlark, eastern bluebird, blue jay, red-tail hawk, and great horned owl. The information contained in these previous studies was reviewed as part of the *Work Plan for the Soils Operable Unit Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, and it was determined that the results were consistent with current conditions (DOE 2010). The Ecological RMD contains an updated list of ecological species/receptors (DOE 2019).

Examples of a few amphibians and reptiles present include the cricket frog, Fowler's toad, common snapping turtle, green tree frog, chorus frog, southern leopard frog, eastern fence lizard, and red-eared slider (KSNPC 1991).

The aquatic communities in and around the Paducah Site area that could be impacted by the Paducah Site plant discharges include two perennial streams [Bayou Creek (named in older documents as Big Bayou Creek) and Little Bayou Creek], the NSDD, a marsh located at the confluence of Bayou Creek and Little Bayou Creek, and other smaller drainage areas. The dominant taxa in all surface waters include several species of sunfish, especially bluegill and green sunfish, as well as bass and catfish. Shallow streams, characteristic of the two main area creeks, are dominated by bluegill, green and longear sunfish, and stonerollers. Algal and benthic macroinvertebrate and insect populations vary seasonally. Periphyton, benthic macroinvertebrates, and fishes found in Bayou and Little Bayou Creeks are described in *Final Report on Environmental Studies at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, to Union Carbide Corporation* (Battelle 1978).

Soil and groundwater migrating and entering surface water are the media of interest for the C-400 Complex.[20] Most soil at the C-400 Complex is located below the building footprint or are located under concrete/asphalt covering; however, the surface soil outside the building footprint has the potential for uptake by plants and soil invertebrates and could enter higher trophic levels through the food chain. Therefore, the surface soil of the soil exposure units located outside the C-400 Cleaning Building footprint in Sector 2 through Sector 7 were evaluated in the SERA.

The analytes detected in groundwater have the potential to migrate downgradient and be discharged to surface waters located further away from the C-400 Complex. The RGA groundwater has the potential to migrate and daylight in downgradient surface water bodies, while McNairy groundwater is unlikely to daylight in surface water bodies; therefore, RGA groundwater within 300 ft of the C-400 Complex boundary was evaluated in the SERA. Because the C-400 complex is within an industrialized area with a variety of large structures and pavement that is unlikely to change significantly in the foreseeable future, there is no expectation of ecological function associated with the site. Site soil is unlikely to function as a habitat that could sustain a population of these receptors. The SERA evaluated several potential receptor groups that could be exposed to surface soil at the C-400 Complex including terrestrial plants, soil invertebrates, and terrestrial birds and mammals. The list of receptors evaluated in the SERA that could be exposed to groundwater from the C-400 Complex assuming migration and discharge to downgradient surface water includes aquatic invertebrates, fish, aquatic plants, semi-aquatic birds and mammals, reptiles, and amphibians. The potential exposure pathways to surface soil for ecological receptors are direct contact with and incidental ingestion of soil and ingestion of food sources exposed to contaminated soil media. The primary routes of concern for terrestrial receptors are the incidental ingestion of contaminated soils during feeding and the ingestion of contaminated food sources that are exposed to C-400 Complex media.

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[20] As documented in the C-400 Complex RI/FS Work Plan, subsurface soil is not likely to be a complete exposure pathway for current or future ecological receptors.

6.2.2 Effects Estimate

There are three levels for which adverse effects may result from exposure to contaminated site media by ecological populations, ecological communities, and habitats. Adverse effects on ecological populations of ecological receptors are based on measures related to impaired reproduction, growth, and survival. Adverse effects on ecological communities are based on changes in community structure and function. Adverse effects on habitats are based on changes in composition and characteristics that reduce a habitat's ability to support plant and animal populations and communities. Evaluation of these adverse effects in the SERA was streamlined by comparing site concentrations to ecological benchmarks [referred to as NFA values]. NFA values for chemical exposures were referenced from the 2019 Ecological RMD and included values from the following (DOE 2019):

- EPA's Superfund program ecological SSLs;
- EPA Region 4 Ecological Risk Assessment Supplemental Guidance screening values;
- KDEP screening values; and
- Oak Ridge National Laboratory benchmarks.

For radionuclides, the ecological benchmarks used in the SERA to quantify effect estimates were developed using the RESRAD-BIOTA (https://resrad.evs.anl.gov/codes/resrad-biota), Version 1.8 software. The default input values were used to calculate the NFA values with the exception of dose, which was adjusted to 0.1 rad/day.

6.2.3 Exposure Estimate

The media for which exposure to ecological receptors is likely has been identified in the ecological CSM. The two media are surface soil (0–1 ft bgs) for Sector 2 through Sector 7 and groundwater that has migrated downgradient and discharged to surface water. The value selected to represent the exposure estimate, the EPC, for the Step 2 surface soil screen was the maximum of either the maximum detected concentration for each sector or one-half the maximum detection limit for the analyte. For Step 2 of the SERA groundwater screen, the maximum of either the maximum detected concentration or one-half the maximum detection limit was selected to represent the exposure estimate.

6.2.4 Step 2 Risk Characterization

The Step 2 screening process of the SERA was used to identify COPECs for surface soil and groundwater. The COPEC identification process consisted of the development of an HQ for each analyte, using the ratio of the exposure estimate to the NFA value as shown below:

$$HQ_i = \frac{EPC_i}{NFA_i}$$

where:

HQi is the hazard quotient, dimensionless

EPCi is the exposure point concentration for an analyte, mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides

NFAi is the no further action value based on the ecological benchmark (DOE 2019), mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides

6.2.5 Step 3 COPEC Refinement

The exposure estimate, the EPC, for comparison to a NFA value in Step 2 was the maximum site concentration, which is either the greater of the maximum detected concentration or one half the maximum reported detection limit for substances reported as nondetect. In Step 3, the EPC for the COPEC was adjusted to use an average concentration for comparison to a representative background value and/or the NFA value. For each soil sector, the average concentration from detected values within the sector was used to represent the EPC for the COPEC. For groundwater, the average concentration of detected values was used to represent the EPC.

Step 2 of the SERA utilized risk-based values to select the COPECs that would be further evaluated in Step 3. Step 3 includes not only a comparison of COPECs EPCs to risk-based values but also includes a comparison of the EPC to representative background values. If the average concentration of the COPEC in a soil sector or RGA groundwater was below its respective provisional background value, it was excluded from the refined list of COPECs.

The selected soil NFA values used in the Step 2 screen were the minimum of the values available for four classes of receptors: plants, soil invertebrates, mammals, and avian. In Step 3, the soil NFA values were separated into two groups for comparing the sector EPCs, direct contact NFA values and bioaccumulative NFA values. The direct contact NFA value for a COPEC was selected as the minimum between the plant NFA value and the soil invertebrate NFA value presented in the Ecological RMD (DOE 2019). For those COPECs that are identified as bioaccumulative based on EPA guidance (EPA 2018a), a bioaccumulative NFA value was selected to develop a bioaccumulative HQ. The bioaccumulative NFA value was the minimum between the mammal NFA value and the avian NFA value. For groundwater, the same NFA values used in the Step 2 screen for COPECs were used for the Step 3 screen. If the COPEC calculated HQ is less than one, the COPEC was removed from the refined list of COPECs. If a COPEC has a calculated HQ greater than one, the COPEC was further evaluated in the refinement.

Additional lines of evidence used to refine the list included information related to the distribution of concentrations within the media as well as the magnitude of the calculated HQs.

6.2.6 SERA Uncertainties

There are uncertainties related to each of the steps performed within this SERA. Each of these uncertainties should be reviewed by risk managers, while considering potential remedial alternatives that may be discussed in a future FS report.

One uncertainty is related to the ecological CSM. There are areas within the Paducah Site that could be suitable terrestrial habitat for ecological terrestrial receptors; however, the C-400 Complex is within an industrial use area, and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. The C-400 building footprint covers the Sector 1 soil, preventing a complete exposure pathway; and the surrounding surface soil is mostly covered by a combination of concrete, asphalt, gravel, and/or industrial material. Because there is little surface soil outside the C-400 building footprint that is not obstructed in some way, it is highly unlikely that terrestrial ecological receptors would be exposed to contaminants within the C-400 Complex for a duration that would result in unacceptable risk; therefore, the uncertainty is likely to overestimate risk. The surface soils surrounding the C-400 building were evaluated as suitable habitat to provide information to risk managers.

There is uncertainty introduced to the SERA with the selection of NFA values used in the Step 2 and Step 3 screens. The NFA values were developed to be protective of entire classes of receptors, some of which may not be present at the C-400 Complex and the surrounding area. The use of the NFA values, based on receptors that may not be present at the C-400 Complex and the surrounding areas, would identify COPECs that are not relevant; however, because this is a streamlined SERA, the evaluation of receptors that were observed was limited, therefore, the uncertainty is likely to overestimate risk.

A major uncertainty in the selection of COPECs in the SERA is the use of groundwater data underlying the C-400 Complex for comparison to surface water NFAs. The direct comparison of groundwater data to surface water NFA values assumes that the concentrations do not undergo any attenuation before entering a surface water feature. This is an unrealistic assumption due to the distance from the C-400 Complex to Bayou Creek and the C-400 Complex to Little Bayou Creek. The uncertainty likely greatly overestimates risk to potential surface water receptors; however, the comparison provides risk managers additional information related to risks to ecological receptors from impacted groundwater at the C-400 Complex.

The refinement step in the SERA introduces uncertainty to the final list of COPECs identified for the C-400 Complex. The refinement step is intended to further evaluate COPECs identified in Step 2 of the SERA by using assumptions that are more appropriate for the site. The refinement step includes multiple lines of evidence to focus on those COPECs that drive risk, which has been translated to remove COPECs with low FOE of the NAL value and also remove those COPECs with relatively low HQs. Sampling within the C-400 Complex has been determined to be representative of concentrations at the site; however, sampling was focused on areas with high concentrations of COPECs, possibly biasing high the estimated average for the soil sectors and RGA groundwater. COPECs with an HQ between 3 and 10 are likely not risk drivers in the SERA; however, basing the EPC on the average of detected values is a protective assumption that provides more information for risk managers to consider when determining the selected remedy for the C-400 Complex; therefore, the uncertainty is likely to overestimate risk.

6.2.7 SERA Observations

Step 3 of the SERA included a refinement of assumptions used as part of the Step 2 of the SERA. The result of the refinement process resulted in seven soil COPECs identified that may cause excess risk to ecological receptors. These include the following analytes.

- bis(2-ethylhexyl)phthalate (potential laboratory contaminant)
- high molecular weight PAHs
- mercury
- thallium
- Total PCBs
- *cis*-1,2-dichloroethene
- TCE

Risk managers should be aware of the uncertainties related to identifying COPECs in surface soil at the C-400 Complex. The primary uncertainty with evaluating surface soil at the C-400 Complex is if the exposure pathway is complete for ecological receptors. There are areas within the Paducah Site that could be suitable terrestrial habitat for ecological terrestrial receptors; however, the C-400 Complex itself is within an industrial use area and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. Because there is little surface soil outside the C-400 Cleaning Building footprint that is not obstructed in some way, it is highly unlikely that terrestrial ecological receptors would be exposed to the contaminants in the C-400 Complex for a duration that would result in unacceptable risk.

One COPEC, TCE, was identified for RGA groundwater. TCE has potential to cause excess risk to surface water ecological receptors if groundwater under the C-400 Complex migrates and discharges to surface water. Identification of TCE as a COPEC assumes that concentrations of TCE will not be decreased as groundwater migrates or enters a surface water body, which is highly unlikely. The potential for elevated concentration of TCE to enter surface water bodies around the Paducah Site may exist; however, the concentrations would be significantly less than what was used in the SERA.

6.3 SRE AND SERA SUMMARY

In summation, the SRE and the SERA utilized protective assumptions to identify COCs and COPECs for C-400 Complex OU soil and groundwater. The identified COCs and priority COCs for human health are provided in Tables 6.1 through 6.3. The human health risk drivers for the C-400 Complex OUs were identified by use of multiple lines of evidence and included uranium metal, thorium-230, uranium-235/236, and uranium-238 in soil and chromium; *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, TCE, and technetium-99 were included in groundwater. The refined COPECs for ecological receptors were identified by use of multiple lines of evidence and included bis(2-ethylhexyl)phthalate, high molecular weight Total PAHs, mercury, thallium, Total PCBs, *cis*-1,2-dichloroethene, and TCE. Risk managers should be aware of the uncertainties associated with identification of COCs and refined COPECs. The uncertainties in the SRE and SERA are discussed in detail in the Appendix C.

7. SUMMARY AND CONCLUSIONS

This section summarizes and presents conclusions of the C-400 Complex OU RI. The RI was designed to investigate nature, extent, fate, and transport; and to characterize potential risks/hazards from current and future exposures as a basis for evaluating remedial alternatives, using historical data and data collected for this RI to supplement the existing data. The C-400 Complex RI/FS Work Plan specified the following goals for the RI.

Goal 1: Characterize Nature of Source Zone(s);

Goal 2: Define Extent of Source and Contamination in Soil and Remaining Structures in the OU Area;

Goal 3: Evaluate Surface and Subsurface Transport Mechanisms; and

Goal 4: Complete a Risk Assessment for the C-400 Complex (conduct an SRE of the combined newly generated data and historical data to complement the previously performed WAG 6 BHHRA, and conduct an SERA).

The representative data set developed during the RI is sufficient to support decision-making and indicates that a future FS is appropriate for the C-400 Complex OU. Other information was gathered to support the evaluation of future remedial alternatives.

7.1 SUMMARY

During the RI, soil, concrete, and groundwater were investigated. There were also a limited number of liquid and sludge samples collected from SWMUs. Analytical data provided by the analytical laboratory were assessed, verified, and validated in accordance with the C-400 Complex QAPP. The analytical results for the various media were screened against appropriate criteria to select COPCs for further evaluation.

7.1.1 Nature and Extent of Contamination

The significant findings related to soil and concrete in each sector, and groundwater across the complex, are described below.

7.1.1.1 Soil and concrete

Contamination in the soil and concrete in the C-400 Complex is widespread horizontally and vertically. In surface soil and concrete (0–1 ft bgs), and in subsurface soil (1–16 ft bgs), the COPCs identified include metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, manganese, nickel, selenium, thallium, and uranium), Total PCBs, Total PAHs, radionuclides (americium-241, cesium-137, neptunium-237, plutonium-239/240, radium-226, technetium-99, thorium-230, and uranium isotopes), total dioxins/furans, and VOCs (1,4-dioxane, 1,1,2-trichloroethane, 1,2-dichloroethane, acrolein, chloroform, *cis*-1,2-dichloroethene, TCE, and vinyl chloride).

In the deep soil interval (16 ft bgs to the bottom of the RGA), the identified COPCs include metals (antimony, arsenic, barium, cobalt, copper, iron, manganese, nickel, selenium, silver, thallium, uranium, and vanadium), Total PCBs, naphthalene, radionuclides (neptunium-237, technetium-99, thorium-230, and uranium isotopes), total dioxins/furans, and VOCs (1,4-dioxane, 1,1,2-trichloroethane, acrolein, chloroform, *cis*-1,2-dichloroethene, TCE, and vinyl chloride). A summary of contamination by sector follows.

Sector 1

All surface samples in Sector 1 were concrete and/or brick from the floor/slab. Occurrences of many contaminants in the surface and shallow subsurface are the results of previous spills and potential leaks from the drain lines beneath the slab (e.g., acid drain system, waste discard lines). Uranium was the most commonly occurring metal exceeding background and industrial worker/excavation worker NAL values. Total PCBs were detected in many areas of the surface interval (96 of 101 samples), with a maximum of 19 mg/kg in the east basement/plenum room. Several radionuclides exceeded background and industrial worker/excavation worker NALs with technetium-99, thorium-230, and uranium isotopes being most commonly detected and widespread in the sector.

Uranium metal exceeded the excavation worker AL in Sector 1 in 19 of 147 samples (uranium metal also exceeded excavation worker ALs in Sectors 2, 4, and 6). All of the uranium metal results collected across the C-400 Complex for this RI that are greater than the excavation worker AL (197 mg/kg) occur within the upper 10 ft of soil.

Uranium-238 exceeded the industrial worker ALs in Sector 1 as well as other sectors. Uranium-238 exceeded the industrial worker and/or excavation worker ALs in five sectors (Sectors 1, 2, 4, 5, and 6). The location of uranium-238 exceeding these ALs was shallow, with all of the estimated volume above the industrial worker/excavation worker ALs located within the upper 10 ft of soil (or other shallow media).

There is an area of technetium-99 contamination in the subsurface soil in the southern end of Sector 1C near borings 400S1C-29, 400S1C-40, 400S1C-C01, 400S1C-C02, 400S1C-C03, and 400S1C-C18A, which indicates the presence of a soil source of technetium-99 below the C-400 Cleaning Building. Technetium-99 activity in soil > 35.7 pCi/g is the site-specific soil activity calculated to result in groundwater contamination to the RGA of 900 pCi/L or greater. The highest technetium-99 in this area is 1,390 pCi/g in boring 400S1C-C01 from a sample collected from 3–4 ft bgs. In the area with these borings, technetium-99 is present in a zone from depths of 20–55 ft bgs, with a maximum activity of 1,020 pCi/g and an average activity of approximately 285 pCi/g.

VOCs, primarily TCE, were widespread in the deep subsurface soil interval (i.e. within the UCRS) in Sector 1. The higher concentrations, > 1 mg/kg of TCE, occurred in Sector 1B and the southern end of Sector 1A. This contaminant zone is likely related, or connected, to the previously identified zone of TCE contamination present at the southeast side of the building in Sector 4. TCE was detected in the McNairy soil in Sector 1, with a maximum concentration of 6.10 mg/kg in boring 400S1A-03 at a depth of 88–89 ft bgs.

Sector 2

Occurrences of contaminants in the surface and shallow subsurface appear to result from potential leaks from the utility drains (e.g., acid drain system, sanitary/storm sewer system). Arsenic, chromium, and uranium were the most commonly occurring metals exceeding background and industrial worker/excavation worker NAL values, with uranium metal also exceeding the excavation worker AL. Total PCBs and Total PAHs did not exceed industrial worker/excavation worker NALs in Sector 2. Radionuclides exceeded background and industrial worker/excavation worker NALs, with uranium isotopes being most common and widespread within the sector.

Deep subsurface soil contamination was not prevalent. Selenium and uranium isotopes were the metal and radionuclide, respectively, that most frequently exceeded background and groundwater protection SSLs. VOCs occurred at low levels in the deep subsurface soil. The highest concentration of TCE (15 µg/kg) occurred at a depth of approximately 53–54 ft bgs in the northwestern portion of Sector 2.

Sector 3

Occurrences of contaminants in the surface and shallow subsurface are widespread in Sector 3, with arsenic, chromium, and uranium being the most common metals exceeding background and industrial worker/excavation worker NAL values. Total PAHs exceeded industrial worker NALs at two surface soil locations. Total PCBs were detected in several surface soil samples (detected in 10 of 11 samples) but did not exceed industrial worker/excavation worker NALs. Uranium-238 frequently exceeded background and industrial worker/excavation worker NALs in the sector. A few VOCs were detected in Sector 3 surface and shallow subsurface soil, with TCE at one location exceeding the industrial worker NAL. The widespread occurrences of low concentrations of metals, Total PCBs, VOCs, SVOCs, and radionuclides in Sector 3 soil may represent minor surface spills or releases from the buried utilities that pass through the sector as a result of past operations. Total PCBs in surface soil may be due to the explosion of a transformer that was located on the southwest side of the C-400 Cleaning Building on the east side of 11th Street.

In the deep soil interval (16 ft bgs to the bottom of the RGA), no radionuclides exceeded both background criteria and the SSLs for protection of groundwater.

TCE was detected in the deep soil interval, with a maximum concentration of 1.23 mg/kg from a sample collected from 48–49 ft bgs. The TCE contamination appears to be associated with a release near the C-400 Cleaning Building. TCE was also detected in several samples from the McNairy Formation soils, with a maximum detection of 2.36 mg/kg in a sample from the top of the McNairy.

Sector 4

Contaminants in the surface and shallow subsurface are widespread in Sector 4, with several metals exceeding background and industrial worker/excavation worker NAL values and uranium metal exceeding excavation worker ALs in a few locations. Total PCBs exceeded industrial worker NALs at two surface soil locations out of 27 samples. Total PAHs exceeded NALs at one location out of 85 samples and total dioxins/furans exceeded NALs at two locations along the railway. Several radionuclides exceeded background and industrial worker/excavation worker NALs in the sector, with uranium-238 being the most common (uranium-238 exceeded the industrial worker AL at 2 out of 46 samples). VOCs were detected in Sector 4 surface and shallow subsurface soil, with TCE at one location exceeding the excavation worker AL.

Total PCBs were detected in several subsurface soil samples, with a maximum detection of 0.0869 mg/kg occurring in a sample from the deep soil interval. Total PCBs were not detected in the soil samples from the McNairy Formation soil in Sector 4. In addition to Total PCBs, total dioxin/furans exceeded the excavation worker NAL in samples collected along the railroad tracks in Sector 4.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to the bottom of the RGA) intervals, technetium-99 was infrequently detected, with a maximum activity of 19.5 pCi/g. The maximum activity for uranium-238 in these same intervals was 6.75 pCi/g.

In the area of the railroad tracks that passes through Sector 4, there were a few metals (primarily arsenic, chromium, and uranium), radionuclides (primarily uranium-238), and total dioxins/furans that exceeded the industrial worker and/or excavation worker NALs. There were no exceedances of the industrial worker or excavation worker ALs along the railroad tracks.

As expected, based on previous investigations, most of the VOC detections occurred in Sector 4. Several VOCs were detected in the subsurface and deep soil interval, with TCE having a maximum concentration of 49.2 mg/kg in a sample from the deep soil interval. VOCs that exceeded the protection of groundwater SSLs for a DAF of 20 in Sector 4 subsurface and deep soil include 1,1,2-trichloroethane, 1,4-dioxane, acrolein, chloroform, *cis*-1,2-dichloroethene, TCE, and vinyl chloride. The maximum TCE result in the McNairy Formation soil was 6,940 mg/kg from a sample collected from the top of the McNairy Formation in boring 400S4-12. Soil concentrations dropped significantly with the depth at that location.

This sector contains a widespread VOC-impacted area located primarily southeast of the C-400 Cleaning Building, 11th Street, and north of Tennessee Avenue (Figure 4.57). Concentrations of TCE and its degradation products in groundwater, along with other indicators, suggest the presence of TCE as a DNAPL in both the vadose zone and the saturated zone in Sector 4 and adjacent Sector 1. The confirmed/probable source zone in the southeastern portion of the C-400 Complex (in Sectors 1 and 4) occurs in the UCRS, RGA, and the Upper McNairy.

Sector 5

Contaminants in the surface and shallow subsurface are widespread in Sector 5, with several metals (most commonly arsenic, chromium, manganese, and uranium) exceeding background and industrial worker/excavation worker NAL values. Total PCBs were detected in several samples but none exceeded the industrial worker/excavation worker NALs. Total PAHs exceeded industrial worker NALs at two locations out of 32 samples and excavation worker NALs at one location out of 72 samples. Several radionuclides exceeded background and industrial worker/excavation worker NALs, with uranium isotopes being the most common (uranium-235/236 and uranium-238 exceeded the industrial worker AL at one surface location). TCE was detected in Sector 5 surface and shallow subsurface soil, with TCE at one location, out of 72 samples, exceeding the excavation worker AL. TCE at this location had a result of 144 mg/kg in the 5.5–6.5 ft bgs sample from boring 400S5-08 (this location had a TCE result of 23.6 mg/kg in the 0–1 ft bgs sample).

Total PCBs were not detected in the deep soil interval (16 ft bgs to bottom of the RGA) but were detected in three samples from the McNairy soil (maximum detection of Total PCBs was 0.00903 mg/kg). In addition to Total PCBs, total dioxin/furans exceeded the groundwater protection SSLs in several samples for a DAF of 20 in the 1–16 ft bgs interval.

In the subsurface and deep soil intervals, technetium-99 was detected infrequently, with a maximum activity of 26.2 pCi/g. The maximum activity for uranium-238 in these same intervals was 18.4 pCi/g.

In the area of the railroad tracks that passes through Sector 5, there were a few metals (primarily arsenic, chromium, manganese, and uranium) and radionuclides (primarily uranium-235/236 and uranium-238) that exceeded the industrial worker and/or excavation worker NALs. There were no exceedances of the industrial worker or excavation worker ALs along the railroad tracks.

VOCs, primarily TCE, were detected in approximately 40% of the samples from the subsurface and deep soil intervals in Sector 5. The maximum result of 144 mg/kg occurred in the 5.5–6.5 ft bgs sample near the southwest corner of C-400. This confirmed/probable source zone is shallow, occurring at depths < 20 ft bgs, and appears to represent an area that was not completely treated in a previous interim action.

All of the higher TCE soil concentrations (i.e., > 1 mg/kg) were in samples collected at < 10 ft bgs. The highest concentration of TCE in soil deeper than 10 ft bgs was 0.375 mg/kg in a sample collected at 59–60 ft bgs.

In addition to the confirmed/probable area discussed above, another area impacted by VOCs, SVOCs, metals, and radionuclide contamination was identified in the northeastern portion of Sector 5 (just west of the C-400 Cleaning Building) that appears related to the building perimeter drain collection line or a sewer line leading from the C-400 Cleaning Building.

Sector 6

Contaminants in the surface and shallow subsurface in Sector 6 included several metals, with chromium and uranium most commonly exceeding background and industrial worker/excavation worker NAL values (uranium exceeded the excavation worker AL in 2 out of 40 samples). Total PCBs and Total PAHs exceeded the industrial worker/excavation worker NALs in a few locations. Several radionuclides exceeded background and industrial worker/excavation worker NALs, with cesium-137, thorium-230, and uranium isotopes being the most common (thorium-230 and uranium-238 exceeded the industrial worker/excavation worker ALs at two locations). VOCs, such as TCE, were detected in Sector 6 surface and shallow subsurface soil but no locations exceeded the industrial worker/excavation worker NALs. Most of the contamination occurred near the bermed area around the former location of the Technetium Storage Tank and near the waste discard drain lines on the western side of the C-400 Cleaning Building. An area of surface soil located immediately below the end of a pipe that protrudes from the C-400 Cleaning Building toward the Technetium Storage Tank berm was found to be impacted with PAH compounds and radionuclides.

In the subsurface soil (1–16 ft bgs) and the deep soil (16 ft bgs to bottom of the RGA) intervals, technetium-99 was detected in the 1–16 ft bgs interval only, with a maximum activity 50.5 pCi/g. The maximum activity for uranium-238 in these same intervals was 179 pCi/g, with the maximum also occurring in the 1–16 ft bgs interval.

In the deep subsurface soil interval, several VOCs were detected, with TCE having a maximum concentration of 0.124 mg/kg in a sample from a depth of approximately 30 ft bgs. The maximum TCE result in the McNairy Formation soil was 4.16 mg/kg from a sample in the top of the McNairy.

Sector 7

Contaminants in the surface and shallow subsurface in Sector 7 included several metals, with arsenic, chromium, and uranium exceeding background and industrial worker/excavation worker NAL values most frequently. Total PAHs exceeded the industrial worker/excavation worker NALs in several locations. Radionuclides exceeded background and industrial worker/excavation worker NALs, with cesium-137 and uranium isotopes being the most common. VOCs were detected in Sector 7 surface and shallow subsurface soil at low concentrations and did not exceed the industrial worker/excavation worker NALs.

In the subsurface and deep subsurface soil intervals, technetium-99 was detected in several samples, with a maximum activity of 129 pCi/g. There was only one detection out of 41 samples in the deep subsurface soil interval. Uranium isotopes exceeded background and groundwater protection SSLs in several samples as well.

In the subsurface and deep subsurface soil intervals, TCE was detected in approximately half of the samples, with a maximum concentration of 0.44 mg/kg. The maximum result was from a sample collected from 54–55 ft bgs. Many of the more elevated TCE detections in Sector 7 were in the 47–60 ft bgs interval. The maximum for TCE in McNairy Formation soil was 6.22 mg/kg from a sample collected from the top of the McNairy.

Contamination of surface and subsurface soils in Sector 7 may be related to spills and releases of C-400 Cleaning Building effluent to the Discard Waste Sump. The sludge sampled from the Discard Waste Sump contained elevated concentrations of VOCs and radionuclides; however, the lack of VOCs at shallow depths near the sump suggests a different source. The sludge sampled from the Discard Waste Sump contained elevated concentrations of VOCs and radionuclides.

7.1.1.2 Groundwater

Groundwater within the C-400 Complex consists of a shallow saturated zone (i.e., UCRS), the shallow aquifer (i.e., RGA), and the underlying McNairy Formation. Groundwater data from MWs for the UCRS, RGA, and the McNairy groundwater systems at the C-400 Complex were screened to identify COPCs. COPC concentrations were greatest and most widespread in the RGA when compared to the other two zones.

UCRS. In the UCRS, no metals exceeded MCLs; the metals that exceeded resident NALs included antimony, arsenic, chromium, cobalt, manganese, and uranium. The concentration of chromium exceeded the resident AL.

The only radionuclide detected in UCRS groundwater was technetium-99 (detected in approximately 62% of the samples). The maximum activity of technetium-99 in the UCRS was 57.7 pCi/L.

VOCs that were detected and exceeded MCLs in UCRS groundwater include 1,1-dichloroethene, *cis*-1,2-dichloroethene, methylene chloride, TCE, and vinyl chloride. TCE was the most commonly detected VOC contaminant and was reported in all samples from the UCRS (detected in 13 of 13 samples). The highest TCE concentrations are found on the southeast side of the C-400 Cleaning Building in close association with SWMU 11. The maximum concentration of TCE in the UCRS from MWs was 645 mg/L in MW407-PRT1 located in Sector 4.

RGA. Several metals and inorganics exceeded the RGA background values. Analytes that also exceeded MCLs include chromium, uranium metal, and nitrate. Several constituents also exceeded the resident AL, including arsenic, chromium, manganese, uranium metal, and fluoride. There is no discernible trend in the metals distribution that would suggest that the C-400 Cleaning Building is a source of a metals plume in the RGA.

Total PCBs were not widely detected in groundwater, but their presence may have been masked by the high concentrations of VOCs. Total PCBs were detected in approximately 2% of the RGA groundwater samples, with a maximum detection of Total PCBs was 0.000473 mg/L.

Radionuclides that exceeded the RGA background values and at least one other screening criteria included neptunium-237, technetium-99, uranium-233/234, uranium-235/236, and uranium-238. Technetium-99 was the most commonly detected isotope in the RGA. The maximum activity for technetium-99 in RGA groundwater was 31,700 pCi/L from a sample in MW423-PRT1 located just north of the C-400 Complex. High activities of technetium-99 were also detected in RGA grab samples in contingency borings drilled in Sector 1C (boring 400S1C-C1 with 155,000 pCi/L and boring 400S1C-C3 with 96,800 pCi/L).

VOCs detected in RGA groundwater above MCLs included 1,1,2-trichloroethane, 1,1-dichloroethene, carbon tetrachloride, *cis*-1,2-dichloroethene, tetrachloroethene, TCE, and vinyl chloride. Acetone and methylene chloride also were detected above MCLs, but these are potential laboratory contaminants.

1,4-dioxane, which does not have a MCL, was detected at concentrations exceeding the resident AL in two samples.

The maximum TCE concentration detected in RGA groundwater was 1,400 mg/L from MW408-PRT5 (MRGA). The highest concentration of TCE from groundwater grab samples collected during this investigation was 81.3 mg/L from an URGA sample collected in Sector 1B. The axis of the TCE contaminant plume trends approximately southeast-northwest across the C-400 Complex, originating from the southern end of the C-400 Cleaning Building where TCE has leaked in the past. A second area of high TCE concentrations in the RGA is present in the northern end of the C-400 Complex. The high TCE content in the RGA observed in this area could be due to the commingling of TCE that has migrated downgradient from Sectors 4 and 5, with TCE contamination derived from a separate source associated with the NSDD.

McNairy. In the McNairy groundwater samples, no metals or inorganics exceeded the McNairy provisional background values or MCLs. Uranium-238 is the only radionuclide detected in the McNairy groundwater. It was detected in one of four samples.

While several VOCs were detected in McNairy groundwater, there were not as many compounds detected, or at as high concentrations, as observed in the RGA. VOCs exceeding MCLs in the McNairy included *cis*-1,2-dichloroethene and TCE. The maximum concentration of TCE in MWs in the McNairy was 6.80 mg/L from MW406-PRT7 located in Sector 4. The highest concentration of TCE from groundwater grab samples collected during this investigation from the McNairy was 57.6 mg/L from a boring in Sector 1A. Migration of contaminants into the McNairy Formation appears limited to more porous zones in the Upper McNairy that are in direct contact with RGA sediments that contain high TCE content.

7.1.1.3 NAPL zones

Dissolved concentrations of VOCs in the C-400 Complex are indicative of the presence of TCE as a DNAPL in both the vadose zone and the saturated zone (TCE was the only DNAPL component identified). The presence of nonaqueous phase liquid (NAPL) was evaluated on a spatial, vertical, and lithologic scale to delineate the distribution of potential NAPL zones at the C-400 Complex using data collected during the RI.

For the purposes of this RI, source zones composed of TCE DNAPL and high concentration TCE contamination at the C-400 Complex have been defined using multiple lines of evidence including, but not limited to, areas with TCE concentrations in groundwater exceeding 33,000 µg/L, TCE concentrations in soil exceeding 100,000 µg/kg, MIP responses > 700,000 µV, and DyeLIF responses > 5% RE. Figure 4.57 shows the confirmed/probable and potential source zones in the C-400 Complex. Other VOCs (e.g., TCE degradation products) identified in soil and groundwater, if present as potential sources, likely occur within the TCE source zones delineated using these lines of evidence.

The presence of a DNAPL phase is generally suspected when high concentrations of chlorinated VOCs are reported in groundwater. TCE was reported in UCRS, RGA, and McNairy groundwater across the C-400 Complex at levels typically ranging from trace amounts to as high as 645,000 µg/L in a sample from MW407-PRT1 (UCRS) in Sector 4. EPA suggests a 1% rule of thumb as a generality that sampled groundwater concentrations in excess of 1% effective solubility (TCE = 11,000 µg/L) indicate that DNAPL may be present in the vicinity of any direction in the monitoring point of interest (EPA 2009). The use of TCE groundwater concentrations > 11,000 µg/L to indicate a potential source zone is consistent with EPA's terminology. The use of TCE groundwater concentrations > 33,000 µg/L to indicate a confirmed/probable source zone is based on multiple lines of evidence, such as the coincidence of areas exceeding 33,000 µg/L of TCE in groundwater, with areas where the MIP PID and DyeLIF RE responses also exceed their respective threshold. In Figure 4.57, for delineating the confirmed/probable source zones and the potential source zone, values of 33,000 µg/L and 11,000 µg/L TCE in groundwater were used based on its correlation with other lines of evidence, respectively (e.g., MIP, DyeLIF results).

The maximum detections of TCE in soils occurred in Sector 4 at location 400S4-12 (6,940,000 µg/kg) in the Upper McNairy at 94–95 ft bgs and in Sector 5 at location 400S5-08 (144,000 µg/kg) in the upper UCRS at 5.5–6.5 ft bgs. The concentration in soil samples used to evaluate a TCE source was 100,000 µg/kg.

As discussed in Section 3.3.2 of this report, correlation results for the MIP results indicate considerable variability and uncertainty in predicting quantitative soil and/or groundwater concentrations. Because of the uncertainty related to predicting quantitative results, the MIP profiles were used qualitatively to provide lines of evidence for determining the extent of potential source zones. Based on MIP measurements in areas highly suspected of having DNAPL, MIP values > 7.0E05 µV are considered an indicator for the presence of DNAPL.

Likewise, estimating a threshold value for positive DNAPL response with DyeLIF is difficult. Based on past project and lab experience, any signal % RE above 10% RE generally indicates DNAPL exists with confidence. Responses 0–5% RE do not provide confident indicators of DNAPL. Responses 5–10% RE are suspect for the potential for DNAPL. Responses > 10% RE should be considered very confident that DNAPL is present, unless another line of evidence indicates otherwise.

The confirmed/probable source zone in the southeastern portion of the C-400 Complex occurs in the UCRS, RGA, and the Upper McNairy. Previous interim actions have removed TCE mass from portions of this source area. The UCRS portion of the source is mostly located beneath the southeastern corner of the building (southeastern portion of Sector 1), but a couple of smaller zones in the UCRS are also present in Sector 4 (Figure 4.57).

The smaller confirmed/probable source zone near the southwestern portion of the C-400 Complex in Sector 5 was particularly shallow, occurring at depths < 20 ft bgs. This appears to be a small area that was not completely treated in the previous interim action. Additional information about source zones can be found in Section 4.7.

7.2 FATE AND TRANSPORT

The RI evaluated the primary migration pathway for COCs in soil within the UCRS to assess whether or not they represented a potential source of contamination to groundwater in the RGA at the C-400 Complex. The evaluation included screening soil data to evaluate leachability and three-dimensional modeling to identify potential source areas in the UCRS soil with the potential to impact RGA groundwater. Specifically, the evaluation of leachability of contaminants in soil and their potential for impacting groundwater in the RGA entailed a multi-stage decision-making process. Steps in the decision-making process included the following:

- Screening sector-specific soil sampling results against Paducah Site project-specific RG SSLs;
- Reviewing soil constituents that are not screened from further modeling to identify potential source areas that could impact groundwater in the RGA (performed by evaluating spatial distribution using three-dimensional modeling);
- Analyzing potential source areas constituent soil data laboratory detection limits to evaluate uncertainty in the data screening and spatial modeling; and

- Assessing applicability of previous modeling efforts documented in the WAG 6 RI report to estimate current impacts to groundwater (DOE 1999).

The RG SSLs were calculated using EPA-established formulas for nonradionuclides and radionuclides. These formulas and inputs are consistent with those used in the Human Health RMD (DOE 2021). The RG SSLs were back calculated from MCLs (or NAL values, if an MCL was not available) using the site-specific DAF. Only soil constituents identified in the risk assessment as C-400 groundwater COCs (both current and historical) were included in the screening process. Screening was applied to current and historical groundwater COCs at the C-400 Complex area to evaluate which COCs were likely to result in impacts to groundwater in the RGA. The following five COCs were identified based on this screening process.

- 1,4-dioxane—2 sectors exceeded
- TCE—6 sectors exceeded
- vinyl chloride—2 sectors exceeded
- naphthalene—4 sectors exceeded
- technetium-99—3 sectors exceeded

Subsequent evaluation of the data determined that none of the identified COCs required further fate and transport modeling for decision making in a future FS. Two compounds, naphthalene and 1,4-dioxane, did not require modeling because they screened out due to detection limits above the screening levels. The low frequency of detects for both compounds resulted in no potential source areas being identified for either COC and, therefore, they were not modeled.

Technetium-99, TCE, and vinyl chloride were not modeled because they represent stable soil sources with no change in plume characteristics, or have been previously modeled as part of the WAG 6 RI (DOE 1999).

Two of the COCs, TCE and technetium-99, have been delineated in the RGA as part of the PGDP sitewide plume evaluation (FRNP 2021). A review of these plumes indicates that the principal source(s) of both TCE and technetium-99 at PGDP originate at the C-400 Complex. The highest concentration portions of these plumes are co-located and migrate through the RGA from the C-400 Complex toward the northwest corner of the PGDP industrialized area.

7.3 RISK ASSESSMENT

Consistent with agreements reached during project scoping and because the C-400 Complex area already has been subjected to a BRA that concluded action needed to be taken, a new BRA was not performed under this RI. Instead, a focused risk evaluation using the combined, newly generated data and historical data was conducted. This focused SRE, along with previous risk assessments, provide updated information to the BRA. Together the SRE, the SERA, and the previous risk assessments constitute a full BRA, as documented in the C-400 Complex RI/FS Work Plan (DOE 2020). The screening risk characterization results were used to identify soil and groundwater COCs. The list of surface soil COCs and priority COCs across the C-400 Complex is primarily based on risk characterization results for industrial worker NALs. The list of surface and subsurface soil COCs is based on risk characterization results for excavation worker NALs.

The COC identified as a priority COC most frequently in surface soil was uranium-238 indicating that uranium-238 is identified as the primary risk driver in surface soil across the C-400 Complex. Thorium-230, uranium metal, and uranium-235/236 were also identified as priority COCs in certain sectors which indicates elevated concentration above either an ELCR of 1E-04 or a HI of 1 in individual sectors investigated and not across the C-400 Complex.

The COC identified as a priority COC most frequently in surface and subsurface soil was uranium metal, indicating that uranium metal is identified as the primary risk driver in surface and subsurface soil across the C-400 Complex. Thorium-230 was also identified as a priority COC in Sector 6, which indicates elevated concentration above an ELCR of 1E-04 in an individual sector investigated and not across the C-400 Complex. TCE was identified as a priority COC in two sectors, Sectors 4 and 5, located in the southern portion of the C-400 Complex. TCE is a risk driver, but the elevated concentrations are located in surface and subsurface soil located south of the C-400 Complex.

There was a relatively large number of COCs identified as priority COCs in groundwater, particularly in the RGA. Review of multiple lines of evidence indicate that there are five primary risk drivers in groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. The first line of evidence is the FOE of the analyte's respective ALs. There were five analytes with a FOE of their respective AL > 10%: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. TCE was identified as the primary risk-driver for groundwater. TCE ELCR contributed approximately 84% of the total ELCR and approximately 96% of the total noncancer hazard.

As agreed upon by the FFA parties, the overall approach of ecological risk for the C-400 Complex OU is to conduct a SERA through Steps 3b, as appropriate, as described in the Ecological RMD (DOE 2019). The problem formulation within a SERA provides information to support a risk management decision concerning the need for additional evaluation of ecological risk. The results of the problem formulation are a final list of COPECs, assessment endpoints, questions, and hypotheses potentially requiring further evaluation in an ERA. As part of the streamlined SERA, the problem formulation step began with a review of the preliminary CSM for the C-400 Complex, including a description of wildlife at PGDP, relevant exposure media, receptor groups, and relevant exposure routes.

Soil and groundwater are the media of concern for the C-400 Complex OU. Most soil at the C-400 Complex is located below the building footprint or under concrete/asphalt covering; however, the surface soil outside the building footprint has the potential for uptake by plants and soil invertebrates and entering higher trophic levels through the food chain. Because of these potential scenarios, surface soil in Sectors 2–7 (the soil exposure units located outside the C-400 Cleaning Building footprint) were evaluated in the SERA.

Step 3 of the SERA included a refinement of assumptions used as part of Step 2 of the SERA, which resulted in seven soil COPECs identified that may cause excess risk to ecological receptors. These include the following analytes.

- bis(2-ethylhexyl)phthalate
- high molecular weight PAHs
- mercury
- thallium
- Total PCBs
- *cis*-1,2-dichloroethene
- TCE

Risk managers should be aware of the uncertainties related to identifying COPECs in surface soil at the C-400 Complex. The primary uncertainty with evaluating surface soil at the C-400 Complex is if the exposure pathway is complete for ecological receptors. There are areas within the Paducah Site that could be suitable terrestrial habitat for ecological terrestrial receptors; however, the C-400 Complex is within an industrial use area, and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. Because there is little surface soil outside the C-400 Cleaning Building footprint that is not obstructed in some way, it is highly unlikely that terrestrial ecological receptors would be exposed to contaminants in the C-400 Complex for a duration that would result in unacceptable risk.

TCE was the only COPEC identified for RGA groundwater that has the potential to cause excess risk to surface water ecological receptors if groundwater under the C-400 Complex migrates and discharges to surface water. Identification of TCE as a COPEC assumes that concentrations of TCE will not be decreased as groundwater migrates or enters a surface water body, which is highly unlikely. There may be potential for elevated concentration of TCE to enter surface water bodies around PGDP; however, the concentrations will be significantly less than what was used in the SERA.

7.4 CONCLUSIONS

The C-400 Complex contains SWMUs and contaminated environmental media/debris (e.g., soil, concrete, groundwater) and is the primary source of off-site TCE and technetium-99 groundwater contamination at PGDP. The remaining portions of the C-400 Cleaning Building following deactivation contain hazardous substances that are present in the infrastructure. The presence of contamination that is associated with the C-400 Cleaning Building includes PCBs, radionuclides, specific VOCs (e.g., TCE), and specific heavy metals (e.g., uranium, lead). The building also has ACM in its structure. The building is a known source of contamination to surrounding ditches and surface soil. The presence of hazardous substances in the C-400 Cleaning Building has been determined to pose an actual or potential threat of release to the environment. Chemical releases have likely occurred at the C-400 Complex since operations began in the 1950s. Chemical releases have been associated with processes that occurred within the C-400 Cleaning Building and with ancillary features (e.g., acid and discard waste lines, sewers, storage/transfer areas). Significant quantities of chemicals, primarily TCE, and a variety of other constituents and products have been released to the environment at various areas within the C-400 Complex throughout its operational history, with chemicals present in sludges, concrete/brick, soil, and groundwater. Source zones for COCs and Priority COCs also were evaluated against risk-based values and other EPA guidance, as appropriate.

The presence of a confirmed/probable source zone, composed of TCE DNAPL and high concentration TCE contamination, was identified and evaluated in the southern portion of the C-400 Complex. The confirmed/probable source zone in the southeastern portion of the C-400 Complex, in Sectors 1A, 1B, and 4, occurs in the UCRS, RGA, and the Upper McNairy Formation. Previous interim actions have removed portions of this source area. The UCRS portion of the source is mostly located beneath the southeastern corner of the building (southeastern portion of Sector 1), but smaller zones in the UCRS are also present in Sector 4. TCE was found in UCRS, RGA, and McNairy groundwater with a maximum detection in groundwater of 645,000 µg/L [MW407-PRT1 (UCRS)] in Sector 4. The maximum detection of TCE in soils within Sector 4 was 6,940,000 µg/kg [400S4-12 (Upper McNairy at 94–95 ft bgs)]. Another smaller confirmed/probable source zone, composed of TCE DNAPL and high concentration TCE contamination, is located near the southwestern portion of the C-400 Complex in Sector 5. The maximum TCE in soil in Sector 5 was 144,000 µg/kg [400S5-08 (upper UCRS at 5.5–6.5 ft bgs)]. This confirmed/probable source zone was particularly shallow, occurring at depths less than 20 ft bgs. This zone is located above the Phase I Southwest Treatment Area that was previously treated with ERH at depths below 20 ft bgs.

In addition, a likely soil source of technetium-99 contamination was identified in the southern end of Sector 1C. The highest technetium-99 in this area was 1,390 pCi/g in boring 400S1C-C01 in a sample collected from 3–4 ft bgs. Also in this area, technetium-99 is present in a zone from depths of 20–55 ft bgs, with a maximum activity of 1,020 pCi/g and an average of approximately 285 pCi/g within that depth interval. There are additional, smaller technetium-99 source zones within the upper 5 ft of soil in Sectors 1B, 6, and 7 (Figure 4.45). Technetium-99 activity in soil > 35.7 pCi/g is the site-specific soil activity calculated to result in groundwater contamination to the RGA of 900 pCi/L or greater.

Groundwater transport represents a significant route of contaminant migration at the Paducah Site. Although lithologic heterogeneity may cause localized groundwater flow patterns to vary, the general groundwater flow direction is northward towards the Ohio River.

Consistent with agreements reached during project scoping, and because the C-400 Complex area already has been subjected to a BRA that concluded action needed to be taken, a new BRA was not performed under this C-400 Complex OU RI. Instead, an SRE and SERA were conducted to evaluate the current and potential future risk to human health and the environment. Together the SRE, the SERA, and the previous risk assessments constitute a full BRA, as documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

Uranium-238 is identified as the primary risk driver in surface soil across the C-400 Complex. Thorium-230, uranium metal, and uranium-235/236 were also identified as priority COCs in certain sectors. Uranium metal is identified as the primary risk driver in surface and subsurface soil across the C-400 Complex. Thorium-230, was also identified as a priority COC in Sector 6. TCE was identified as a priority COC in two sectors, Sectors 4 and 5, located in the southern portion of the C-400 Complex.

There were a relatively large number of COCs identified as priority COCs in groundwater, particularly in the RGA. There were five primary risk drivers identified in groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. TCE ELCR contributed approximately 84% of the total ELCR and approximately 96% of the total noncancer hazard.

The SERA identified seven soil COPECs that may cause excess risk to ecological receptors. These include bis(2-ethylhexyl)phthalate, PAHs, mercury, thallium, Total PCBs, *cis*-1,2-dichloroethene, and TCE. Risk managers should be aware of the uncertainties related to identifying COPECs in surface soil at the C-400 Complex. The primary uncertainty with evaluating surface soil at the C-400 Complex is if the exposure pathway is complete for ecological receptors. There are areas within the Paducah Site that could be suitable terrestrial habitat for ecological terrestrial receptors; however, the C-400 Complex is within an industrial use area, and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. It is highly unlikely that terrestrial ecological receptors would be exposed to contaminants in C-400 Complex for a duration that would result in unacceptable risk. TCE was the only COPEC identified for RGA groundwater that has the potential to cause excess risk to surface water ecological receptors if groundwater under the C-400 Complex migrates and discharges to surface water.

Overall, the results of the RI show that characterization of the C-400 Complex is comprehensive. The representative data set used for the C-400 Complex is sufficient to support decision-making and indicates that a future FS is appropriate. Other information, such as geotechnical and geochemical data, was gathered during the RI in support for the evaluation of future remedial alternatives. Contaminant source areas and contaminant plumes are generally known and delineated.

7.4.1 Recommended Remedial Action Objectives

Recommended RAOs are goals for the protection of human health and the environment. RAOs provide a general description of what a CERCLA cleanup is designed to accomplish. Recommended RAOs for the C-400 Complex OU RI, developed in accordance with National Contingency Plan (NCP) requirements, consist of site-specific goals for protecting human health and the environment and meeting ARARs in the absence of an ARAR waiver. The recommended RAOs were developed from the CSM; the historical human health risk assessment results and the SRE that identified the COCs; and the contaminant migration pathways and exposure scenarios that the remedial action will address.

The RI includes infrastructure- and media-specific recommended RAOs for addressing source areas, including treatment and/or removal of PTW consistent with CERCLA, the NCP (including the preamble), and any pertinent EPA guidance. The following general recommended RAOs were developed during scoping meetings conducted among EPA, KDEP, and DOE and documented in the C-400 Complex RI/FS Work Plan (DOE 2020).

- Contribute to the protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination;

- Prevent exposure to waste, groundwater, soils, slab, and subsurface structures, including exposure to vapors from these environmental media and structures that present an unacceptable risk; and

- Treat or remove PTW wherever practicable, consistent with 40 *CFR* § 300.430 (a)(1)(iii)(A).

The general recommended RAOs were refined based on the results of the RI. Recommended RAOs were developed for infrastructure, soil, and groundwater. Infrastructure refers to construction materials (e.g., concrete, brick, metal, paint, coatings, caulk); piping material; and surface and subsurface infrastructure (e.g., utilities, auxiliary systems, railroads) inside the C-400 Complex that remained following deactivation activities.

Infrastructure RAO: Eliminate, reduce, or otherwise mitigate the potential for releases of hazardous substances from infrastructure (including slabs, aboveground structures, and subsurface structures) to soil, groundwater, or surface water.

Soil RAO 1: Treat PTW inside the C-400 Complex OU, consistent with 40 *CFR* § 300.430(a)(1)(iii)(A), or remove, wherever practicable. If treatment or removal of PTW is not practicable, then reduce or control PTW, wherever practicable.

Soil RAO 2: Prevent exposure to contaminated subsurface waste source material (e.g., DNAPL), soils, sediment, and sludge inside the C-400 Complex OU that exceeds revised preliminary remediation goals (PRGs) selected from risk-based, background-based, and ARAR-based chemical-specific values. The acceptable cumulative risk levels for this RAO are defined as follows:

- Surface Soil: cumulative ELCRs < 1E-05 and cumulative target organ noncancer HI ≤ 1 for a current and future industrial worker; and

- Surface and Subsurface Soil: cumulative ELCR < 1E-05 and cumulative target organ HI ≤ 1 for a future excavation worker.

Soil RAO 3: Contribute to the protection of groundwater by eliminating, reducing, or controlling non-PTW sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values in soil/sediment/sludge inside the C-400 Complex OU to reduce the migration of COCs to groundwater.

Soil RAO 4: Contribute to the protection of groundwater by eliminating, reducing, or controlling non-PTW sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values in soil/sediment/sludge inside the C-400 Complex OU to minimize migration of COCs to surface water and air.

Groundwater RAO 1: Prevent exposure to groundwater inside the C-400 Complex OU, including exposure to vapors that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values.

Groundwater RAO 2: Contribute to the protection of groundwater by eliminating, reducing, or controlling (PTW[21] and non-PTW[22]) sources that exceed revised PRGs selected from risk-based, background-based, and ARAR-based chemical-specific values of groundwater COCs inside the C-400 Complex OU in the UCRS, RGA, and Upper McNairy Formation.

Groundwater RAO 3: Restore contaminated groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. If restoration of groundwater to beneficial uses is determined to not be practicable, then prevent further migration of the plume, prevent exposure to contaminated groundwater, and evaluate further risk reduction.

[21] NAPLs
[22] Contaminants sorbed to soil in saturated zones (e.g., perched UCRS, RGA, McNairy).

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APPENDIX A

TECHNICAL MEMORANDA FOR FIELD ACTIVITIES

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The purpose of these memoranda is to provide certain technical details regarding field activities pertaining to the C-400 Complex Operable Unit remedial investigation. Technical memoranda are provided for the following activities.

- Radiological walkover survey
- Membrane Interface Probe (MIP)
- Dye-Enhanced Laser Induced Fluorescence (DyeLIF)
- Rehabilitation of existing monitoring wells
- Colloidal borescope investigation
- Pressure transducer data collection

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ATTACHMENT A1

TECHNICAL MEMORANDUM FOR RADIOLOGICAL WALKOVER SURVEY FIELD ACTIVITIES

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GAMMA WALKOVER SURVEYS

Radiological walkover surveys were completed using Ludlum Model 2221 scaler/ratemeters connected to Ludlum Model 44-10 2x2 sodium iodide (NaI) detectors. Surveys were conducted to define the highest count rate area/location within each sector with the purpose of determining the area/location of biased samples within each sector. The radiological surveys were conducted as outlined in Appendix C of the *Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2433&D2/R1 and according to guidance supplied by the Project Manager. For simplicity, Appendix C is referred to as the "Survey Plan".

The logged survey data was downloaded from a Trimble GEO7X handheld data collector previously connected to the Ludlum Model 2221/Model 44-10 NaI detector. The data was corrected and processed using Trimble GPS Pathfinder Office software.

The downloaded data set included fields for gross count rate data in counts per minute and State Plane coordinates (feet), Kentucky South. The data fields also included time stamps and other fields related to the survey.

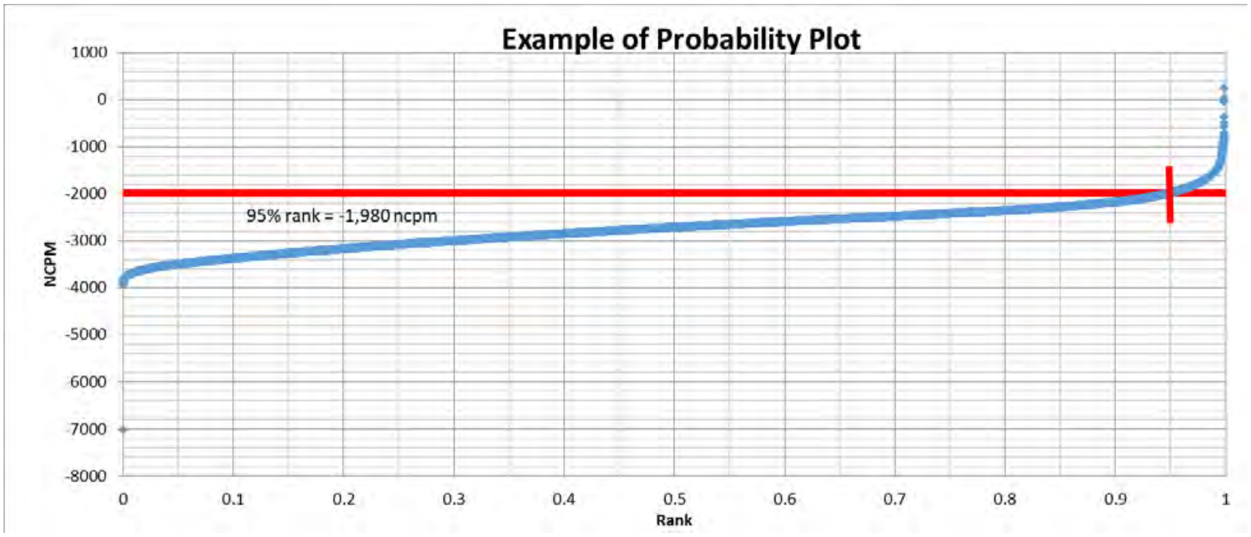
Using ArcGIS, the data was assessed for coverage as indicated in the Survey Plan. If the coverage was determined to be sufficient for the area surveyed in the sector and the detector fell within its two sigma control limit, the data was accepted and surveys were continued in the Sector until all accessible portions of the sector had been sufficiently surveyed.

Upon completion of surveys within a sector, all data set files within the sector were merged into a single Microsoft Excel data file. The merged file survey data set was created using net counts per minute (gross counts per minute minus background for each instrument/detector combination used) for the entire sector.

Each survey data set was analyzed in order to identify the highest count rate areas or locations within each sector.

A probability plot and inflection/break point analysis was conducted for each sector's survey data set to identify data greater than the inflection point/break point or 95% level. The probability plot for each sector survey data set was developed by the following steps:

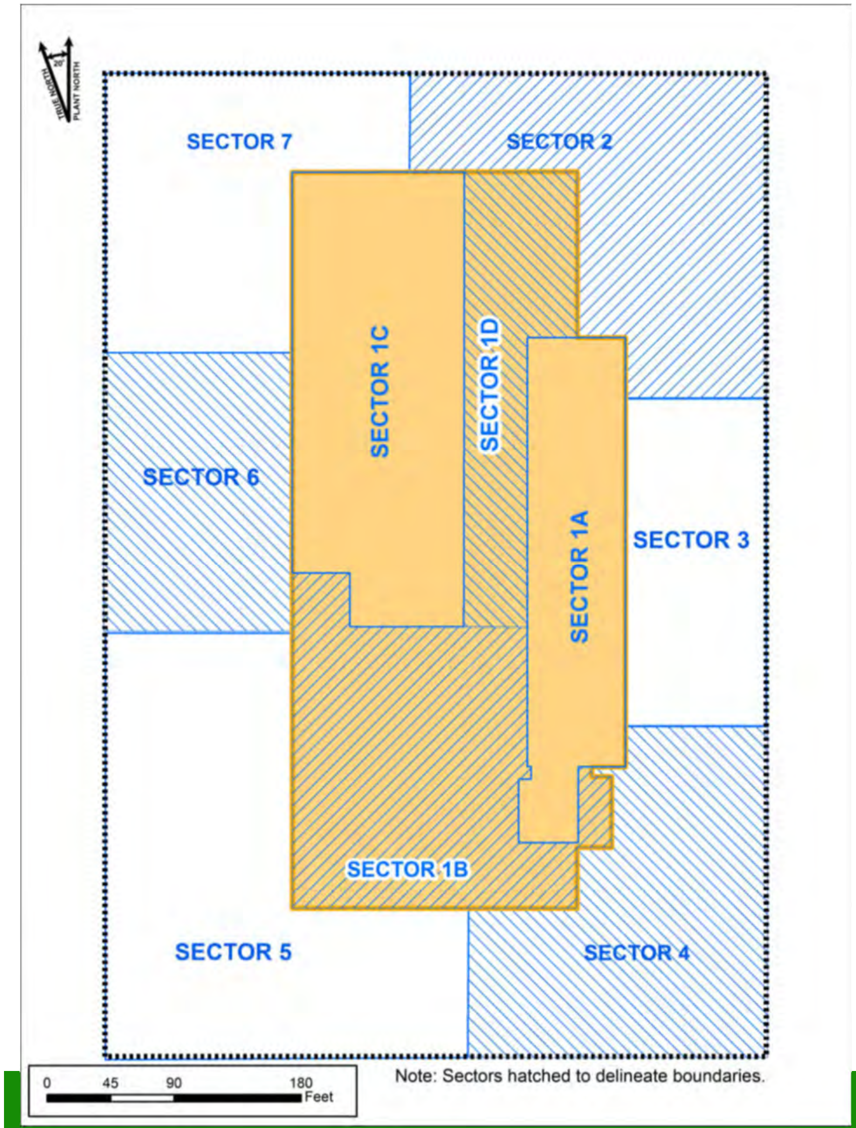
- The survey net count rate and coordinate data for the sector was sorted using Excel.
- The net survey count rate, cpm, was ranked for the data set as a percentage of the data set using Excel.
- The probability plot, (see below) was developed from the net count rate, cpm, and the percent (0 to 1) for the data set.



Areas above the inflection point/break point or 95% level were mapped using ArcGIS. Coordinates for these areas were provided to and marked by land surveyors using Real-Time Kinematic (RTK) equipped GPS equipment Areas. These areas were resurveyed according to the Survey Plan and guidance from the Project Manager.

Biased samples are to be taken based on the locations with the highest radioactivity measurements.

Background



- In accordance with the RI/FS Work Plan, walkover surveys of accessible areas were performed for Sectors 2-7
  - NOTE: examples of areas that are not accessible include structures that remain following deactivation activities (e.g., C-403 Neutralization Pit) and areas close to the C-400 Building structure that impact GPS surveying
- The intent of the radiological walkover of the surface soils is to delineate areas of high activity
- Based on inflection point analysis of the Gamma Walkover Survey, one biased grab sample per sector will be collected for Sectors 2-7
- These samples will be collected from 0 - 0.5 ft bgs and analyzed for the radionuclides listed in Table 6.1 of the RI/FS Work Plan (excluding those designated with footnote "a")

Planned Analyte List

RI/FS Work Plan Page 6-16

Table 6.1. Planned Analyte List

Metals	VOCs	SVOCs	PCBs	Dioxins/Furans[d,e]	Radionuclides
Aluminum	Acrylonitrile	Acenaphthene	Total PCBs	2,3,7,8-TCDD	Actinium-227[a,e]
Antimony	Benzene	Acenaphthylene	Aroclor 1016	1,2,3,7,8-PeCDD	Americium-241
Arsenic	Bromodichloromethane	Anthracene	Aroclor 1221	1,2,3,4,7,8-HxCDD	Cesium-137
Barium	Carbon tetrachloride	Carbazole	Aroclor 1232	1,2,3,6,7,8-HxCDD	Cobalt-60[a,e]
Beryllium	Chloroform	Fluoranthene	Aroclor 1242	1,2,3,7,8,9-HxCDD	Lead-210[a,e]
Boron	1,1-Dichloroethene	Fluorene	Aroclor 1248	1,2,3,4,6,7,8-HpCDD	Neptunium-237
Cadmium	1,2-Dichloroethane	Hexachlorobenzene	Aroclor 1254	OCDD	Plutonium-238
Total Chromium	1,2-Dichloroethene	Naphthalene	Aroclor 1260	2,3,7,8-TCDF	Plutonium-239[b]
Cobalt	*trans*-1,2-Dichloroethene	2-Nitroaniline		1,2,3,7,8-PeCDF	Plutonium-240[b]
Copper	*cis*-1,2-Dichloroethene	N-Nitroso-di-n-propylamine		2,3,4,7,8-PeCDF	Protactinium-231[a,e]
Fluoride	1,4-Dioxane	Pentachlorophenol[c]		1,2,3,4,7,8-HxCDF	Radium-226[a,e]
Iron	Ethylbenzene	Phenanthrene		1,2,3,6.7,8-HxCDF	Strontium-90[a,e]
Lead	Tetrachloroethene	Pyrene		1,2,3,7,8,9-HxCDF	Technetium-99
Manganese	Toluene	Total Carcinogenic PAHs		2,3,4,6,7,8-HxCDF	Thorium-228[a,e]
Mercury	1,1,1-Trichloroethane	Benz(a)anthracene		1,2,3,4,6,7,8-HpCDF	Thorium-230
Molybdenum	1,1,2-Trichloroethane	Benzo(a)pyrene		1,2,3,4,7,8,9-HpCDF	Thorium-232[a,e]
Nickel	Trichloroethene	Benzo(b)fluoranthene		OCDF	Uranium-234
Selenium	Vinyl chloride	Benzo(k)fluoranthene		Total TCDD	Uranium-235
Silver	Xylenes (Mixture)	Chrysene		Total PeCDD	Uranium-238
Thallium	p-Xylene	Dibenz(a,h)anthracene		Total HxCDD	
Uranium	m-Xylene	Indeno(1,2,3-cd)pyrene		Total HpCDD	
Vanadium	o-Xylene			Total TCDF	
Zinc				Total PeCDF	
				Total HxCDF	
				Total HpCDF	

[a] Additional radionuclides analyzed only in designated locations.
[b] Reported as plutonium-239/240.
[c] Pentachlorophenol is analyzed in designated locations, as discussed during project scoping.
[d] Dioxins and furans are analyzed in designated locations, as discussed during project scoping.
[e] Solid (concrete), Soil Matrix will be sampled for analysis.

Background (cont.)
RI/FS Work Plan Page C-22

- After a sampling location within a sector has been determined, a discussion will be held with the Kentucky Department for Environmental Protection (KDEP) and the U.S. Environmental Protection Agency (EPA) to gain agreement of the sampling location. KDEP and EPA will send agreement of the sampling location or a proposed alternate location within three business days.[1] If there is continued disagreement of the sampling location, discussions will be held to determine an agreed upon location

[1] Three business days is an expectation for scheduling purposes

GWS Results and Proposed Biased Sample Location

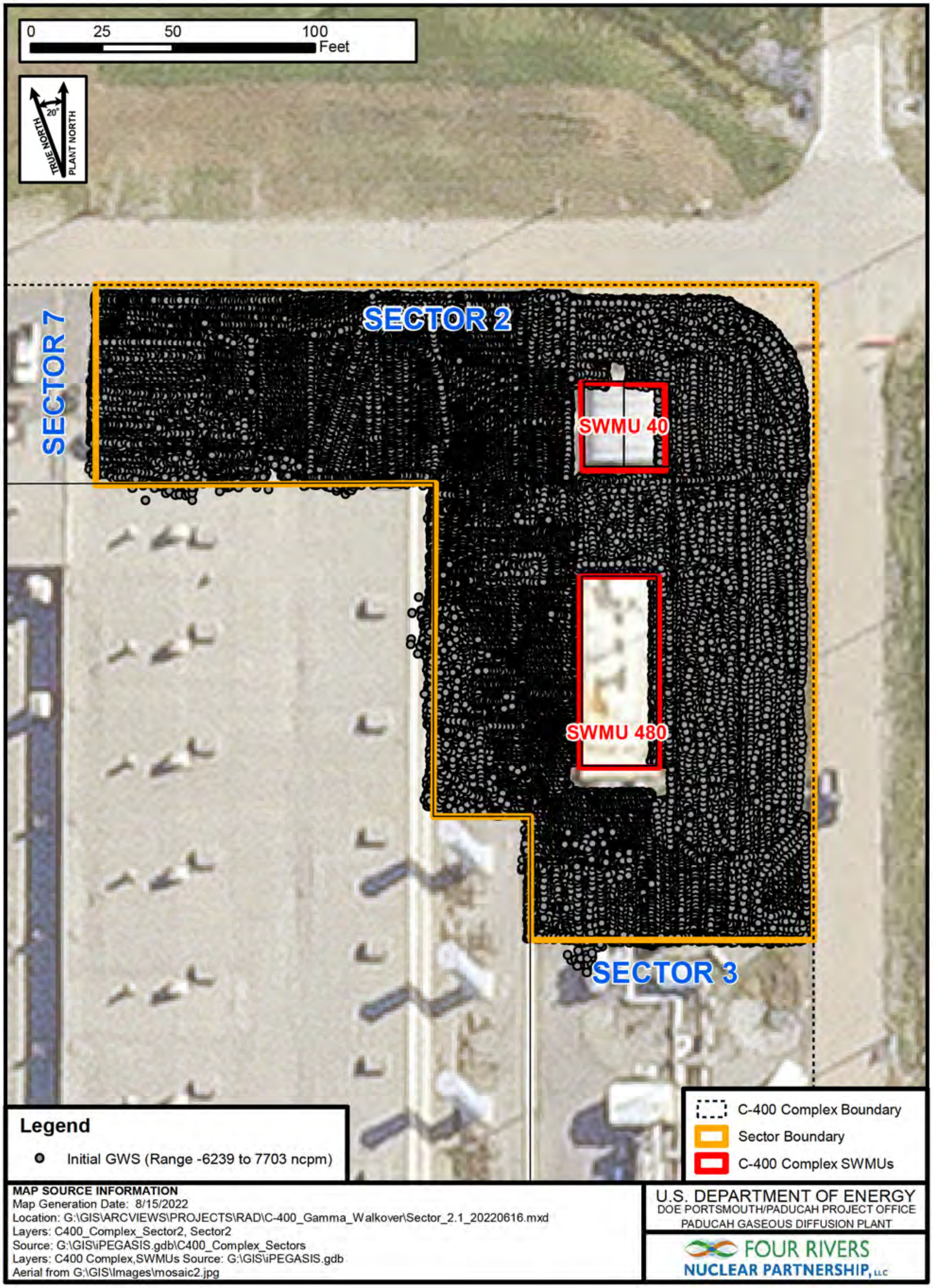
- The GWS data for the sectors were analyzed using inflection point analysis and probability plots were used to determine whether a break/inflection point occurs in the data

- Data above the break/inflection point were mapped to determine the location of the data above the inflection point within the sector. The analysis indicates the following two cases at the C-400 Complex (RI/FS Work Plan Page C-21):
  - Case 2: A sector may have multiple areas with a group of elevated count rate data points. The sample areas will be resurveyed (e.g., confirmation) to determine the boundary of the each area (e.g., count rate above the break/inflection point) and the location with the highest count rate within each area. From the areas, the area with the highest count rate will be chosen for sampling at the location with the highest count rate
    - **<u>Applies to Sectors 2, 5, 6, and 7</u>**

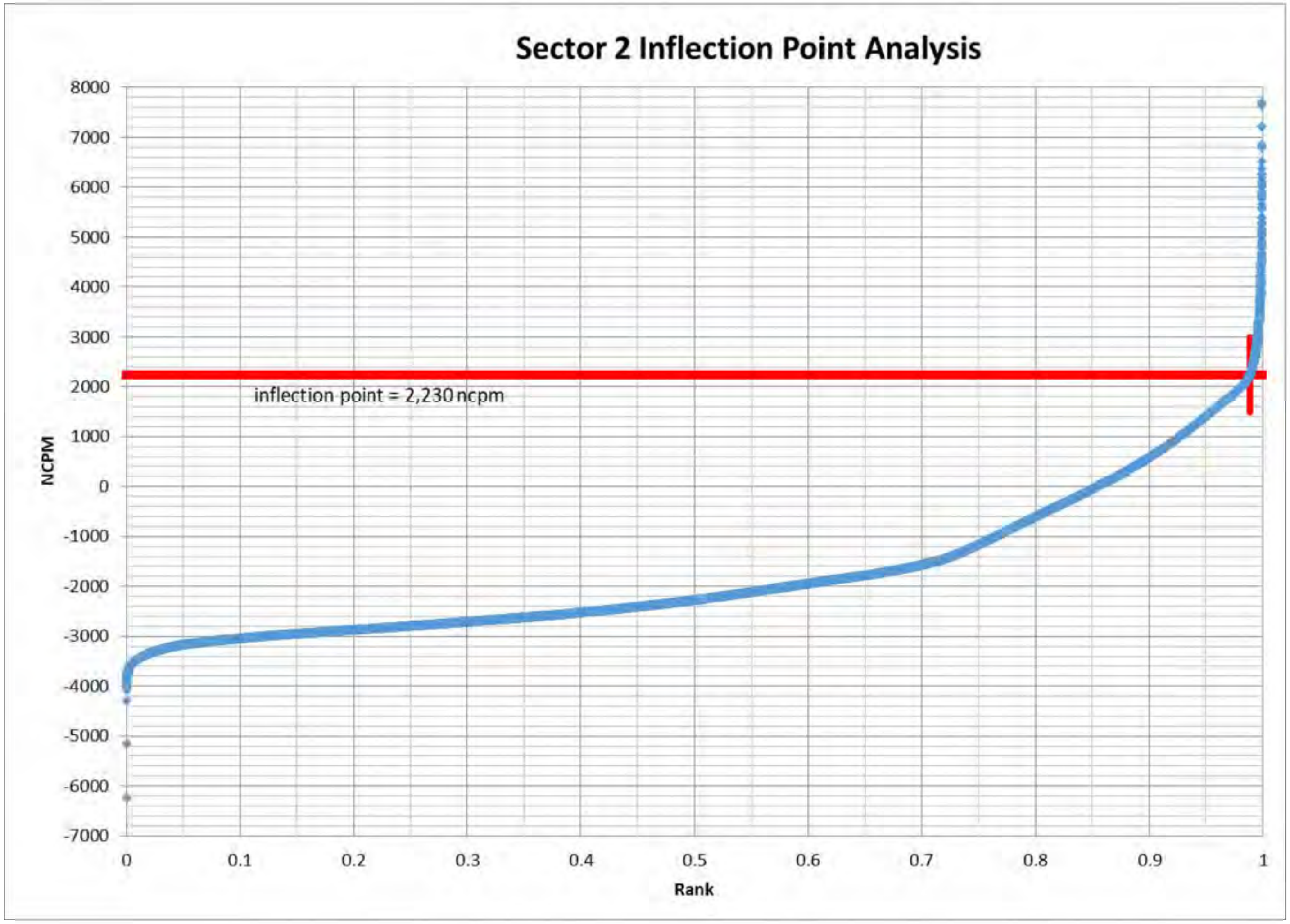
  - Case 5: If no inflection point is observed for the probability plot, data points above the 95th percentile will be mapped and used, along with professional judgment, to determine the location for a judgmental sample
    - **<u>Applies to Sectors 3 and 4</u>**

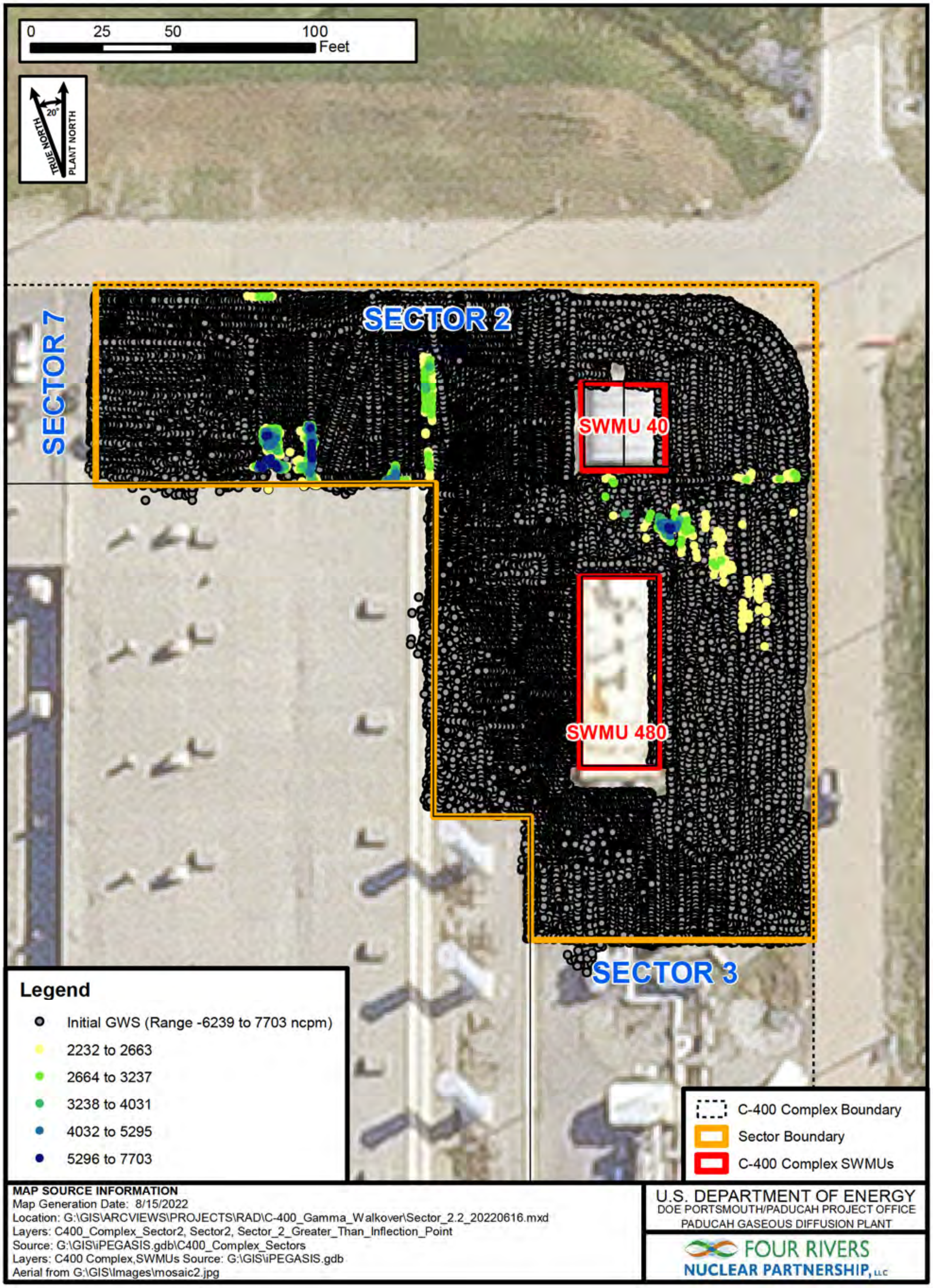
Sector 2

- Case 2: Multiple areas with a group of elevated count rates
- Inaccessible Area(s)
  - C-403 Neutralization Pit
  - C-402 Lime House Building Slab
- Figure on next slides show areas greater than inflection point and location with the highest count rate (i.e., biased sample location)
  - Concrete is present at biased sample location.
  - Per the RI/FS Work Plan (Page 9-27), the concrete will be cored, removed, etc., to allow collection of the surface soil sample. Once soil is encountered under the concrete, the soil sample will be collected, and this sample depth will be considered the surface soil sample.

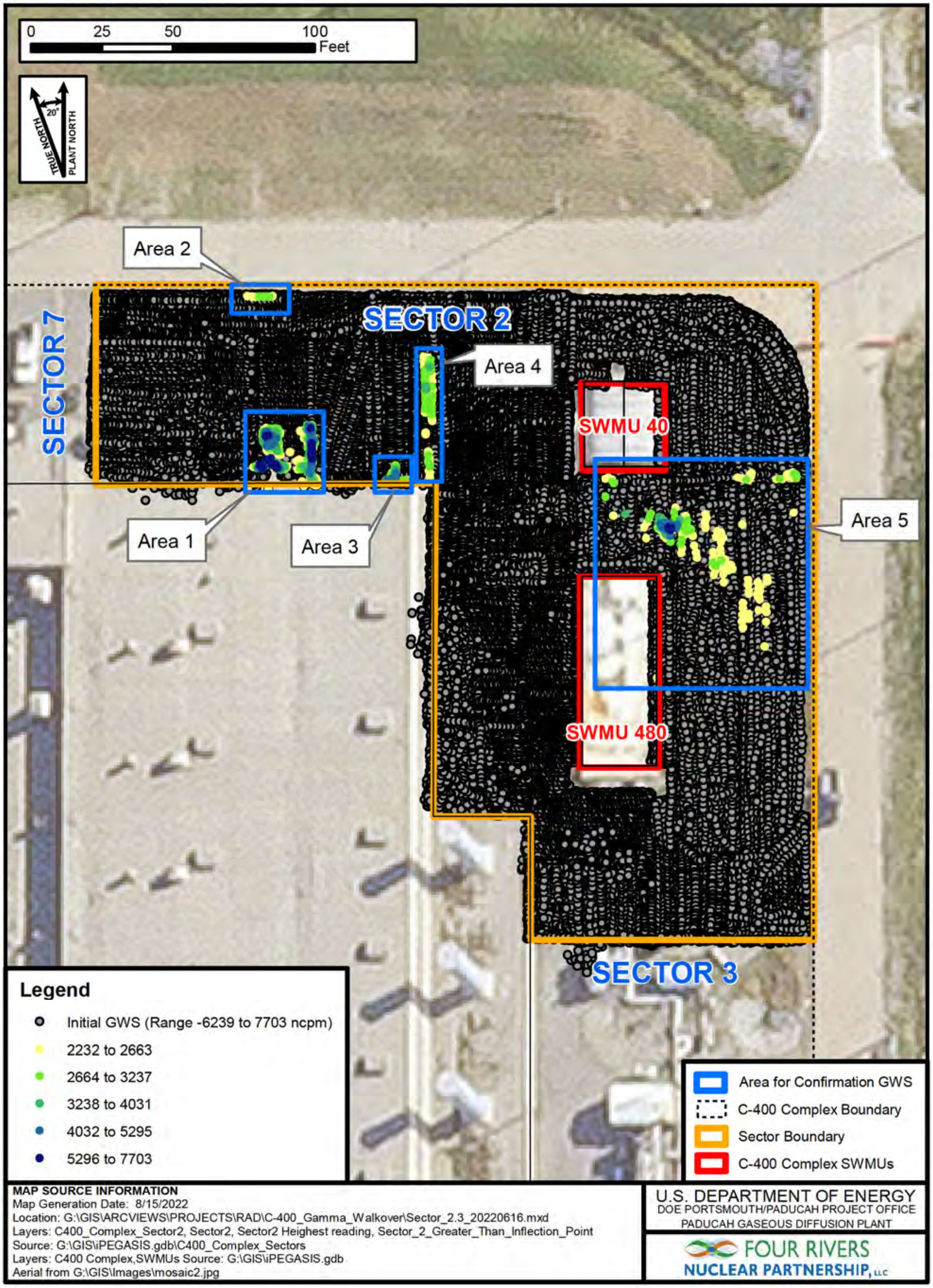


Sector 2 Figure 1

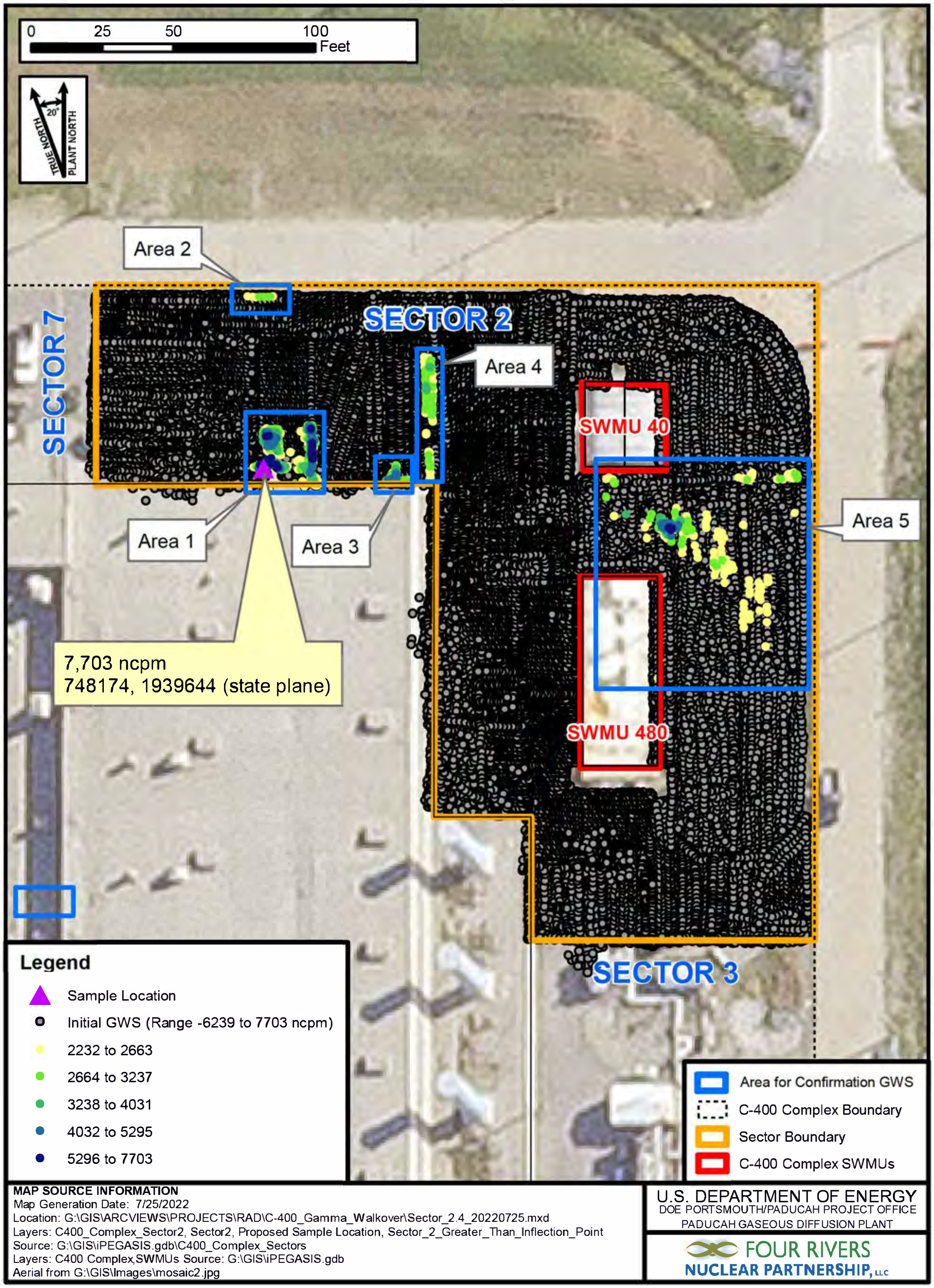

Sector 2 Inflection Point Analysis
inflection point = 2,230 ncpm
NCPM
Rank
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1



Sector 2 Figure 2



Sector 2 Figure 3



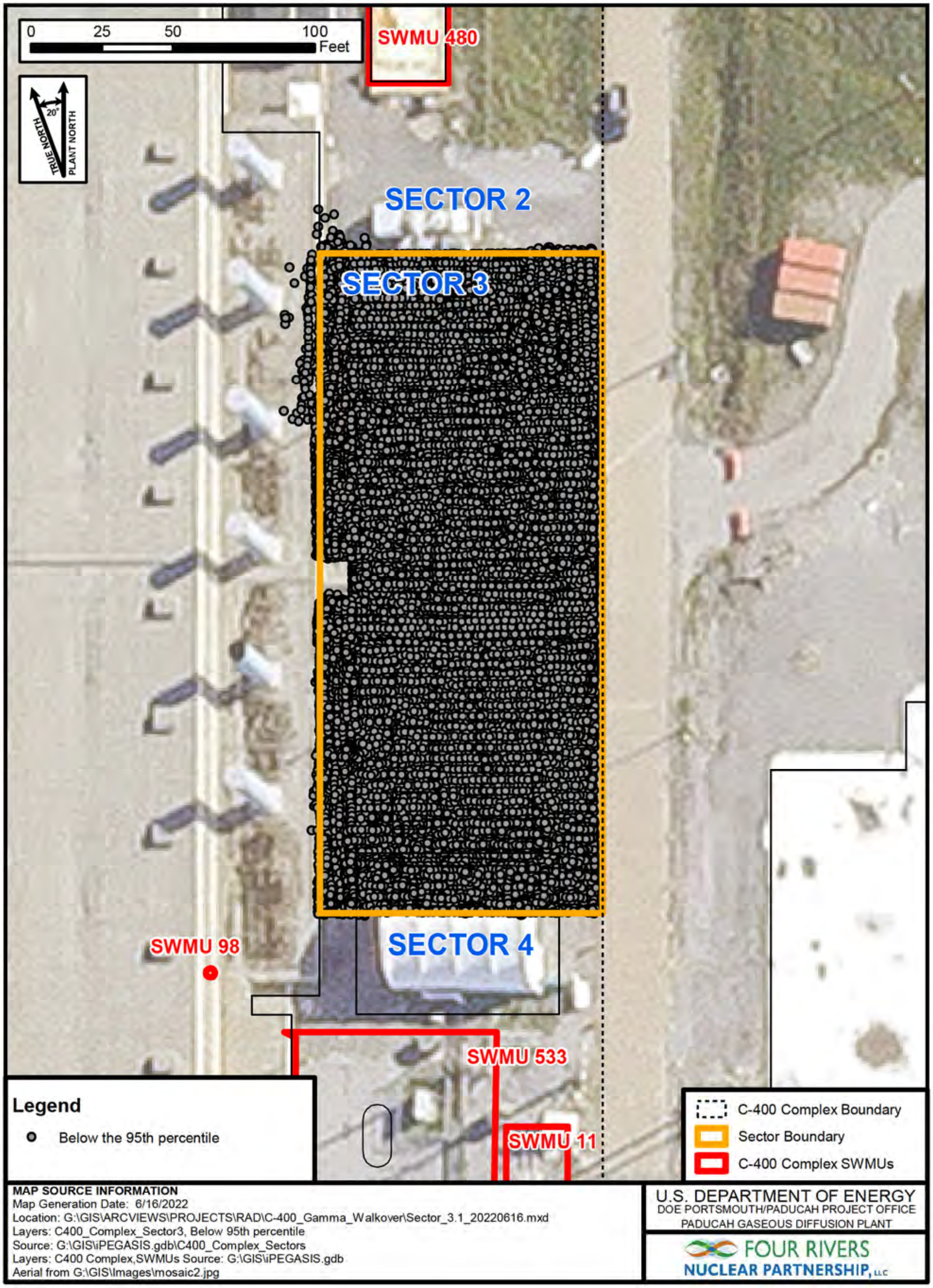
Sector 2 Figure 4

Sector 3

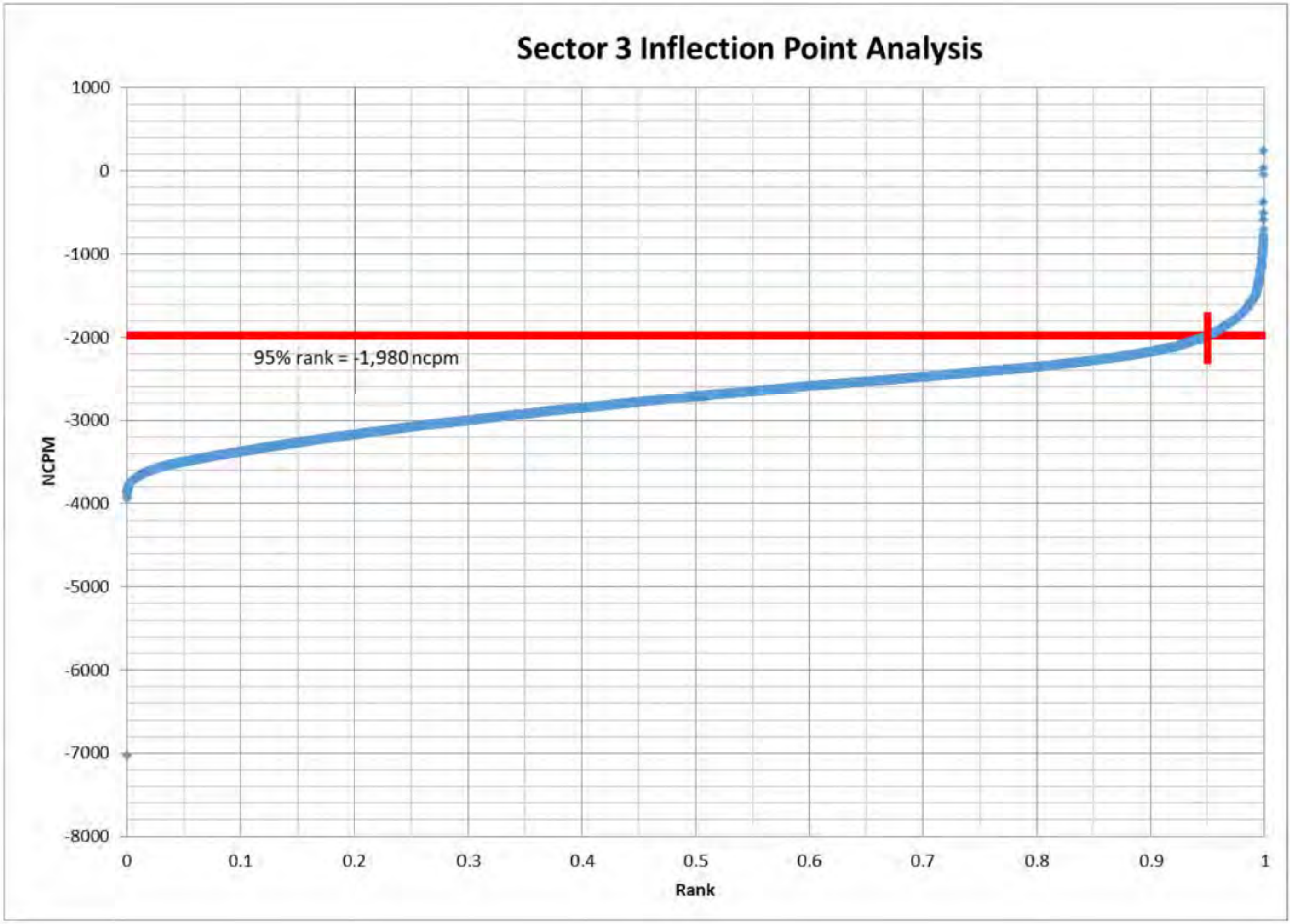
- Case 5: If no inflection point is observed for the probability plot, data points above the 95th percentile will be mapped and used, along with professional judgment, to determine the location for a judgmental sample

- Inaccessible Area(s)
  - C-400 basement access hatch

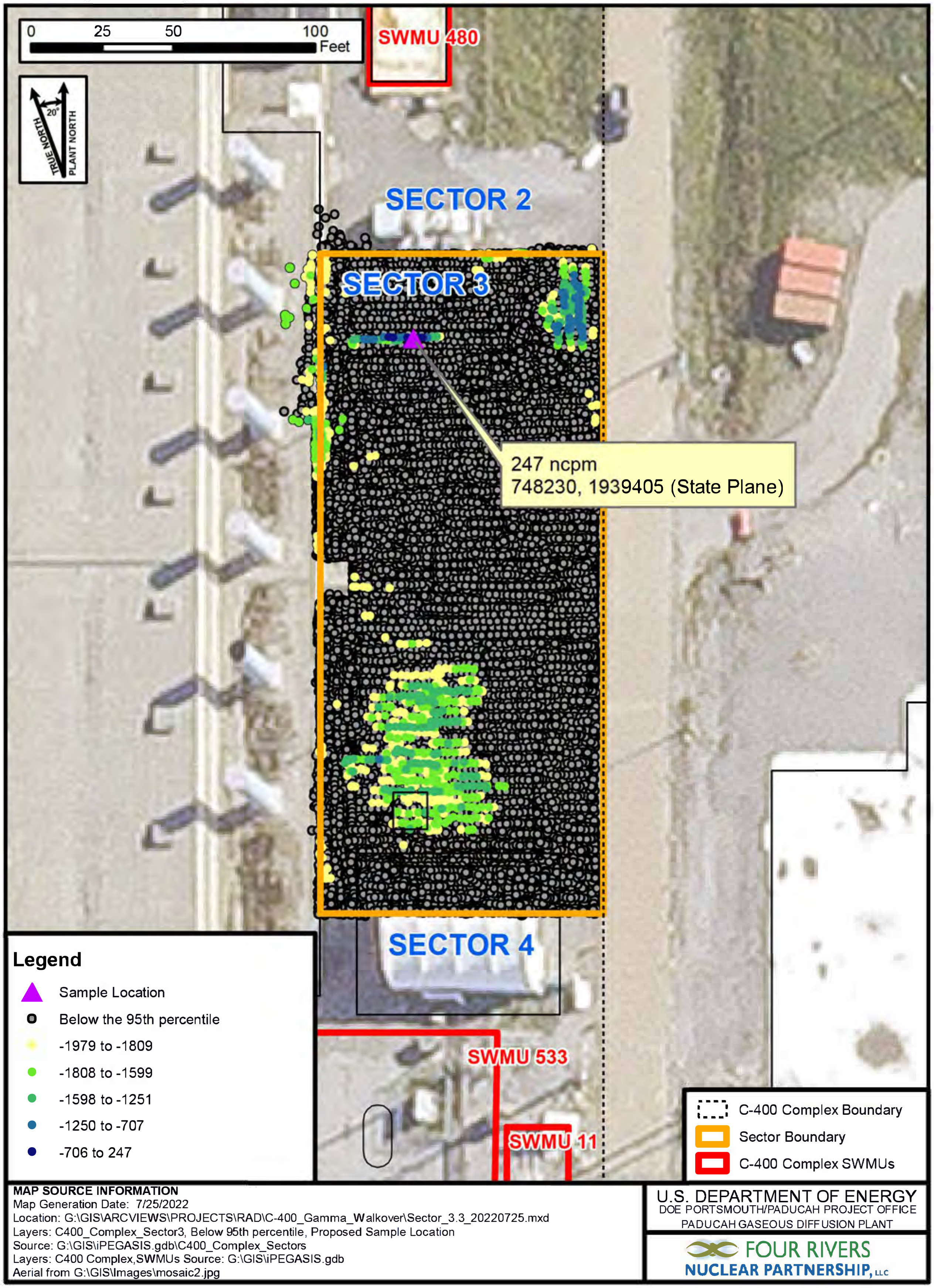
- Figure on next slides show data points above the 95th percentile and location with the highest count rate (i.e., biased sample location)



Sector 3 Figure 1


Sector 3 Inflection Point Analysis
NCPM
Rank
95% rank = -1,980 ncpm
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-8000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Sector 3 Figure 2



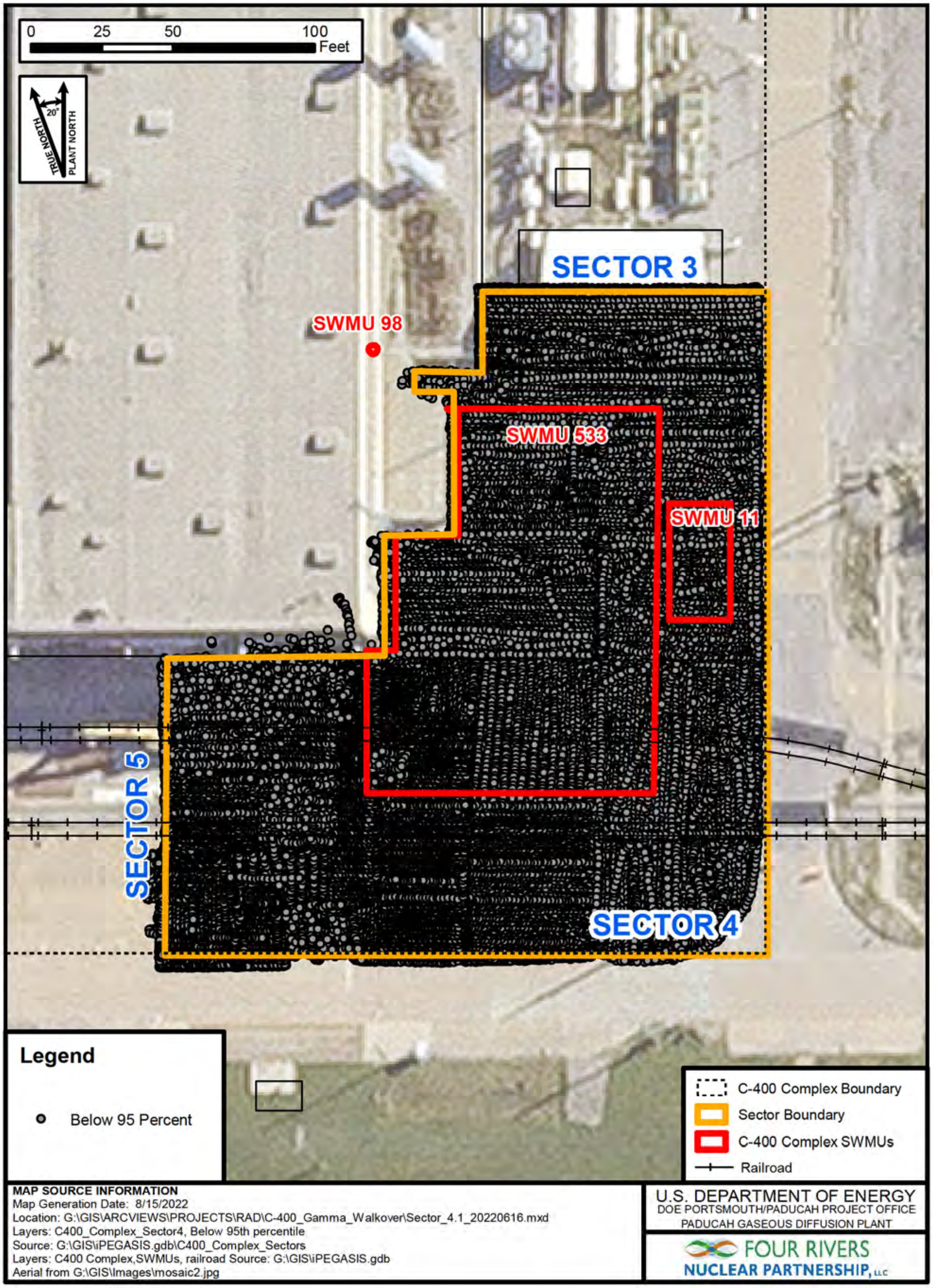
Sector 3 Figure 3

Sector 4

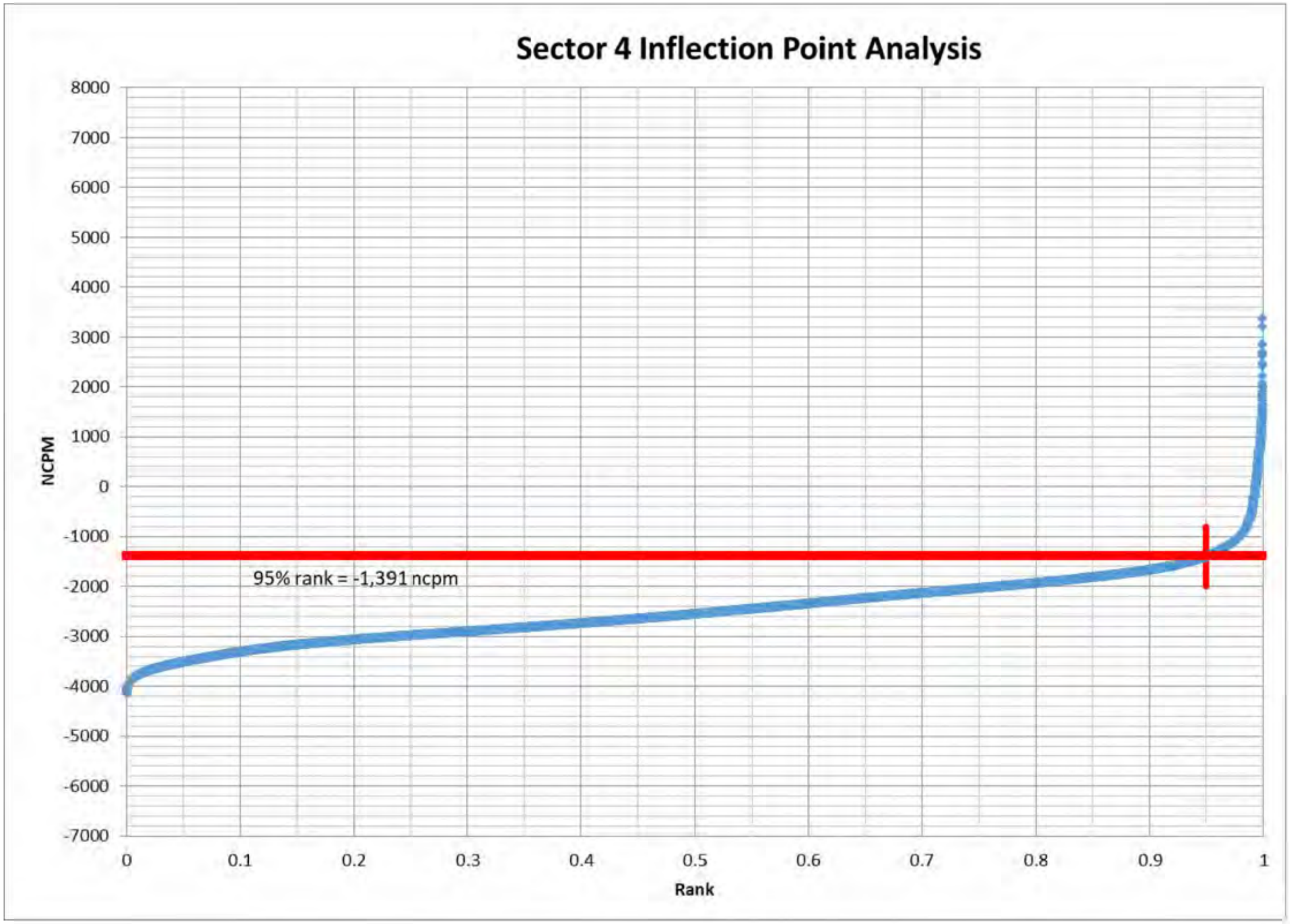
- Case 5: If no inflection point is observed for the probability plot, data points above the 95th percentile will be mapped and used, along with professional judgment, to determine the location for a judgmental sample

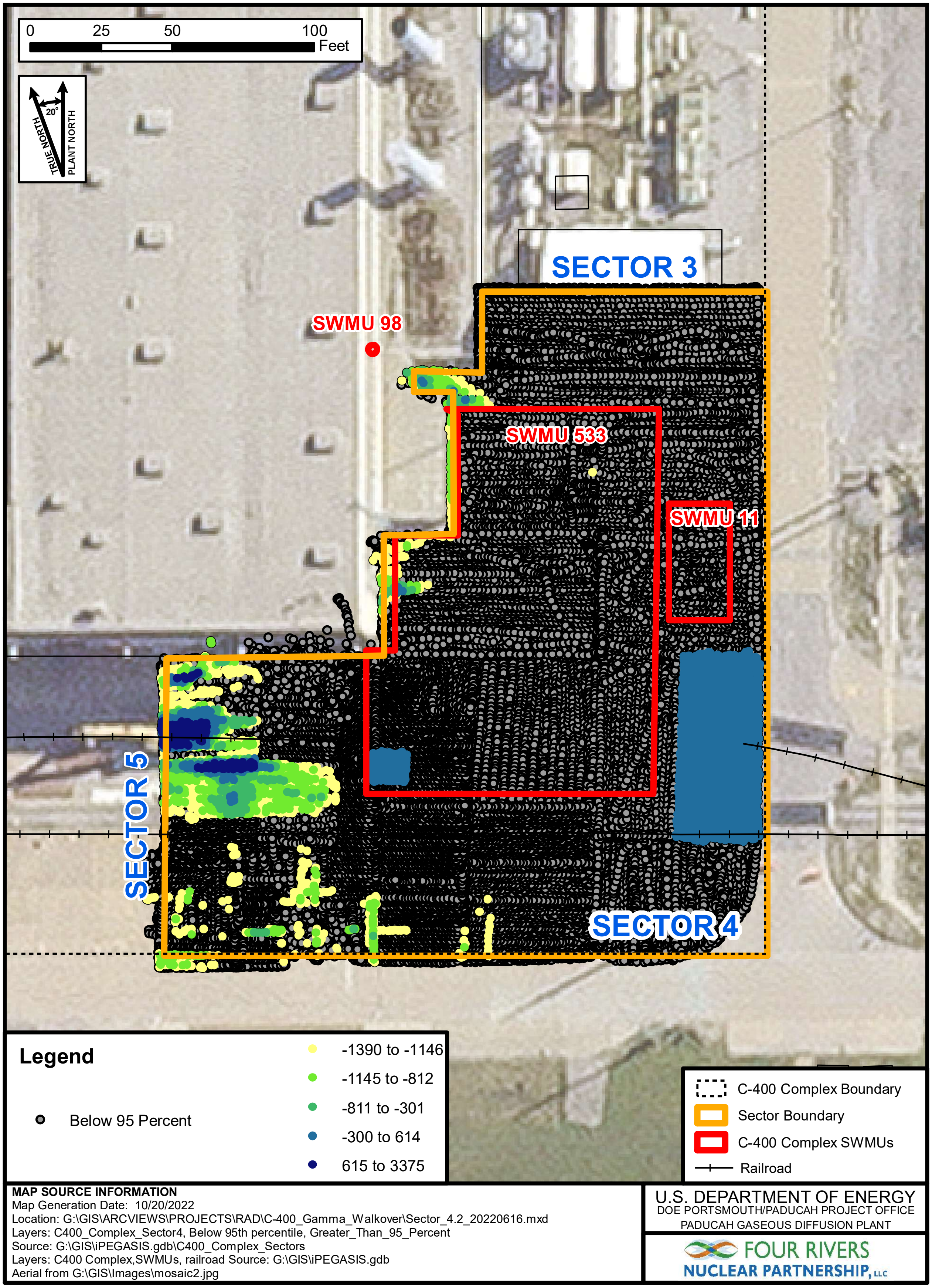
- Inaccessible Area(s)
  - None

- Figure on next slides show data points above the 95th percentile and location with the highest count rate (i.e., biased sample location)

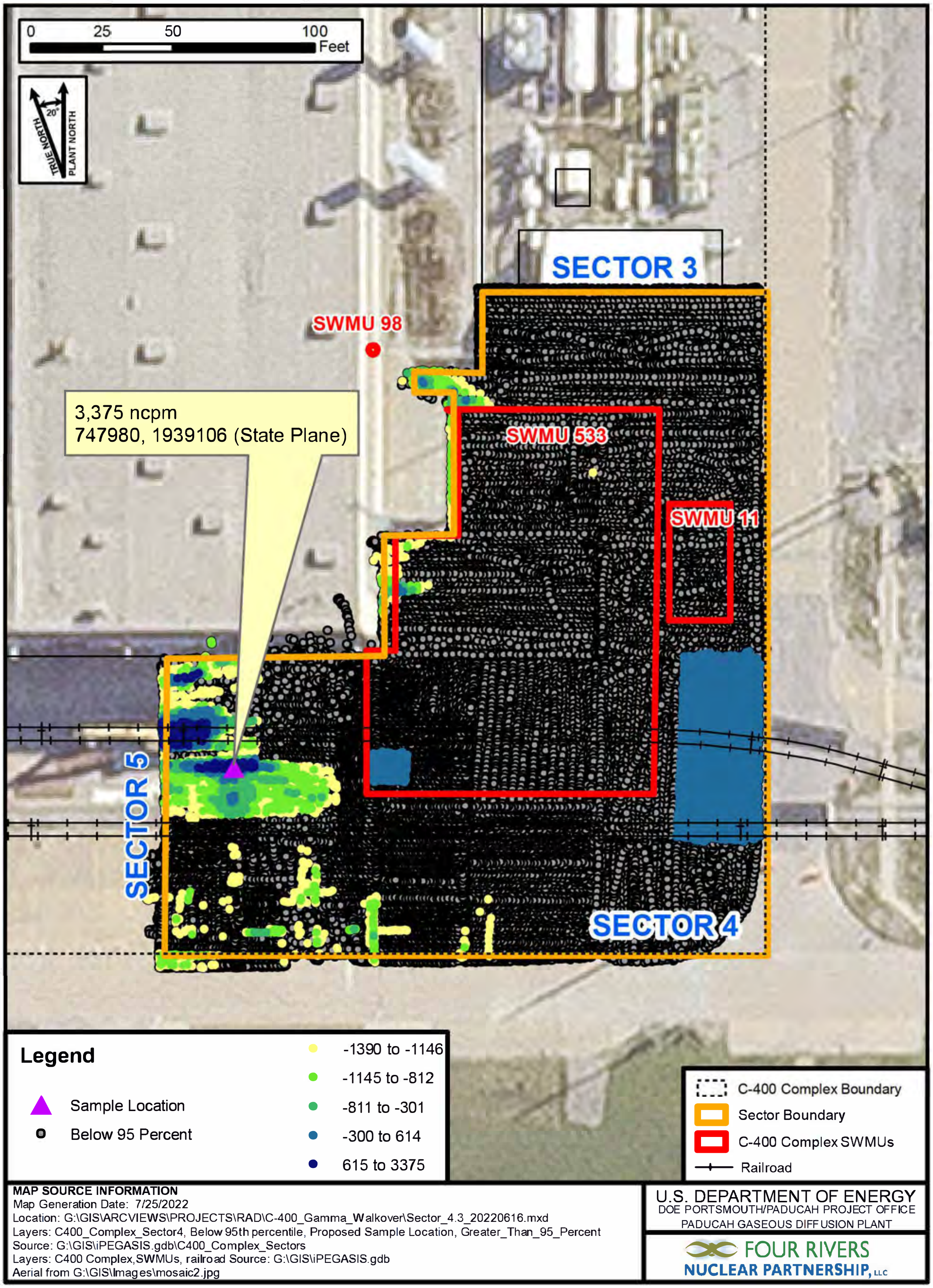


Sector 4 Figure 1


Sector 4 Inflection Point Analysis
NCPM
Rank
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
95% rank = -1,391 ncpm



Sector 4 Figure 2



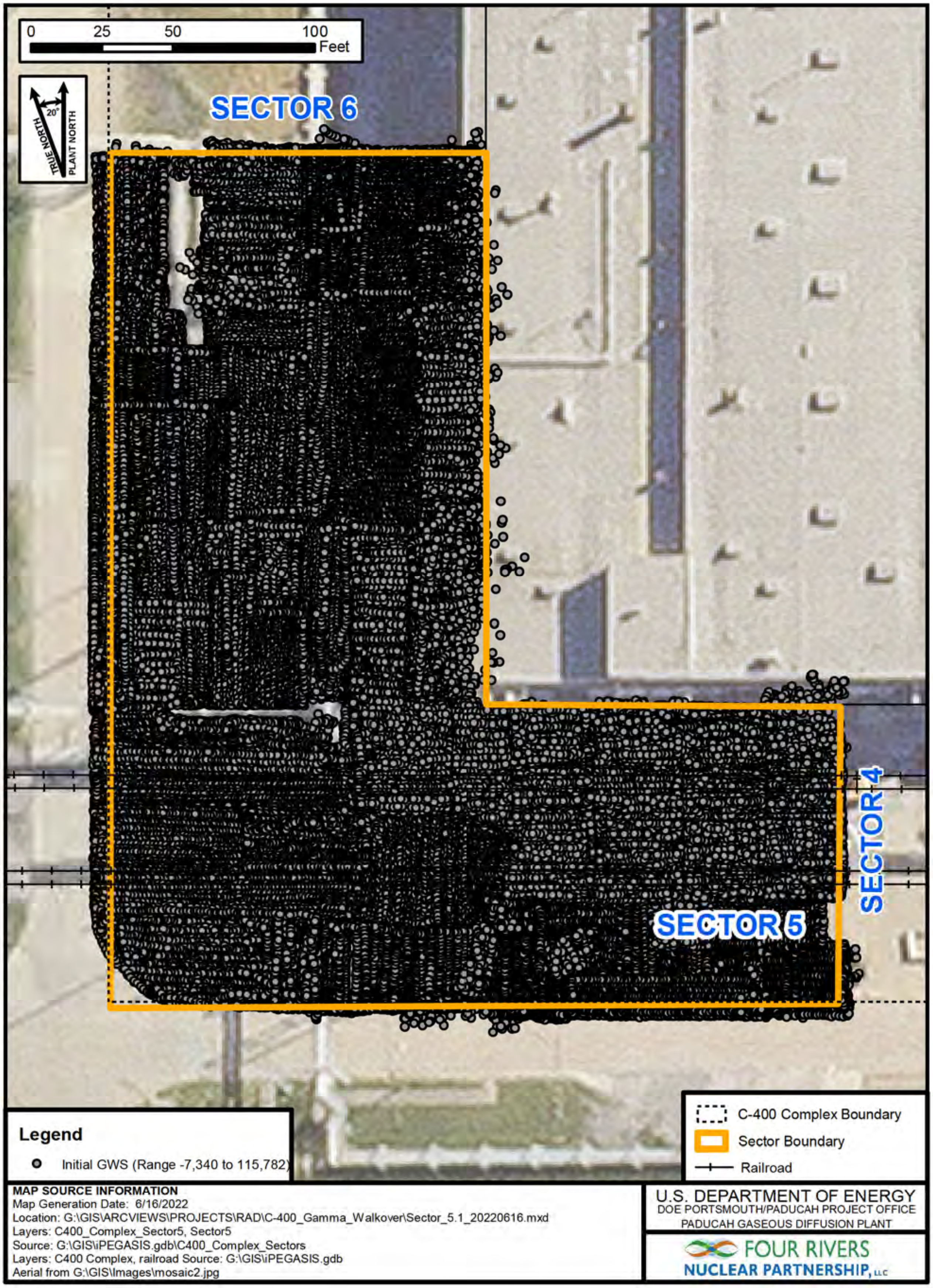
Sector 4 Figure 3

Sector 5

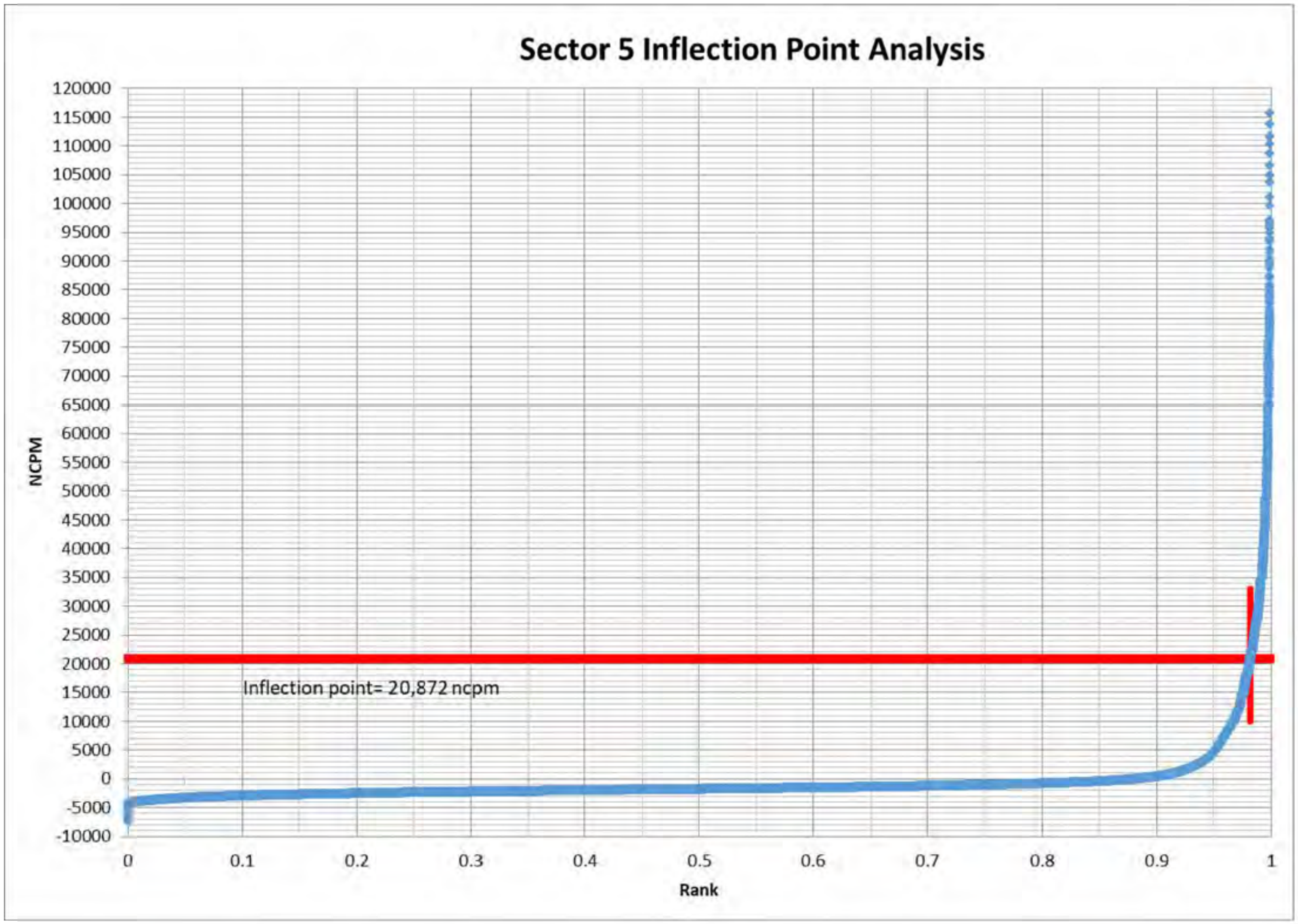
- Case 2: Multiple areas with a group of elevated count rates

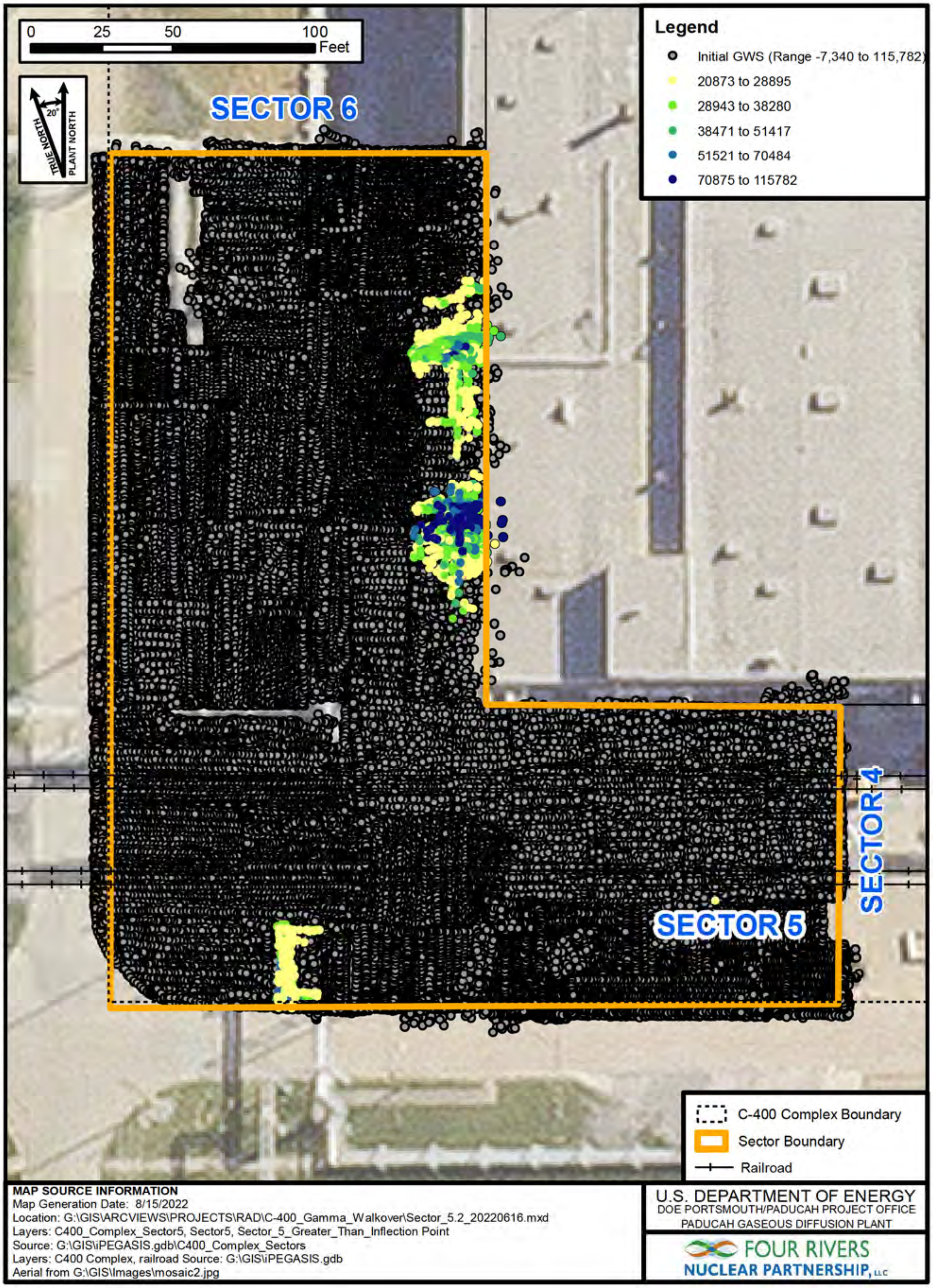
- Inaccessible Area(s)
  - Above ground utilities that supply other facilities
  - Waste heat recovery system equipment

- Figure on next slides show areas greater than inflection point and location with the highest count rate (i.e., biased sample location)

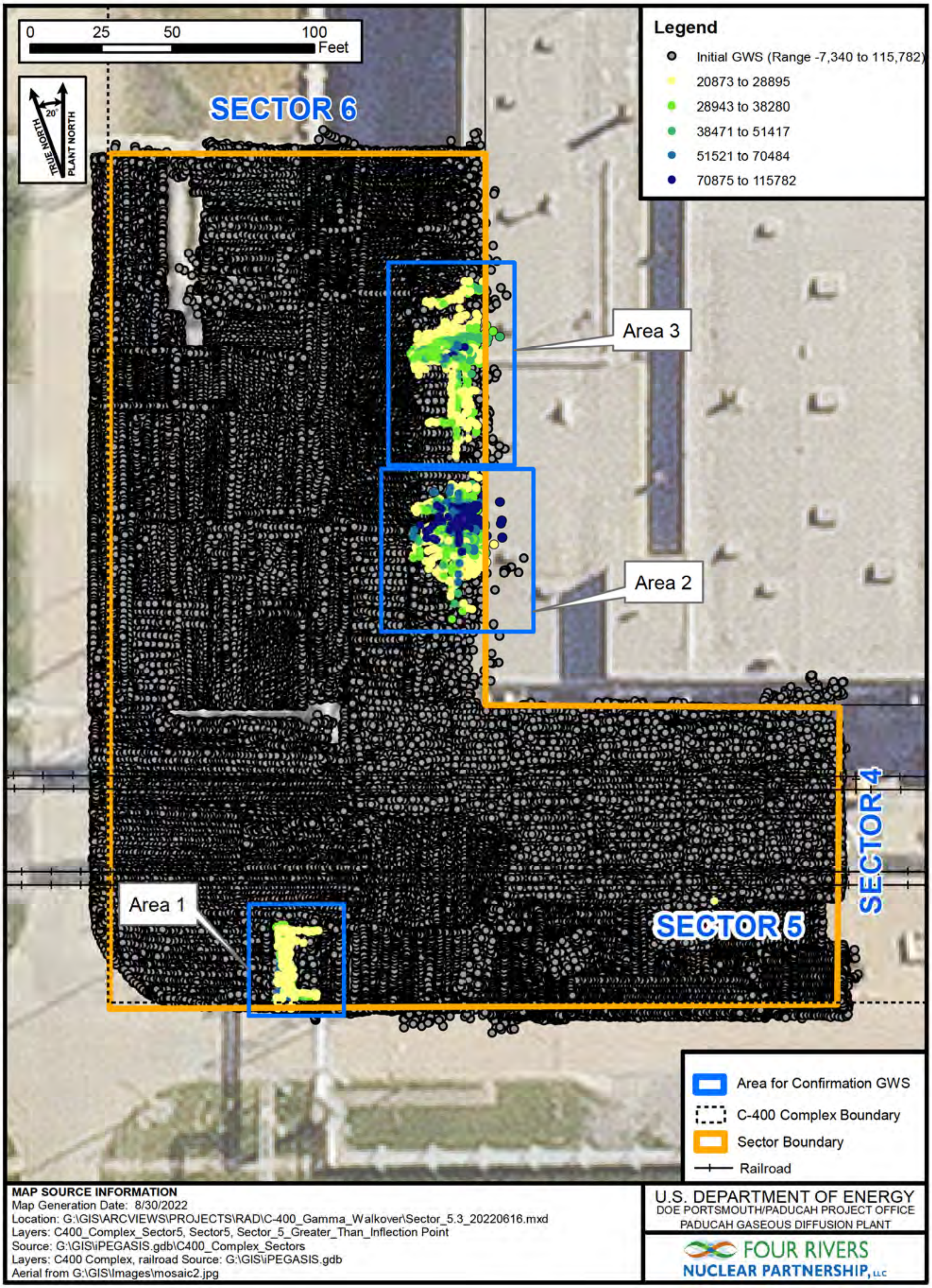


Sector 5 Figure 1

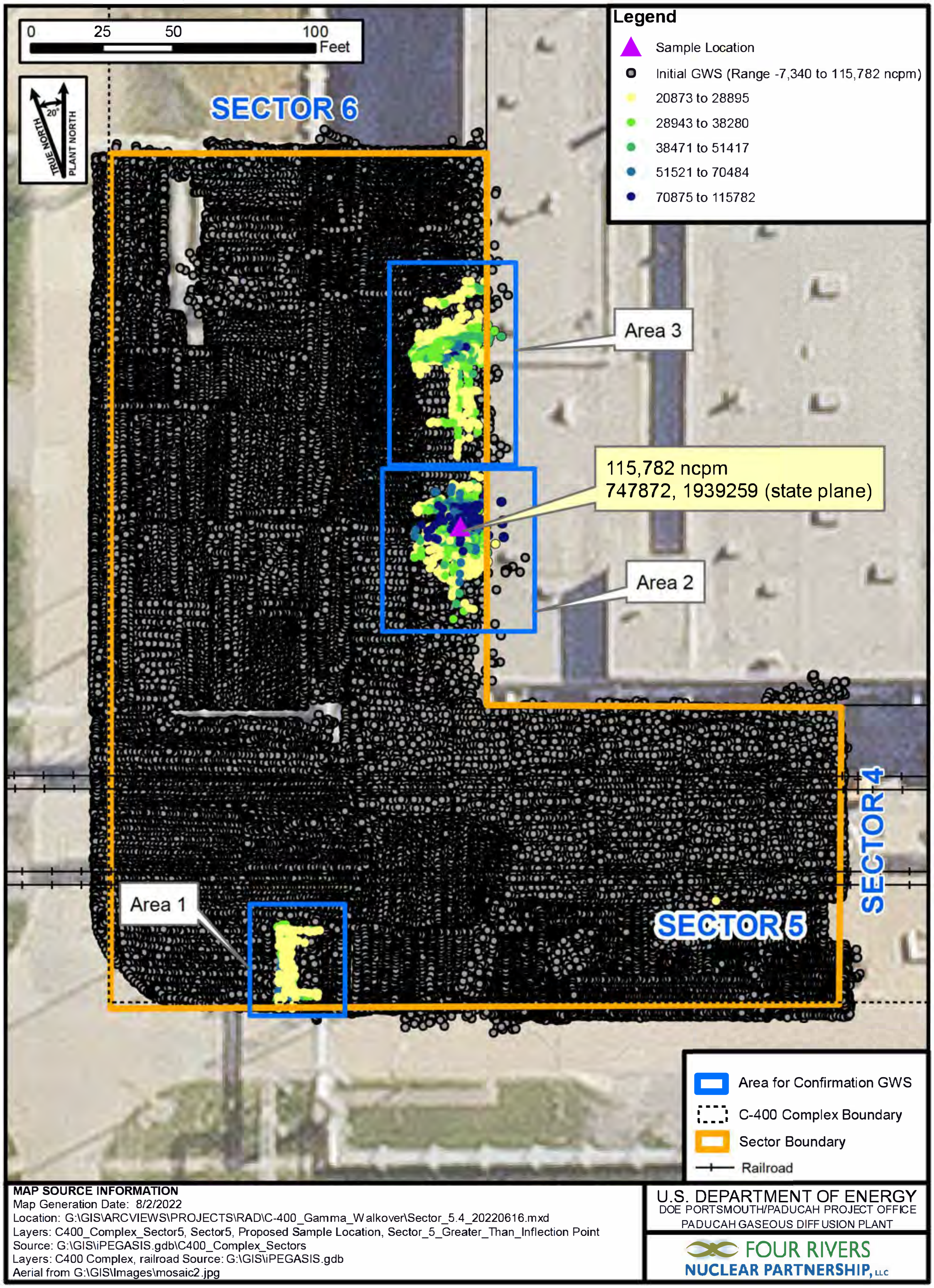

Sector 5 Inflection Point Analysis
NCPM
Rank
Inflection point= 20,872 ncpm
120000
115000
110000
105000
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
-10000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1



Sector 5 Figure 2



Sector 5 Figure 3



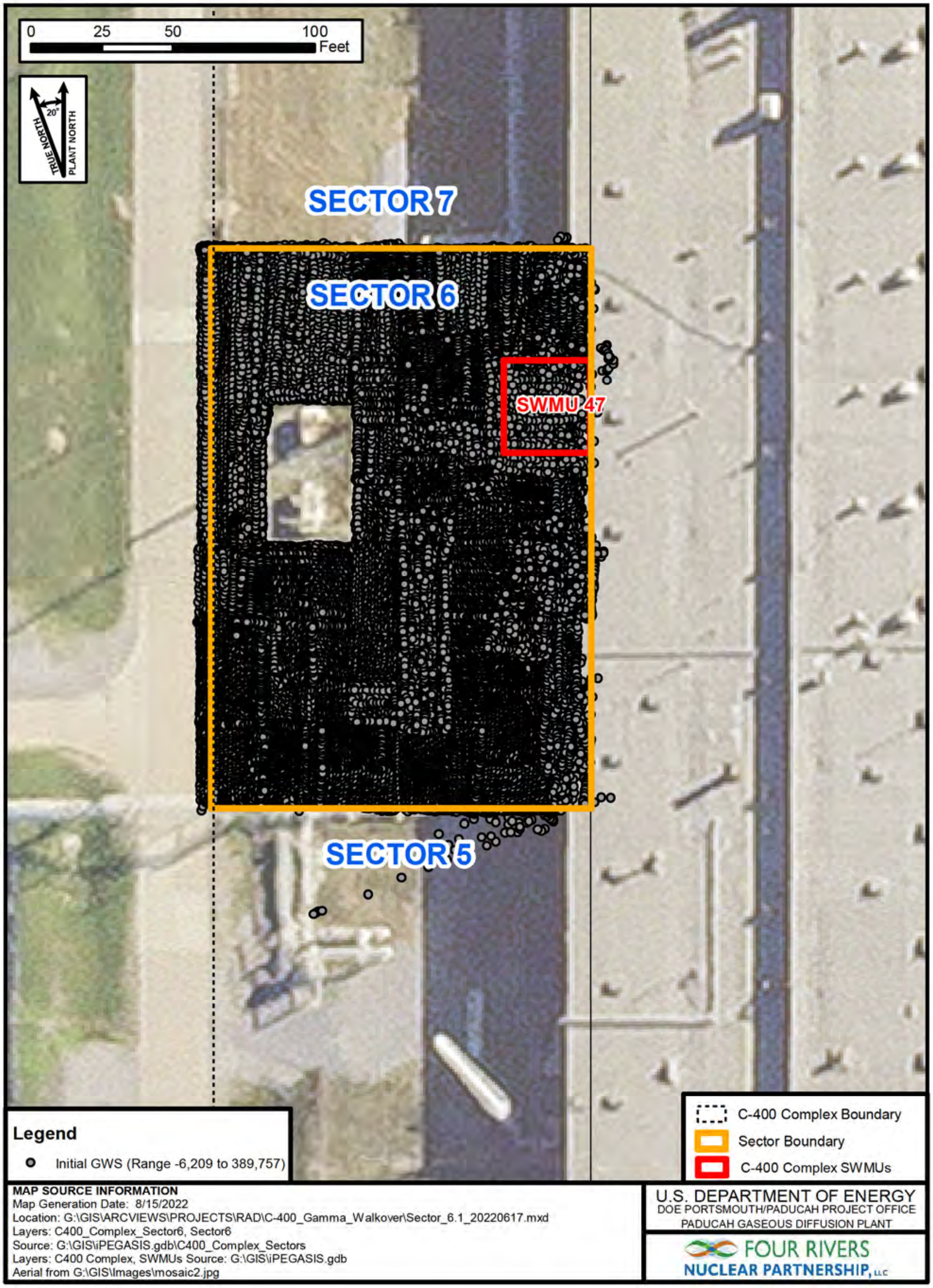
Sector 5 Figure 4

Sector 6

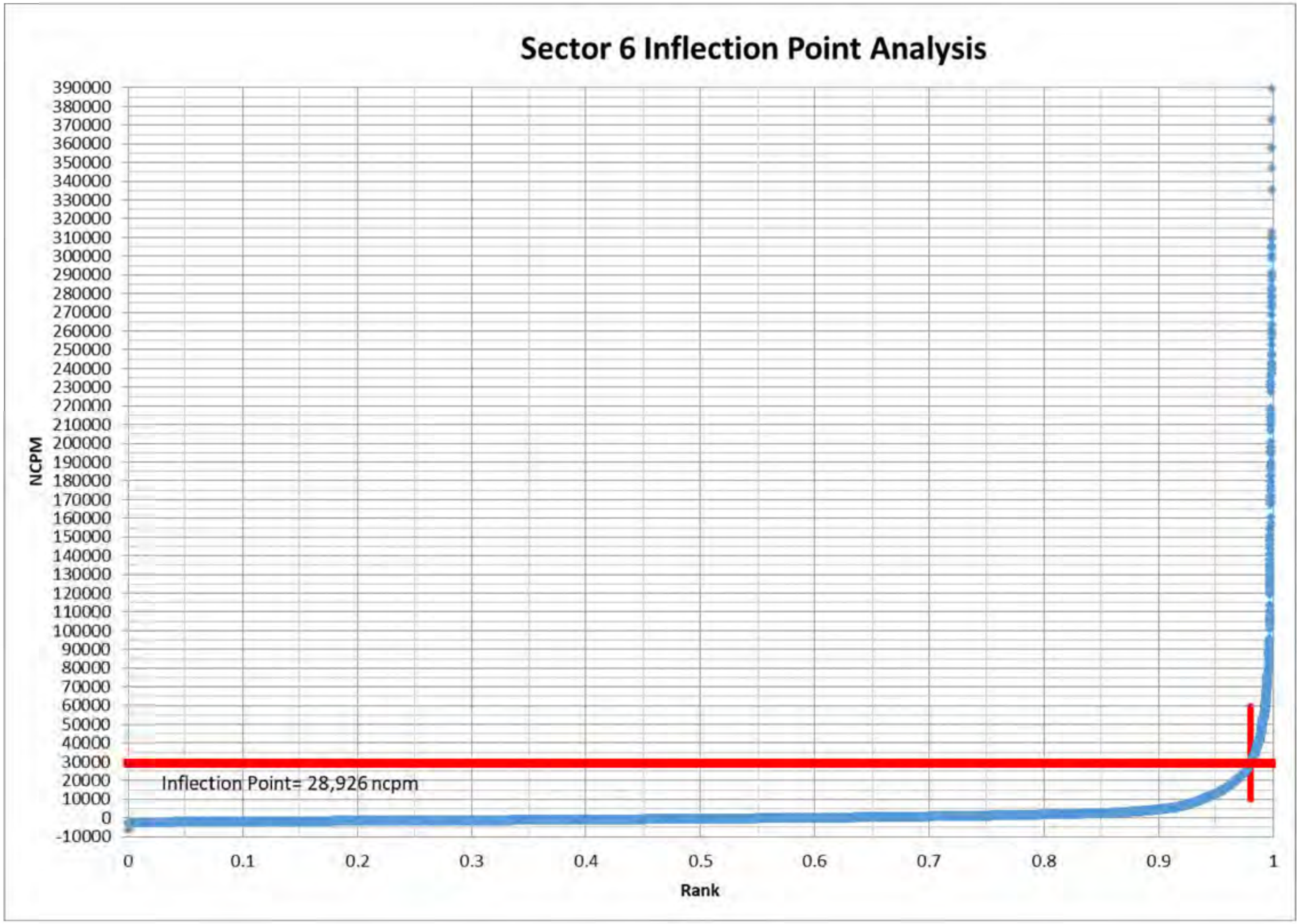
- Case 2: Multiple areas with a group of elevated count rates

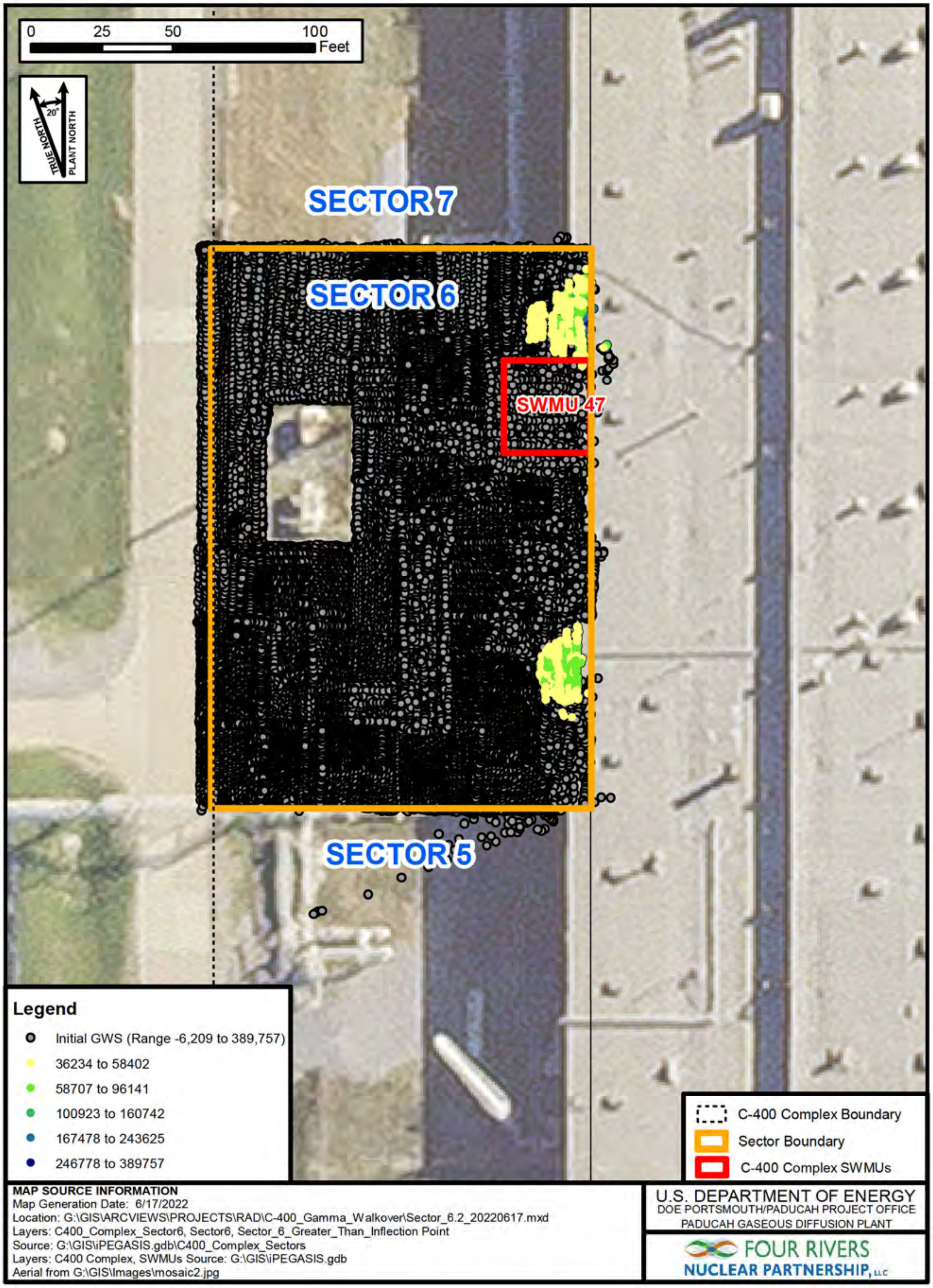
- Inaccessible Area(s)
  - Electrical transformer station

- Figure on next slides show areas greater than inflection point and location with the highest count rate (i.e., biased sample location)

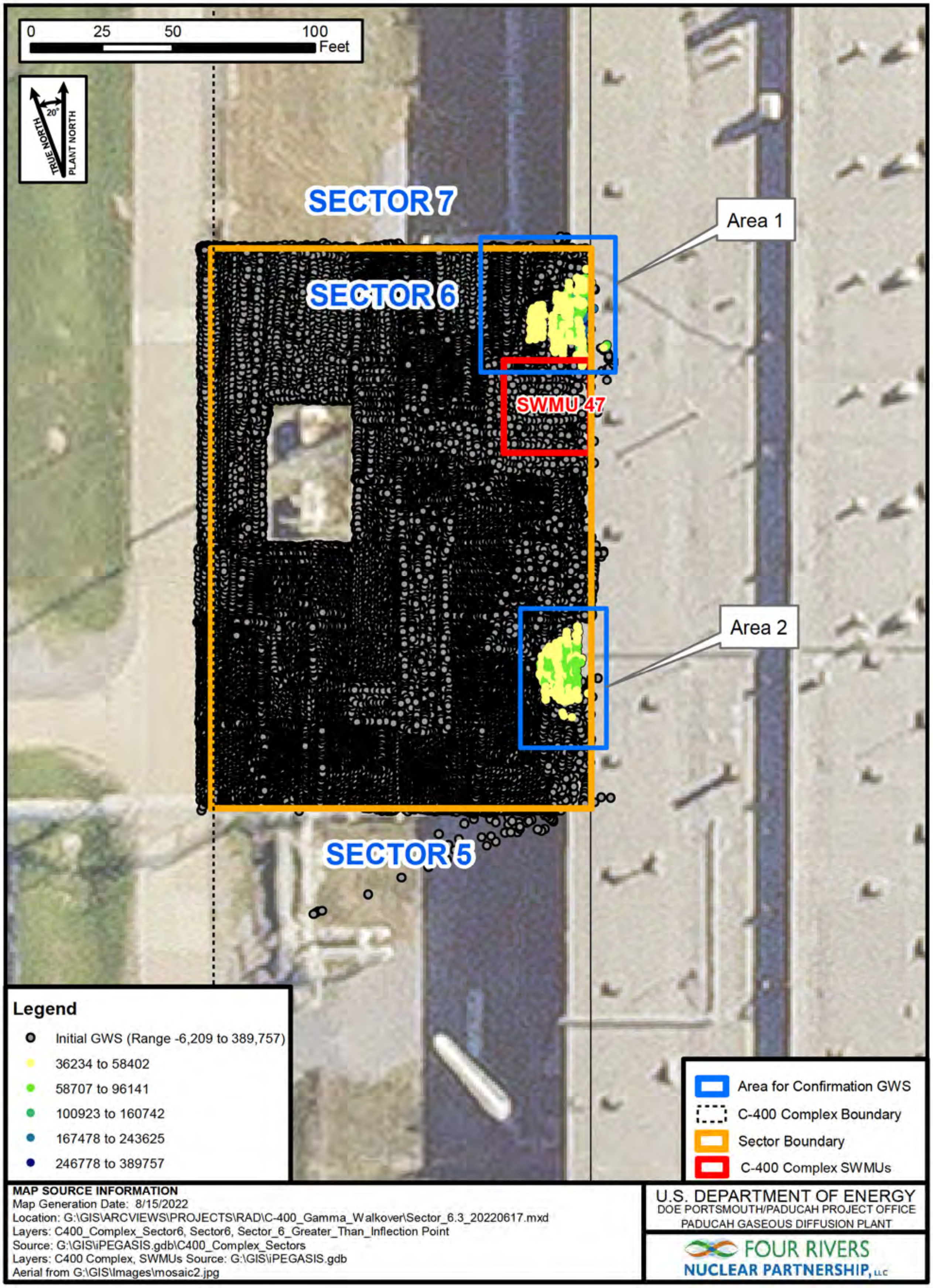


Sector 6 Figure 1

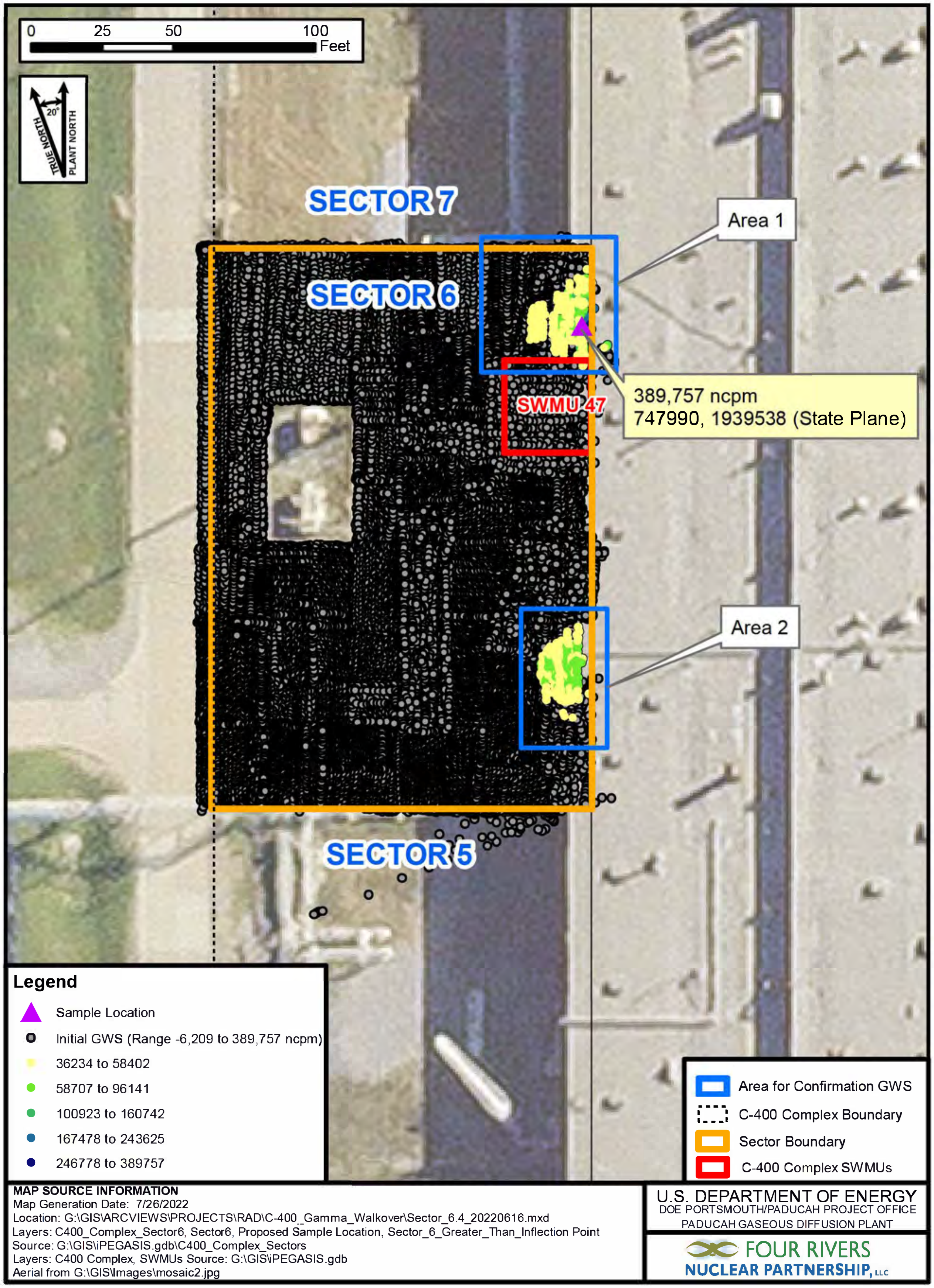

Sector 6 Inflection Point Analysis
390000
380000
370000
360000
350000
340000
330000
320000
310000
300000
290000
280000
270000
260000
250000
240000
230000
220000
210000
200000
190000
180000
170000
160000
150000
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
-10000
NCPM
Inflection Point= 28,926 ncpm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Rank



Sector 6 Figure 2



Sector 6 Figure 3



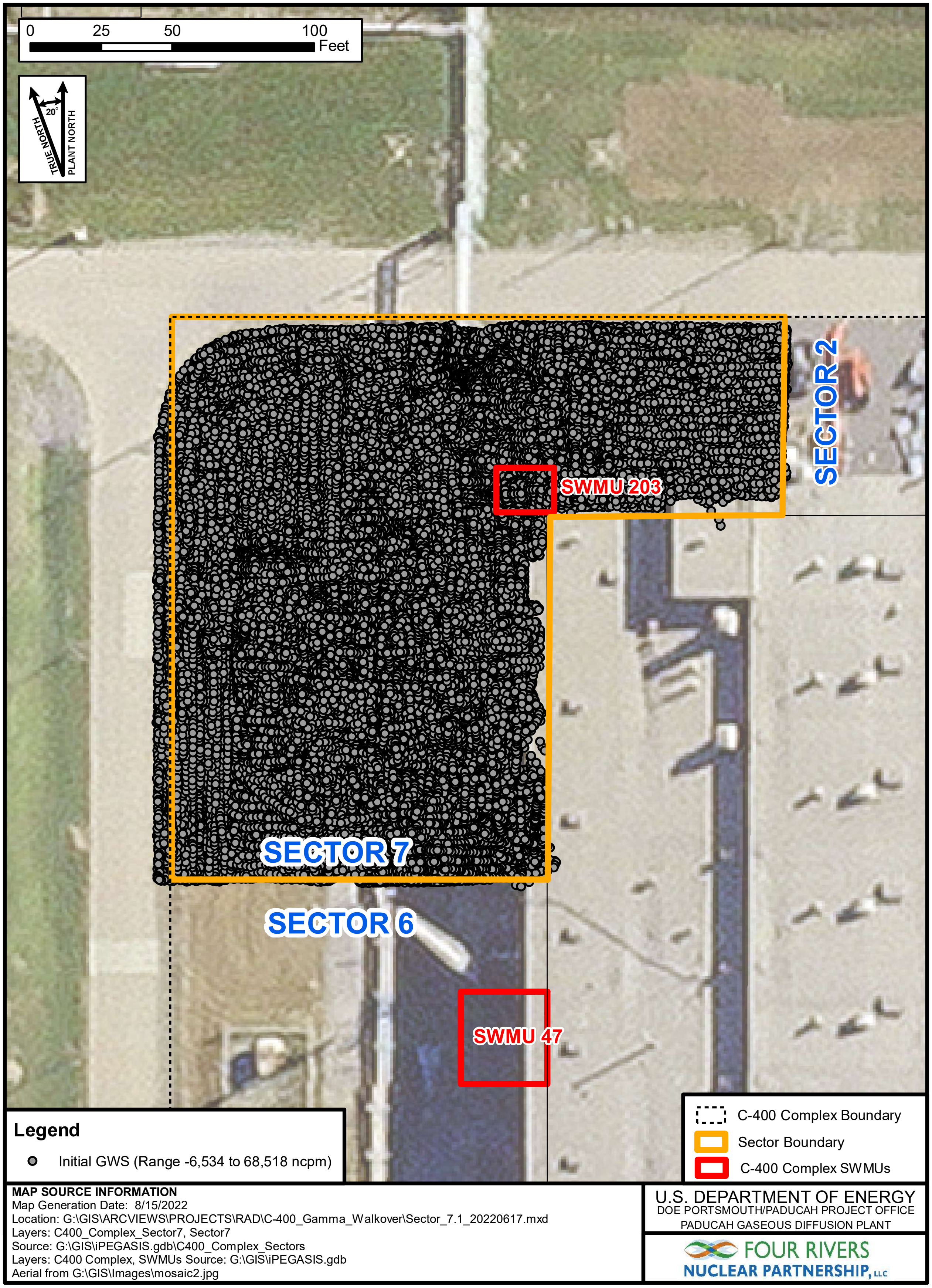
Sector 6 Figure 4

Sector 7

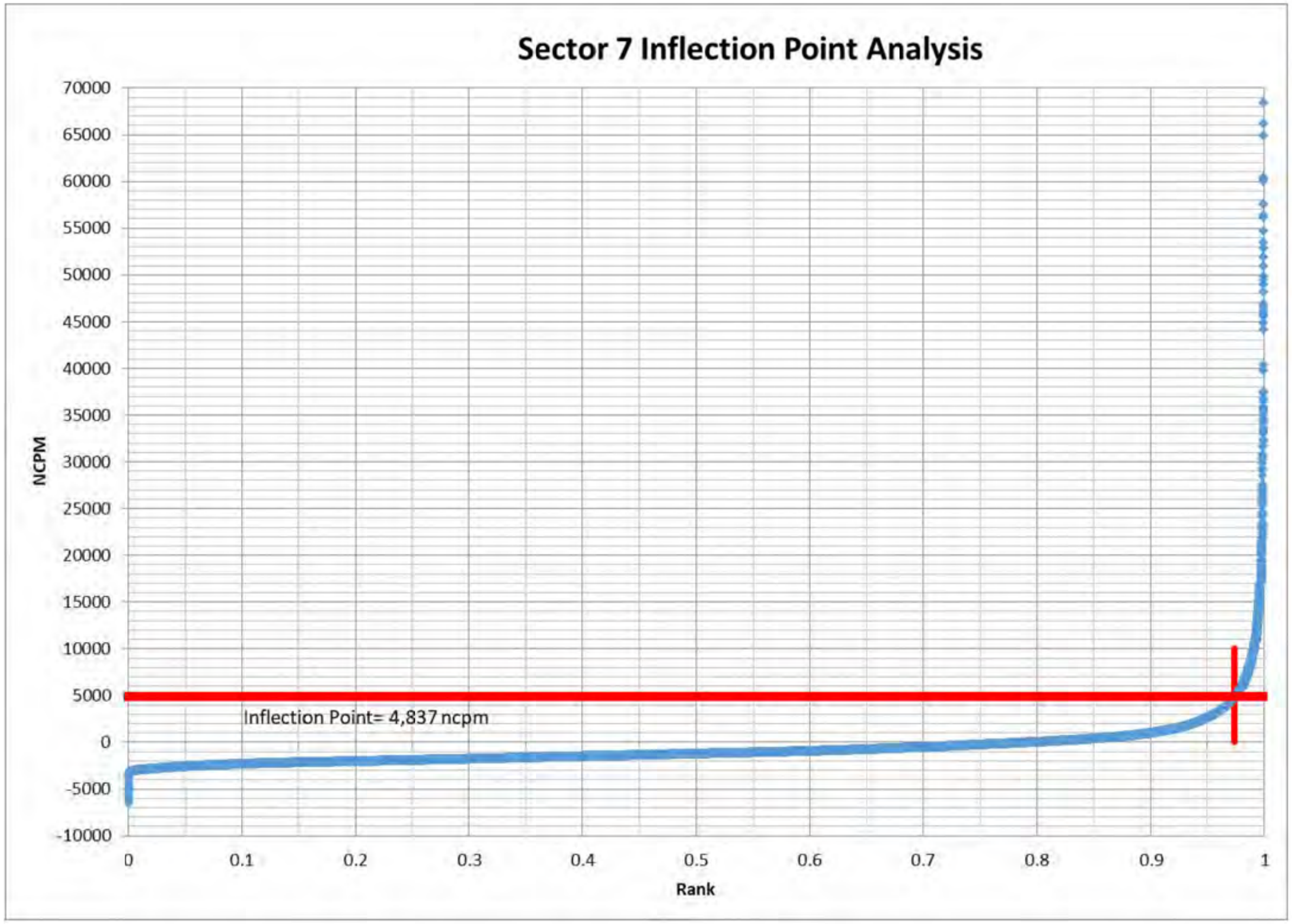
- Case 2: Multiple areas with a group of elevated count rates

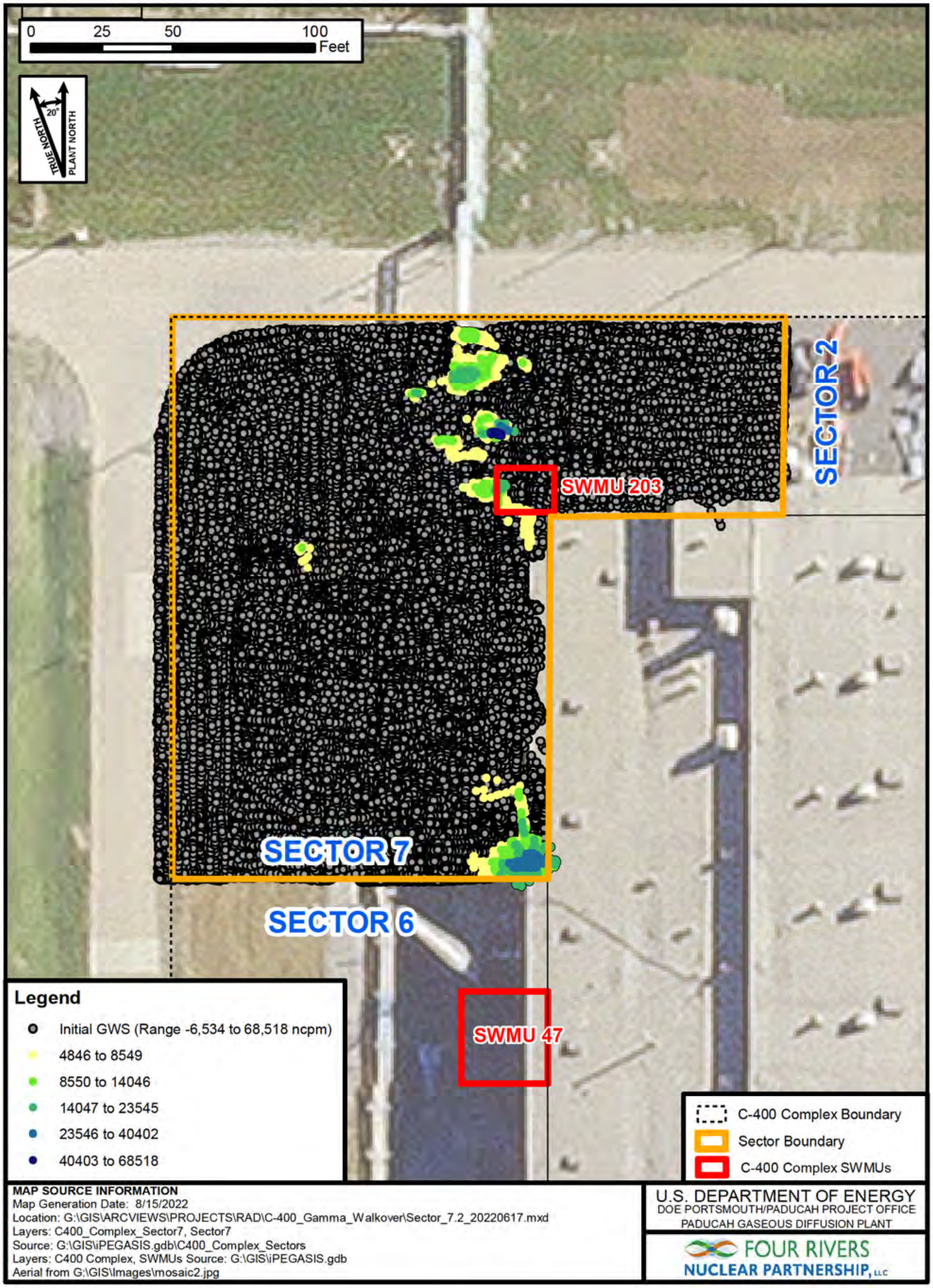
- Inaccessible Area(s)
  - None

- Figure on next slides show areas greater than inflection point and location with the highest count rate (i.e., biased sample location)

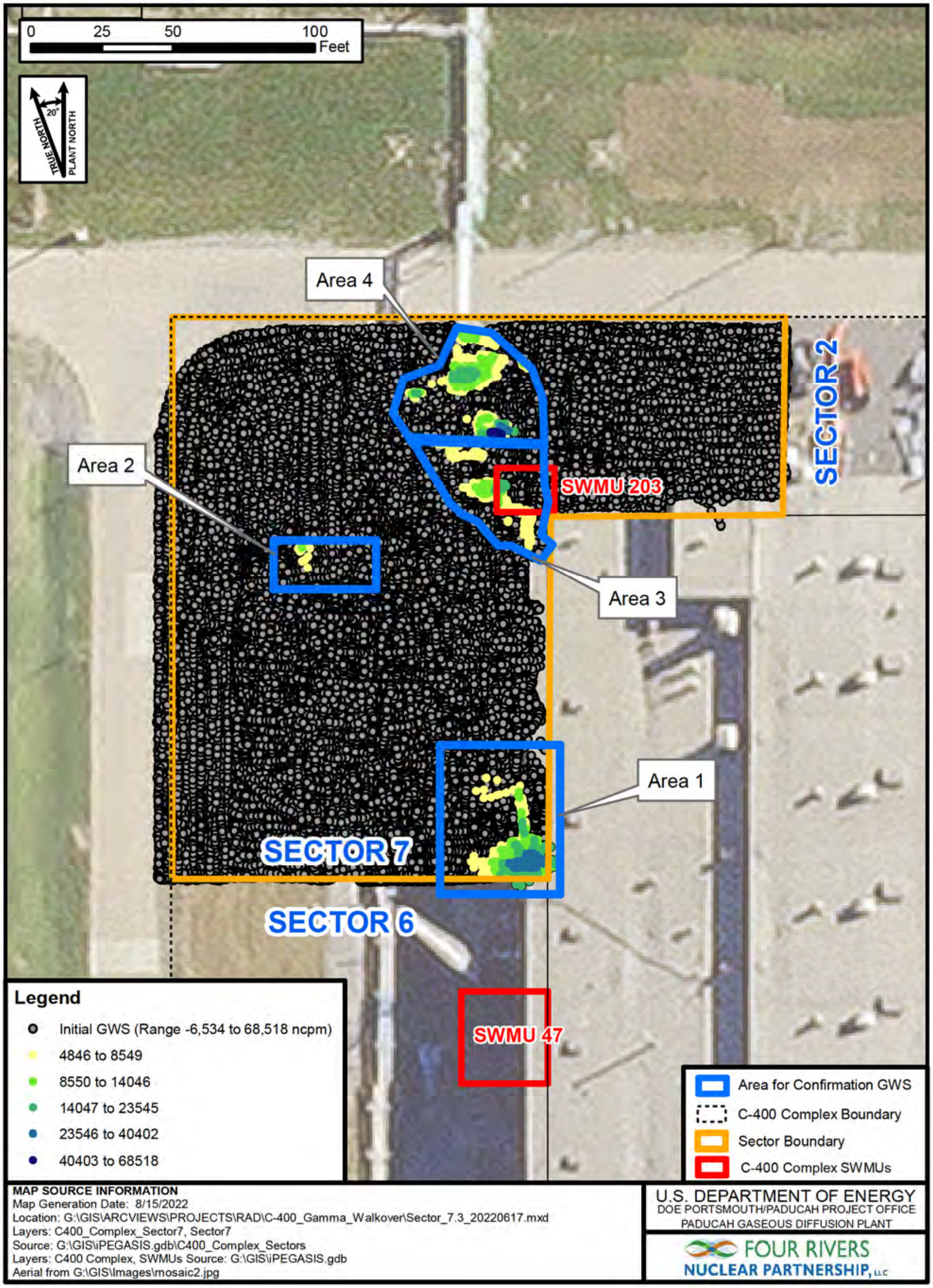


Sector 7 Figure 1

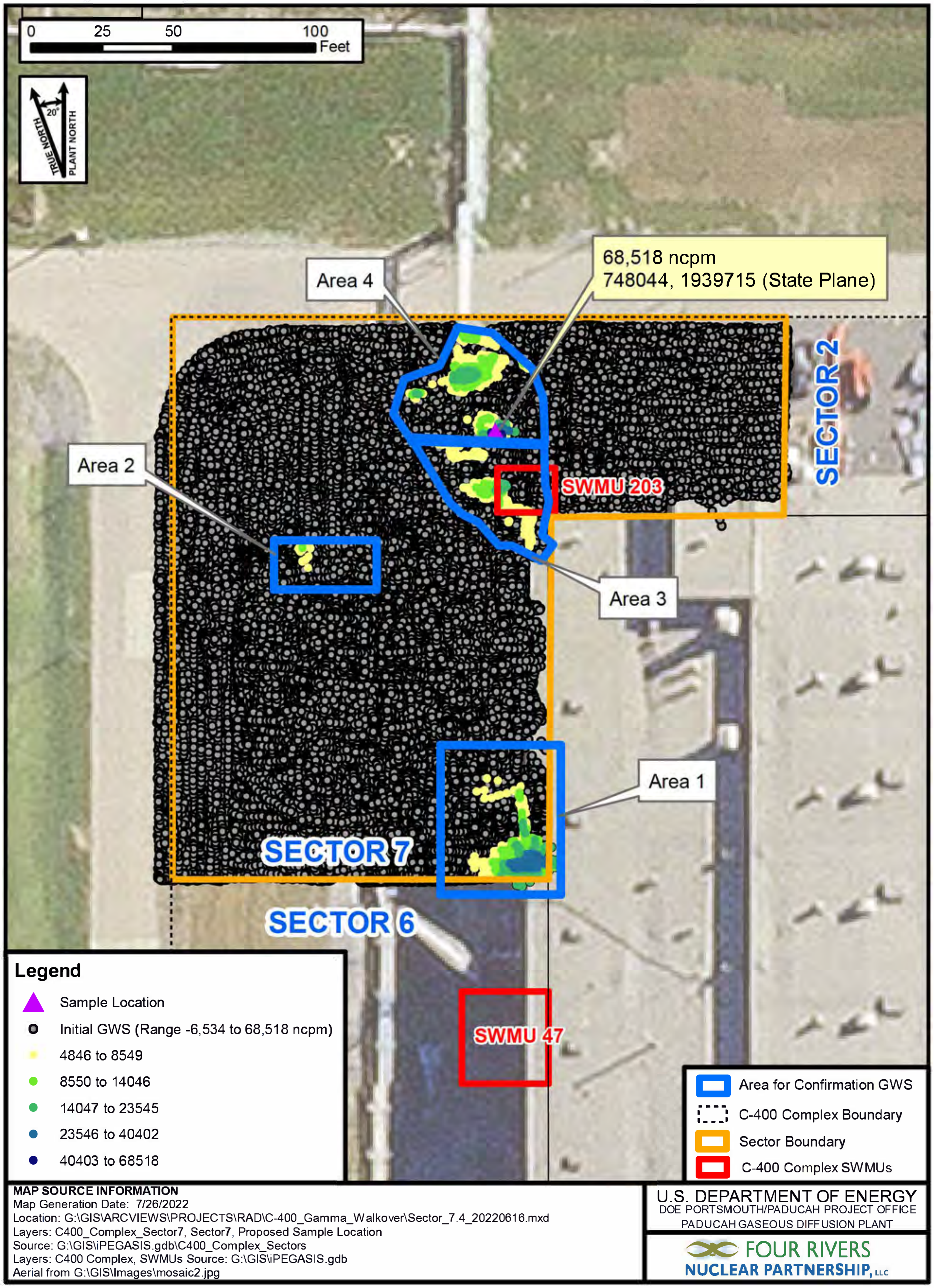

Sector 7 Inflection Point Analysis
NCPM
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
-10000
Inflection Point= 4,837 ncpm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Rank



Sector 7 Figure 2



Sector 7 Figure 3



Sector 7 Figure 4

ATTACHMENT A2

TECHNICAL MEMORANDUM FOR MEMBRANE INTERFACE PROBE (MIP) FIELD ACTIVITIES

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CONTENTS

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FIGURES

TABLES

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ACRONYMS

DPT	direct push technology
EVS	environmental visualization system
FID	flame ionization detector
GC	gas chromatograph
MIP	membrane interface probe
PID	photo-ionization device
QA	quality assurance
QC	quality control
RGA	Regional Gravel Aquifer
RI	remedial investigation
VOC	volatile organic compound
XSD	halogen specific detector

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A2.1. INTRODUCTION

A drilling subcontractor was utilized to investigate the extent of the trichloroethylene (TCE) source zone in the subsurface soils at the C-400 Complex. Delineation of the subsurface contamination was conducted using the membrane interface probe (MIP) logging tool as one of the multiple lines of evidence. The MIP profiling tool used a photoionization detector (PID), halogen-specific detector (XSD), and flame ionization detector (FID), and electrical conductivity sensor. The MIP investigation was conducted June 10, 2021, through November 3, 2021.

A2.2. OBJECTIVES

The objective goals of the MIP investigation were the following:

- Address data gaps from completed sample borings.
- Provide additional characterization of TCE source zones.
- Further delineate the horizontal and vertical boundaries of the TCE source area.

A2.3. EQUIPMENT

The MIP probe is 1.5 inches in diameter and about 12 inches in length. A MIP trunk line is strung through multiple MIP rods and connects the probe to the SRI 310C gas chromatograph (GC) at the surface. The trunk line contains polyether ether ketone (PEEK) tubing, which is used as a supply line to the MIP probe and as a return line to the field GC.

The probe is advanced by a direct push technology (DPT) rig percussion hammer and driven into the ground to a desired depth. A string pot continuously measures the depth of the MIP probe while it is being advanced. Electrodes in the tip and in the body of the MIP probe measure soil conductivity (see Figure A2.1). Higher values of soil conductivity indicate the probe is passing through low permeability material such as clay and silt.

A heated membrane block with a semi-pervious polymer membrane that is located approximately 1 ft above the cone tip heats up to 160 to 232°F. Volatile organic compounds (VOCs) volatize and diffuse across the membrane once the heated block comes into contact with contaminated soil and groundwater (Figure A2.2). The MP6500 series MIP controller sends a constant flow of inert gas (nitrogen) down to the probe, which sweeps past the heated membrane and carries diffused VOCs back to the gas phase detectors at the surface. The GC at the surface contains three detectors: (1) a PID, which senses aromatic hydrocarbons and double bonded chlorinated compounds; (2) an FID, which senses aliphatic compounds and petroleum hydrocarbons; and (3) an XSD, which senses halogenated compounds. A MIP data logging system records the data generated by the chromatograph, and a field laptop computer provides a real-time display. Figure A2.3 provides a diagram of the MIP system.

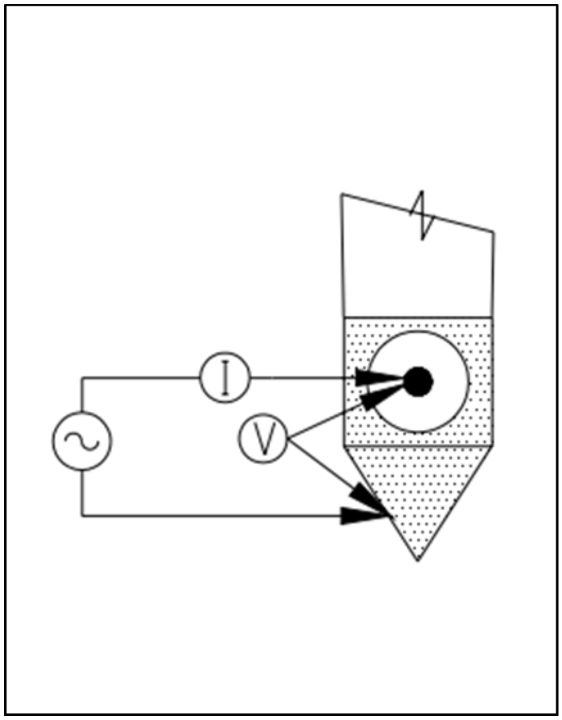


Figure A2.1. Dipole Soil Conductivity Probe Schematic

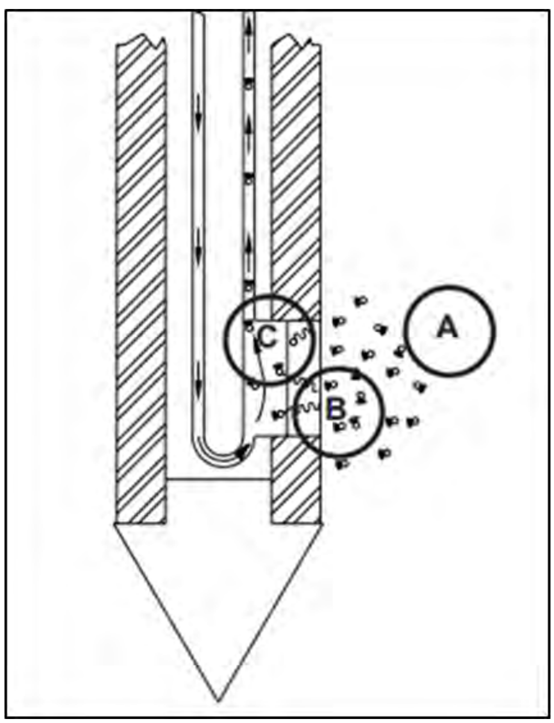


Figure A2.2. MIP Probe Schematic

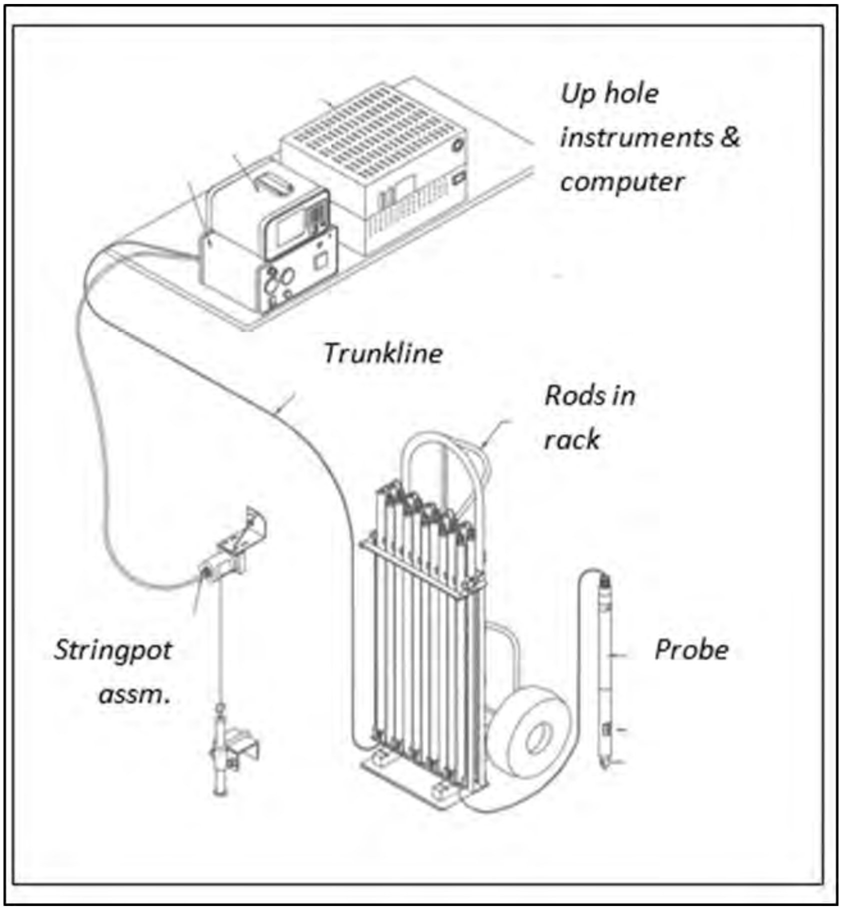


Figure A2.3. General Components of a MIP Logging System

A2.4. QUALITY ASSURANCE/QUALITY CONTROL

A quality assurance (QA)/quality control (QC) test is conducted on the probe before and after each log to ensure that the entire system is functioning correctly and that the equipment is able to generate quality data. An example of the QA/QC check is shown for MIP-01 in Figures A2.4 through A2.6. The QA/QC test includes a chemical response test and an electrical conductivity dipole test. For the chemical response test, the operator applies specific compounds to the membrane with the membrane block heated to 120°C. A toluene/TCE/methanol mix is used to test the PID and XSD sensors, and neat butane is used to test the FID sensor. The operator verifies that there is an ample sensor response. The trip time, which is how long it takes for the VOCs to travel from the MIP membrane to the GC sensor, is entered into the software to allow for accurate tracking of contaminant depths in the log. The electrical conductivity test is done by submerging the probe in water and testing the low and high conductivity readings for accuracy.

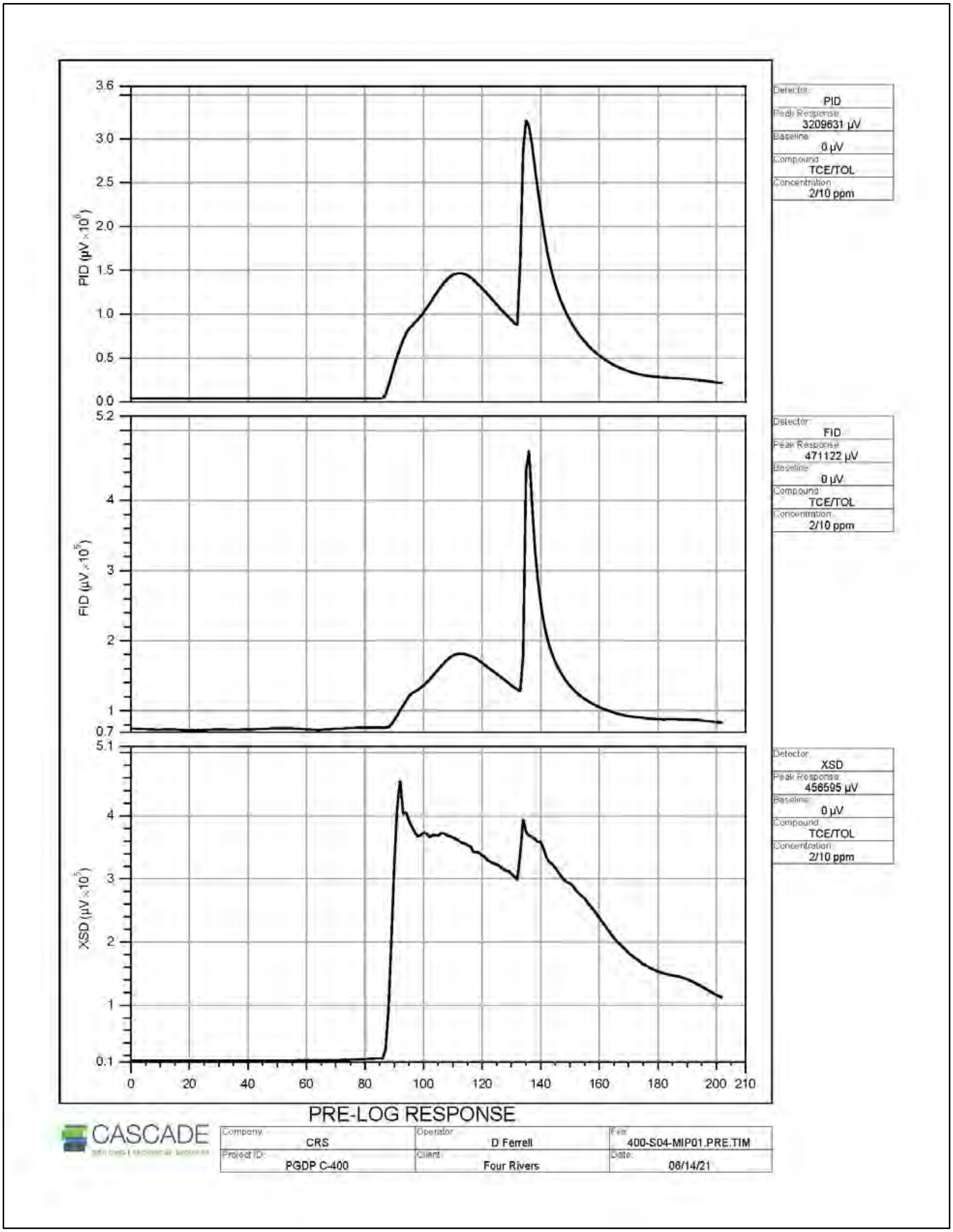


Figure A2.4. Pre-Log Response Test for 400-S04-MIP01

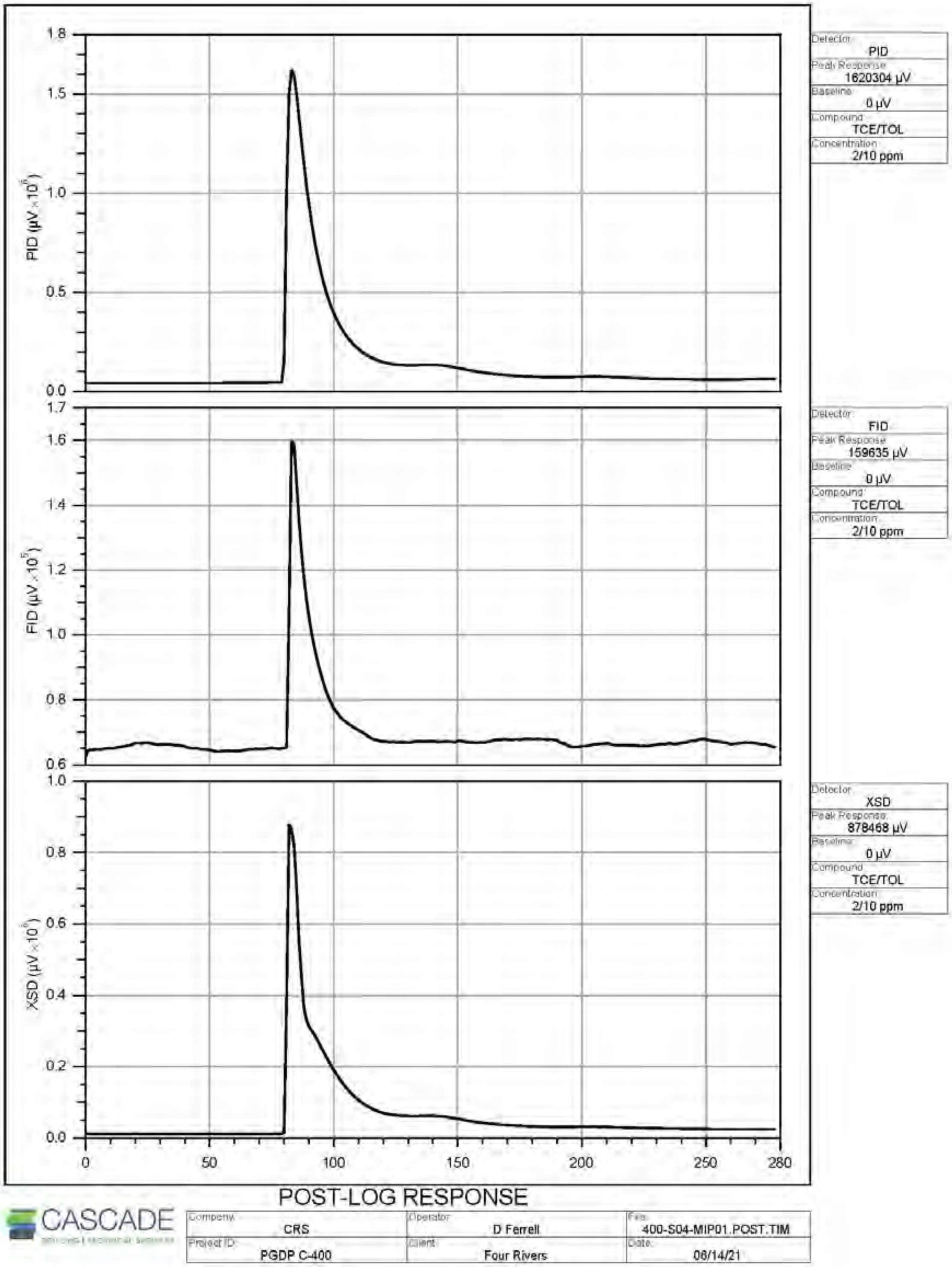


Figure A2.5. Post-Log Response Test for 400-S04-MIP01

400-S04-MIP01.zip

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	58.1	5.7	PASS
High	360.0	371.4	3.2	PASS

Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	59.0	7.2	PASS
High	290.0	288.6	0.5	PASS

Figure A2.6. Electrical Conductivity QA/QC Pre- and Post-Log Load Test for 400-S04-MIP01

A2.5. INVESTIGATION METHOD

MIP profiling was conducted at 41 locations within the C-400 Complex OU (Figure A2.7). The MIP profile locations were the consensus of the remedial investigation (RI) contractor, the U.S. Department of Energy, and the Federal Facility Agreement parties based on review of the available soil and groundwater data and a strategy to optimize remaining data collection from soil borings (i.e., sample analyses) and MIP and DyeLIF surveys. Table A2.1 summarizes the locations and depths of the MIP borings.

MIP borings were advanced to the base of the Regional Gravel Aquifer (RGA) and up to 1 ft deep into the underlying McNairy Formation without the use of temporary isolation casing. Where the MIP profile was continued deeper (> 1 ft into the McNairy Formation), temporary isolation casing was required to avoid cross-contamination of the McNairy Formation. In those cases, the MIP tooling was retrieved, and a 3-inch/5-inch rotary sonic drill string assembly was advanced over the MIP hole to the depth of the top of the McNairy Formation. Beginning at the depth of the top of the McNairy Formation, the drill crew advanced the 5-inch diameter drill string alone, without the addition of water for a minimum of 5 ft. The 5-inch drill string was the temporary isolation casing used for the deeper advancement of the MIP probe.

Following 5-inch emplacement, the drill crew cleaned out the hole to the top of the McNairy Formation with the 3-inch drill string assembly and then tripped out the 3-inch tooling. The MIP tooling then was set to the depth of the top of the McNairy Formation through the 5-inch diameter sonic drill string, and advanced to the targeted depth of investigation or depth of refusal. Upon completion of the MIP profile, the MIP tooling was withdrawn, and the driller sealed the borehole through the 5-inch diameter drill string using the same steps that were used for soil borings.

If refusal was encountered, the MIP tooling was withdrawn and a solid drive point was advanced using DPT rods to the point of refusal. The drill crew advanced the solid drive point past the depth of refusal. If the drill crew was unable to drive past the depth of refusal, then the DPT rig was moved off the boring and the sonic rig was staged over the boring. A 3-inch casing was advanced through the depth of refusal. Once past the depth of refusal, the DPT was repositioned above the borehole and resumed the MIP profile at the depth of the sonic drilling (past the depth of refusal), resulting in some minimal data gaps.

During the MIP profile, the drill team occasionally encountered technical difficulties. When those issues arose, the MIP tooling was extracted to allow the MIP operator to troubleshoot the problem until the issue could be resolved. If the MIP operator was unable to find a resolution to the problem, then the equipment was replaced (e.g., trunk line, MIP probe).

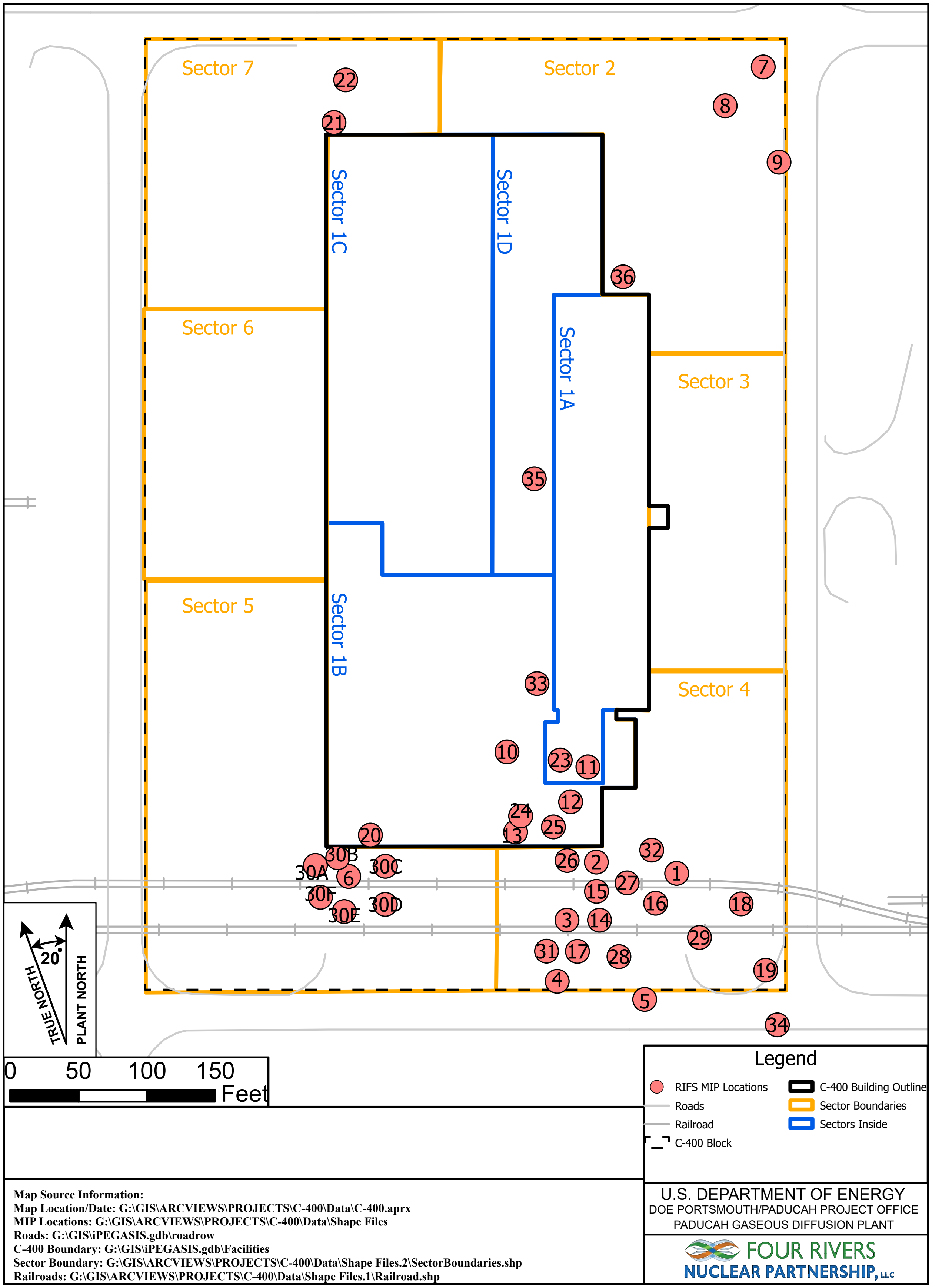


Figure A2.7. Map of All MIP Locations at the C-400 Complex

Table A2.1. MIP Boring Coordinates, Termination Depths, and Surface Grades

Borehole ID*	Northing	Easting	Total Depth	Surface Grade		Borehole ID*	Northing	Easting	Total Depth	Surface Grade
S04-MIP01	-1748.04	-4095.71	116.50	379.72		S07-MIP22	-1166.79	-4338.11	105.40	378.71
S04-MIP02	-1739.79	-4154.54	116.65	379.86		S1A-MIP23	-1665.06	-4180.81	111.20	379.47
S04-MIP03	-1782.26	-4176.04	116.15	378.87		S1A-MIP24	-1706.02	-4209.68	115.15	379.55
S04-MIP04	-1827.09	-4183.20	113.00	378.79		S1B-MIP25	-1713.76	-4185.48	114.20	379.51
S04-MIP05	-1840.34	-4119.17	114.75	378.98		S04-MIP26	-1738.58	-4175.94	115.15	379.37
S05-MIP06	-1750.28	-4335.87	99.25	379.20		S04-MIP27	-1754.98	-4131.60	115.15	379.49
S02-MIP07	-1157.27	-4032.33	108.65	376.03		S04-MIP28	-1809.07	-4138.13	115.15	379.09
S02-MIP08	-1185.73	-4060.19	105.35	376.31		S04-MIP29	-1796.38	-4079.16	119.45	379.50
S02-MIP09	-1227.06	-4020.74	107.15	376.66		S05-MIP30A	-1742.22	-4360.27	20.80	379.33
S1B-MIP10	-1663.53	-4220.88	114.15	379.58		S05-MIP30B	-1736.59	-4343.94	27.45	379.37
S1A-MIP11	-1670.03	-4160.74	119.15	379.45		S05-MIP30C	-1742.84	-4309.03	20.80	379.37
S1B-MIP12	-1695.62	-4173.39	116.75	379.42		S05-MIP30D	-1770.77	-4309.11	21.15	378.95
S1B-MIP13	-1717.75	-4213.70	118.85	379.55		S05-MIP30E	-1776.01	-4339.19	33.70	378.94
S04-MIP14	-1782.33	-4152.21	114.80	379.01		S05-MIP30F	-1765.54	-4356.61	22.95	379.11
S04-MIP15	-1761.20	-4154.43	115.90	379.17		S04-MIP31	-1805.86	-4191.06	114.70	379.01
S04-MIP16	-1769.90	-4111.14	116.80	378.35		S04-MIP32	-1730.87	-4114.31	115.20	380.15
S04-MIP17	-1805.15	-4168.39	115.75	379.10		S1B-MIP33	-1609.09	-4197.70	123.40	379.58
S04-MIP18	-1770.40	-4048.54	108.25	378.97		S04-MIP34	-1858.89	-4023.65	112.20	379.35
S04-MIP19	-1818.90	-4030.53	116.85	379.92		S1D-MIP35	-1456.46	-4200.33	107.55	379.50
S1B-MIP20	-1722.05	-4326.20	117.40	379.56		S02-MIP36	-1304.40	-4134.67	111.35	376.15
S07-MIP21	-1198.01	-4346.66	112.75	379.11						

*Borehole ID begins with the prefix “400-” (e.g., 400-S04-MIP01).

A2.6. CORRELATION EFFORTS

Correlation efforts were made to determine the strength of the relationship between the MIP generated PID readings and laboratory groundwater and soil analyses. If a strong correlation existed between the two data sets, then the confidence level of the MIP data was strong and the MIP data could be used quantitatively; however, if the correlation was weak, then the MIP data could only be used qualitatively.

MIP boring 400-S04-MIP01 was placed adjacent to correlation soil boring 400S4-99 (installed within 1.4 ft distance) to determine if there was a quantitative comparison of the MIP PID data and laboratory results. For correlation efforts, Upper Continental Recharge System and McNairy Formation soil samples were collected every two ft down to 20 ft below the top of the McNairy Formation in 400S4-99. RGA and McNairy Formation groundwater samples were collected at depths of 65, 70, 75, 80, 85, 90, and 95 ft below ground surface. No RGA soil samples were collected for correlation efforts.

The data sets were evaluated using Pearson correlation and Spearman rank correlation measures (Attachment 2, PID Correlation). The Pearson correlation measure was used to assess linear correlation, while the Spearman rank correlation measure was used to assess nonparametric correlation between the data sets. For the correlation efforts, the Pearson nondetect results were set to one-half their reporting value, and the Spearman nondetect values were set to zero. The correlation analysis was also run by deleting nondetect laboratory results from soil boring 400S4-99 and MIP boring 400-S04-MIP01.

The correlation between the MIP-generated PID readings and laboratory groundwater and soil TCE results were poor. Possible reasons for poor correlation include (1) the discrete sample depths associated with the MIP and laboratory results in a background of heterogeneous distribution of organic compounds in soils and groundwater; (2) different sample sizes (i.e., the laboratory analysis uses small quantity from a discrete depth whereas the MIP results were averaged for the depth interval); and (3) the insensitivity of the MIP detectors to the relatively low TCE levels common to 400S4-99. Alternative assessments of nondetect results yielded similar poor correlations. For example, Pearson and Spearman correlation coefficients for soil of 0.52 and 0.58, respectively, were calculated when nondetects were replaced with half the detection limit. When the nondetects were removed from the correlation efforts, the Pearson and Spearman correlation coefficients were 0.03 and 0.65, respectively.

A2.6.1. SOILS CORRELATION SUMMARY

Correlation efforts were attempted between MIP borings and sample borings that were within a 20 ft distance to determine if there was any correlation between the MIP boring and paired soil boring. Table A2.2 summarizes the correlation efforts. As indicated in Table A2.2, 12 pairs of MIP borings and soil borings for laboratory analysis were evaluated. MIP values and TCE laboratory analytical data collected from the same depth intervals of the boring pairs were evaluated using Pearson and Spearman correlations. The Pearson Correlation compared a linear relationship between the two variables (i.e., MIP and laboratory TCE results). The Spearman Correlation used ranks of the MIP and laboratory TCE results to assess the relationship between the two variables. The correlation coefficients calculated using the two methods are presented in Table A2.2. The results indicate that there is uncertainty in predicting the soil concentrations using MIP data, which does not reflect the actual small-scale contaminant heterogeneity.

Table A2.2. Pearson and Spearman Correlation Values to TCE Analytical Data

Pair #	MIP Boring	Paired Soil Boring	Distance	Pearson's Correlation		Spearman Correlation	
				Corr. Coeff.	p Value	Corr. Coeff.	p Value
1	400-S04-MIP01	400S4-99	1.4	0.52	0.000	0.58	0.000
2	400-S04-MIP28	400S4-96	3.8	0.34	0.310	-0.22	0.510
3	400-S1A-MIP11	400S1A-23	4.7	-0.07	0.934	-0.8	0.200
4	400-S04-MIP14	400S4-12	4.9	0.98	0.000	-0.18	0.587
5	400-S04-MIP03	400S4-12	10	-0.21	0.482	-0.4	0.181
6	400-S05-MIP06	400S5-08	10.6	0.91	0.031	0.3	0.624
7	400-S02-MIP09	400S2-07	14.7	-0.24	0.696	-0.3	0.624
36	400-S04-MIP14	400S4-98	15.4	0.52	0.000	-0.06	0.690
8	400-S1B-MIP25	400S1B-09	17.3	0.33	0.257	0.37	0.193
9	400-S1B-MIP23	400S1A-23	18.3	-0.42	0.584	-0.4	0.600
10	400-S04-MIP15	400S4-12	19	0.76	0.002	0.64	0.018
11	400-S1B-MIP24	400S1B-24	19	0.83	0.005	0.71	0.031
12	400-S1B-MIP33	400S1B-04	19.6	-0.07	0.932	0.2	0.800

Shading indicates correlation coefficients > 0.50.

A2.6.2. GROUNDWATER CORRELATION SUMMARY

Groundwater sample data were compared to determine if there was any correlation between MIP borings and groundwater samples collected from paired borings that were within a 20 ft distance. In addition to these borings, MIP measurement correlation to TCE concentrations in groundwater was also evaluated with soil borings where groundwater grab samples were collected located within 50 ft of the MIP profile boring. Table A2.3 summarizes the correlation efforts. As indicated in Table A2.3, 14 pairs of MIP borings and soil borings where groundwater samples were collected for laboratory analysis were evaluated. MIP values and groundwater TCE concentrations collected from the same depth intervals of the boring pairs were evaluated using a Pearson Correlation and Spearman Correlation. As shown in Table A2.3, the correlation coefficients were poor. The assessment shows that the distance between the MIP PID boring and the groundwater sample boring was not a factor of the correlation coefficient.

Table A2.3. Pearson and Spearman Correlation Values to TCE Analytical Data

Pair #	MIP	Paired Boring	Distance	Pearson Correlation		Spearman Correlation	
				Corr. Coeff.	p Value	Corr. Coeff.	p Value
1	400-S04-MIP01	400S4-99	1.4	-0.17	0.710	0.36	0.432
4	400-S04-MIP14	400S4-12	4.9	0.32	0.600	-0.10	0.873
5	400-S04-MIP03	400S4-12	10	-0.71	0.179	-1.00	0.000
8	400-S1B-MIP25	400S1B-09	17.3	0.89	0.044	0.90	0.037
10	400-S04-MIP15	400S4-12	19	-0.50	0.394	-0.20	0.747
14	400-S1B-MIP12	400S1B-09	22	0.80	0.104	0.70	0.188
15	400-S04-MIP26	400S1B-09	22	-0.98	0.005	-0.70	0.188
18	400-S04-MIP02	400S1B-09	26	0.99	0.001	0.90	0.037
26	400-S04-MIP29	400S4-17	32	0.18	0.767	-0.30	0.624
27	400-S04-MIP05	400S4-17	34	0.78	0.119	0.70	0.188
32	400-S04-MIP27	400S4-12	36	-0.66	0.222	-0.60	0.285
35	400-S04-MIP16	400S4-12	47	-0.05	0.935	0.30	0.624
36	400-S04-MIP14	400S4-98	15.4	0.20	0.672	0.11	0.819
38	400-S1B-MIP23	400S1A-03	25	0.12	0.842	0.60	0.285

Shading indicates correlation coefficients > 0.50.

A2.7. MIP LOG INTERPRETATION

For each MIP location, a log was generated showing the soil conductivity, PID, XSD, and FID graphs (Attachment 2, MIP Logs). Two additional graphs were created for each MIP location. One shows the point-to-point comparison of soil conductivity and PID (Attachment 2, PID Logs), and the other shows the point-to-point comparison of soil conductivity and XSD (Attachment 2, XSD Logs). Soil conductivity is measured in milliSiemens/meter (mS/m). PID, FID, and XSD are measured in microvolts (µV).

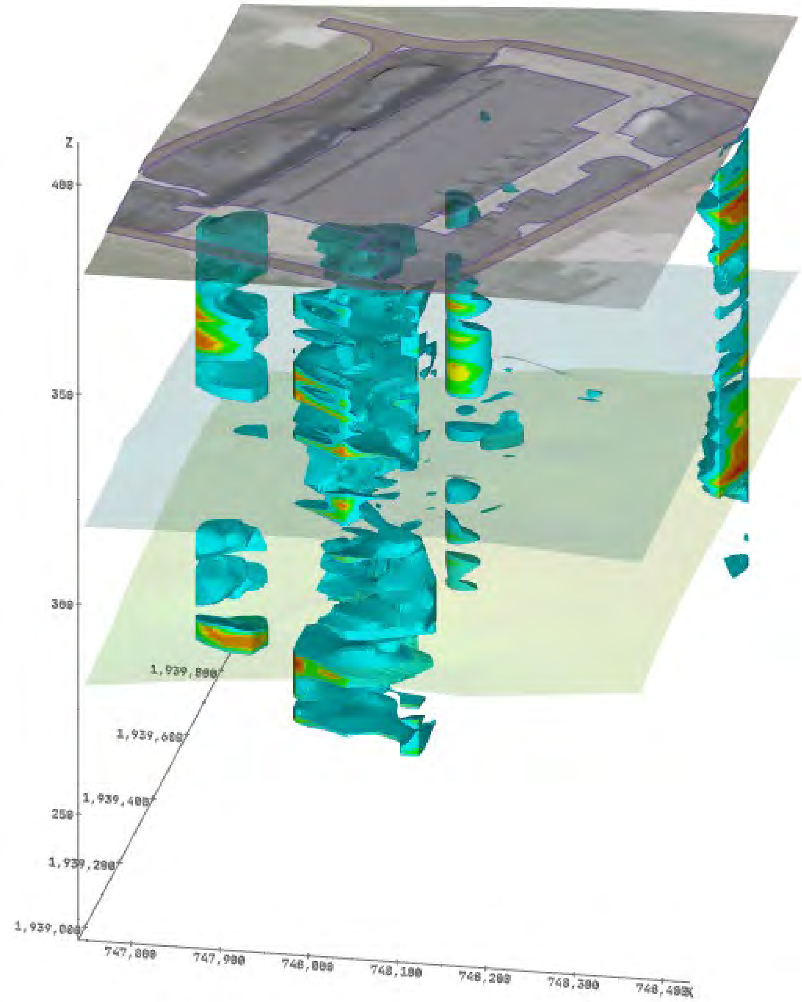
TCE is a chlorinated compound detected by both the XSD and the PID sensors. The point-to-point charts provide a valuable assessment of the changes in concentration of TCE with depth (e.g., across the RGA/McNairy interface).

A2.8. 3-DIMENSIONAL EVS MODEL

For the MIP profiles of the C-400 Complex RI, PID values $\geq 7 \times 10^5$ µV are one of multiple lines of evidence considered to be indicative of the presence of TCE dense nonaqueous phase liquid zones. An environmental visualization system (EVS) model was developed to evaluate the 3-dimensional distribution of the TCE contamination plume under the C-400 Complex.

For the development of the model, the initial PID response value (at depth zero) was subtracted from the entire dataset to remove the baseline response at each location. This normalized the PID values between borings. The PID response was plotted with four base thresholds: (1) 2×10^4, (2) 1×10^5; (3) 3×10^5; and (4) 1×10^6 µV (Figures A2.8 through A2.11).

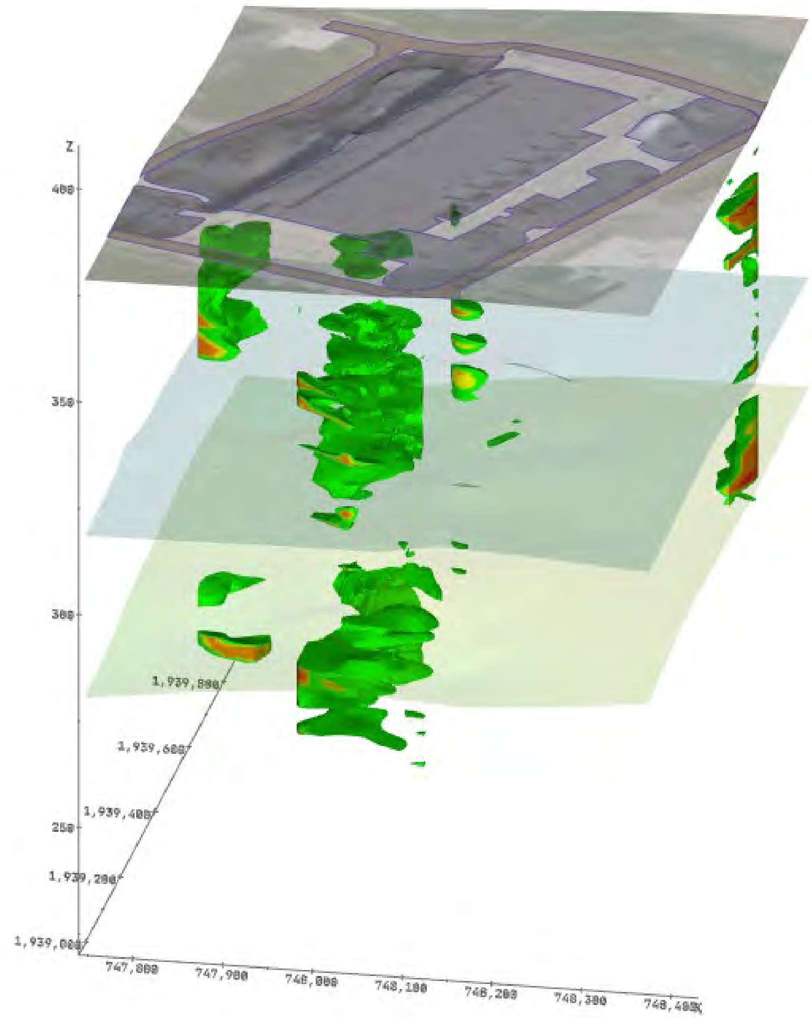
Plan view of EVS model for PID values above 2 × 10^4



Subsurface view of EVS model for PID values above 2 × 10^4

Figure A2.8. EVS Model for PID Values above 2 × 10^4 µV

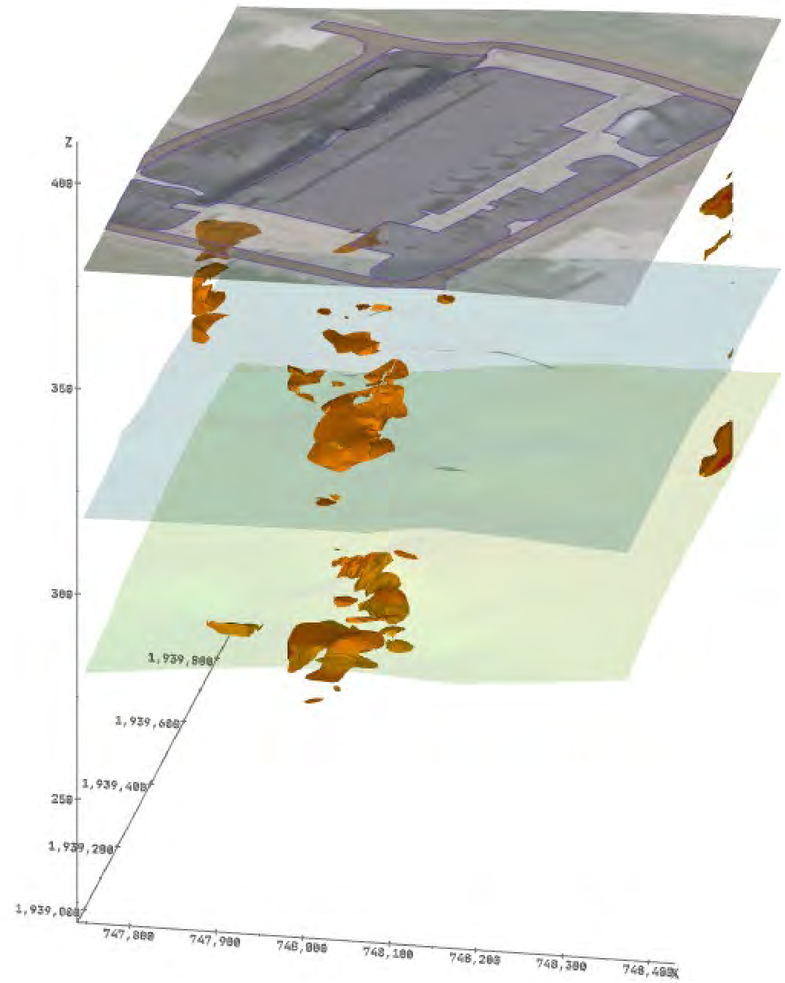
Plan view of EVS model for PID values above 1×10^5



Subsurface view of EVS model for PID values above 1×10^5

Figure A2.9. EVS Model for PID Values above 1×10^5 µV

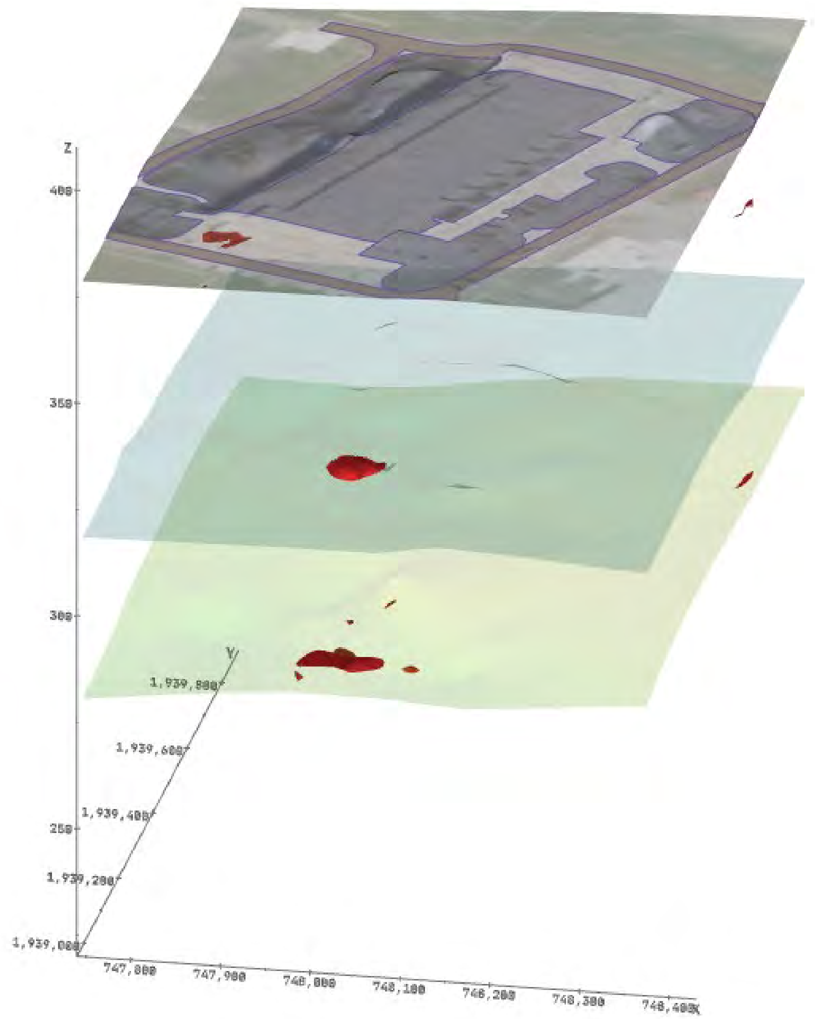
Plan view of EVS model for PID values above 3×10^5



Subsurface view of EVS model for PID values above 3×10^5

Figure A2.10. EVS Model for PID Values above 3×10^5 µV

Plan view of EVS model for PID values above 1 × 10^6



Subsurface view of EVS model for PID values above 1 × 10^6

Figure A2.11. EVS Model for PID Values above 1 × 10^6 µV

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ATTACHMENT A3

TECHNICAL MEMORANDUM FOR DYE-ENHANCED LASER INDUCED FLUORESCENCE (DyeLIF) FIELD ACTIVITIES

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DyeLIF™ Investigation

Client: Chase Environmental Group

Project Name: Paducah Gaseous Diffusion Plant

Location: Paducah, KY

Prepared by:

Randy St. Germain, President

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February 2022

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TABLE OF CONTENTS

Contents

1.0 DyeLIF System

1.1 Technology Background

The Dye-enhanced Laser Induced Fluorescence (DyeLIF™) system is a specialized form of laser induced fluorescence (LIF) that contains many of the same time-resolved elements as the TarGOST® and UVOST® systems. Interested readers are encouraged to review the LIF information in the citations for a general understanding of LIF tooling and deployment prior to exploring the details of the DyeLIF system's capabilities.

The technology relies on the fluorescence response of non-aqueous phase liquids (NAPL) to determine the NAPL's nature and extent in the subsurface. The fluorescence response varies based on a variety of conditions including polycyclic aromatic hydrocarbon (PAH) content, solvent body conditions, and the excitation and emission energies required to excite or observe the emission of fluorescent species contained within the NAPL. Commonly used chlorinated DNAPLs such as tetrachloroethene (PCE) and trichloroethylene (TCE) don't naturally fluoresce because their molecular structures don't support the energy absorbance and emission process necessary to result in fluorescence. Chlorinated DNAPLs often do fluoresce however, because they contain enough PAHs impurities from their manufacture, PAHs picked up while cleaning or degreasing, and even naturally occurring fluorophores solvated after the DNAPL's release into the environment. Unfortunately, because these DNAPLs are tremendous solvents, chlorinated DNAPLs also solvate a host of non-fluorescent molecules including optical chromophores and other molecules that absorb the excitation laser light and/or quench the fluorescence of inherently fluorescent molecules. This leaves relying on inherent DNAPL fluorescence for delineation fraught with the risk that some DNAPLs can exist at significant pore saturations, but the LIF sensor won't successfully report their presence. This uncertainty is "fatal" for screening tools because false negatives are inherently very difficult to recognize because the site investigators "don't know what they don't know". Couple this with the highly heterogeneous subsurface distribution behavior of DNAPLs and you have an extremely challenging data set with which it is difficult to have any confidence in, even when we are confident that all the site's NAPL fluoresces. For this reason, system developers and providers of LIF technologies have generally avoided applying LIF toward the "unpredictable" chlorinated DNAPL releases for liability and general protection of LIF's reputation as being reliable for indicating NAPL.

In order to improve the limit of detection and reliability of applying LIF toward chlorinated DNAPLs, a probe was conceived of in 2009 and eventually commercialized by a team of direct push technology developers and consultants (St. Germain 2014, Einarson 2018). The DyeLIF version of LIF relies on injecting a fluorescent dye into the formation several centimeters ahead of the LIF sensor in order to ensure a response from any DNAPLs present, in a fashion similar to the visual testing for the presence of DNAPLs in soil samples using Oil Red O (ORO) and Sudan IV dyes shake tests (Cohen 1992).

Figure 1 illustrates the general concept behind the approach, which involves injecting an indicator dye below the LIF sensor in order to render any DNAPL ganglia fluorescent for their subsequent detection by the LIF detection system. Rather than changing from a black to red color like ORO or Sudan IV dye testing, the DyeLIF indicator dye fluoresces orders of magnitude more intensely when it contacts DNAPL phase, its fluorescence color shifts, and fluorescence lifetimes increase, which are all recorded in the LIF waveforms (familiar to any previous UVOST and TarGOST users).

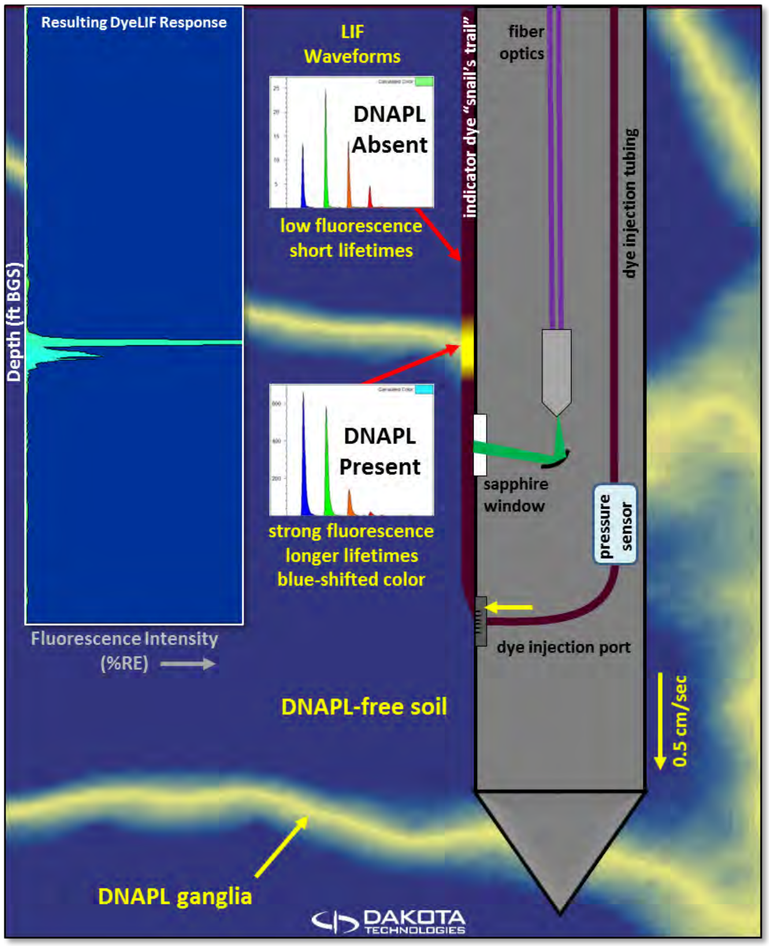

Figure 1. Conceptual diagram of a DyeLIF probe passing through a DNAPL impacted soil formation

The DyeLIF technology was rigorously tested under an ESTCP-funded validation study (Einarson 2016) and has been successfully applied at sites across the United States. In order to improve confidence in the resulting data set, DyeLIF projects rely to some degree on careful targeted validation sampling techniques combined with a multiple lines of evidence (MLOE) approach developed during the ESTCP funded validation study and subsequently improved upon by innovative consultants (Horst 2018).

DyeLIF data is acquired at extremely high-resolution (~0.5 cm spacing), so each day results in the generation of data equivalent to tens of thousands of ORO dye shake tests. The sheer volume of decisive high-resolution information for a typical DyeLIF characterization project (hundreds of thousands of data points), inevitably reveals insights into the nature and extent of the DNAPL body previously unimagined by investigators. Indeed, in every DyeLIF investigation to date, the conceptual site model (CSM) of the nature and the extent of source term DNAPL distribution was changed, often dramatically so, resulting in major changes to the site remediation plan and design (Stuetzle 2018). In some cases, the DNAPL footprint was found to be just a fraction of the previous CSM, while other projects have delineated far more massive DNAPL bodies than previously determined. This is because earlier estimates were based on water solubility exceedance, PID response, DNAPL collection in wells, and other indecisive methodologies that aren't truly NAPL-phase sensitive. As expected, monitoring wells have been found to be notoriously poor indicators of DNAPL distribution, just as they commonly are with LNAPL.

Figure 2 contains a typical DyeLIF field log. Pressure and flow of the dye fluid injection is monitored to produce estimated K values. Non-negative least squares (NNLS) analysis (described later) is plotted in red and indicates zones of DNAPL fluorescence (all "false positives" have largely been removed). A cluster or "bubble" diagram at far right (also described here later) focuses on the qualitative nature of the hundreds or thousands fluorescence responses acquired during logging at this location, as opposed to the semi-quantitative fluorescence response displayed in the main Signal (%RE) and Zoomed In logs plotted vs. depth.

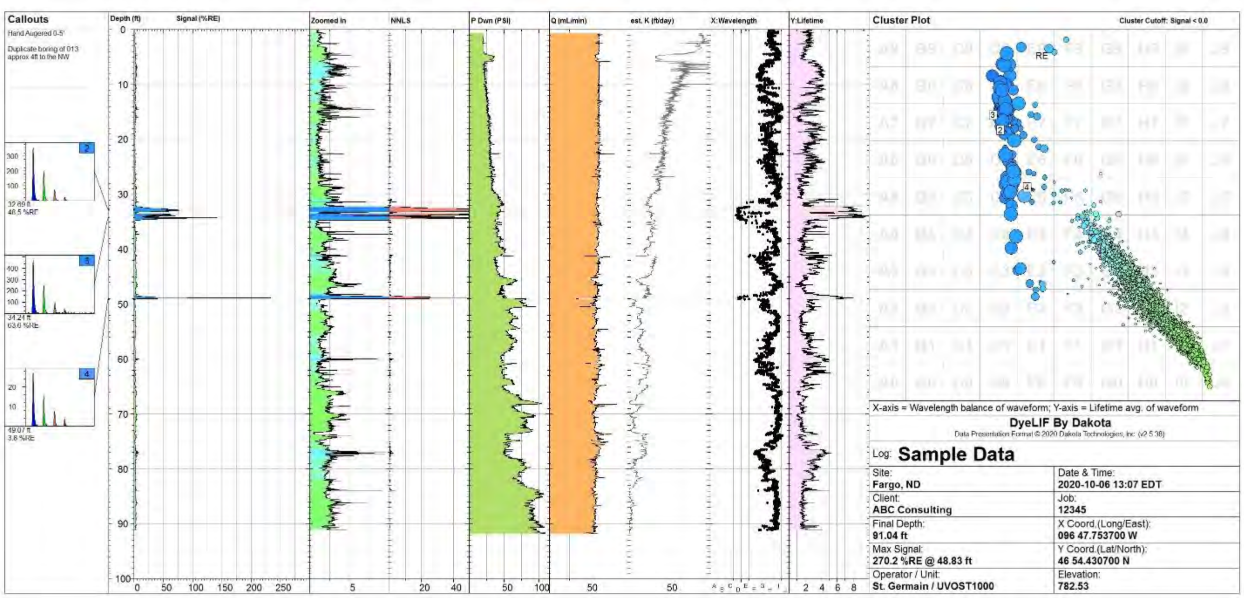

Figure 2. Typical DyeLIF log

The NAPL indicator dye used has been found to perform well with monoaromatics such as benzene and toluene, chlorobenzenes, DCA, TCA, PCE, TCE, chloroform, Freon®, and a host of other typically non-fluorescent solvents. It is expected that DyeLIF will respond to nearly all halogenated solvents but site-specific NAPL or testing of reagent grade solvents of like kind as your target is always advised. Nitrobenzenes are a notable exception, having been found to quench indicator dye fluorescence significantly in benchtop testing.

As with all LIF systems, the fluorescence response of DyeLIF vs NAPL pore saturation is monotonically behaved as long as the soil grain size is fixed. But finer soil particles dampen the response while coarser grained soils improve the response. In general, we assume that the higher the fluorescence responses represent the soils more highly DNAPL saturated pore spaces, but we can't be certain that this is the case.

DyeLIF is nonresponsive to dissolved, vapor, or adsorbed phase chlorinated solvent contamination, making it truly NAPL-specific. DyeLIF, like TarGOST, is blind to the smaller 2- to 4-ring PAHs responsible for the fluorescence of many light fuels such as kerosene and gasoline. DyeLIF does respond well to large PAHs present in diesel and other heavier petroleum NAPLs however, which can interfere greatly with the specificity of the tool's response for halogenated solvent DNAPLs.

Most DyeLIF sites have industrial histories, so anthropogenic false positive fluorophores are commonly encountered. These include crushed limestone, spent lime, paints, and a wide host of other anthropogenic materials at chemical manufacturer sites with typically long histories. Despite the numerous challenges, advanced waveform analysis has been used successfully on every project to date to isolate the target DNAPL response from extensive non-target fluorescence.

One last cautionary note to stakeholders - proper grouting is crucial at sites where DyeLIF is deployed. It is recommended that investigators dedicate a second rig and crew specifically to grouting and that they monitor their work carefully. Use the most confident methods available (typically bottom up tremie immediately after DyeLIF logging) to prevent migration of DNAPL down DyeLIF or sampling boring preferential pathways.

1.2 DyeLIF's Quantitative Response

A DyeLIF data log typically contains thousands of multi-wavelength waveforms with each waveform containing both quantitative and qualitative information about the soil passing just outside the transparent sapphire window of the probe. Each waveform is stored along with the depth (bgs) of the window, which is tracked by a string potentiometer attached to the direct push machine that advances the probe into the ground. The brief flash of fluorescence that occurs as a result of each pulsed laser excitation event is converted to a current pulse by an uphole photomultiplier tube and that current pulse is captured on a high-speed digital storage oscilloscope, resulting in a waveform.

The quantitative information contained in the waveform is represented by its overall magnitude, which represents the total fluorescence intensity coming off the soil with each pulse of laser excitation. The magnitude of the waveform is calculated in pico-Volt-seconds (pVs) since it is the cross section of the voltage (V) measured over time (pico-seconds).

The qualitative nature of the return fluorescence is related to the relative fluorescence in each of the four different colors being monitored, in addition to decay rate or "lifetime" observed as each of the four colors' of fluorescence light dies away soon after pulsed laser excitation (typically lasting only 1-100 nanoseconds).

Importantly, the intensity of the excitation laser light pulses used to excite the PAHs has a direct relationship to the resulting fluorescence intensity therefore the more intense the excitation pulse, the more intense the fluorescence. The laser intensity is controlled by the operator via a mechanical device that limits, with a turn of a shutter screw, the laser intensity being launched into the excitation fiber optic. Prior to each DyeLIF logging event the operator places a standard fluorescent reference emitter (RE) on the cleaned sapphire window and adjusts the intensity of the laser excitation in order to achieve a return fluorescence that is both bright enough to be readily sensed by the detection system, but not too bright so as to overwhelm the detection system and result in saturation. The RE's fluorescence waveform is then stored within the DyeLIF log's data file, traveling with that data as a permanent record of this "single point calibration" made just prior to logging the location.

This RE waveform's total fluorescence intensity is used to normalize all the subsequent downhole waveforms. This results in all the downhole fluorescence measurements being presented as "Signal %RE", in other words how intensely the soil, water, and NAPL just outside the sapphire window fluoresced relative to the RE. While there are factors that can influence the relationship between fluorescence intensity vs NAPL saturation, it is generally assumed that the degree of fluorescence represents the relative NAPL pore saturation vs depth and it is the Signal %RE that is the "semi-quantitative" indicator of NAPL distribution in the subsurface.

1.3 DyeLIF Qualitative Response

A straightforward "more NAPL produces more fluorescence" relationship generally holds true for single NAPL types, but only at sites where no confounding false positive fluorophores such as natural organics and non-target NAPLs are encountered. This ideal scenario, where there is only one fluorescent NAPL type and it is representative of where all the NAPL is located, is unfortunately, rare. Taking the qualitative information inherent in each waveform into account is therefore crucial to successful data interpretation using fluorescence-based sensors. Accounting for false positives is especially important for DyeLIF investigations, because the DNAPL globules are often tiny, resulting in fluorescence responses that are small and scattered because they represent the small and scattered nature of chlorinated DNAPL distribution. Fortunately, the color and lifetime information embedded in each waveform can be used to identify responses as being target vs non-target and this allows for isolation of only target (known DNAPL waveforms) vs the non-target responses using post-processing.

The quantitative and qualitative assessment process starts early, in many cases well ahead of mobilization, with benchtop testing of samples of site soils and NAPL, using the same RE for all phases of the work so that all measurements are relatable. This is similar to how 100 ppm isobutylene has been adopted for use for calibrating a photoionization detector in that the RE allows comparisons of fluorescence measurements regardless of when and where those measurements were made. In many cases, benchtop testing is done in the lab prior to deciding if DyeLIF can meet the performance necessary for a successful investigation. This allows project managers to know ahead of time whether the target NAPL yields enough fluorescence, and what shape of waveform (i.e., signature) their target NAPLs produce. Waveforms of potential false positives are also often acquired during benchtop testing, to assess whether their fluorescence might overwhelm or otherwise confound the ability to discern target fluorescence present in and amongst these potentially confounding materials.

1.4 Waveform Analysis/Interpretation

A typical DyeLIF log contains thousands of waveforms, so using just five callouts alone (located at the left of DyeLIF logs) to interpret the fluorescence response of the entire log limits our ability to compare/contrast depth zones in one log. Cluster plots were developed to help us consolidate thousands of waveform “signatures” into one simple graphic that consolidates all the different types of fluorescence behavior into one graphic. There is perhaps no better way to appreciate the cluster plot’s utility than by examining the DyeLIF system’s response to a wide and varied sampling of NAPLs. The log shown in Figure 3 shows the results when DyeLIF’s proprietary dye (nicknamed Venom) was added to a wide variety of NAPLs, and each was measured in series in a single logging event. Each sample’s fluorescence waveform was measured twenty times and every one of those waveforms in the log has been assigned a position on the cluster plot, represented as a “bubble” whose size scales with fluorescence intensity, with typically insignificant dim fluorescence getting the smallest bubbles ranging up to large bubbles for bright fluorescence.

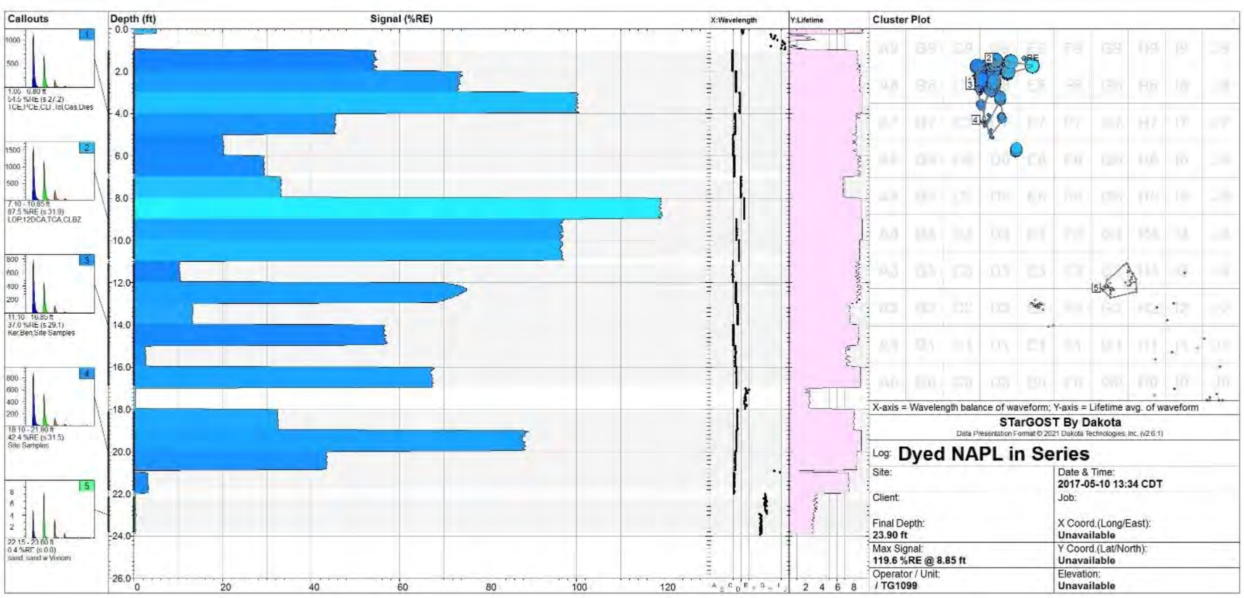

Figure 3. A benchtop study of Venom dye response when it is added to a wide variety of NAPLs

The X axis of the cluster plot (upper right) represents the fluorescence color, in other words the relative intensity/balance of the four different colored fluorescence decay measurements (aka peaks) of each waveform. The Y axis of the cluster plot represents the relative average lifetime of the four fluorescence peaks.

With traditional LIF, which measures innate NAPL fluorescence, a wide variety of NAPLs would typically fluoresce with a wide range of colors and lifetimes due to the wide-ranging (complex) mixture of PAHs of varying size and shape. The resulting cluster plot would therefore have bubbles ranging “all over the map” because they would represent the wide-ranging colors and lifetimes. But remember that the NAPLs in this experiment were all exposed to Venom dye (also a PAH) and they were therefore “labeled” with a strong fluorophore that has a relatively narrow fluorescence color range and lifetime. The Venom dye was synthesized by chemists to generate extremely bright fluorescence (it has what is called a high quantum yield), so it dominates the fluorescence behavior. It does so even though PAHs already exist in relative abundance in some of the test NAPLs like diesel. Other NAPLs like TCE, which contain no PAHs, would not fluoresce at all in the absence of the Venom dye. That is DyeLIF's concept in a nutshell, to introduce ahead of the LIF sensor an indicator dye that rapidly and brightly stains any NAPL the probe comes into contact with, rendering the NAPL reliably detectable by the sensor, whether or not it's inherently fluorescent in its native form.

Looking more closely at the dye's response in Figure 4 you can see that the waveforms from the dyed NAPL samples are blue channel dominant (aka blue-shifted), i.e., they fluoresce predominantly in the bluer (left-most, shorter-wavelength) channels. Remember as well that the x-axis of a waveform is elapsed time, spanning approximately 350 nanoseconds from left to right. Notice that the peaks have an abrupt increase in intensity on the left-hand side, because the laser excites the fluorescence almost instantly, so fluorescence begins almost instantly on the left side of each peak. The rate of fluorescence <u>decay</u> is what is controlling the rate of decrease on the right-hand side of each peak, tracking the NAPL's fluorescence as it fades away after the momentary excitation by the laser light pulse.

This decay causes each peak to "bleed" toward the right side (elapsed time). In the case of Figure 4 the fluorescence peaks reach about halfway toward the next fluorescence channel's arrival at the detector. In contrast to the NAPLs, the indicator dye fluid's response is much different. Its waveform (on the far right) is <u>not</u> blue dominant, and the dye's fluorescence lifetime is much shorter in the fluid delivery form vs. when it is solvated into a NAPL. Notice that the width of the four peaks for the dye fluid are much narrower vs. time, reflecting the carrier fluid dye's more rapid fluorescence decay.

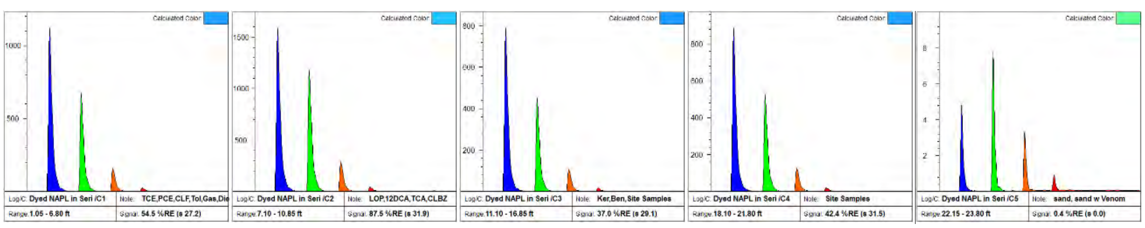

Figure 4. Waveforms from a variety of NAPLs labeled with dye vs aqueous dye fluid (far right)

Finally, let us examine this set of NAPLs' cluster plot up close in Figure 5. Notice that the longer lifetimes and a shift of the fluorescence toward the blue (left) channel of the waveforms results in the NAPLs' bubbles being located high and to the left, while the dye fluids "inactivated" fluorescence response plots much lower and weighted toward the right on the x-axis.

In other words, regardless of the intensity of the fluorescence (the quantitative response) the qualitative aspects of the fluorescence, even when as faint as less than 1% RE as in the case of the sand and sand with dye fluid, allows us to identify fluorescence caused by solvation of the indicator dye vs. non-solvated dye.

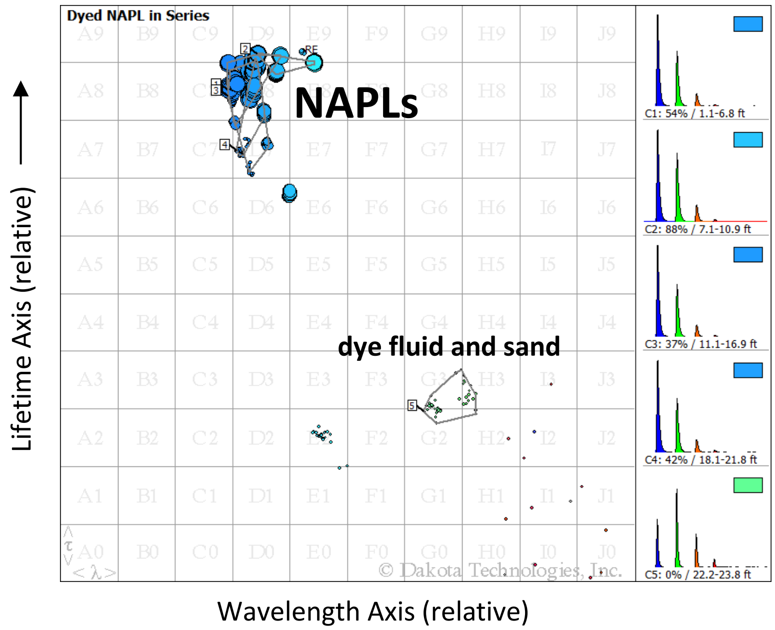

Figure 5. Cluster plot for dye-stained NAPLs and dye in carrier fluid

In general, the higher (longer lived) and the further left (blue-shifted) the fluorescence is on the cluster plot, the higher the confidence that some type of dye-solubilizing NAPL was encountered. In addition, the stronger the fluorescence (the larger the bubbles) the more NAPL pore saturation is suspected.

1.5 DyeLIF Hydraulic Profiling Response

The dye fluid injection process is monitored by sensors that allow for measurement of the pressure required to inject the aqueous dye fluid into the soil as the probe is advanced into the subsurface. The injection takes place as a “weep” of fluid that wets the formation about ten (10) inches below the sapphire window. The backpressure being experienced at the injection port is a direct indication of formation permeability. In addition to pressure measured during injection, hydrostatic pressure can be measured under a zero flow (quiescent) condition, called a dissipation test. This allows a calculation of potentiometric surface (water table) upon successful completion of a successful dissipation test.

Prior to starting a DyeLIF log, there is a quality assurance (QA) check on the down-hole transducer to ensure proper function. The probe is submerged in a reference tube filled with water (which has the same density and viscosity as the dye carrier fluid), and a reading is taken at the dye injection port when it is submerged to a depth of one foot. A second reading at xero feet (baseline) is also measured under zero flow conditions. The reading at zero feet, or the baseline pressure, is equal to the measurement of atmospheric pressure. Subtracting the atmospheric from the submerged reading should produce a result of 0.433 psi (+/-10%), which is the hydrostatic weight of a one-foot column of water. The DyeLIF probe is advanced into the ground at a rate of approximately 0.5 cm/sec. The pump in the DyeLIF flow module draws dye fluid from the supply tank and pumps it down the trunk line at a desired constant flow rate (60 mL/min), which is monitored by a flow meter. The downhole pressure transducer monitors the pressure generated by injecting water into the formation matrix. The log provides graphs of the pressure and flow rate versus depth alongside the fluorescence plot. If a dissipation test is performed below the water table and the test successfully stabilizes, the result can be corrected to an absolute hydrostatic value, from which a potentiometric surface (water table) can be calculated. Using the calculated water table to correct for hydrostatic pressure increase, a hydraulic conductivity (K) value for a given depth below the water table can be estimated using the following equation:

$$K = \ln(Q/P') * 20.0 + 7.0$$

where P' = downhole pressure – (0.433 * depth below water table) – atmospheric pressure, and Q is equal to flow. K values above the water table are also reported after a successful dissipation test even though they are "uncalibrated" due to varying permeability behavior of dry soils. These values still maintain qualitative value however and may lend insight into preferential pathways in the vadose zone.

Unfortunately, injection port clogging can occur due to backflow of fine soil particles into the port's small holes, so potentiometric tests are generally avoided on DyeLIF projects. This is because loss of water flow during traditional LIF+HP is acceptable on occasion, but uninterrupted indicator dye fluid flow is critical to the DyeLIF NAPL detection process.

2.0 Site-Specific Fluorescence Data Discussion

2.1 Pre-mobilization Lab Testing

Due to the dangerous nature of site-specific contaminants, no pre-mob cores, samples, or NAPL was made available for benchtop testing prior to conducting this project.

2.2 Fluorescence Types

Most DyeLIF project sites produce a relatively complex variety of fluorescence responses due to the presence of materials other than target DNAPLs, such as petroleum hydrocarbons (fuels, greases, oils) and other confounding fluorophores such as natural minerals, manmade fluids such as sewage waste, tree roots, or almost any organic material. These non-target materials generate fluorescence which differs from the target fluorescence. To make matters more complicated, this project involved logging only partial sections of each location, with tools being tripped in/out of the borehole and various activities taking place between logging events. Some of these activities may well have produced soil slurries, allowed fluids to move down the borehole walls to collect at the temporary bottoms, or other perturbations. This creates greater uncertainty in the origins of the fluorescence because it increases the possibilities that false fluorescent materials were generated or encouraged to collect in zones that otherwise would not have. We don't have a solution to this dilemma – all we can do it mention its presence in the data.

Examination of the DyeLIF logs revealed five general waveform types that dominated the in-situ logging data. They are shown in Figure 6 and include:

POSITIVE This is the waveform that is consistent with the fluorescence produced when DyeLIF's DNAPL indicator dye is exposed to enough organic NAPL to solvate the dye and thus alter its fluorescence intensity, color, and lifetime, indicating DNAPL. Thus, the name "POSITIVE" means positive for the presence of DNAPL, but stopping short of "confident of DNAPL" (sans validation with cores).

DYEFLUID The fluorescence of the indicator dye fluid that was delivered into the formation from the probe but having had no contact with ("activation" by) DNAPL.

FALSEPOS Unknown material causing fluorescence in the DyeLIF logs that are not considered to be NAPL.

UNKNOWNI Unknown material causing fluorescence in the DyeLIF logs that are not considered to be NAPL.

UNKNOWNII Unknown material causing fluorescence in the DyeLIF logs that are not considered to be NAPL.

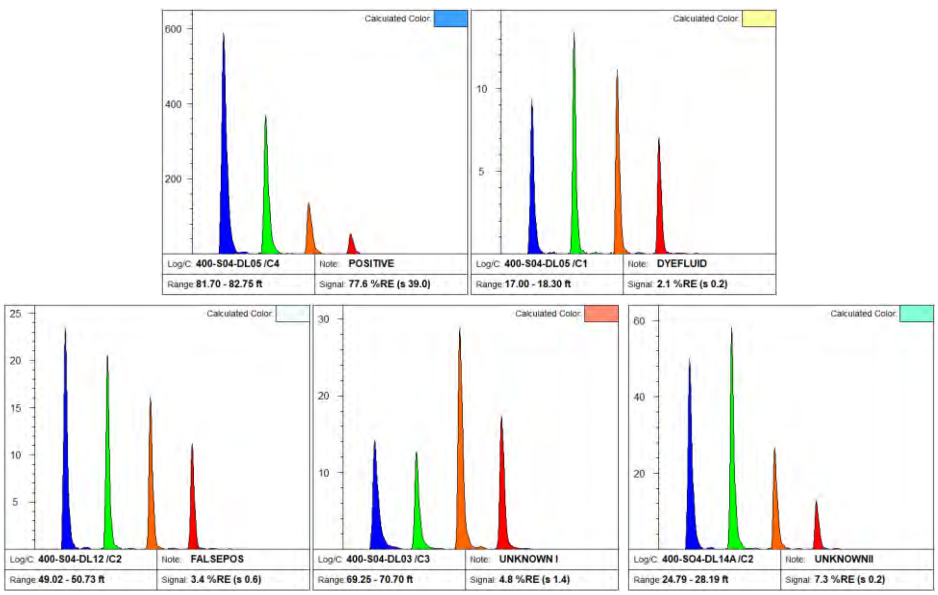

Figure 6. Waveform from the five dominant type of fluorescence observed in-situ

Figure 7 contains the cluster diagram for DyeLIF 001, the very first log acquired at NAVWAR. DyeLIF 400-S04-DL05 serves as a good example for discussing the interpretation of various fluorescence response types observed to varying degree in all the project DyeLIF logs, and is one of the few that appeared positive for DNAPL presence.

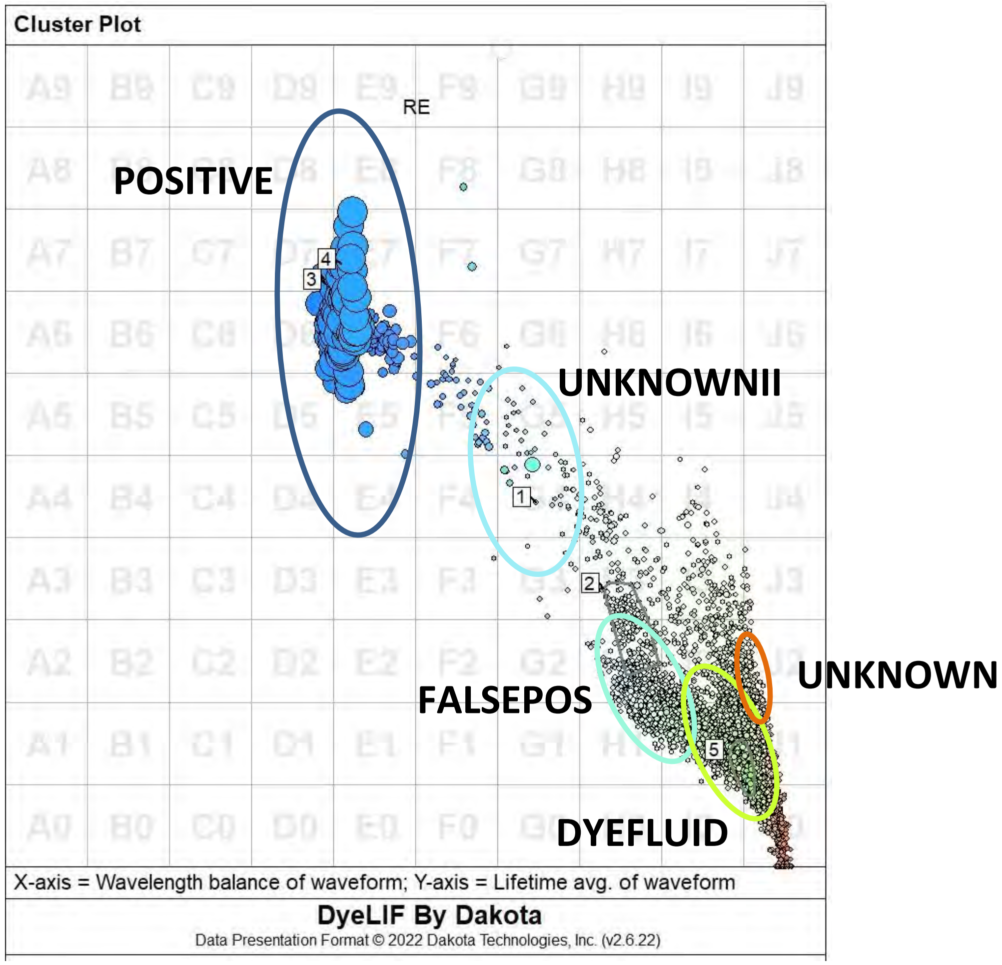

Figure 7. Cluster plot for 400-S04-DL05 and the main fluorescence classes

Notice that all previously described classes of waveforms in Figure 6 are present in Figure 7. The cluster plot contains DNAPL indications at upper left along with the non-target fluorescence waveforms toward the lower right. The DYEFLUID, FALSEPOS, UNKNOWNI waveforms generally occupy the lower right of the chart. Only UNKNOWNII begins to mock the fluorescence of dye dissolved in DNAPL, and it is this false positive material that is most difficult to discriminate confidently as being non-NAPL in origin. The further a waveform lies toward the POSITIVE region, specifically up and to the left, the more it should be considered positive evidence of potential DNAPL in the pore spaces.

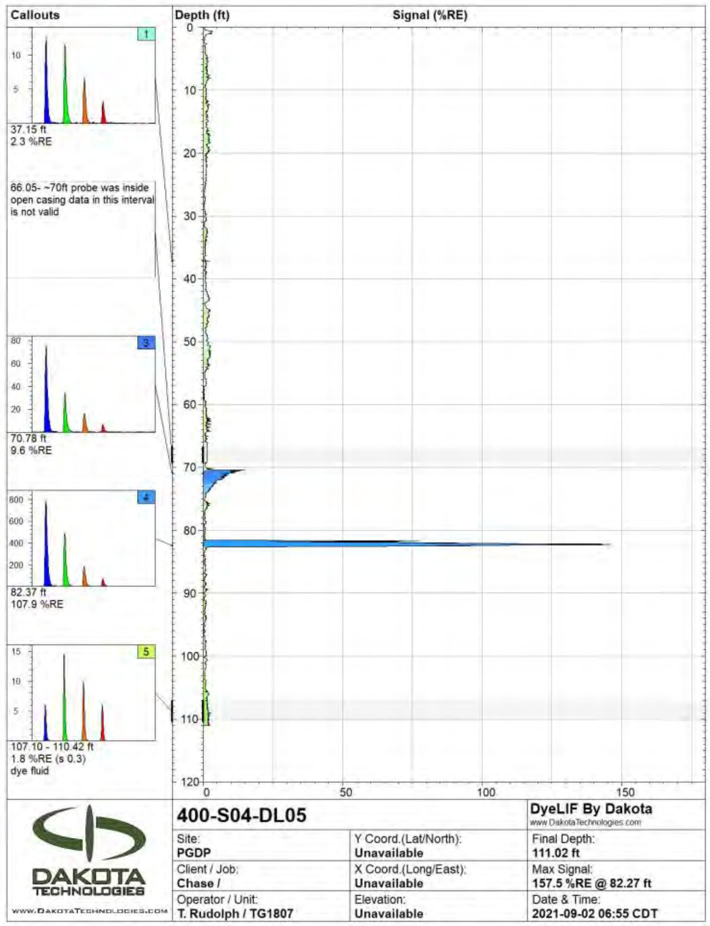

Figure 8. The fluorescence intensity (Signal %RE) of DyeLIF 001 plotted vs depth

The semi-quantitative nature of the DyeLIF response vs DNAPL pore saturation is represented by the fluorescence (Signal %RE) vs depth as shown for 400-S04-DL05 in Figure 8. You can see some of the familiar waveform types that we just discussed under the Callouts (at far left) from various depths within the log. The fill color box in the upper right corner of each of the called-out waveforms show the fill colors calculated for that waveform (or group of waveforms for multiple waveform selections as is the case here). The fill colors are generated by combining blue, green, and red colors in the proportions determined by the relative amount of fluorescence in each of the four peaks (four different colors). The fill color is automatically determined for every waveform in the log and this color is used to fill the Signal %RE plot. The result is a colorized log that simultaneously displays the strength on the x axis, the depth (typically bgs), but the <u>type</u> of fluorescence is represented by the fill color.

Even without examining any of the waveforms themselves, the color-coding allows for quick identification of potential DNAPL zones indicated by a blue color. Horizons dominated by natural soil fluorescence are colored a lighter sky blue, while zones where the dye fluid dominates are colored a bright green. Partial contributions from false positives are a light blue to turquoise. Notice in Figure 8 that the soil and/or dye fluid colored responses consistently fail to surpass the 5-10% RE range across all 7,897 fluorescence waveforms contained in this log. Applying this visual "baseline threshold", in combination with looking for the blue fill color of DNAPL, serves as a way to spot potential DNAPL responses when looking at the log. In other words, any responses that are either bright enough to exceed the intensity of the formation's natural fluorescence AND/OR are blue shifted enough in color and have longer lifetimes, are suspect of indicating DNAPL. The higher the Signal %RE, the bluer the fill color, and the longer the lifetimes, the more confident we can be that the probe has encountered DNAPL.

Significant DNAPL saturations generate high signals, often in hundreds of Signal % RE. As the percentage of DNAPL occupation of the pore spaces in the soil declines, and those pores are instead occupied by water, gas, and/or dye fluid, the degree of blue-shifted longer lived fluorescence wanes, eventually falling to a level where it cannot reliably be identified as DNAPL against the competing fluorescence of soil and dye fluid. Due to the lack of validation evidence generated at this site, estimating a "threshold" for positive DNAPL response is difficult. But based on past project and lab experience, any Signal (%RE) above 10% RE generally indicates DNAPL exists with confidence. But the in-between range of fluorescence intensity between 5% RE and 10% RE represents a range of general uncertainty. 5% RE and lower intensity low levels (i.e., "down in the weeds") are almost certainly void of DNAPL at levels that would positively indicate on any of the traditional colorimetric dye shake tests.

Mathematical processing of the waveforms using NNLS fitting of the waveforms was conducted to differentiate the contributions of the differing fluorescence types in order to maximize our confidence in the DyeLIF data. This is key for winnowing out small NAPL responses, where simultaneous fluorescence of multiple types makes it difficult for the human eye to discern. To accomplish this, a Basis Set of waveforms is first selected, each representing one of the main classes of fluorescence observed at the site. The Basis Set is selected from soil horizons where confidence is high in the type of fluorescence occurring and that it is in its "pure form" (not mixed with other types). Figure 9 shows the processing setup for log 400-S04-DL05 with the Basis Set waveforms listed in Figure 6 shown at right. The background soil fluorescence identified by the analysis software was so low it did not warrant being included in the NNLS processing Basis Set.

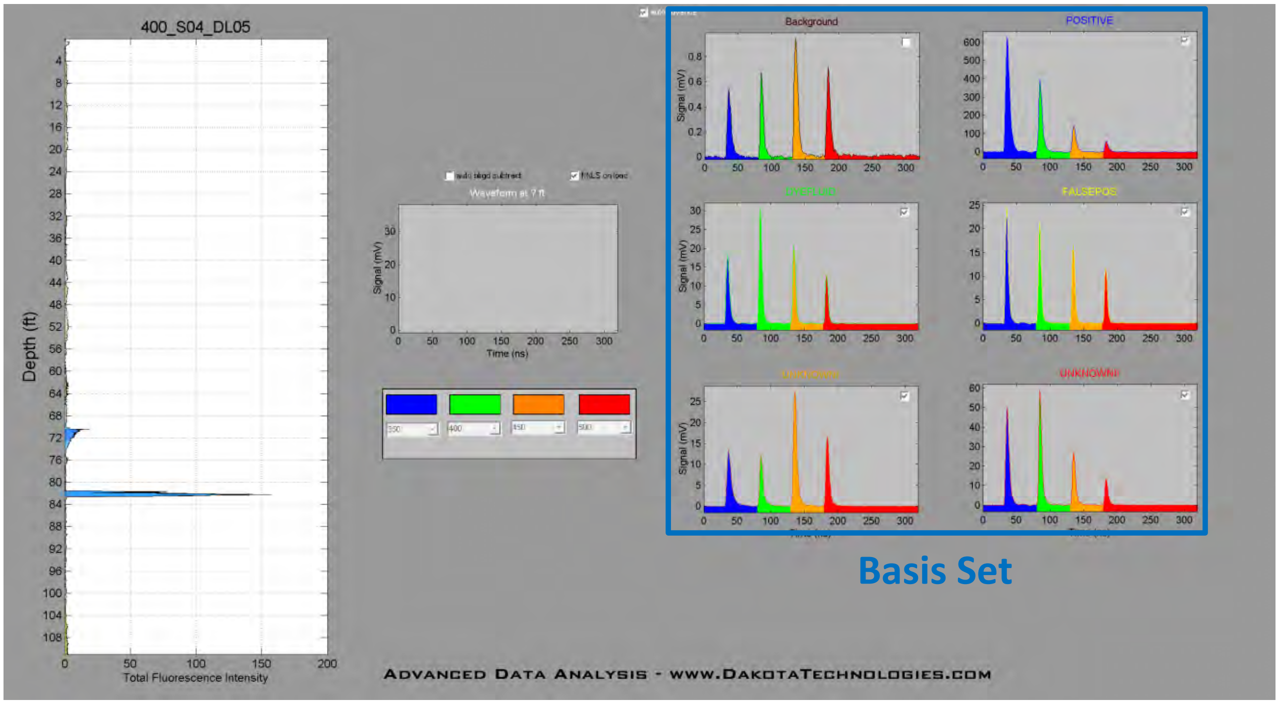

Figure 9. Non-negative least squares Basis Set

With the Basis Set was identified, an automated routine generates synthetic waveforms that are composed of some fraction of all the Basis Set waveforms, which when combined together achieve the best fit to every in-situ derived waveform in the log. Figure 10 illustrates the output in graphical fashion with the original DyeLIF fluorescence log found at far left, the POSITIVE (DNAPL's) waveform's contribution contains blue fill, and the non-target fluorescence consists of other colors in other columns. The far right log contains a unitless goodness of fit which aids the analyst in identifying instances where the in-situ data is not well-represented by a combination of the Basis Set waveforms. In other words, a poor fit generates a low goodness of fit, which in turn indicates a type of fluorescence was logged that is missing from the Basis Set. A poor fit did not occur in this data set, except for sparely occurring electronics saturated waveforms discussed previously. Each type of fluorescence in the Basis Set then is allocated its portion of in-situ response which is stored in separate data files so that analysts can deal with the separate florescence types individually if desired. This allows for rejection of false positives and an additional level of confidence of "hits" when faint fluorescence makes a visual assessment of waveforms difficult. Our site's target fluorescence, the blue colored fluorescence that represents DNAPL, is considered the "final product" of the data analysis and it was this isolated DNAPL type fluorescence that was used for the 3D data visualizations and general remedy engineering. The red dots in Figure 10 indicate which waveform was dominant for each depth.

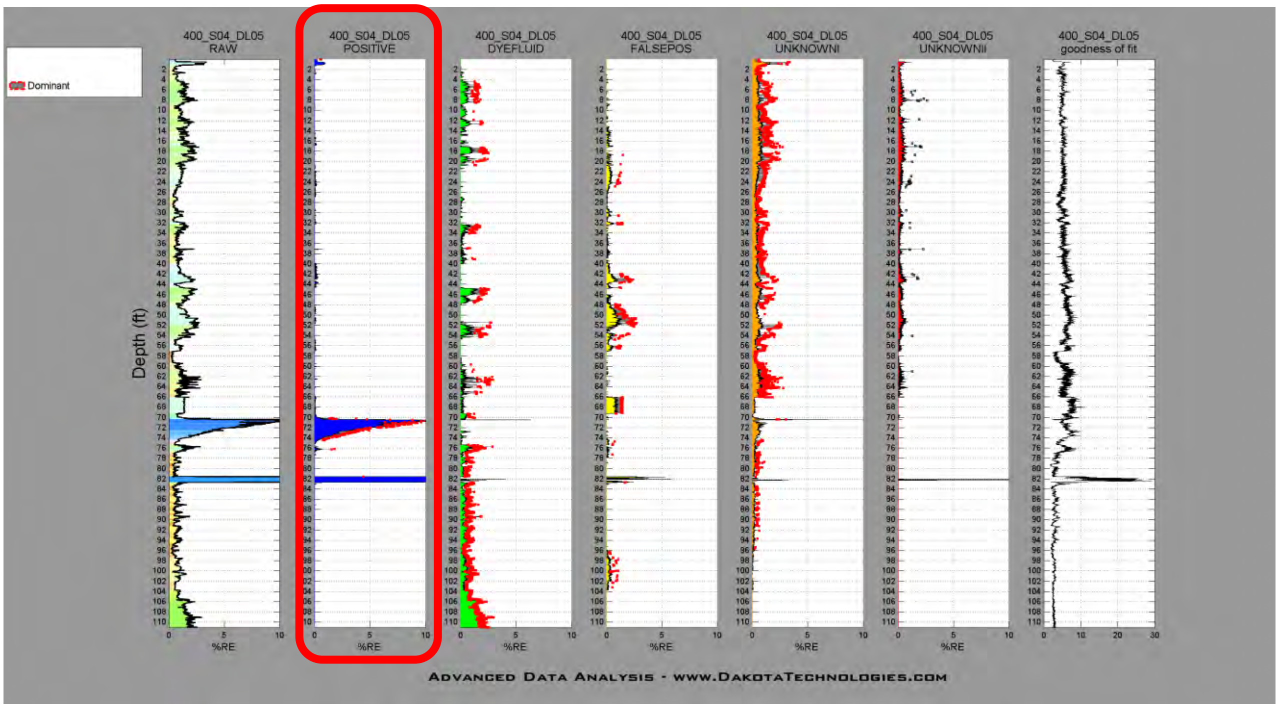

Figure 10. The graphical output of the NNLS fitting of log 400-S04-DL05, with the NAPL-indicative POSITIVE data marked in red.

The POSTIVE fluorescence data was included as an indicator for high confidence DNAPL zones in the final logs by plotting it alongside the other data, as demonstrated in the "NNLS" column of Figure 11, plotted in a coral fill color. Note that the "Zoomed In" log is simply a replication of the Signal %RE graphic, but at a magnified scale that allows for close inspection of the baseline in logs where large Signal %RE responses dwarfed the smaller responses. All DyeLIF logs for this project (including benchtop and NNLS results) can be found in Appendix A.

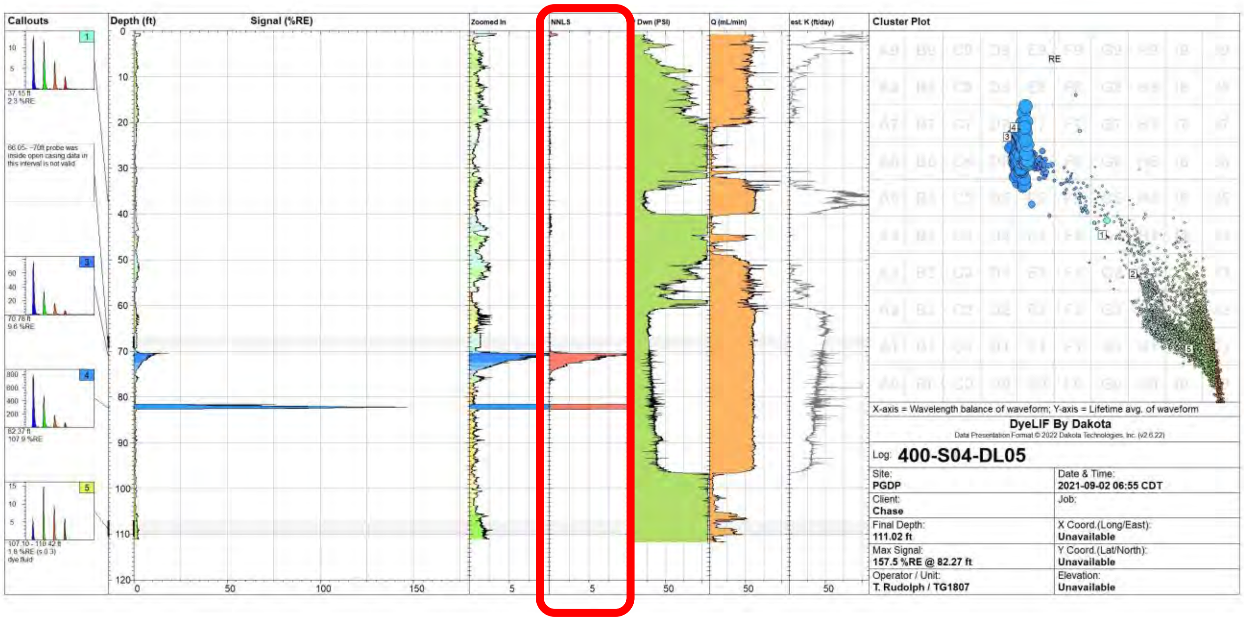

Figure 11. Final post-processed log for 400-S04-DL05, including the NNLS POSITIVE data marked in red.

2.3 DyeLIF Log Interpretation

Important points to consider while interpreting the Paducah projects' DyeLIF logs:

- The complex nature of partially logging the DyeLIF, then withdrawing DyeLIF tooling, using dummy probes, casing, and waiting sometimes long periods to finish logging locations introduces a host of unknown sources for false positives. Disturbed sands, soil slurries, pore water, even sewage porewater, can be sources of dissolved phase or mineral fluorescence which don't show up under normal logging situations. The porosity for these materials to collect at the bottom of boreholes between DyeLIF logging events makes identification of potential sources quite difficult. Section 4.0 with Appendix D contains a table documenting this arduous process and the complex nature of the data acquisition process. Many of the more nuanced positive for DNAPL signals (2-5% RE and blue-shifted with longer lifetimes) occurred in the very start/stop depths where changes were made, suggesting that the signals were the result of unknown effects of drilling/probing activities mentioned above.
- The NNLS data column was purposefully scaled to 10% RE. Any responses between 0 and 5% RE aren't confident indicators of DNAPL, 5-10% RE are suspect for potential for DNAPL, and > 10 %RE (off scale) should be considered very confident that DNAPL is present unless the waveform or other line of evidence indicates otherwise. When the intensity of the fluorescence exceeds a threshold, it's important that one must confirm this "hit" by turning to the nature of fluorescence (information contained in the waveforms), along with the waveform's respective position on the bubble chart, to determine if the Signal %RE was NAPL-induced (blue-shifted and longer lived) vs false positives.

2.4 Limitations

The analysis and opinions expressed in this report are based upon DyeLIF data from the indicated locations and from other information discussed in this report. This report is prepared for the exclusive use of our client, Chase Environmental and their client, for specific application to the project discussed and has been prepared in accordance with generally accepted practices. Reported results shall not be reproduced, except in full, without written approval of Dakota. No warranties expressed or implied are intended or made.

Additionally, the following are known limitations of the DyeLIF technology and should be carefully considered while evaluating DyeLIF data:

- DyeLIF targets fluorescence so PAHs found in petroleum NAPLs such as diesel, bunker fuel, former MGP and creosote NAPLs and DNAPLs fluoresce and can and will be detected along with the “target” Venom dye. In some cases, blue-shifted fluorescence (for instance diesel) will closely mimic the dye/DNAPL response and can be indiscernible from it.
- DyeLIF can/does detect moderate staining and residual levels of DNAPL as well as free phase (near total saturation).
- DyeLIF is typically “blind” to aqueous (dissolved phase) PAHs with the rare exception of groundwater found at some acid tar sites.
- DyeLIF does not respond appreciably to the innate PAH fluorescence of lighter end fuels like gasoline or kerosene. Diesel PAHs are readily detected, however. Lighter fuels can solvate the Venom dye but do so more slowly and ineffectively than chlorinated solvents, so they generally result in a relatively modest response compared to solvent DNAPLs. “Pure” benzenes, chlorobenzenes, xylenes and similar LNAPLs respond exceptionally well, even better than TCE and PCE in some cases.
- DyeLIF system responses are very similar but are not identical unit to unit or over time, so the response for an identical NAPL sample can vary with optical platform and from lab to field (landing in a slightly different coordinate on the cluster diagram). However, once set up on site, the response typically remains quite stable over time and from log-to-log.
- Soil grain size has a significant impact on all LIF systems. Coarse soils generate the highest responses while finer grains can generate responses an order of magnitude dimmer for equivalent NAPL loading.
- Lowered fluorescence due to molecular oxygen quenching (typically during bench studies) is a significant issue with UVOST® but has not been known to occur with DyeLIF.
- Equivalent emulation of the pressures, pore fluid movement, dye/DNAPL interaction, and other conditions occurring in the subsurface soils outside the window during DyeLIF logging is not possible. While the benchtop vial readings with DyeLIF are effective and quite sensitive, they generally represent the fluorescence of dyed DNAPL clinging to the vial’s glass walls which seem to attract DNAPLs more strongly than the soil. Therefore, the benchtop DyeLIF Signal %RE from a sample measured through the transparent walls of a vial are not equivalent to fluorescence measured in the subsurface as the sapphire window passed by that same soil/NAPL.

3.0 Validation with the Multiple Lines of Evidence (MLOE) Process

We are confident in our interpretation of the in-situ DyeLIF results based on our experience developing the DyeLIF system, fielding it at numerous sites, and assuring proper performance prior to fielding as demonstrated in pre-mobilization bench testing as described in Section 2.1 (if conducted). However, because of the potential costs associated with improper design of a remediation approach based on a flawed DyeLIF NAPL conceptual site model (CSM), the DyeLIF data must be scrutinized and validated beyond our professional opinion and any pre-mob benchtop testing that was conducted. This requires collecting physical samples to be measured using other methodologies known to respond appropriately to the target chlorinated NAPL contamination. The scope and size of any LIF validation sampling program will scale with the variety and nature of the LIF responses. Sites with complicated wide-ranging responses require more extensive validation than straightforward “simple” sites. Fortunately, stakeholders can use the LIF logs as a guide to expeditiously target select locations and horizons necessary to validate all the fluorescence responses observed, which helps to limit the number of samples (relative to a traditional “blind” fixed grid sampling program).

The common approach to validating an LIF log is to compare the LIF log data to measurements made on cores recovered from a borehole located within a foot or two from the LIF log. This “logical” approach, however, is fatally flawed from the start, specifically the assumption that the soils collected in the core are sufficiently representative of the soils that the LIF sensor had passed through during logging. One might be able to argue that this assumption is “close enough” for dissolved phase contaminants which are aided in their distribution by diffusion processes. But applying such an assumption to DNAPL distribution is simply unacceptable due to the extreme heterogeneity consistently exhibited by “needle in the haystack” contaminants such as DNAPLs. Extreme concentration variations occur even on the sub-inch scale within the same, let alone an adjacent core that is “miles away” relatively speaking. In fact, ignoring heterogeneity’s effects and allowing its inherent chaos to be introduced into the comparison renders the validation exercise almost futile, if not counter to the validation’s original purpose – to build confidence in the in-situ sensing data. By improperly validating the LIF response against soils that the LIF probe simply did not pass through, generation of random chaotic “nonsense” data is assured. This in turn causes an inappropriate loss of faith in what might well have been very accurate and useful LIF CSM. The only remedy to this significant but common problem, is to assure that both the validation measurements and the LIF measurements are made <u>on the same soils</u>. While this seems intuitive and obvious, it is rarely practiced due to lack of discipline, budgetary constraints, or ignorance.

The Multiple Lines of Evidence (MLOE) validation approach illustrated in Figure 12, was conceived of and introduced by the authors of Einarson 2018. The MLOE technique was borne from decades of frustration in seeing “oranges to apples” comparisons made between in-situ sensor responses and lab results, with the latter always being hailed as the correct answer in case of the inevitable major discrepancies. In addition to heterogeneity issues, typical uphole measurement types used for screening and analyzing soils are measuring different phases of contamination (dissolved, gas, sorbed, VOCs, semi-VOCs, and rarely, NAPL). And finally, they all have differing sensitives to the various phase or contaminant type and varying propensities to generate false positives or false negatives.

It is for these reasons that it is the "Multiple" aspect of MLOE that helps MLOE winnow out "the truth" regarding the target contaminant's distribution in the soil, because where one line of evidence fails, the others often shine. It is the MLOE's totality of evidence that should be used to judge the in-situ sensor's performance if a scientifically credible determination is to be made on the downhole logging sensor's ability to reliably indicate the target contaminant's distribution in the subsurface.

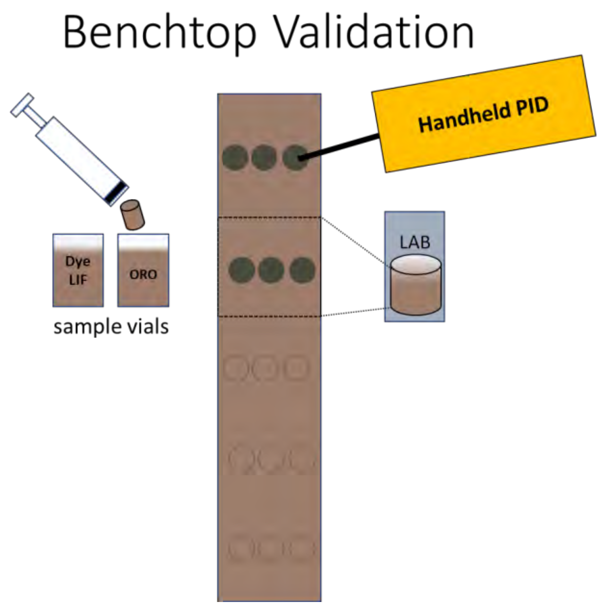

Figure 12. Benchtop (MLOE) validation of DyeLIF on same discrete soil horizons

The key to MLOE's success is that all the data is generated from soils taken from the same narrow discrete horizons within the core. While NAPL heterogeneity still occurs even on sampling spacings such as this, the differences are kept at a level low enough to generate reliable comparison.

The general approach to MLOE benchtop validation screening:

1. Select the appropriate DyeLIF log locations and depth horizons to validate, with preference for those with responses that appear representative of a number of other logs, so that confidence gained from that log's validation can be applied to similar logs, so as to maximize the benefit gained.
2. Place the soil core on a flat work surface that's been covered in white plastic, allowing for notes/observations to be written directly on the table.
3. Mark the table with DyeLIF location ID, core depths, and sampling MLOE horizons
4. Split the core lengthwise to expose a large horizontal face from which to harvest horizon sub-samples.
5. Cover the split core with aluminum foil to avoid loss of volatiles during the sampling and PID screening.
6. Using disposable cut off syringes or a spoon, work down the core and select discrete sub-samples from the regularly spaced horizons.

7. Analyze the horizon sub-samples to generate the MLOE data. Four target analyte measurement techniques were used here, each favoring a different aspect/phase of the DNAPL (or symptoms it produces such as high dissolved phase).

   a) NAPL-specific methods
      - Add ORO dye and 2 ml water to subsamples to induce a dramatic color change from black to bright red if NAPL is present.
      - Add two ml of DyeLIF dye indicator fluid (identical to that injected ahead of the probe window) to the subsample. Conduct benchtop reading of vials using the DyeLIF probe in order to generate what is roughly equivalent to the downhole Signal %RE.

   b) NOT NAPL-specific methods
      - A handheld PID is stuck into a vacant subsample hole to detect the vapors at each horizon – this PID response is typically relied on to indicate “horizons of interest” but is not decisive enough in its response to reliably indicate true NAPL
      - Take subsamples from horizons of interest (the consultant’s responsibility in this case) for lab analysis (typically chromatography) with 8260C VOC analysis or similar. The lab TCE concentration data thus represents the “Lab” data.

8. Record all available MLOE results directly onto the plastic table liner and photograph the results.

Dakota’s involvement in the generation of MLOE data for this project was limited to benchtop screening of a limited cores number of cores using ORO and DyeLIF. We include the benchtop response of core samples in the familiar DyeLIF log format, which are included with the field logs in Appendix A. The depths of the core sections being scanned with the DyeLIF instrument are described under each of the various callouts at left. Each callout consists of the average response of a number of readings taken from the soil sample described under each callout. Only one response (from location S04-97, 35.5’) displayed characteristics that resembled a positive DNAPL response, but the origins of that response were not identified. The lack of other positive responses with visual dyes or PID suggest that this was a false positive. Attempts to rescan that same soil section and learn more about the origins of this apparent false positive didn’t yield any clues unfortunately. It would have been useful to understand the origins.

4.0 Site Activity and Notable Events

- First 3 locations DL01, DL02, DL03 downhole pressure was not working due to an electrical issue within the uphole electronics. Flow was being recorded and the operator used that to determine that dye was, in fact, flowing.
- All locations that went beyond 100ft were stopped in the McNairy formation (usually around 95ft) as determined by pressure, flow, and onsite geologist. DyeLIF was withdrawn and hole was cased using the sonic rig to prevent contamination beyond the McNary. Most often the sonic would set that casing ~5ft beyond where we stopped with the DyeLIF – for example: DyeLIF stopped at 95ft,

Sonic casing would be set to 100'. They would not 'clean out or wash out' beyond where the DyeLIF stopped. Casing set to 100ft but the last 5ft was (in theory) undisturbed material. We believe this casing was 4" inside diameter.

- If refusal was encountered, attempts were made to use a pre-probe first to get through the hard layer generally 2ft. This pre-probe was slightly undersized compared to the DyeLIF probe diameter. Sometimes this worked, if it did, we would lower down DyeLIF to where we stopped and begin logging (including the pre-probed interval). If it didn't, casing was set with the Sonic to slightly beyond our refusal which was usually 1-3 ft.
- Whenever the DyeLIF was stopped to pull out because of refusal, McNairy FM, or other issue the rods were marked with tape or marker to denote the exact position of ground surface. When they were lowered back down logging began at that mark.
- There are several very tight formations where pressure was maxed, indicator dye fluid flow was diverted, and dye was not delivered to the soil. Operator and onsite geologist made judgement calls on whether to continue or to retract because of possible port plugging at these intervals.
- All locations were done in gravel (not crushed limestone) or native soil except when noted below. The borings in concrete were cored prior to DyeLIF. Concrete was generally 1ft thick.

Individual log notes:

400-S04-DL01: Downhole pressure not working. After McNary FM casing was set and DL was pushed to 110' before refusal. When DL probe was retrieved the SPOC had leaked. Because of this, another cable/probe was setup and logging resumed from 95ft. It is not noted if 95-110ft was back through the previous hole or if a new hole was drilled with sonic to 95ft.

400-S04-DL02: Downhole pressure not working

400-S04-DL03: Downhole pressure not working

400-S04-DL04: ~1ft of concrete at surface.

400-S04-DL05: ~1ft of concrete at surface. Wires within downhole cable failed while cleaning out connection tube after retrieval from refusal at 66.05ft. New cable/probe used from 66.05-111.02ft.

400-S04-DL06: Dye port plugged at 41.27ft. pulled out to replace port. Port plugged again at 57.37ft pulled out again to replace.

400-S1A-DL07: ~1ft concrete at surface. Dye port plugged at 48.95 pulled out and replaced port.

400-S05-DL08A: 30ft boring outside SW corner of building

400-S05-DL08B: 30ft boring outside SW corner of building

400-S05-DL08C: 30ft boring outside SW corner of building

400-S05-DL08D: 30ft boring outside SW corner of building

400-S04-DL09: ~1 ft concrete at surface. Window replaced at 66.5' backed out and broken.

400-S04-DL10: No issues

400-S1B-DL11A: ~1 ft concrete at surface. 60ft boring inside building.

400-S1B-DL11B: ~1 ft concrete at surface. 60ft boring inside building.

400-S04-DL12: unexplained low pressure at 77' possible air in line Pressure did return at McNary FM

400-S04-DL13: Changed mirror at 61.71 ft interval.

400-S04-DL14 and DL14A: DL14 was a first attempt that got to 44ft where the port had plugged. The probe was retracted, and the SPOC had broken off but cable was OK so new SPOC was setup on cable, but they could not go down the same hole to continue. DL14A was a new offset hole that was completely started over from ground surface. At 102' signal was lost because of a broken fiber. A new fiber was then used from 102-112.5. Rob requested we keep the original DL14 file.

A table of logging activities can be found in Appendix D.

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Appendix A

DyeLIF Logs

Appendix B

MLOE Data Dashboards
(not assembled for this project)

Appendix C

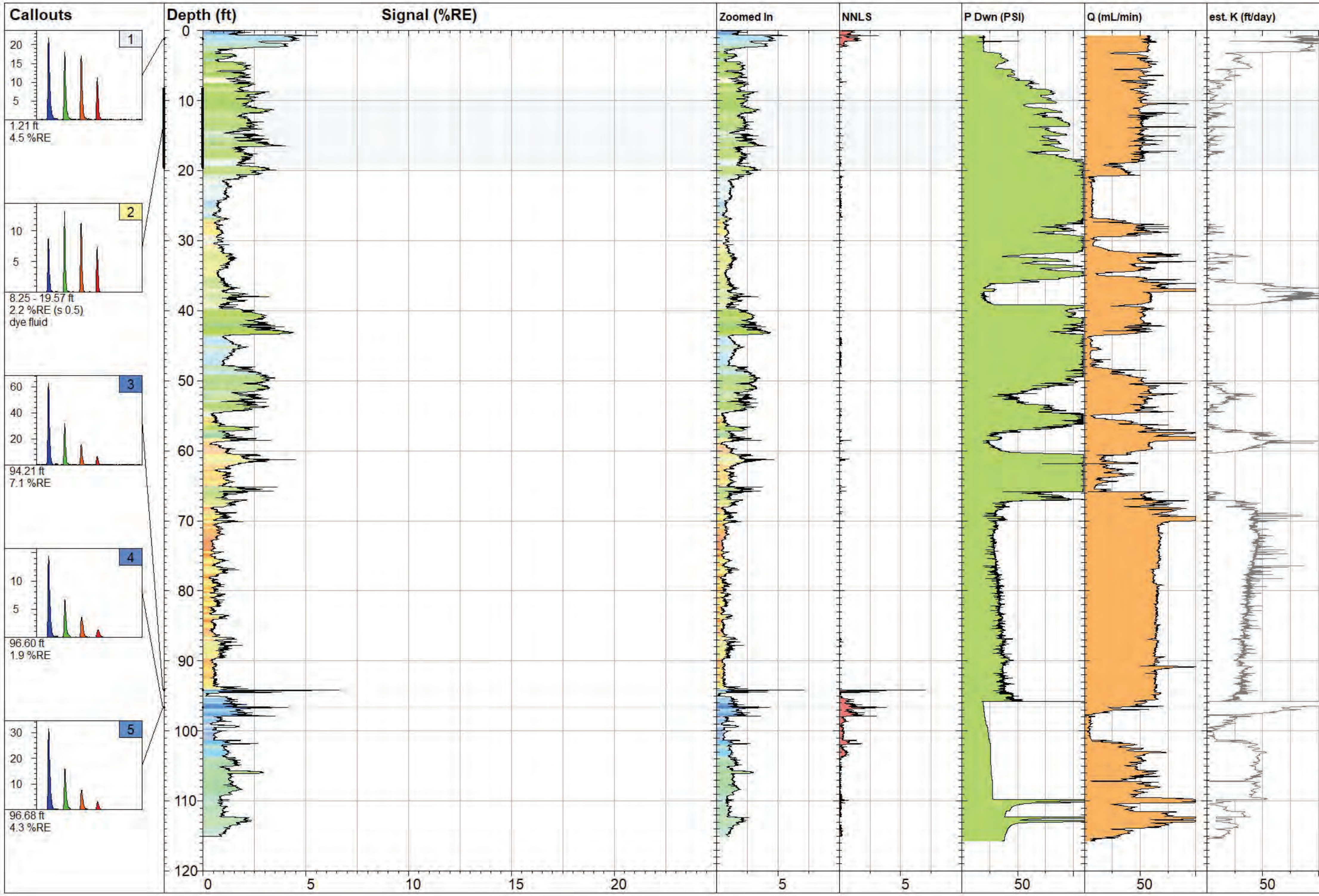
MLOE Data Table
(not assembled for this project)

Appendix D

Field Work Summary

File	Date/Time Started	Date/Time Finished	Final Depth	Refusal Depth	soild point probed to	Sonic drilled and cased	Refusal notes	NOTES:
400-S04-DL01	8/16/2021 13:04		115.02	65.14	67.10		Hard	
File B				95.00		100.00	McNary FM	New Fiber and SPOC used from 95-115
File C		8/18/2021 7:40		115.02			Hard	
400-SO4-DL02	8/18/2021 8:40		111.04	96.00		100.00	McNary FM	
File B		8/18/2021 0:00		111.04			Hard	
400-S04-DL03	8/19/2021 7:44		116.13	68.05	69.00		Hard	
File B				96.38		100.00	McNary FM	
File C				110.83	113.00		Hard	
File D		8/23/2021 12:40		116.13			Hard	
400-S04-DL04	8/30/2021 8:24		111.44	65.02	66.00		Hard	
File B				65.62		66.00	Hard	
File C				95.69		100.00	McNary FM	
File D				98.65	100.00		Hard	
File E		8/31/2021 9:45		111.44			Hard	
400-S04-DL06	8/31/2021 11:30		113.63	41.27			No dye flow plugged port	
File B				57.37		58.00	No dye flow plugged port	
File C				94.33		100.00	McNary FM	
File D				107.58	108.00		Hard	
File E		9/1/2021 14:20		113.63			Hard	
400-S04-DL05	9/2/2021 6:55		111.02	66.05	68.00	70.00	Hard	New Fiber and SPOC used from 66-110ft
File B				95.93		100.00	McNary FM	
File C		9/2/2021 14:37		111.02			Hard	
400-S05-DL08A	9/13/2021 7:52		30.05					
400-S05-DL08B	9/13/2021 9:42		30.02					
400-S05-DL08C	9/13/2021 12:01		30.02					
400-S05-DL08D	9/13/2021 13:26		30.03					
400-S1A-DL07	9/15/2021 7:45		110.96	48.95			No dye flow plugged port	Inside building
File B				65.91		70.00	Hard	
File C				93.00		100.00	McNary FM	
File D		9/15/2021 13:30		110.96			Hard	
400-S04-DL09	9/20/2021 9:09		114.97	66.50	?		Hard	
File B				67.13		68.00	Hard	
File C				96.20		100.00	McNary FM	
File D		9/21/2021 9:45		114.97			Hard	
400-S04-DL10	9/21/2021 12:27		110.72	59.85		60.00	Hard	
File B				96.00		100.00	McNary FM	
File C		9/22/2021 9:30		110.72			Hard	
400-S1B-DL11A	9/23/2021 10:32		60.03					Inside building
400-S1B-DL11B	9/23/2021 12:28		60.12					Inside building
400-S04-DL12	10/6/2021 12:10		109.64	52.18	58.00	52.00	Hard	
File B				92.32		97.00	McNary FM	
File C				109.64			Hard	
400-SO4-DL13	10/18/2021 8:01		111.80	61.71		63.00	Hard	
File B				96.22		100.00	McNary FM	
File C		10/18/2021 15:30		111.80			Hard	
400-SO4-DL14A	10/19/2021 9:53		112.50	57.70		60.00	Hard	New SPOC for this location
File B				96.20		100.00	McNary FM	
File C				102.00			Broken fiber	New fiber used from 102-112.50ft
File D		10/21/2021 9:45		112.50			Hard	

DAKOTA TECHNOLOGIES

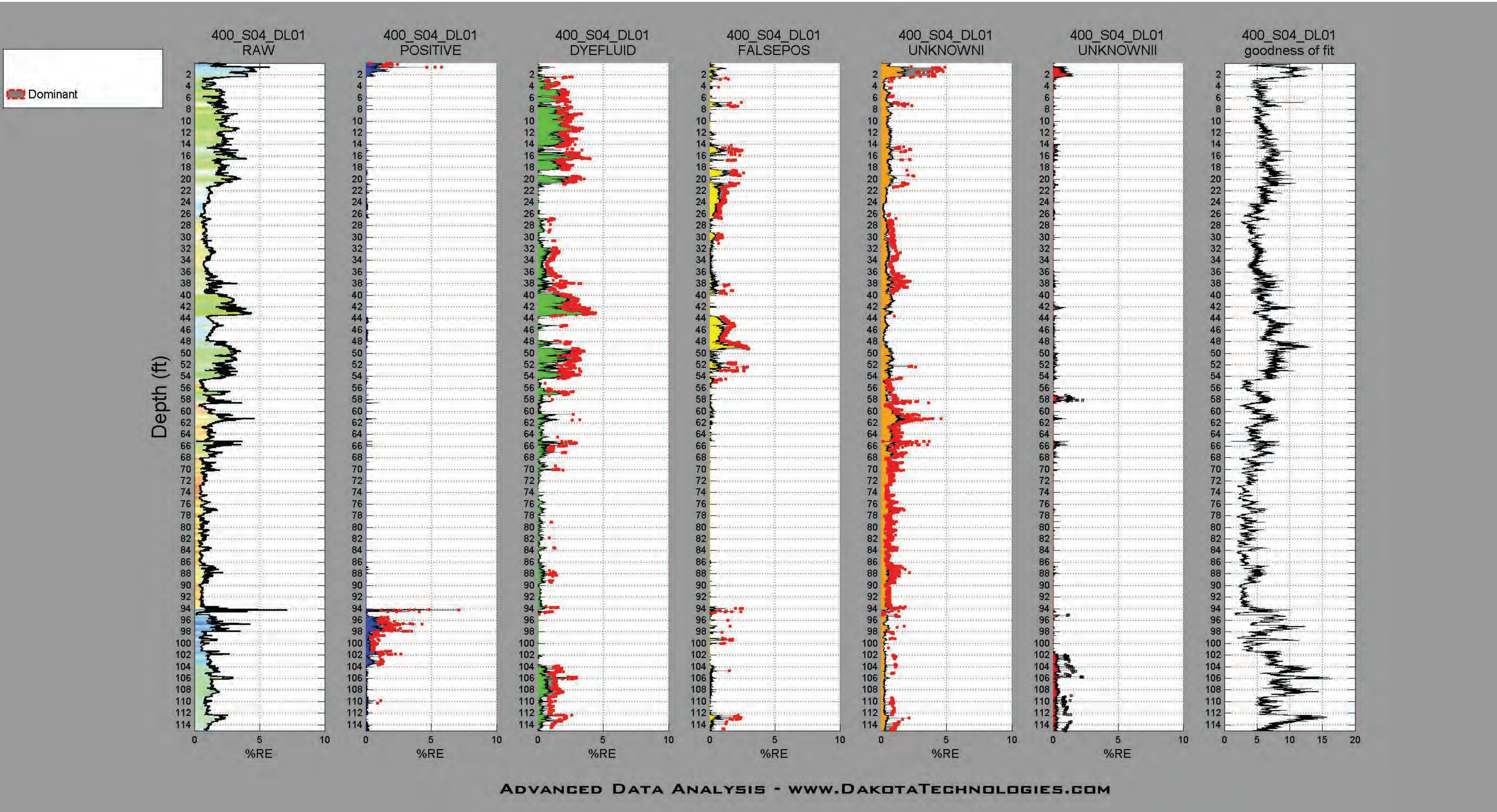


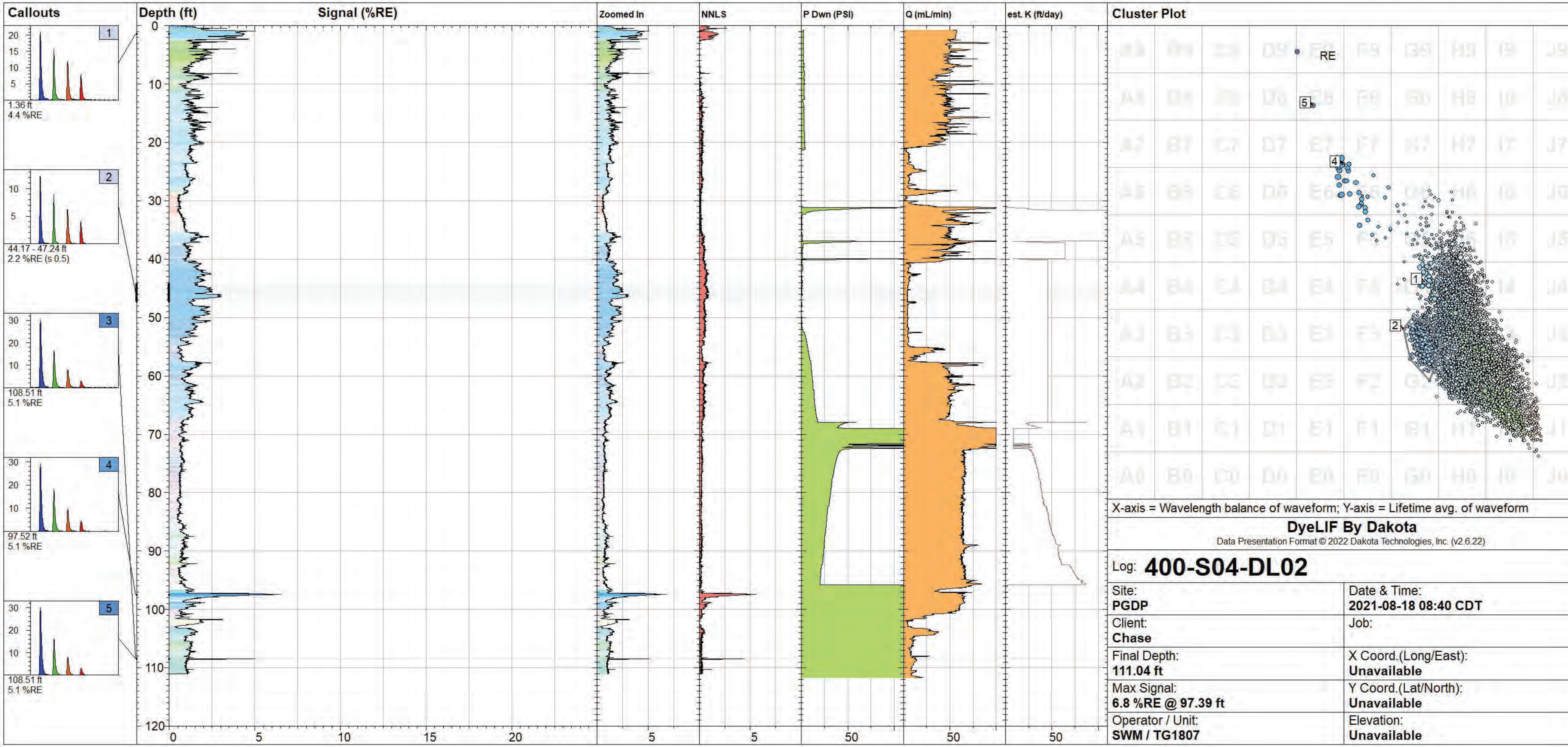
DyeLIF By Dakota

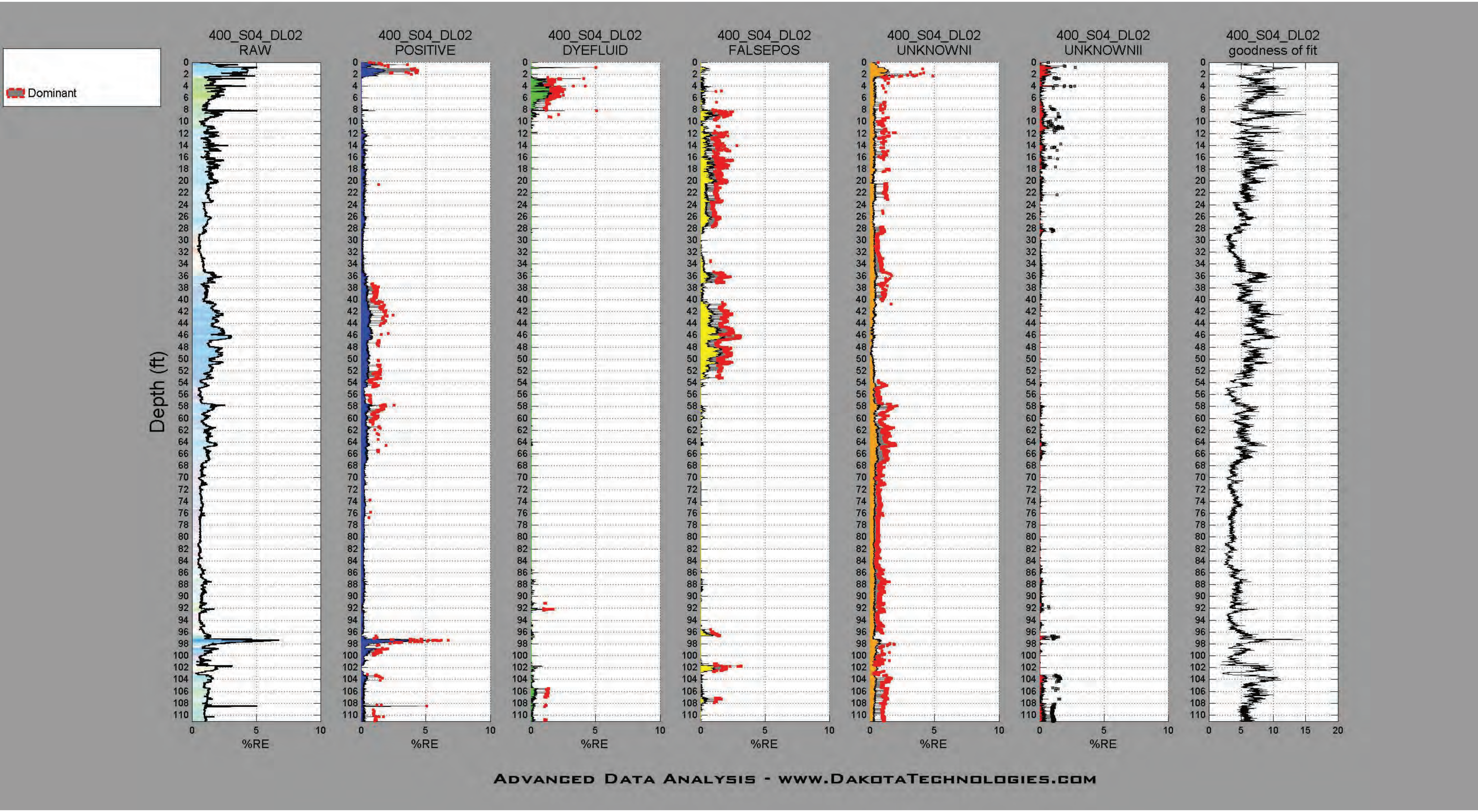
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

Log: **400-S04-DL01**

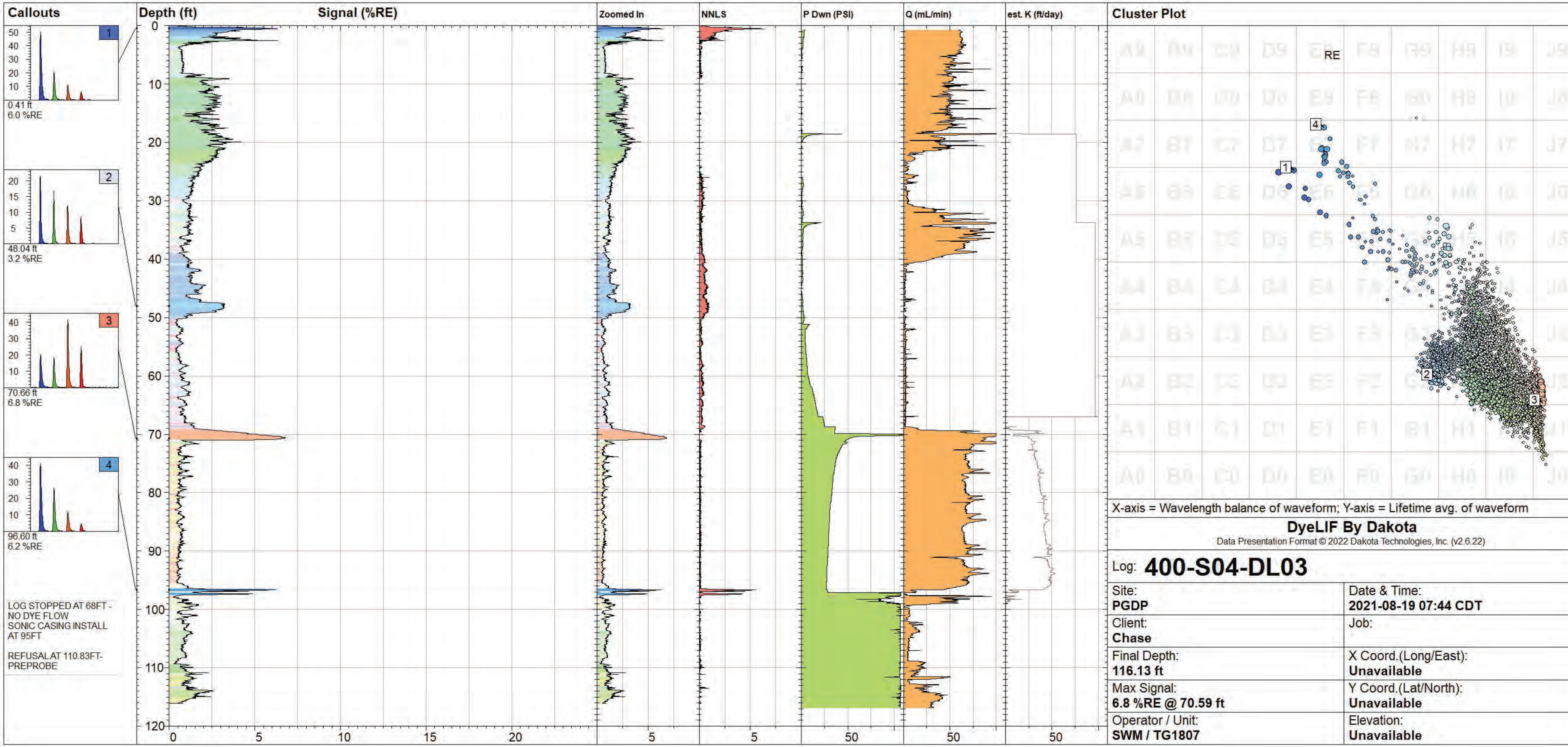
Site: **PGDP**	Date & Time: **2021-08-16 13:04 CDT**
Client: **Chase**	Job:
Final Depth: **115.02 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **7.1 %RE @ 94.21 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **SWM / TG1807**	Elevation: **Unavailable**

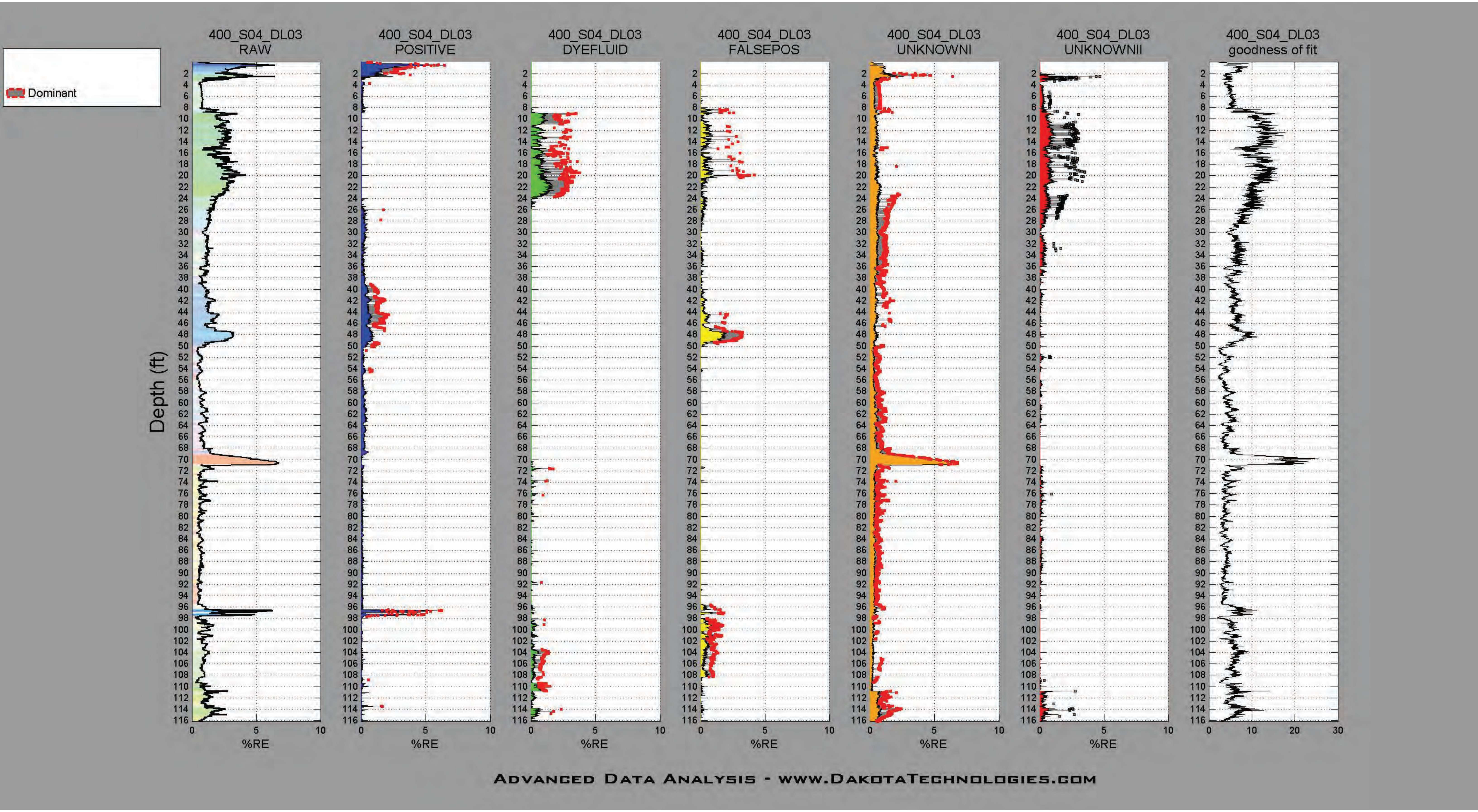

Dominant
400_S04_DL01
RAW
400_S04_DL01
POSITIVE
400_S04_DL01
DYEFLUID
400_S04_DL01
FALSEPOS
400_S04_DL01
UNKNOWNI
400_S04_DL01
UNKNOWNII
400_S04_DL01
goodness of fit
Depth (ft)
%RE
ADVANCED DATA ANALYSIS - WWW.DAKOTATECHNOLOGIES.COM


Callouts
1.36 ft
4.4 %RE
44.17 - 47.24 ft
2.2 %RE (s 0.5)
108.51 ft
5.1 %RE
97.52 ft
5.1 %RE
108.51 ft
5.1 %RE
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL02
Site:
PGDP
Date & Time:
2021-08-18 08:40 CDT
Client:
Chase
Job:
Final Depth:
111.04 ft
X Coord.(Long/East):
Unavailable
Max Signal:
6.8 %RE @ 97.39 ft
Y Coord.(Lat/North):
Unavailable
Operator / Unit:
SWM / TG1807
Elevation:
Unavailable

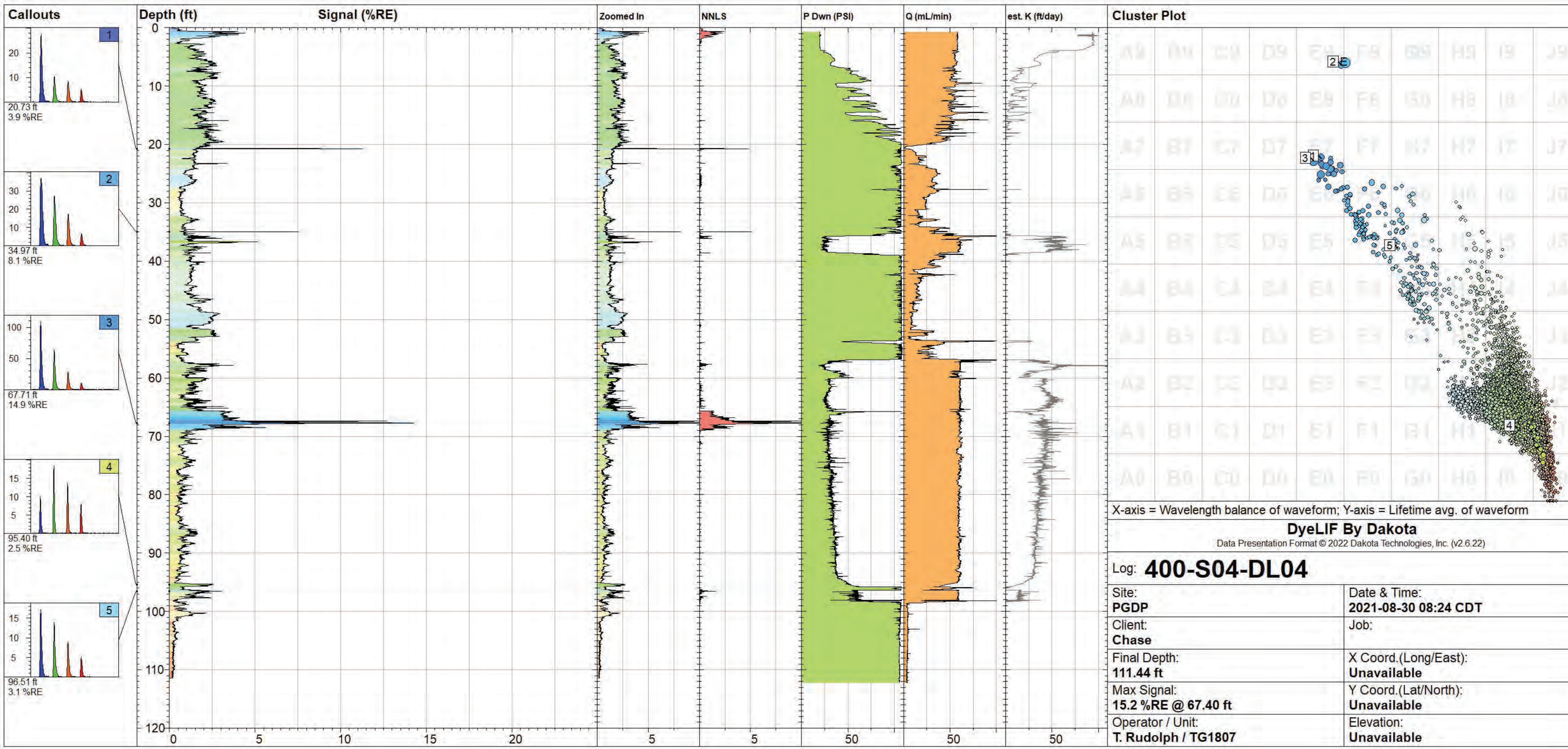


Dominant
400_S04_DL02
RAW
400_S04_DL02
POSITIVE
400_S04_DL02
DYEFLUID
400_S04_DL02
FALSEPOS
400_S04_DL02
UNKNOWNI
400_S04_DL02
UNKNOWNII
400_S04_DL02
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

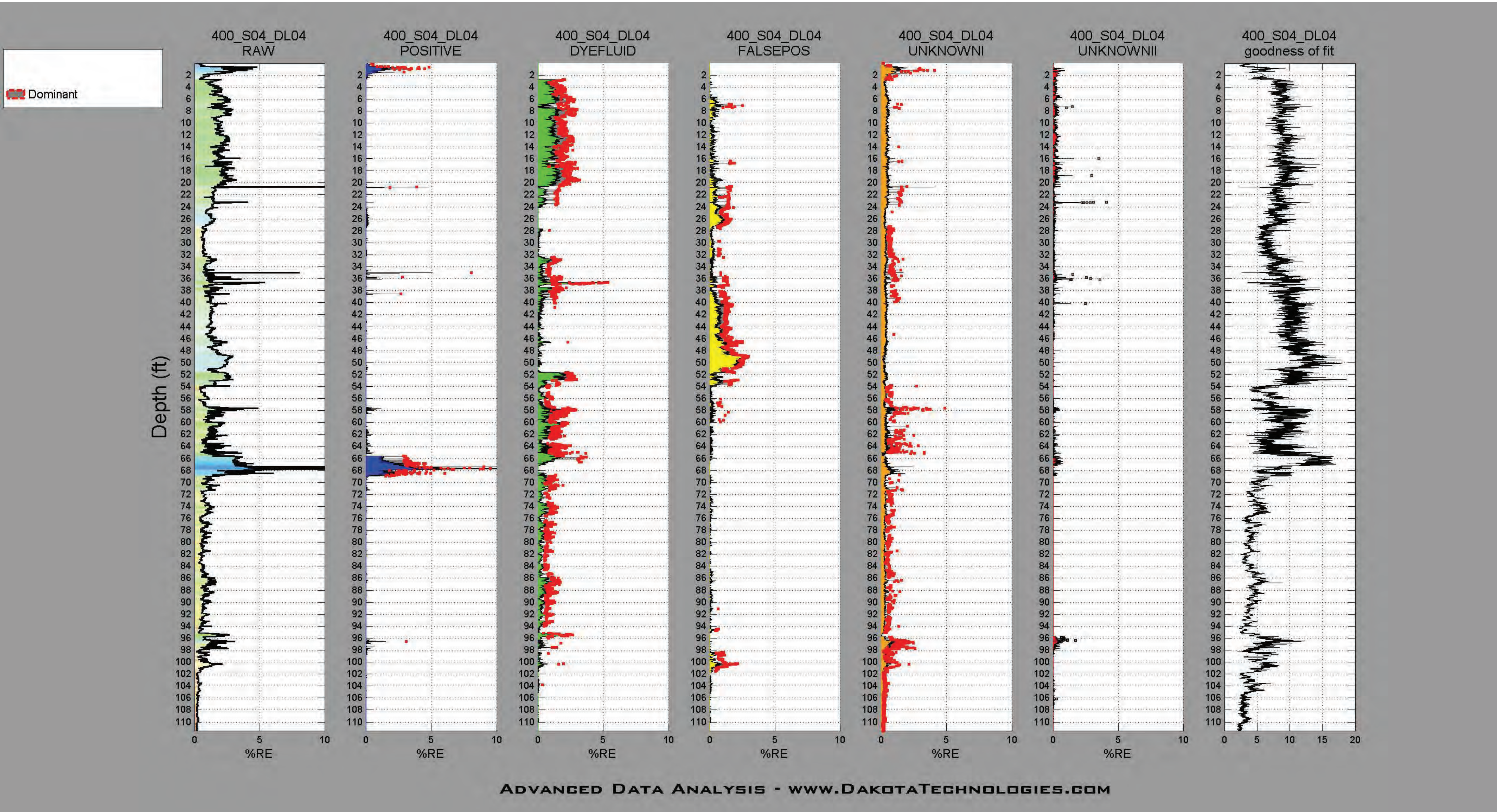

Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
0.41 ft
6.0 %RE
48.04 ft
3.2 %RE
70.66 ft
6.8 %RE
96.60 ft
6.2 %RE
LOG STOPPED AT 68FT - NO DYE FLOW
SONIC CASING INSTALL AT 95FT
REFUSAL AT 110.83FT- PREPROBE
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL03
Site: PGDP
Date & Time: 2021-08-19 07:44 CDT
Client: Chase
Job:
Final Depth: 116.13 ft
X Coord.(Long/East): Unavailable
Max Signal: 6.8 %RE @ 70.59 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: SWM / TG1807
Elevation: Unavailable



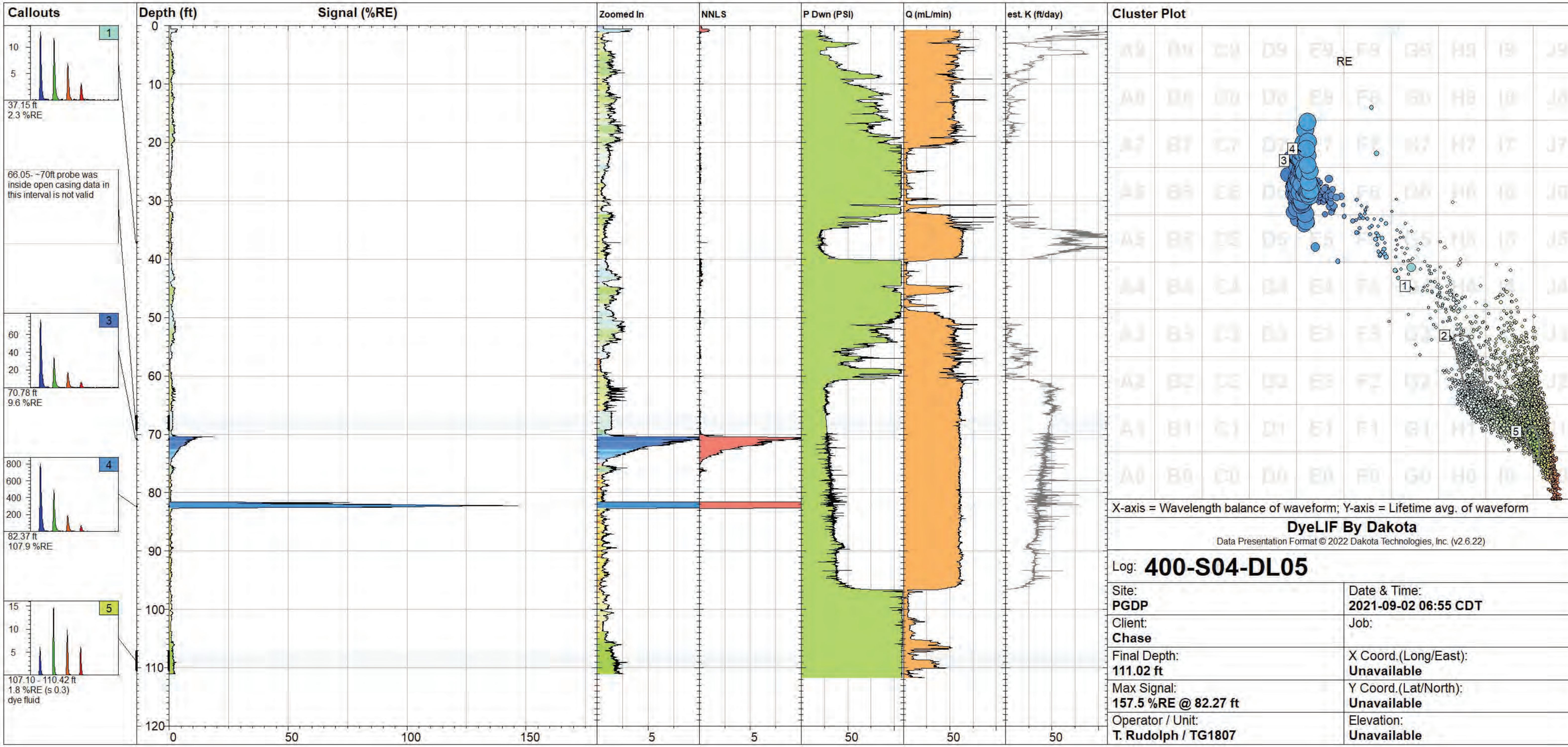
Dominant
400_S04_DL03
RAW
400_S04_DL03
POSITIVE
400_S04_DL03
DYEFLUID
400_S04_DL03
FALSEPOS
400_S04_DL03
UNKNOWNI
400_S04_DL03
UNKNOWNII
400_S04_DL03
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



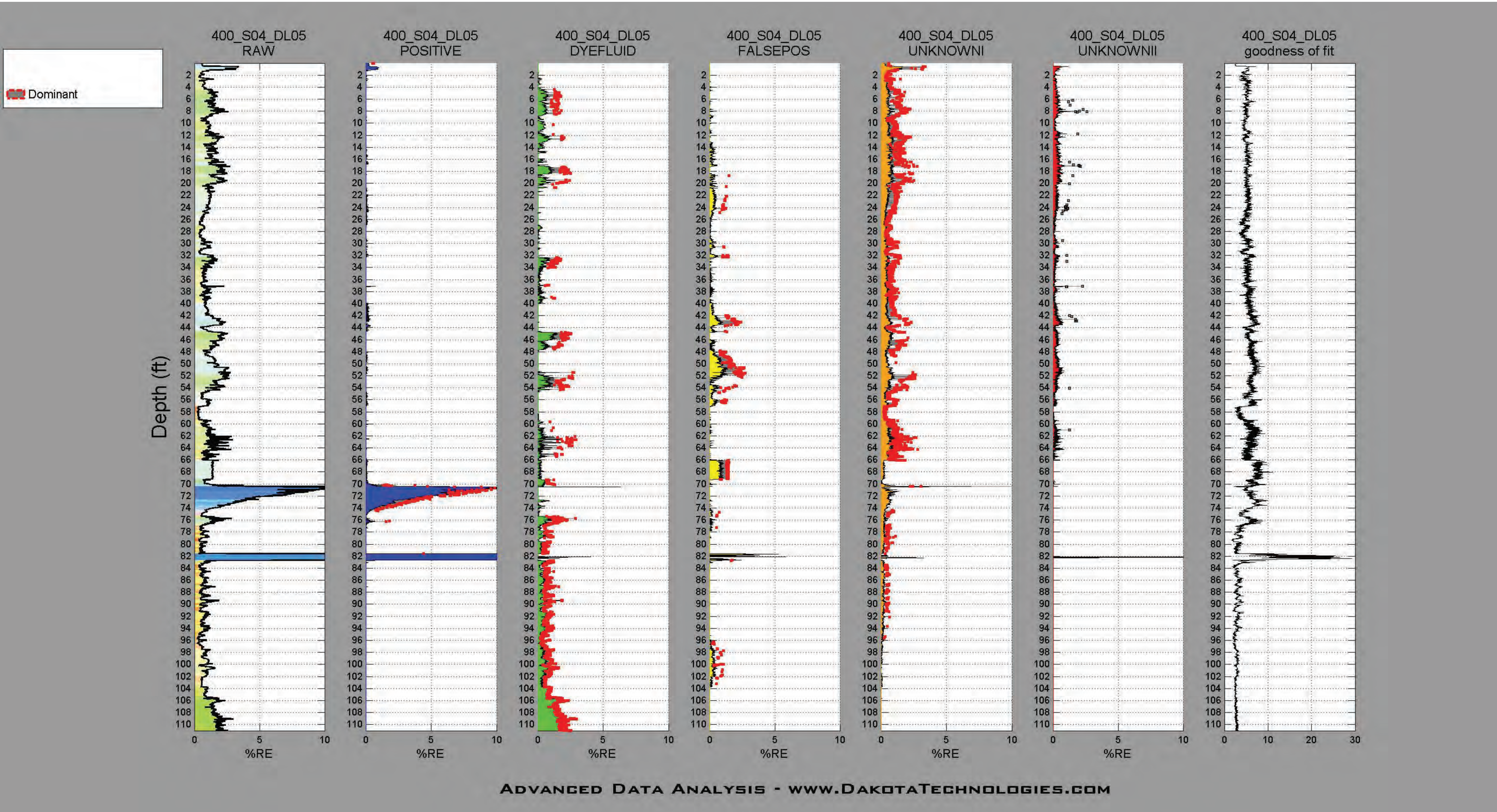
Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
20.73 ft
3.9 %RE
34.97 ft
8.1 %RE
67.71 ft
14.9 %RE
95.40 ft
2.5 %RE
96.51 ft
3.1 %RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL04
Site: PGDP
Date & Time: 2021-08-30 08:24 CDT
Client: Chase
Job:
Final Depth: 111.44 ft
X Coord.(Long/East): Unavailable
Max Signal: 15.2 %RE @ 67.40 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: T. Rudolph / TG1807
Elevation: Unavailable



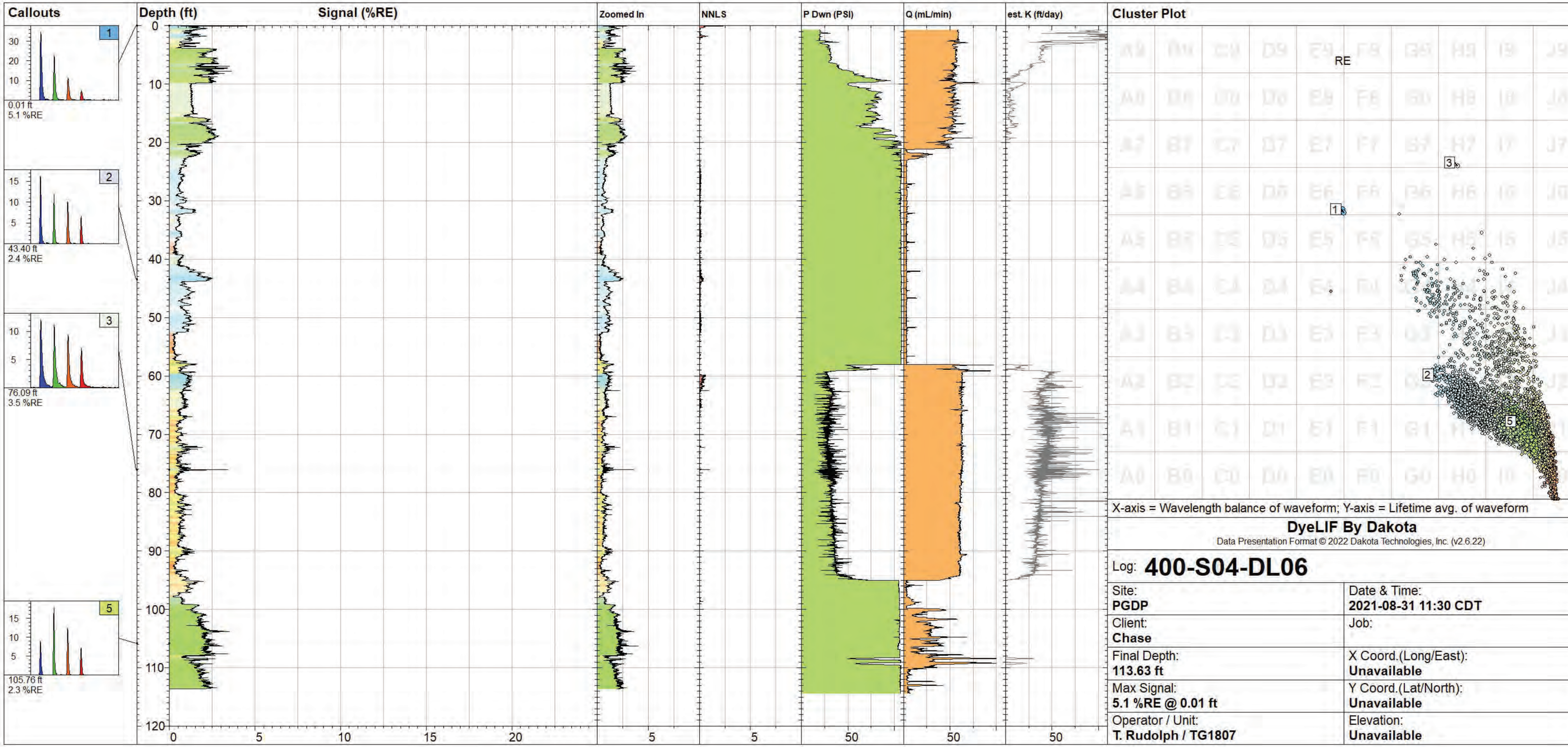
Dominant
Depth (ft)
400_S04_DL04
RAW
400_S04_DL04
POSITIVE
400_S04_DL04
DYEFLUID
400_S04_DL04
FALSEPOS
400_S04_DL04
UNKNOWNI
400_S04_DL04
UNKNOWNII
400_S04_DL04
goodness of fit
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

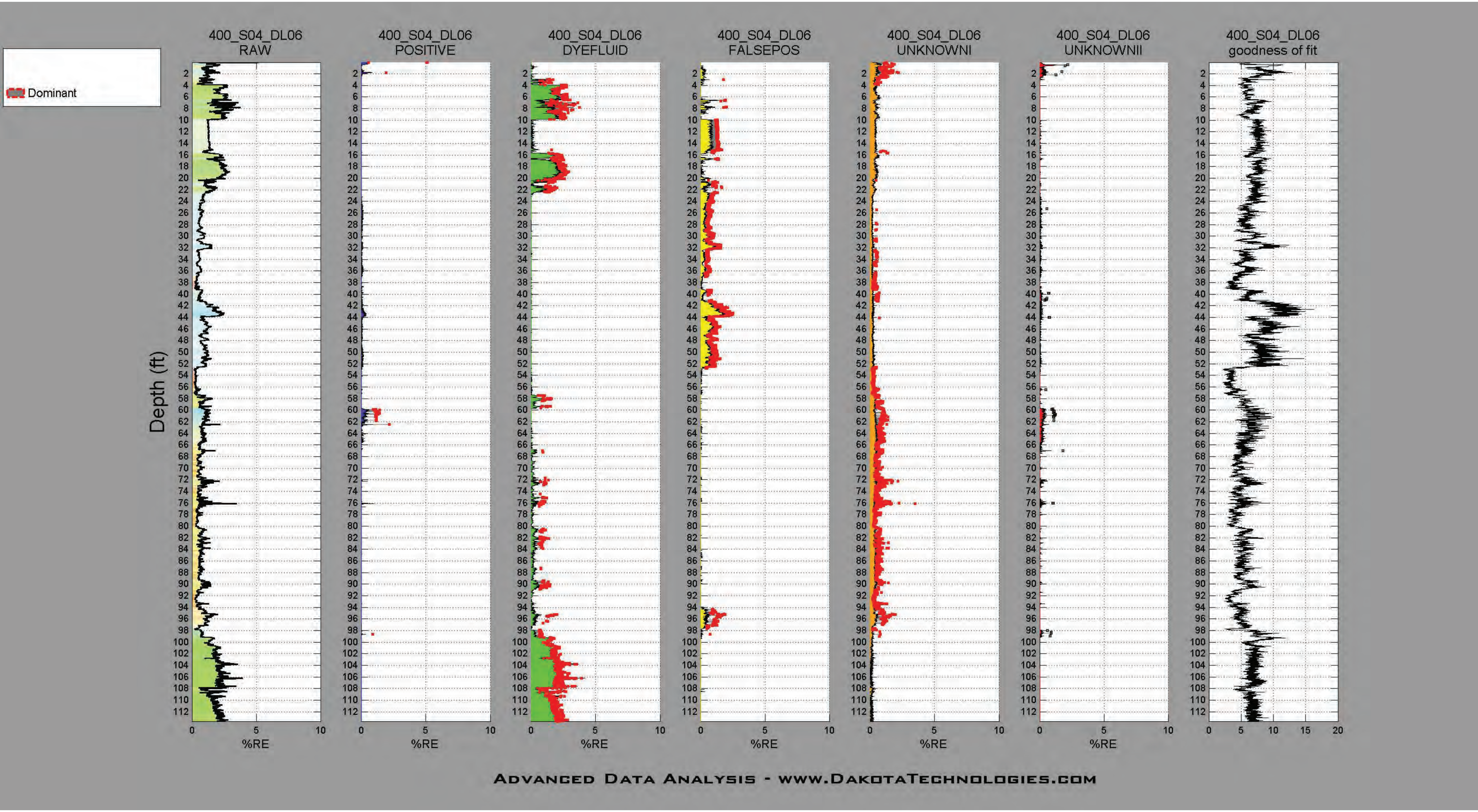


Callouts
37.15 ft
2.3 %RE
66.05- ~70ft probe was inside open casing data in this interval is not valid
70.78 ft
9.6 %RE
82.37 ft
107.9 %RE
107.10 - 110.42 ft
1.8 %RE (s 0.3)
dye fluid
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL05
Site:
PGDP
Date & Time:
2021-09-02 06:55 CDT
Client:
Chase
Job:
Final Depth:
111.02 ft
X Coord.(Long/East):
Unavailable
Max Signal:
157.5 %RE @ 82.27 ft
Y Coord.(Lat/North):
Unavailable
Operator / Unit:
T. Rudolph / TG1807
Elevation:
Unavailable

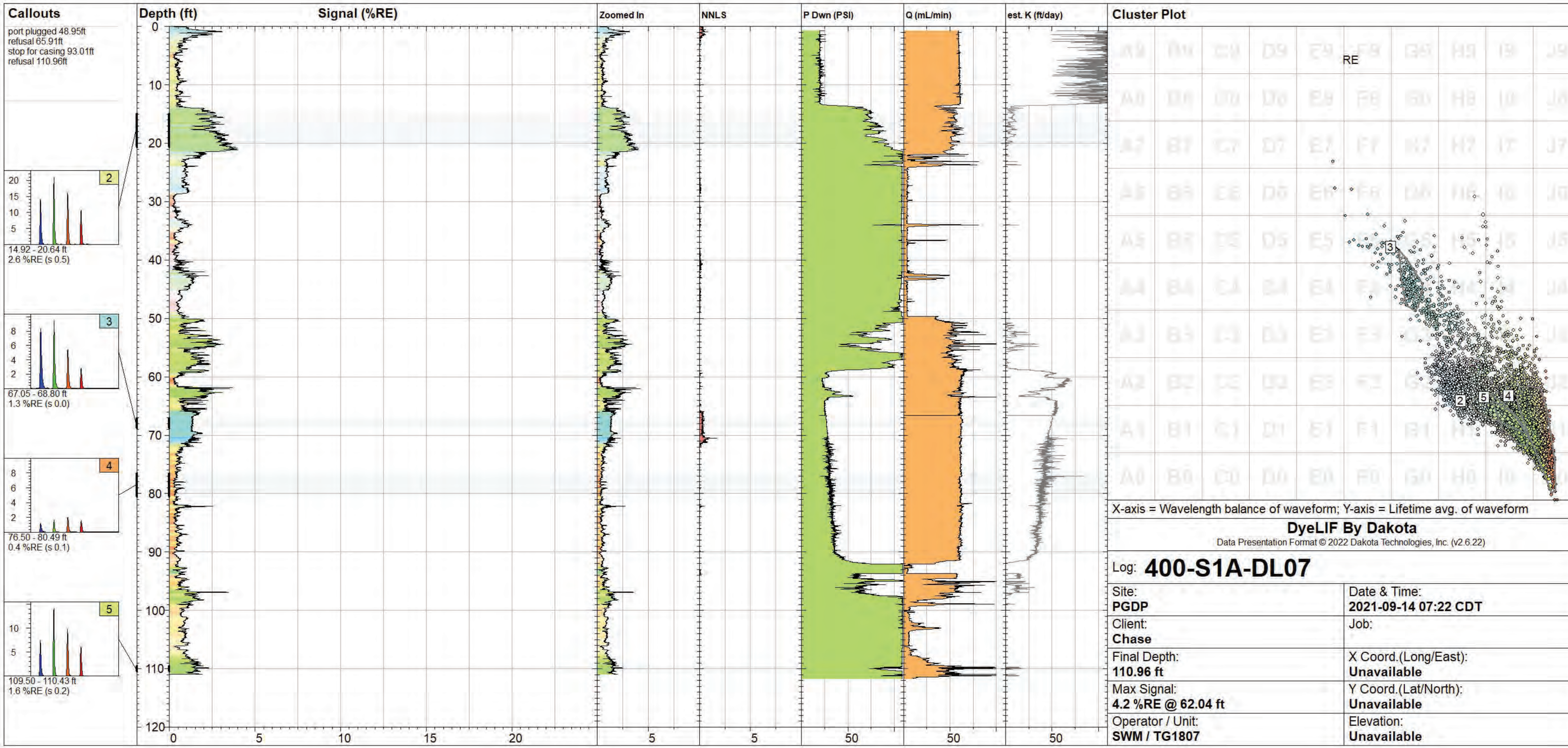


Dominant
400_S04_DL05 RAW
400_S04_DL05 POSITIVE
400_S04_DL05 DYEFLUID
400_S04_DL05 FALSEPOS
400_S04_DL05 UNKNOWNI
400_S04_DL05 UNKNOWNII
400_S04_DL05 goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

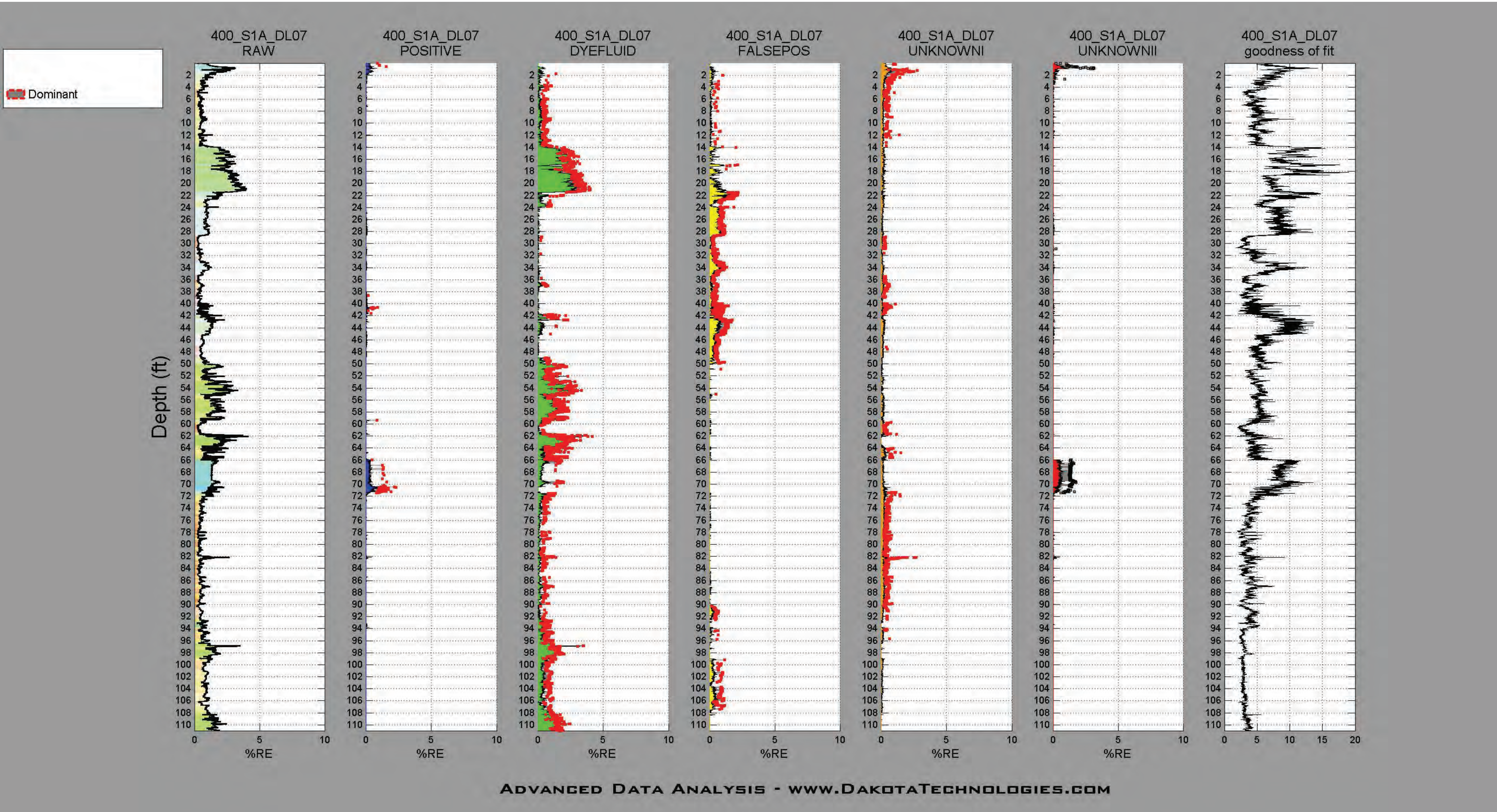

Callouts
1
0.01 ft
5.1 %RE
2
43.40 ft
2.4 %RE
3
76.09 ft
3.5 %RE
5
105.76 ft
2.3 %RE
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL06
Site: PGDP
Date & Time: 2021-08-31 11:30 CDT
Client: Chase
Job:
Final Depth: 113.63 ft
X Coord.(Long/East): Unavailable
Max Signal: 5.1 %RE @ 0.01 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: T. Rudolph / TG1807
Elevation: Unavailable

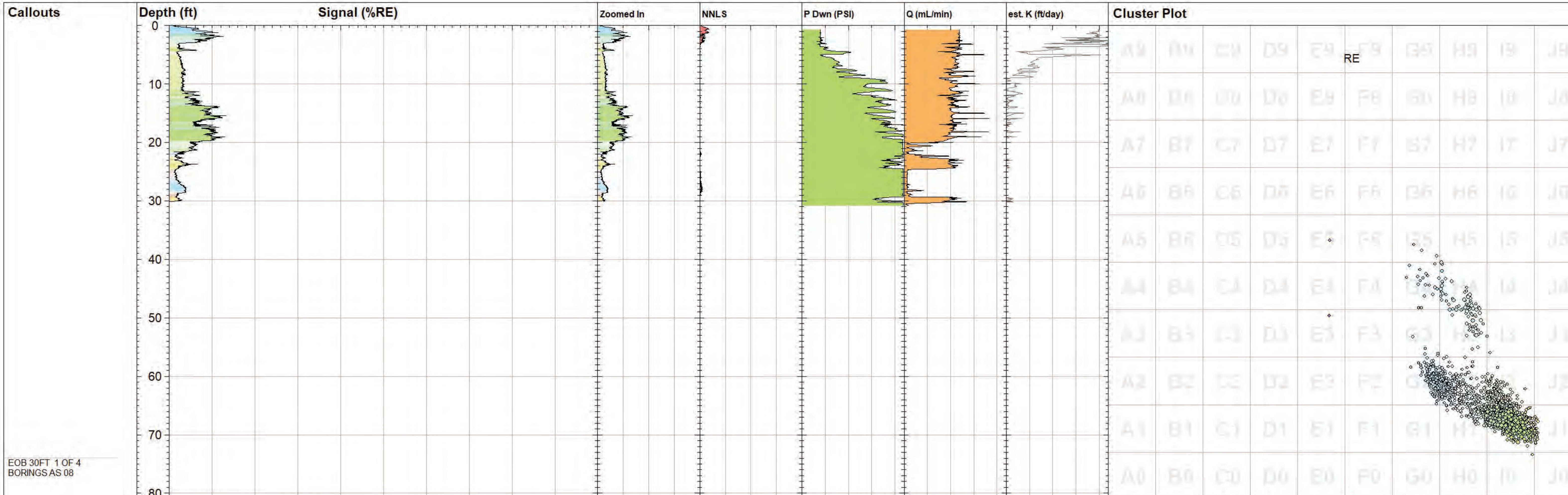


400_S04_DL06
RAW
400_S04_DL06
POSITIVE
400_S04_DL06
DYEFLUID
400_S04_DL06
FALSEPOS
400_S04_DL06
UNKNOWNI
400_S04_DL06
UNKNOWNII
400_S04_DL06
goodness of fit
Dominant
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



Callouts
port plugged 48.95ft
refusal 65.91ft
stop for casing 93.01ft
refusal 110.96ft
14.92 - 20.64 ft
2.6 %RE (s 0.5)
67.05 - 68.80 ft
1.3 %RE (s 0.0)
76.50 - 80.49 ft
0.4 %RE (s 0.1)
109.50 - 110.43 ft
1.6 %RE (s 0.2)
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S1A-DL07
Site: PGDP
Date & Time: 2021-09-14 07:22 CDT
Client: Chase
Job:
Final Depth: 110.96 ft
X Coord.(Long/East): Unavailable
Max Signal: 4.2 %RE @ 62.04 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: SWM / TG1807
Elevation: Unavailable


Dominant
400_S1A_DL07
RAW
400_S1A_DL07
POSITIVE
400_S1A_DL07
DYEFLUID
400_S1A_DL07
FALSEPOS
400_S1A_DL07
UNKNOWNI
400_S1A_DL07
UNKNOWNII
400_S1A_DL07
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

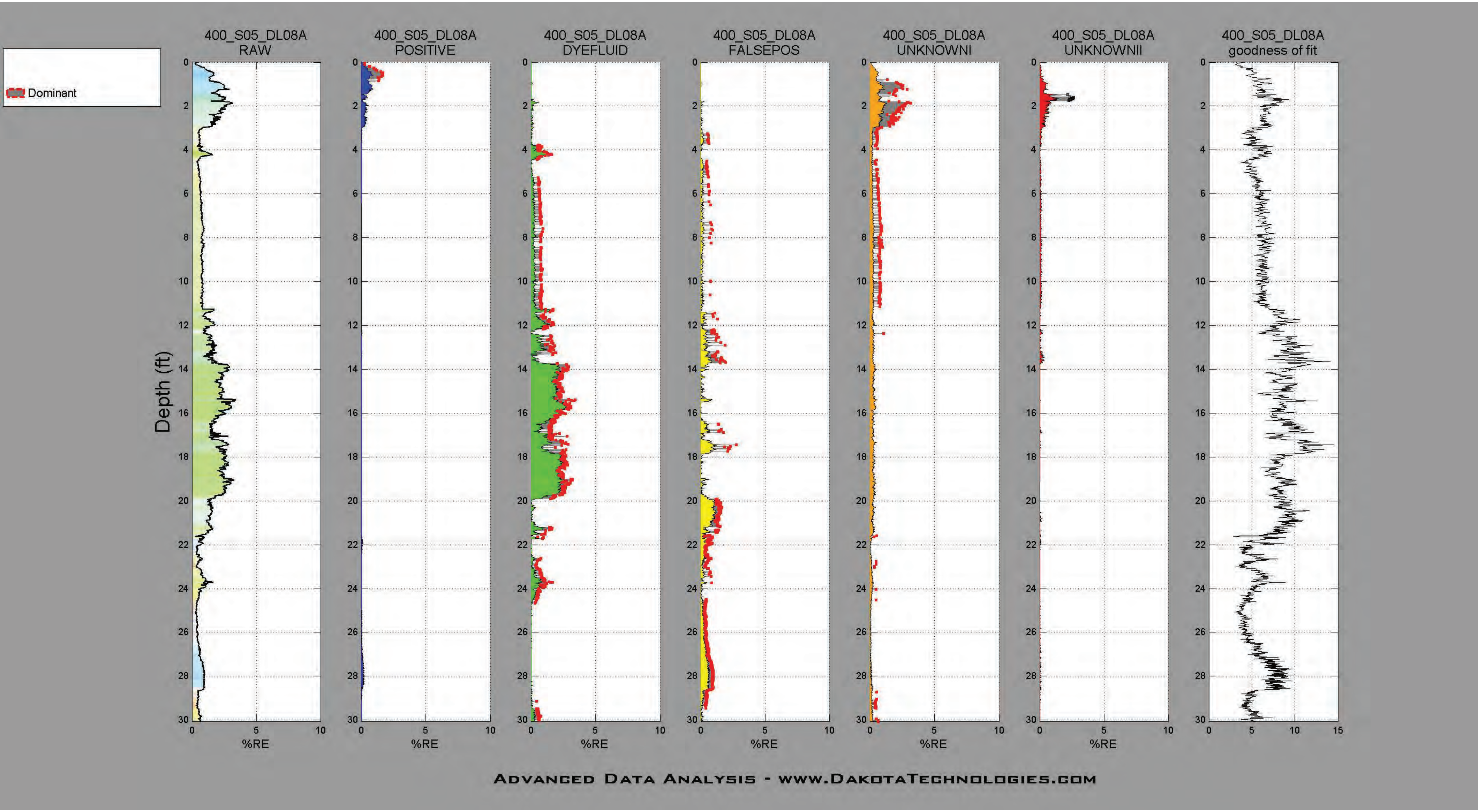


DyeLIF By Dakota

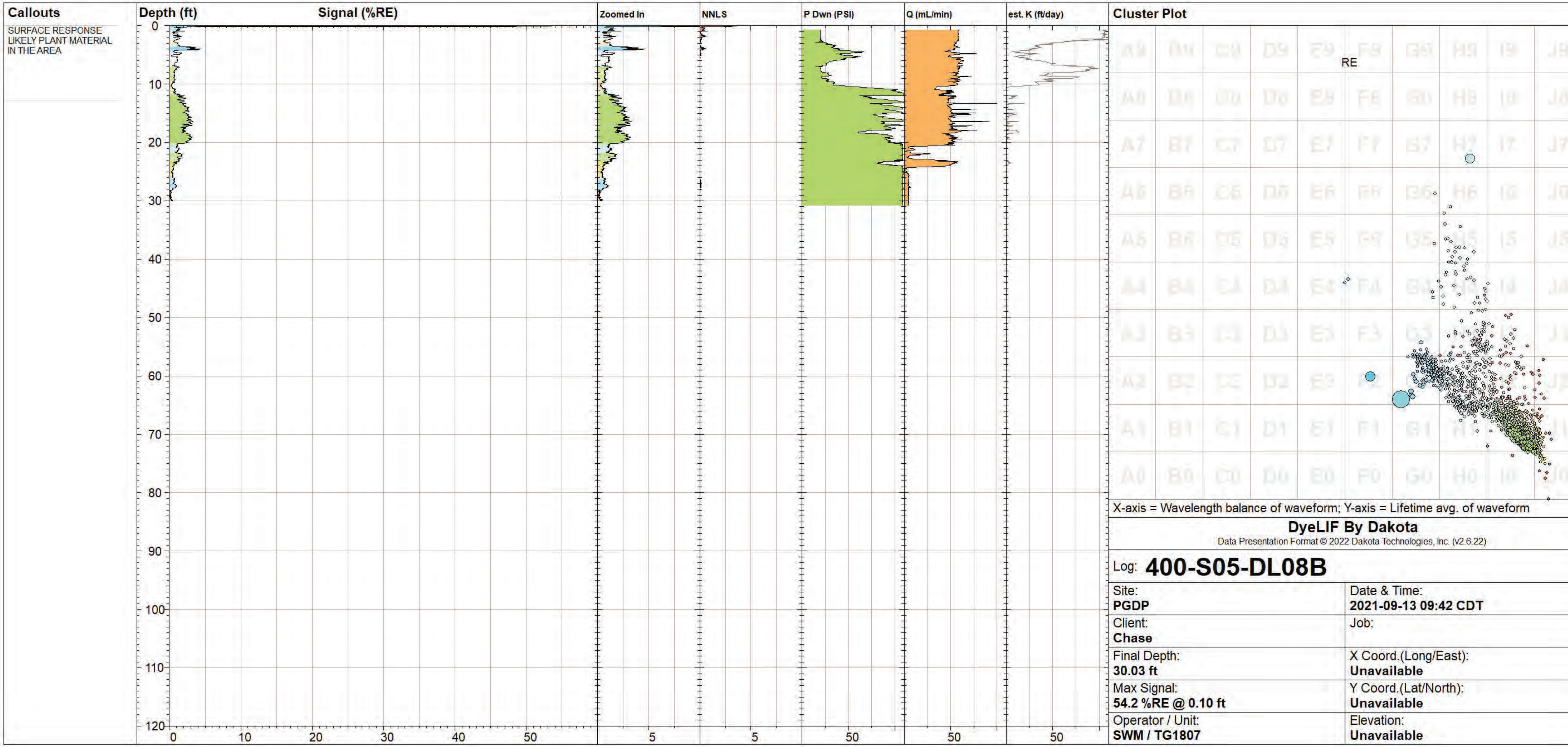
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

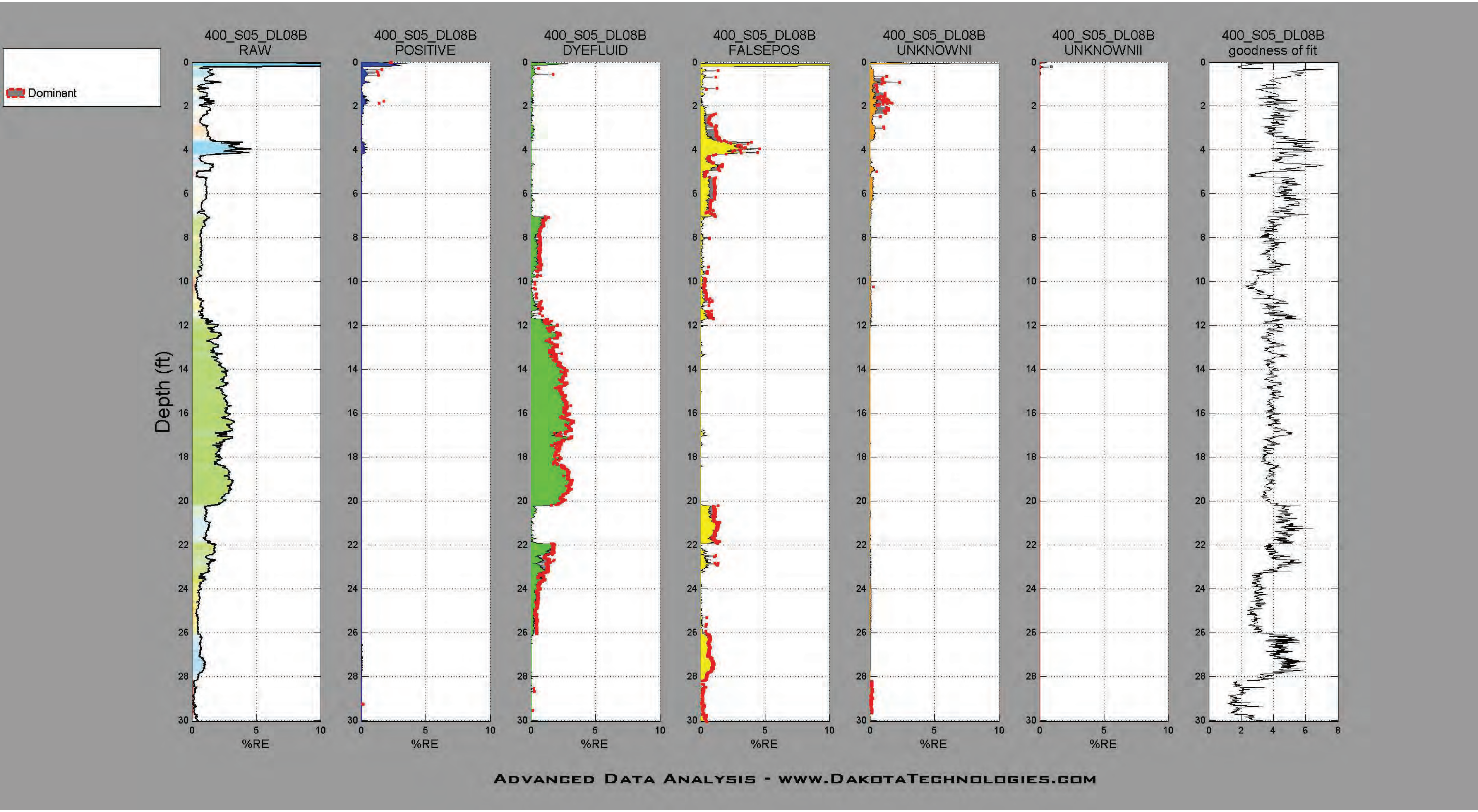
Log: **400-S05-DL08A**

Site: **PGDP**	Date & Time: **2021-09-13 07:52 CDT**
Client: **Chase**	Job:
Final Depth: **30.05 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **3.4 %RE @ 15.39 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **SWM / TG1807**	Elevation: **Unavailable**



Dominant
400_S05_DL08A RAW
400_S05_DL08A POSITIVE
400_S05_DL08A DYEFLUID
400_S05_DL08A FALSEPOS
400_S05_DL08A UNKNOWNI
400_S05_DL08A UNKNOWNII
400_S05_DL08A goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

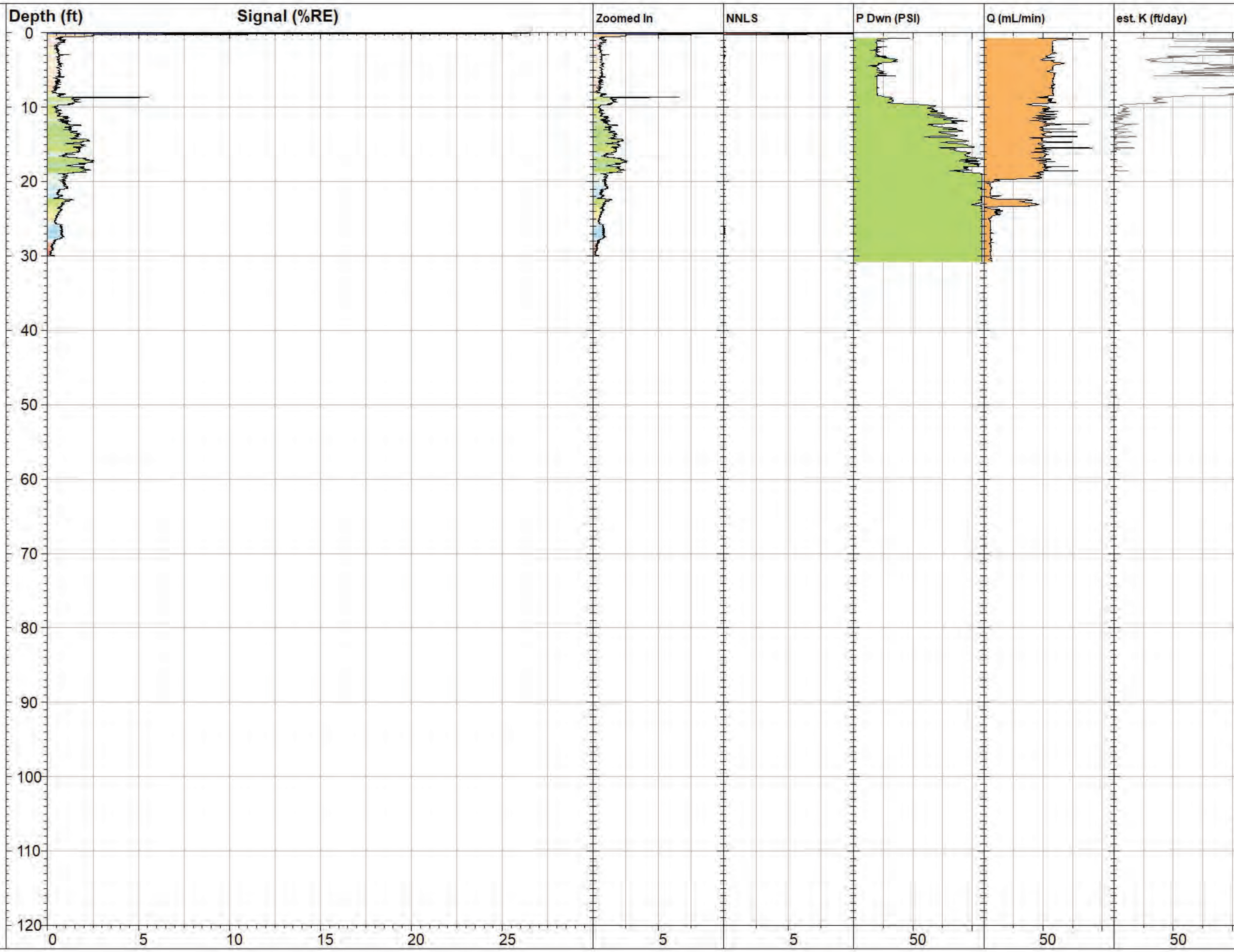

Callouts
SURFACE RESPONSE LIKELY PLANT MATERIAL IN THE AREA
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S05-DL08B
Site: PGDP
Date & Time: 2021-09-13 09:42 CDT
Client: Chase
Job:
Final Depth: 30.03 ft
X Coord.(Long/East): Unavailable
Max Signal: 54.2 %RE @ 0.10 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: SWM / TG1807
Elevation: Unavailable



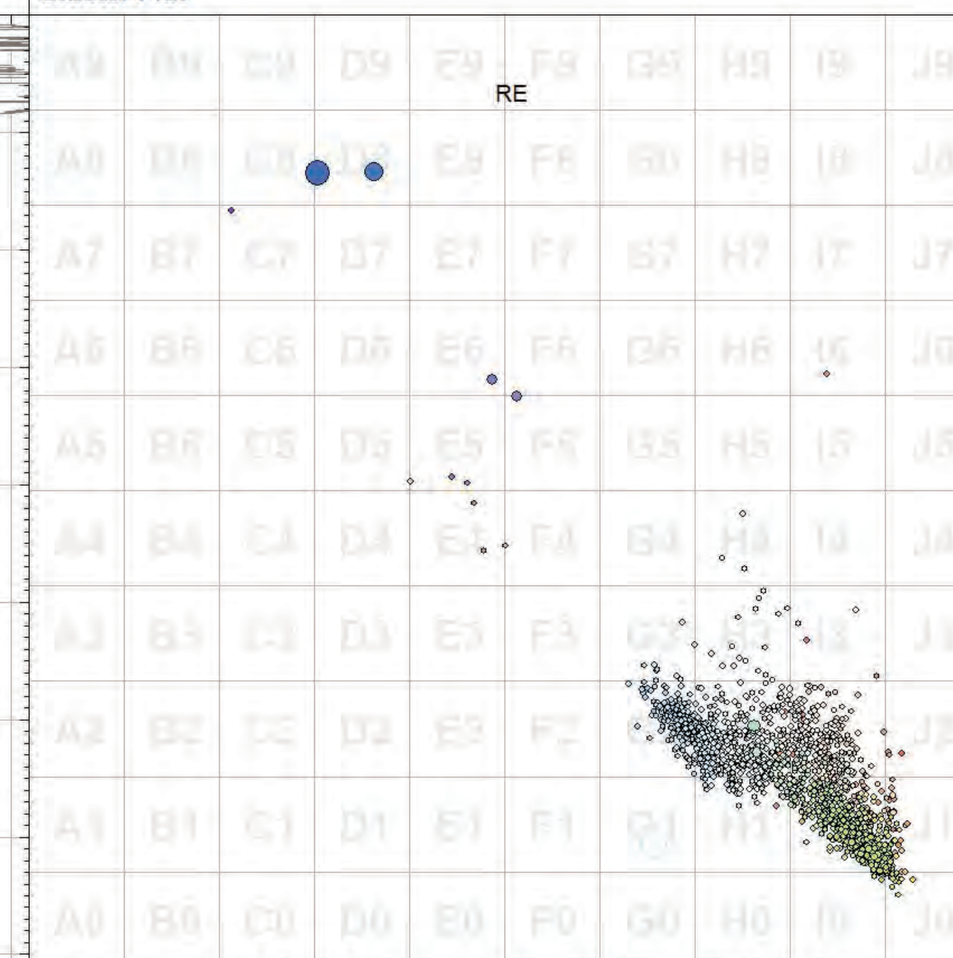
Dominant
400_S05_DL08B
RAW
400_S05_DL08B
POSITIVE
400_S05_DL08B
DYEFLUID
400_S05_DL08B
FALSEPOS
400_S05_DL08B
UNKNOWNI
400_S05_DL08B
UNKNOWNII
400_S05_DL08B
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

Callouts

PLANT MATERIAL AT SURFACE



Cluster Plot



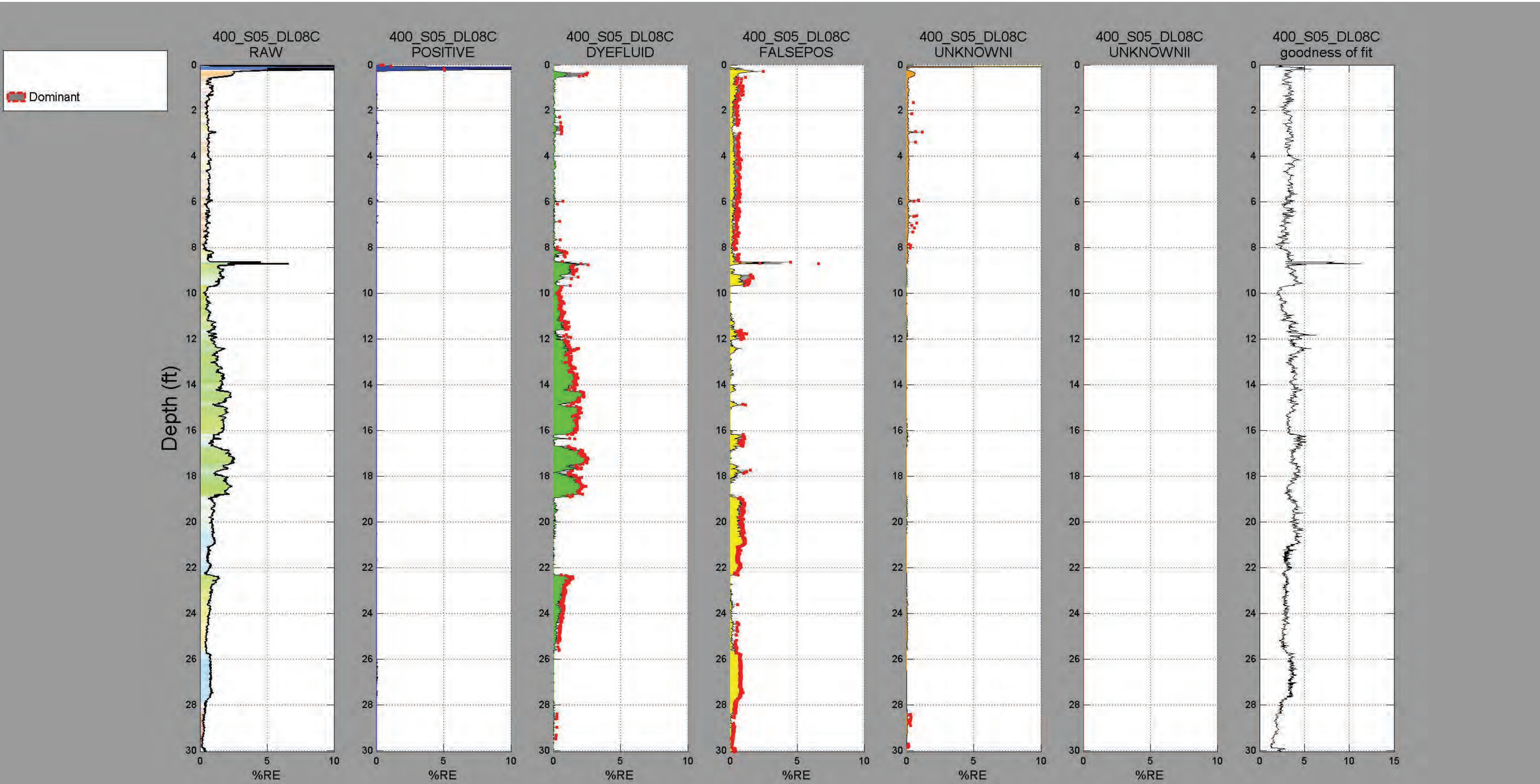
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

DyeLIF By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

Log: **400-S05-DL08C**

Site: **PGDP**	Date & Time: **2021-09-13 12:01 CDT**
Client: **Chase**	Job:
Final Depth: **30.03 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **27.8 %RE @ 0.08 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **SWM / TG1807**	Elevation: **Unavailable**



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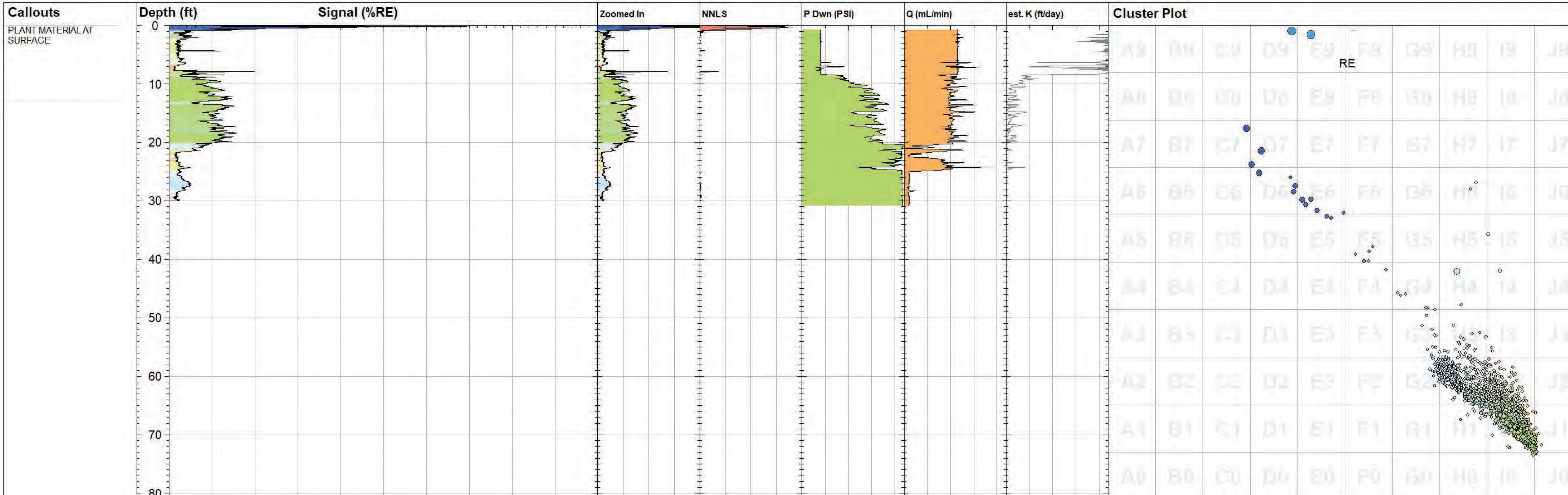
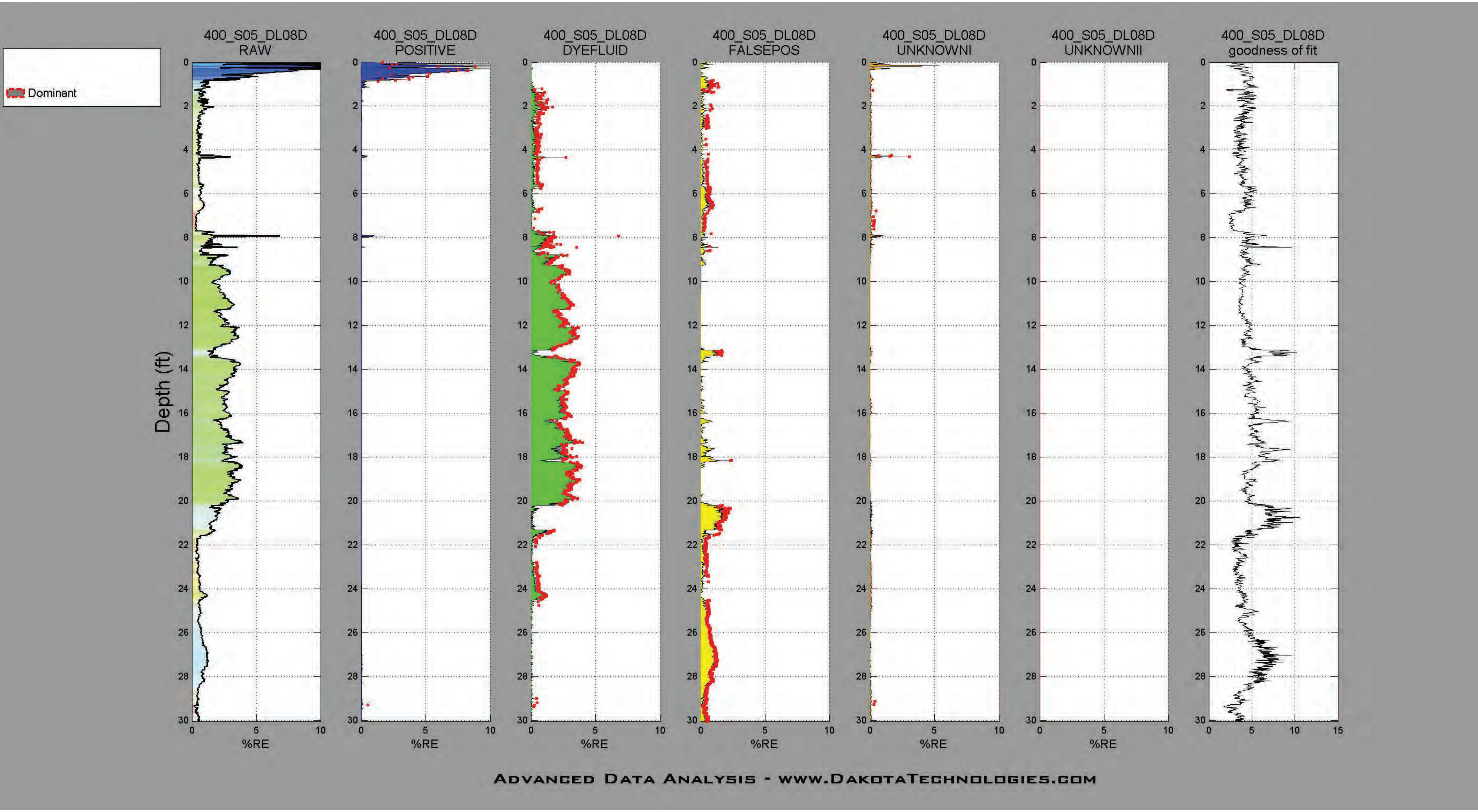


DyeLIF By Dakota

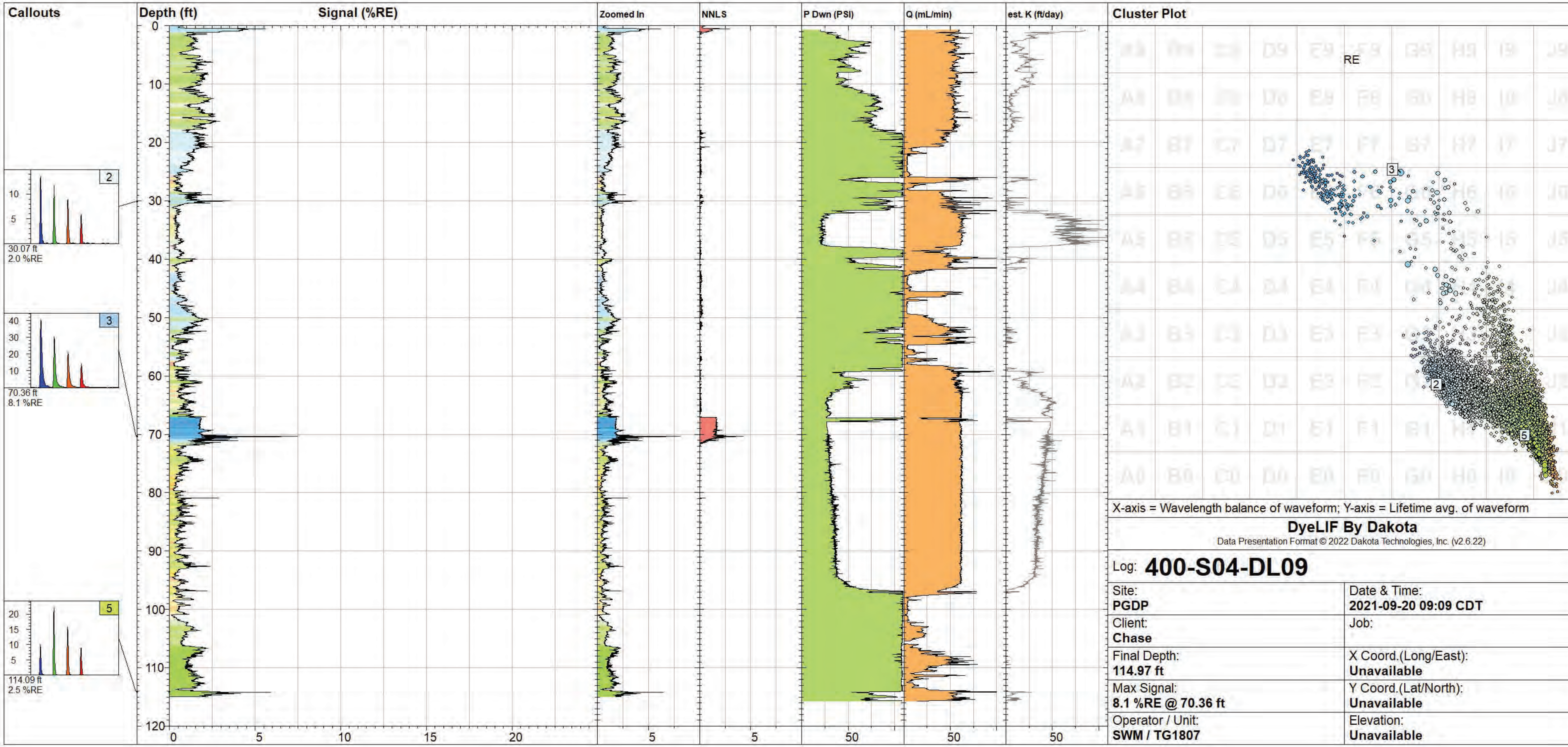
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

Log: **400-S05-DL08D**

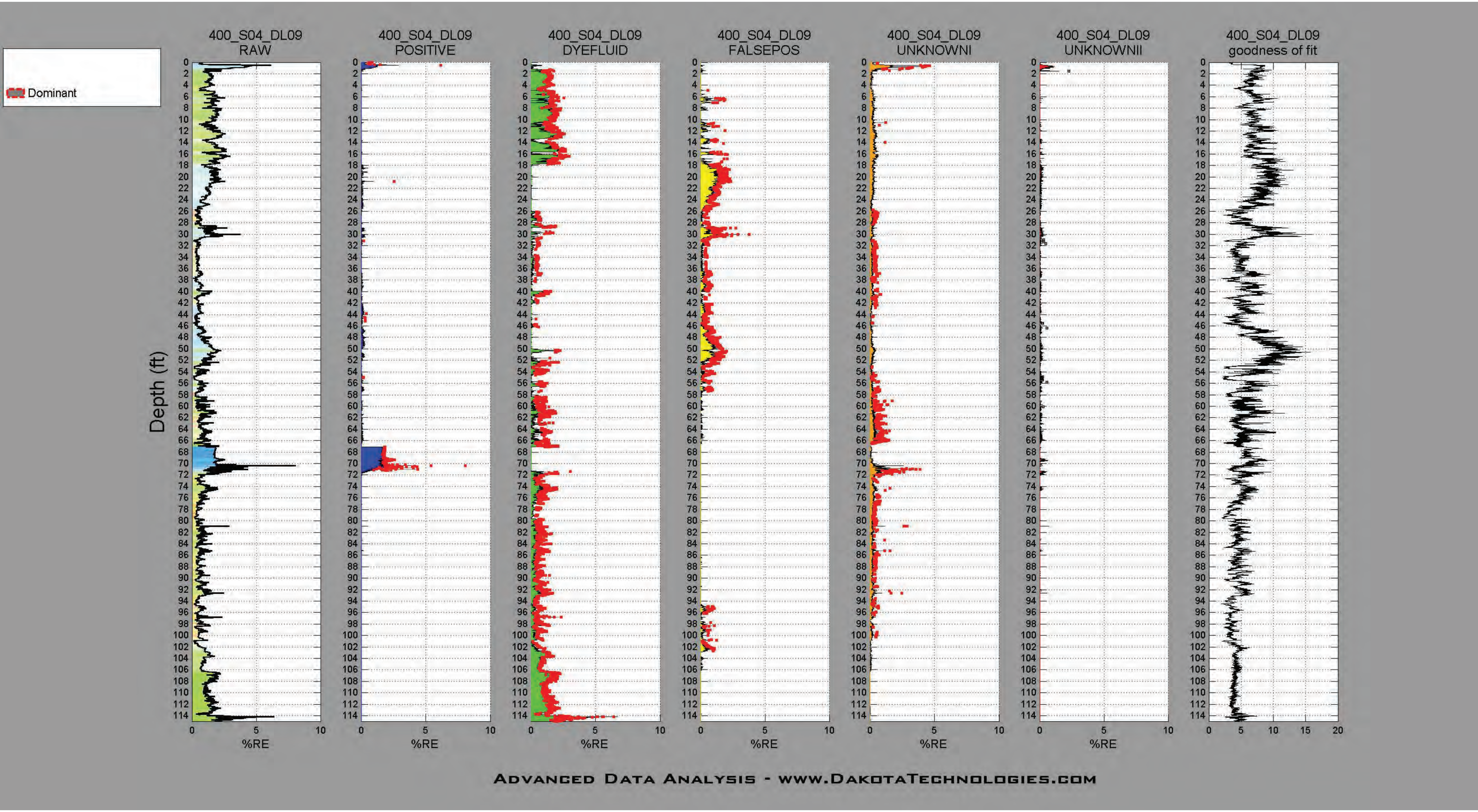
Site: **PGDP**	Date & Time: **2021-09-13 13:26 CDT**
Client: **Chase**	Job:
Final Depth: **30.03 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **18.5 %RE @ 0.17 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **SWM / TG1807**	Elevation: **Unavailable**

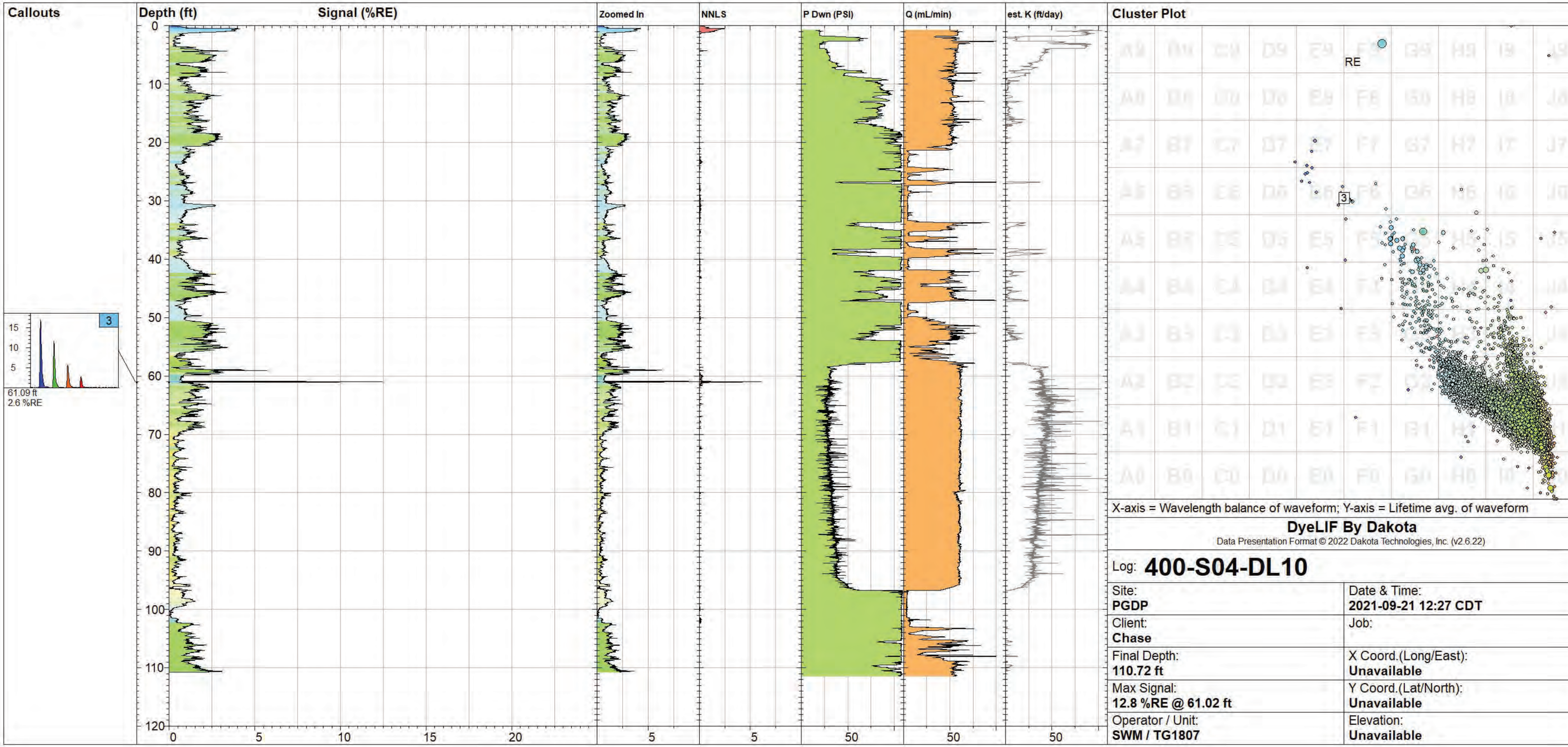


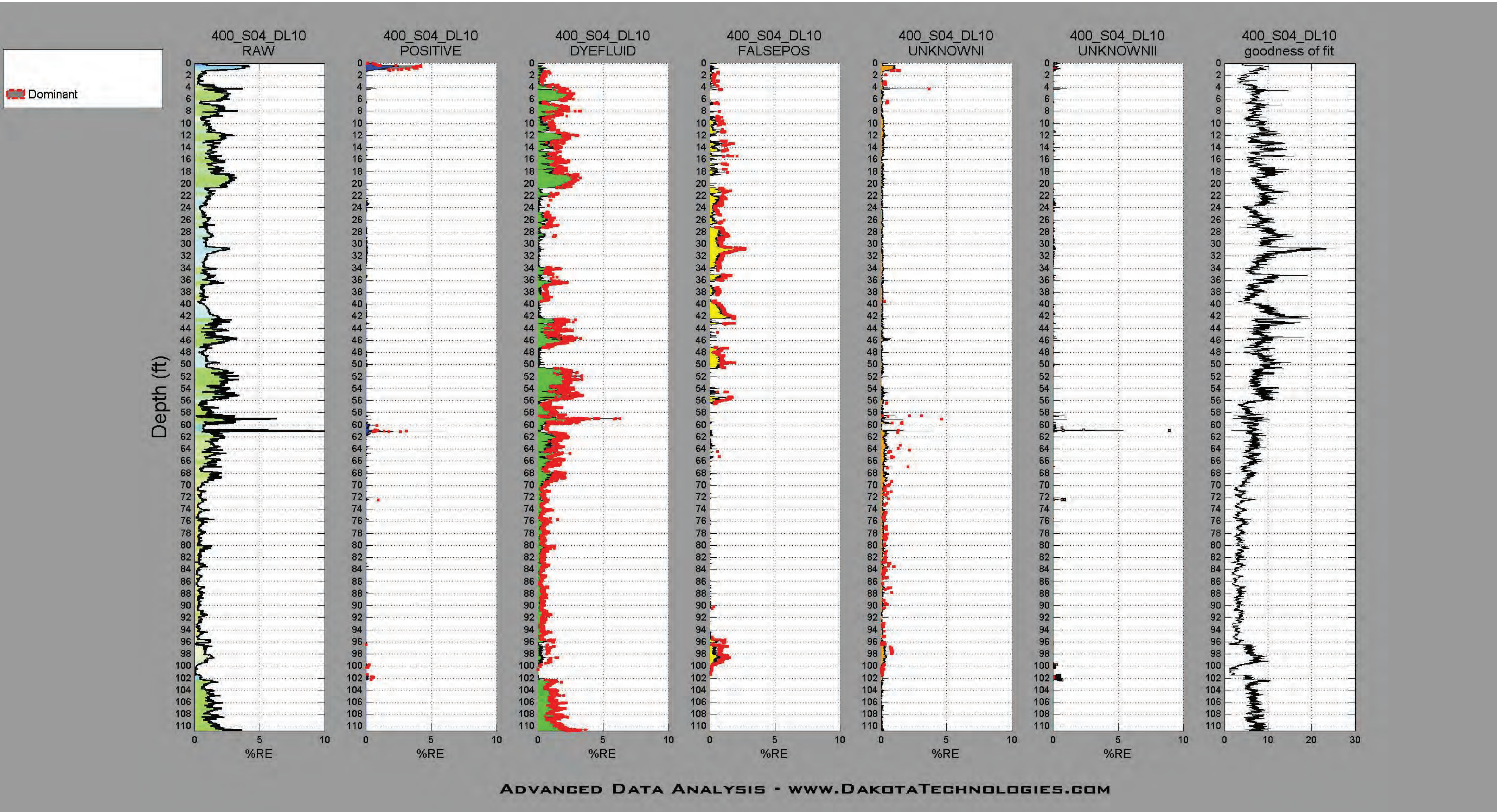
Dominant
400_S05_DL08D
RAW
400_S05_DL08D
POSITIVE
400_S05_DL08D
DYEFLUID
400_S05_DL08D
FALSEPOS
400_S05_DL08D
UNKNOWNI
400_S05_DL08D
UNKNOWNII
400_S05_DL08D
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

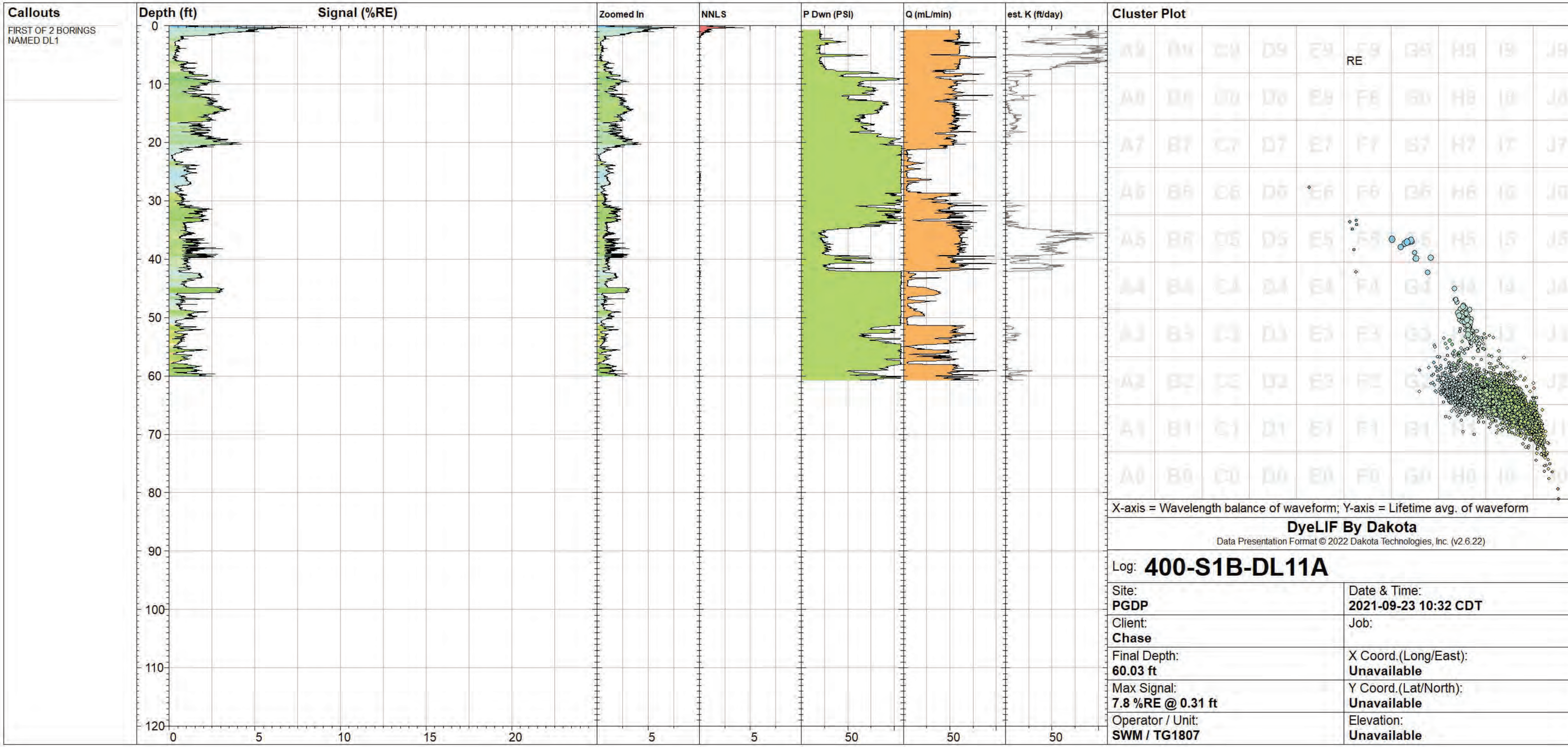


Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
30.07 ft
2.0 %RE
70.36 ft
8.1 %RE
114.09 ft
2.5 %RE
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL09
Site: PGDP
Date & Time: 2021-09-20 09:09 CDT
Client: Chase
Job:
Final Depth: 114.97 ft
X Coord.(Long/East): Unavailable
Max Signal: 8.1 %RE @ 70.36 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: SWM / TG1807
Elevation: Unavailable

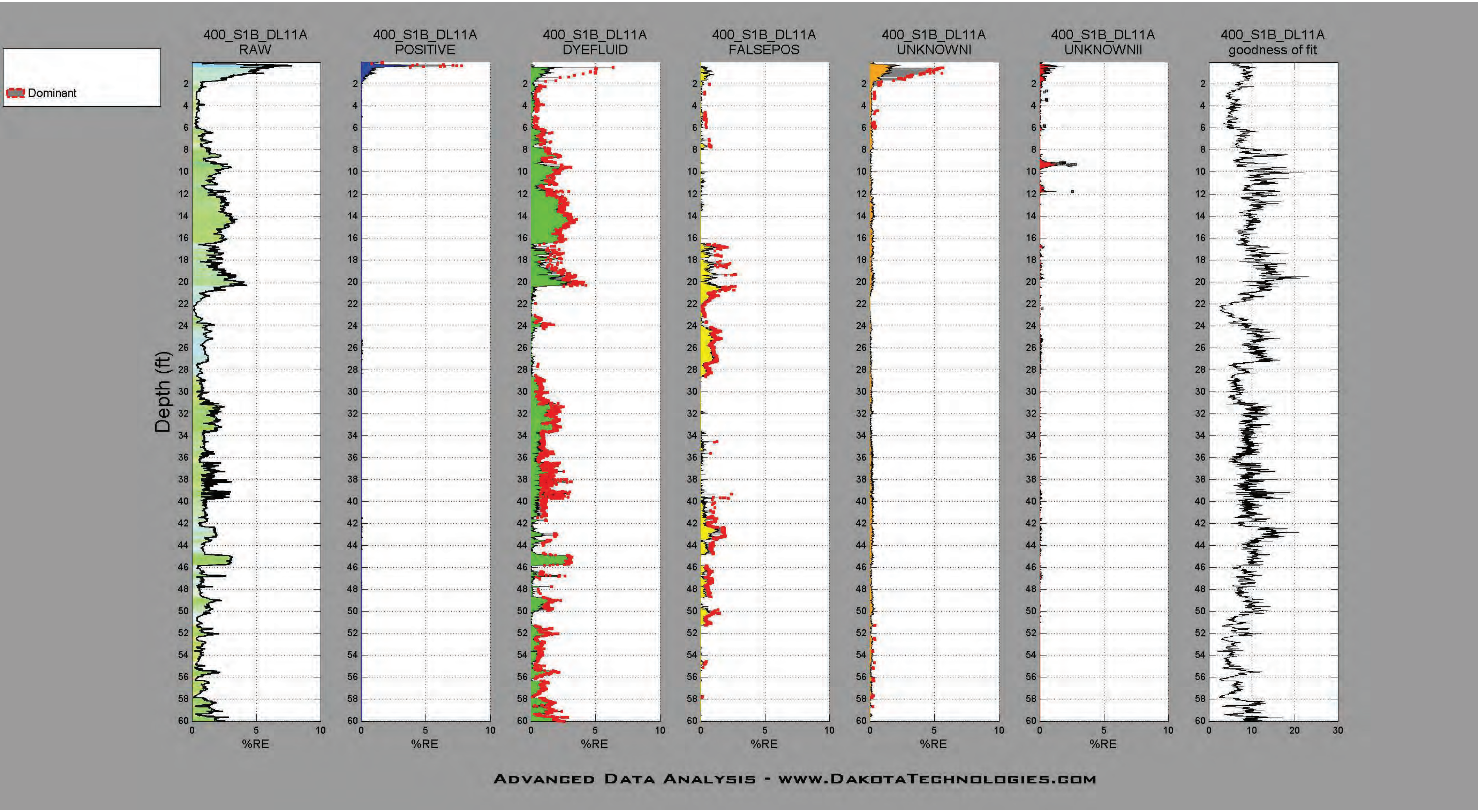

Dominant
400_S04_DL09
RAW
400_S04_DL09
POSITIVE
400_S04_DL09
DYEFLUID
400_S04_DL09
FALSEPOS
400_S04_DL09
UNKNOWNI
400_S04_DL09
UNKNOWNII
400_S04_DL09
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com


Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
61.09 ft
2.6 %RE
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL10
Site:
PGDP
Date & Time:
2021-09-21 12:27 CDT
Client:
Chase
Job:
Final Depth:
110.72 ft
X Coord.(Long/East):
Unavailable
Max Signal:
12.8 %RE @ 61.02 ft
Y Coord.(Lat/North):
Unavailable
Operator / Unit:
SWM / TG1807
Elevation:
Unavailable

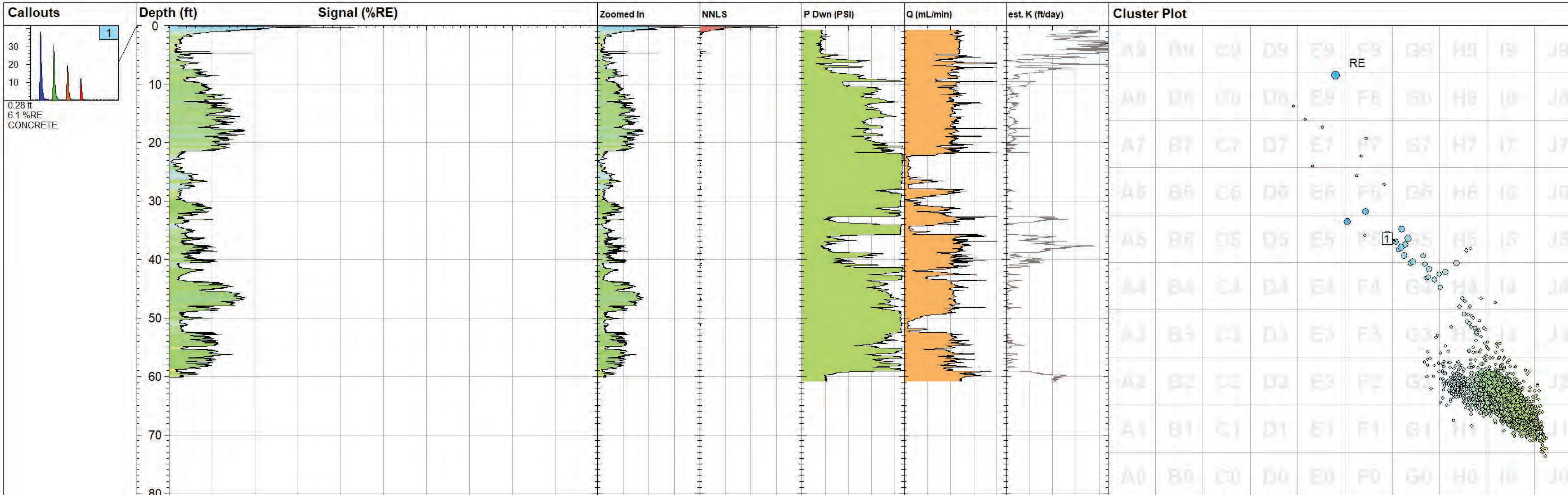

Dominant
400_S04_DL10
RAW
400_S04_DL10
POSITIVE
400_S04_DL10
DYEFLUID
400_S04_DL10
FALSEPOS
400_S04_DL10
UNKNOWNI
400_S04_DL10
UNKNOWNII
400_S04_DL10
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



Callouts
FIRST OF 2 BORINGS NAMED DL1
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S1B-DL11A
Site: PGDP
Date & Time: 2021-09-23 10:32 CDT
Client: Chase
Job:
Final Depth: 60.03 ft
X Coord.(Long/East): Unavailable
Max Signal: 7.8 %RE @ 0.31 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: SWM / TG1807
Elevation: Unavailable



Dominant
400_S1B_DL11A RAW
400_S1B_DL11A POSITIVE
400_S1B_DL11A DYEFLUID
400_S1B_DL11A FALSEPOS
400_S1B_DL11A UNKNOWNI
400_S1B_DL11A UNKNOWNII
400_S1B_DL11A goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

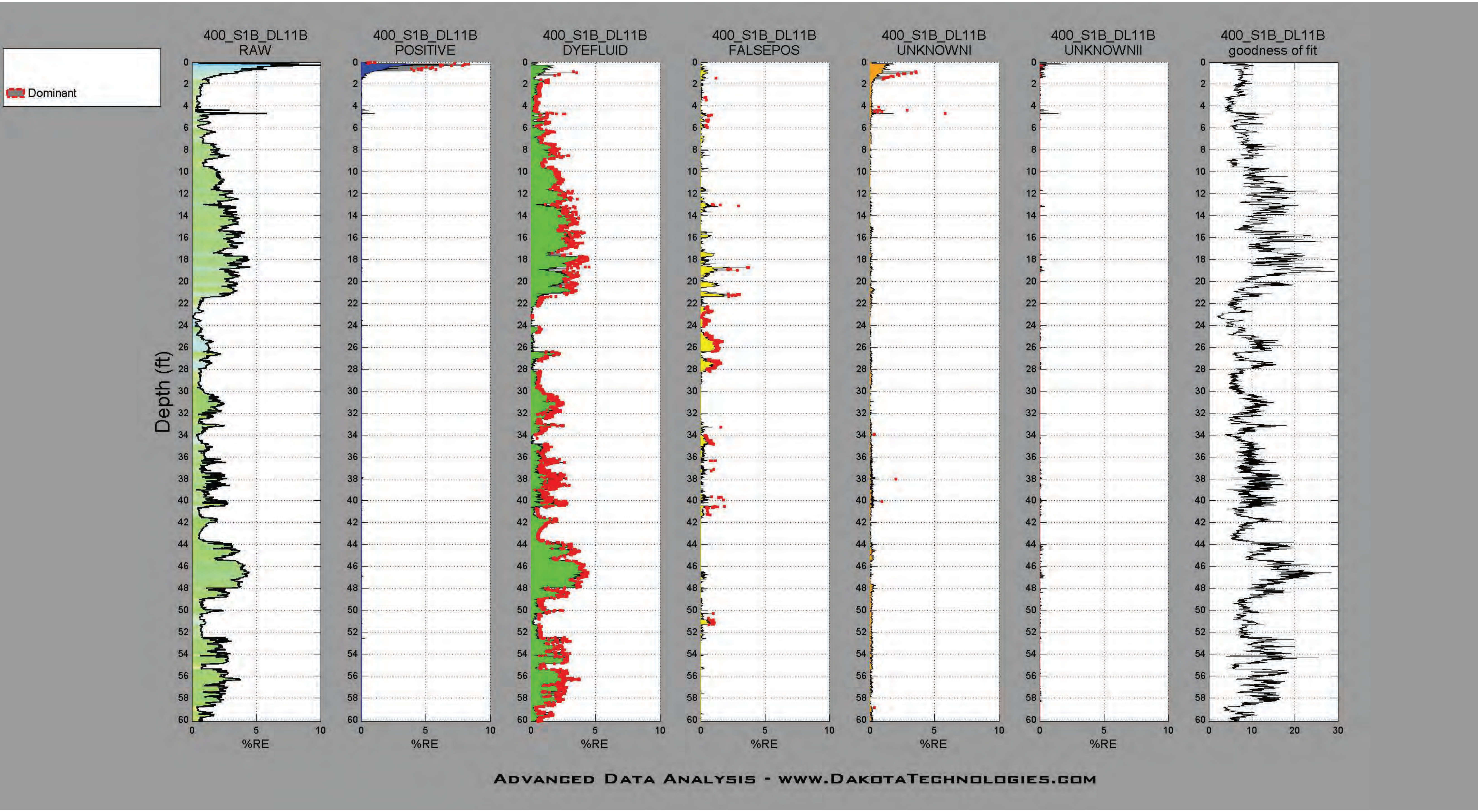


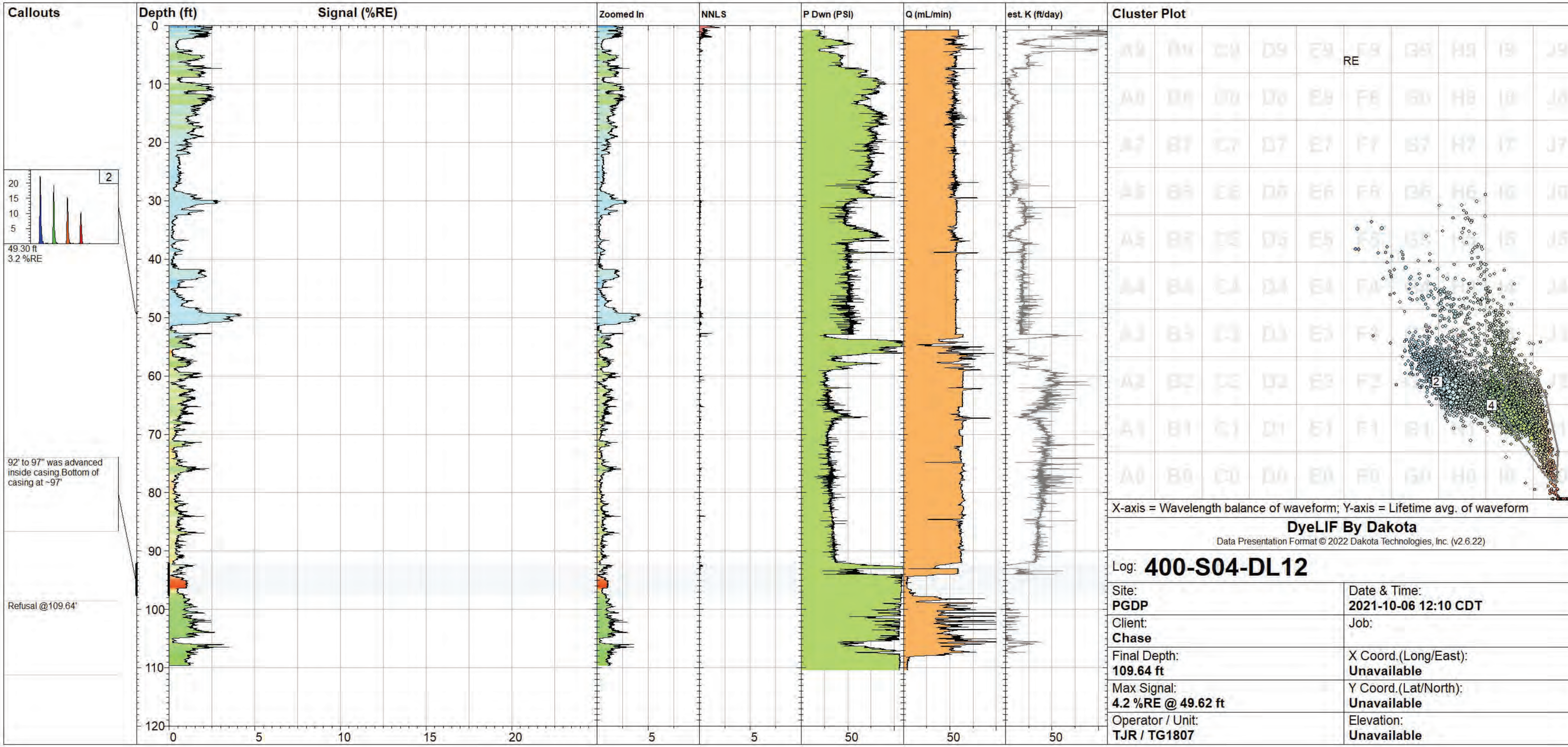
DyeLIF By Dakota

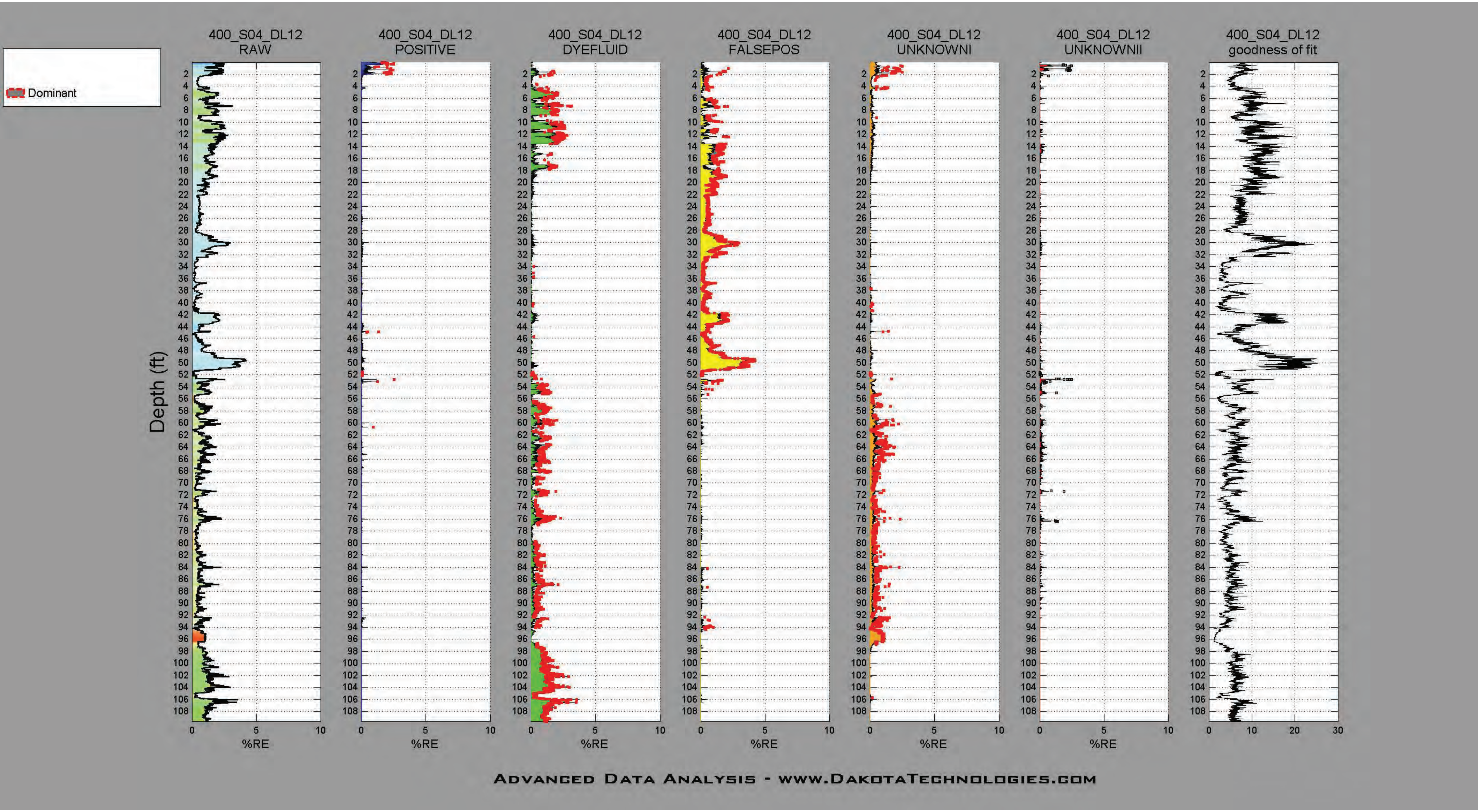
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

Log: **400-S1B-DL11B**

Site: **PGDP**	Date & Time: **2021-09-23 12:28 CDT**
Client: **Chase**	Job:
Final Depth: **60.12 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **10.8 %RE @ 0.25 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **SWM / TG1807**	Elevation: **Unavailable**


Dominant
400_S1B_DL11B
RAW
400_S1B_DL11B
POSITIVE
400_S1B_DL11B
DYEFLUID
400_S1B_DL11B
FALSEPOS
400_S1B_DL11B
UNKNOWNI
400_S1B_DL11B
UNKNOWNII
400_S1B_DL11B
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com


Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
49.30 ft
3.2 %RE
92' to 97' was advanced inside casing.Bottom of casing at ~97'
Refusal @109.64'
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-S04-DL12
Site: PGDP
Date & Time: 2021-10-06 12:10 CDT
Client: Chase
Job:
Final Depth: 109.64 ft
X Coord.(Long/East): Unavailable
Max Signal: 4.2 %RE @ 49.62 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: TJR / TG1807
Elevation: Unavailable



Dominant
400_S04_DL12
RAW
400_S04_DL12
POSITIVE
400_S04_DL12
DYEFLUID
400_S04_DL12
FALSEPOS
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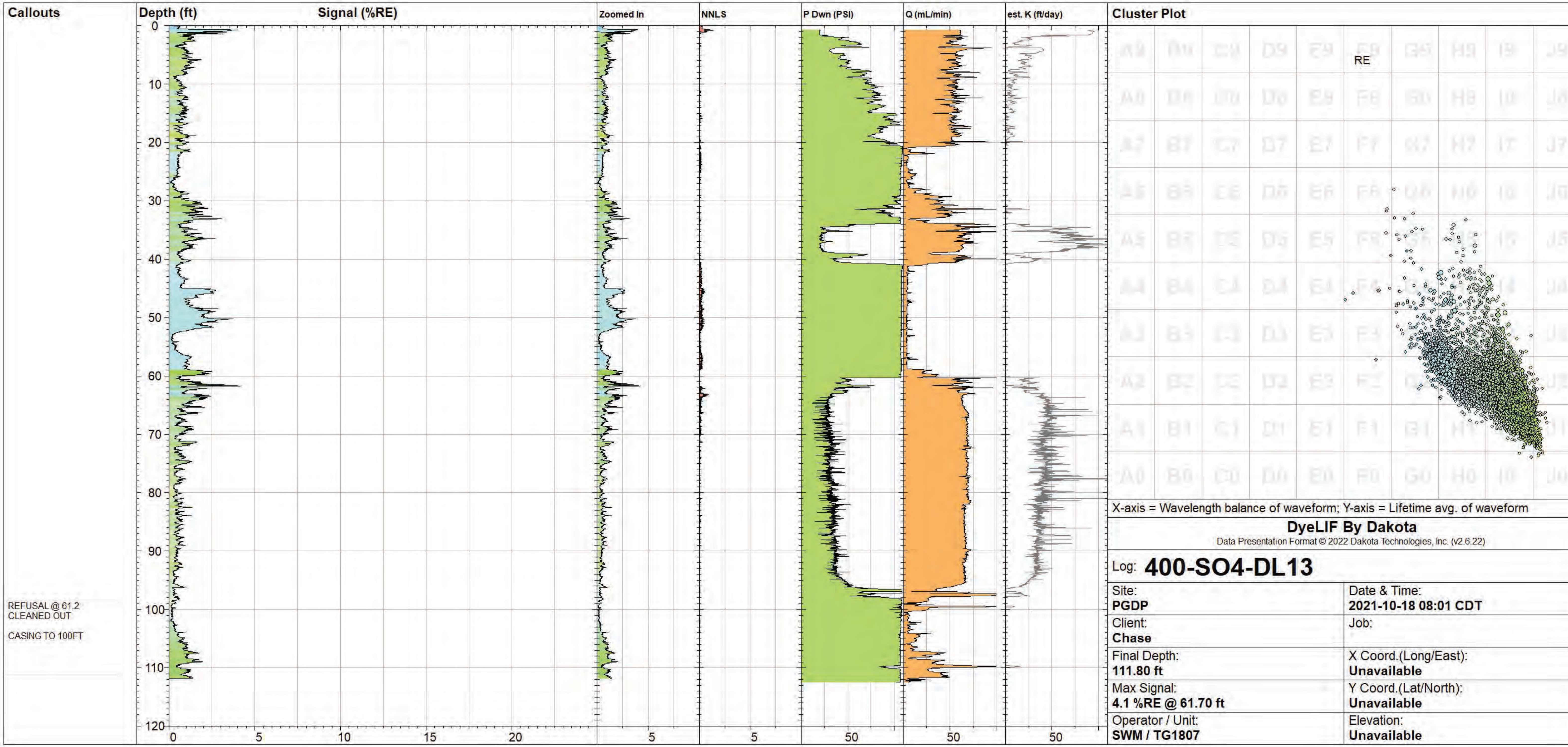
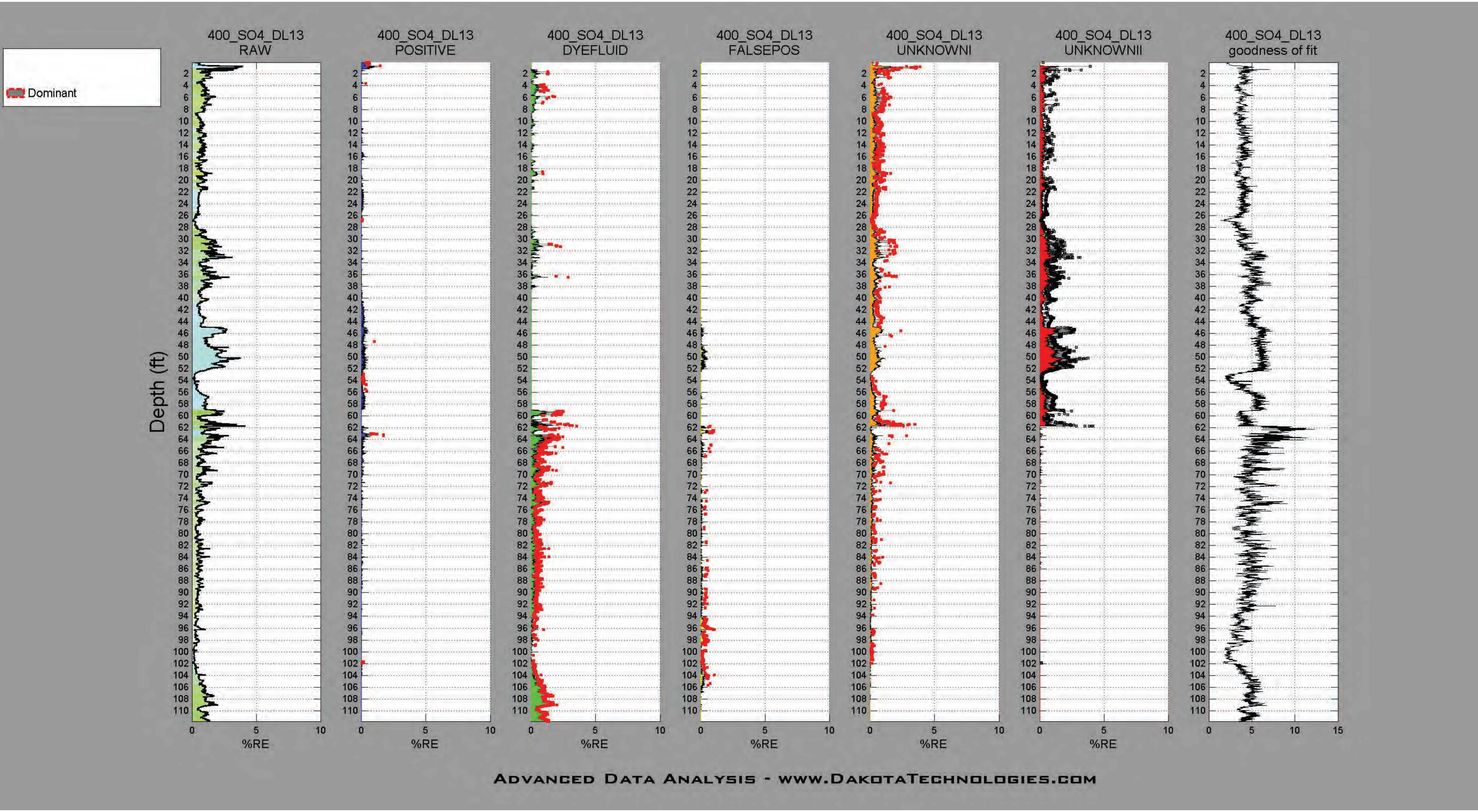
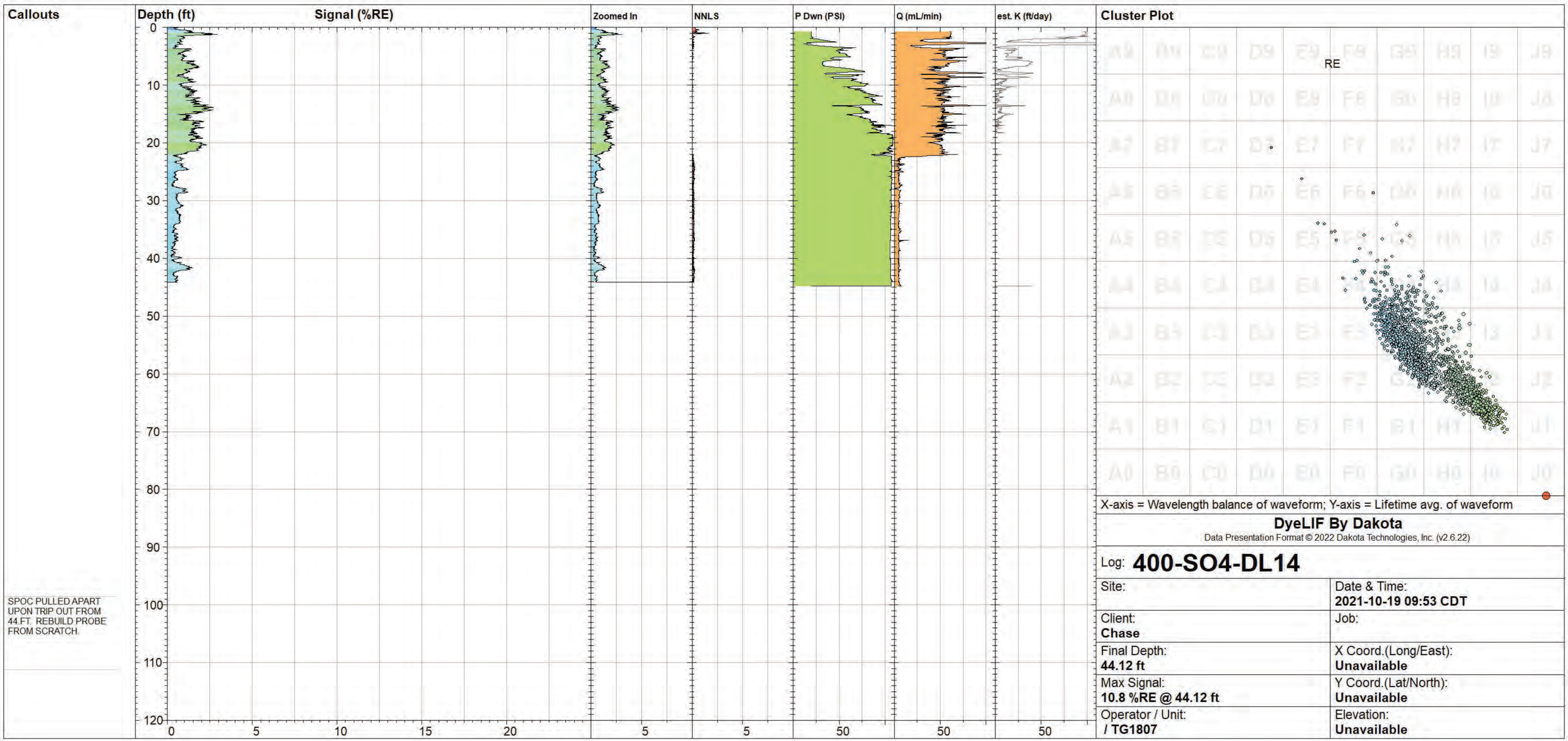
UNKNOWNI
400_S04_DL12
UNKNOWNII
400_S04_DL12
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

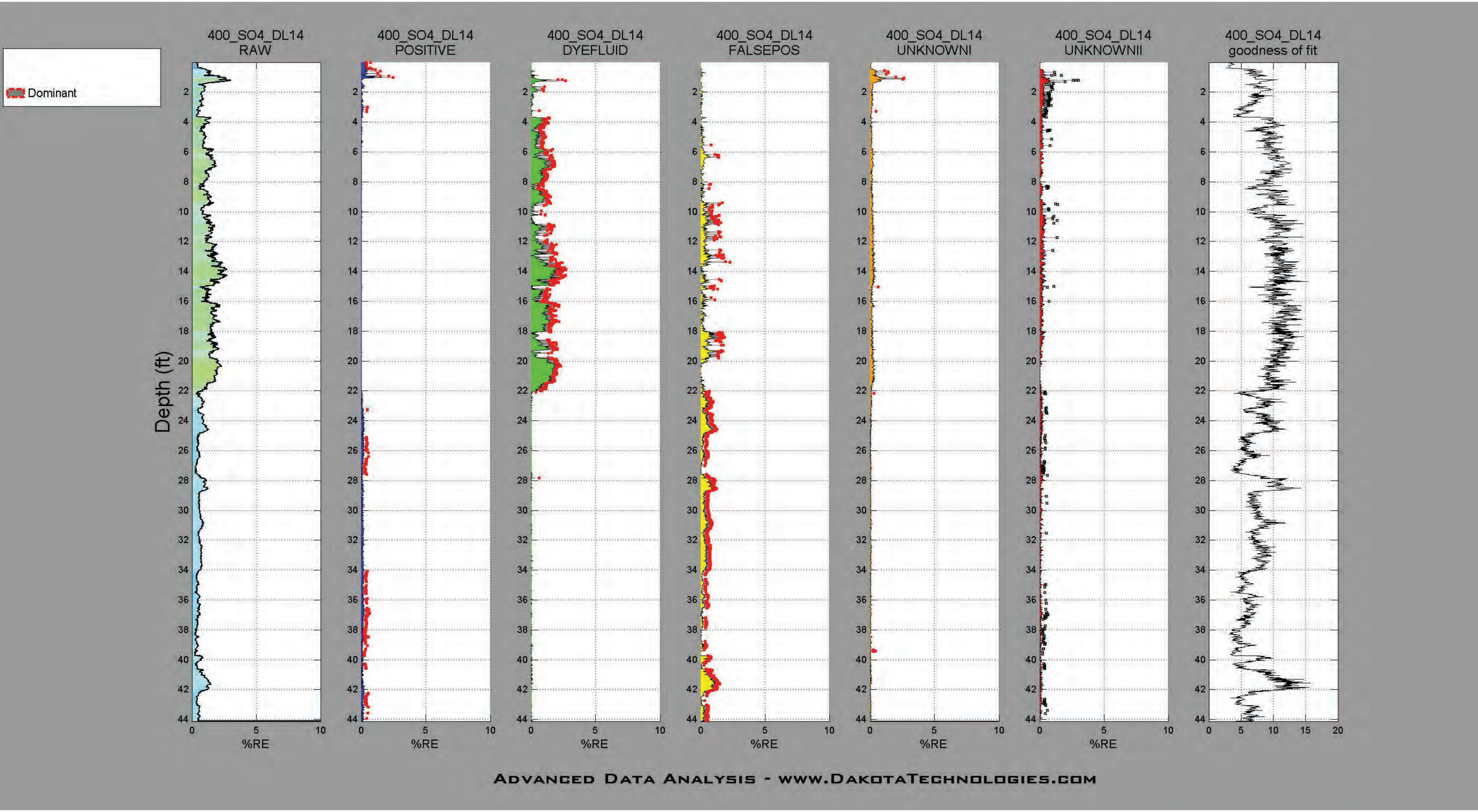


Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
REFUSAL @ 61.2
CLEANED OUT
CASING TO 100FT
0
10
20
30
40
50
60
70
80
90
100
110
120
0
5
10
15
20
5
5
50
50
50
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-SO4-DL13
Site:
PGDP
Date & Time:
2021-10-18 08:01 CDT
Client:
Chase
Job:
Final Depth:
111.80 ft
X Coord.(Long/East):
Unavailable
Max Signal:
4.1 %RE @ 61.70 ft
Y Coord.(Lat/North):
Unavailable
Operator / Unit:
SWM / TG1807
Elevation:
Unavailable

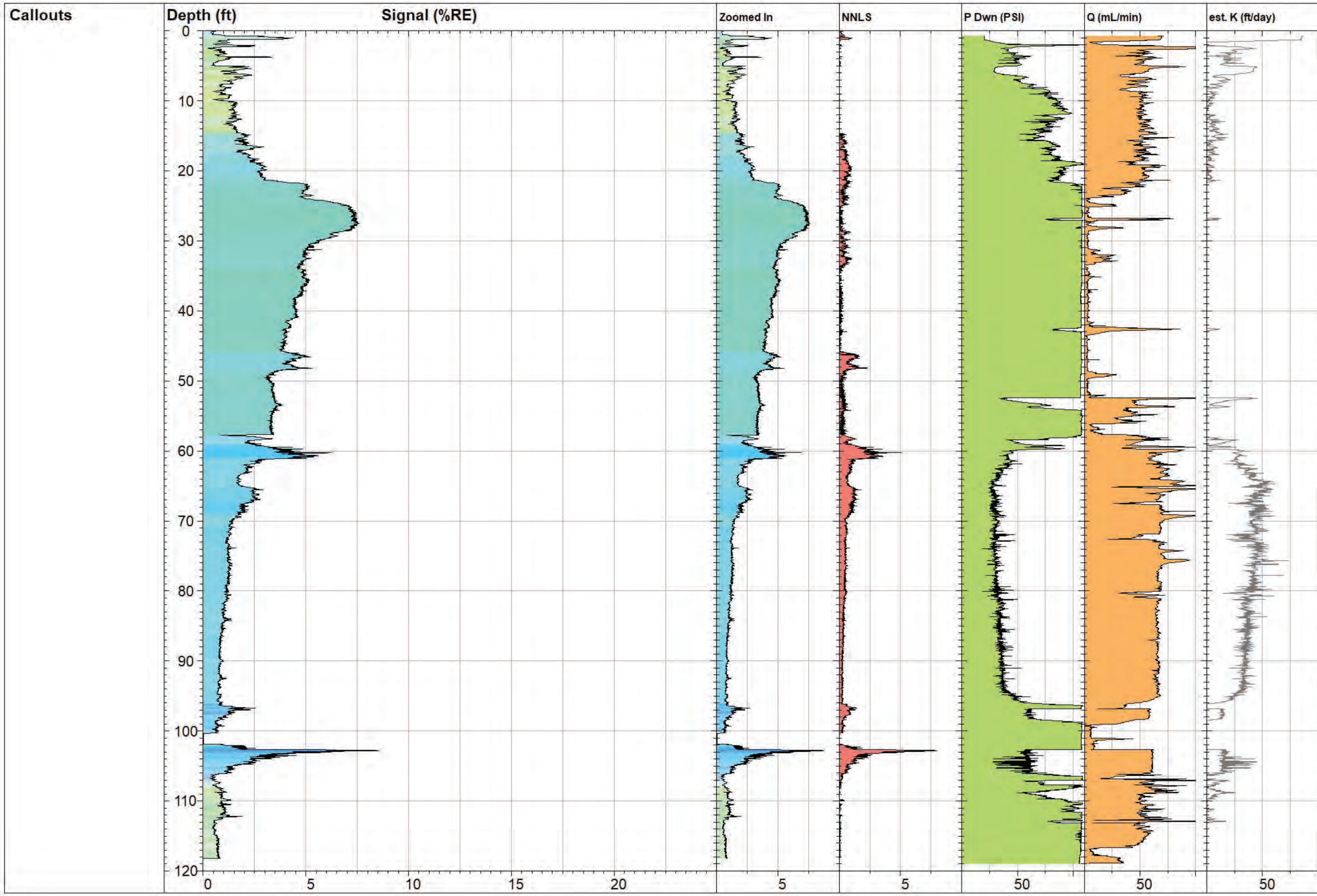

Dominant
Depth (ft)
400_SO4_DL13
RAW
400_SO4_DL13
POSITIVE
400_SO4_DL13
DYEFLUID
400_SO4_DL13
FALSEPOS
400_SO4_DL13
UNKNOWNI
400_SO4_DL13
UNKNOWNII
400_SO4_DL13
goodness of fit
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



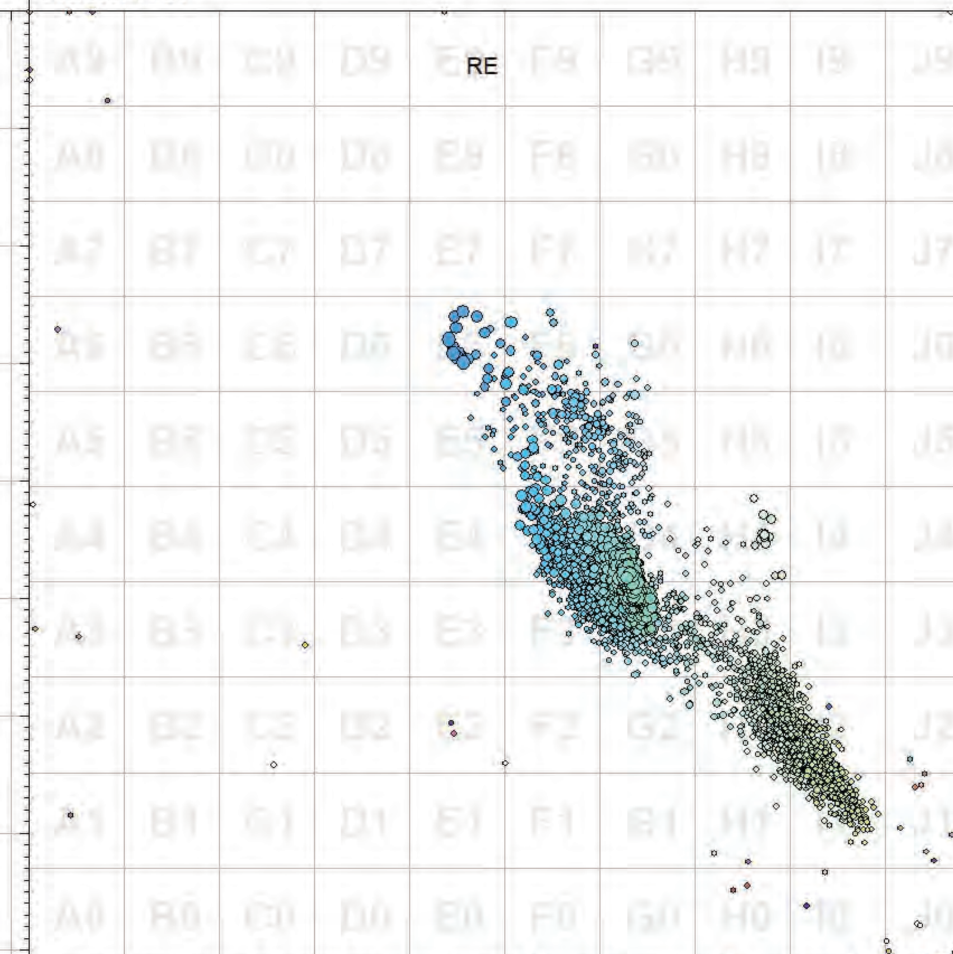
Callouts
Depth (ft)
Signal (%RE)
Zoomed In
NNLS
P Dwn (PSI)
Q (mL/min)
est. K (ft/day)
Cluster Plot
RE
SPOC PULLED APART UPON TRIP OUT FROM 44.FT. REBUILD PROBE FROM SCRATCH.
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform
DyeLIF By Dakota
Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)
Log: 400-SO4-DL14
Site:
Date & Time: 2021-10-19 09:53 CDT
Client: Chase
Job:
Final Depth: 44.12 ft
X Coord.(Long/East): Unavailable
Max Signal: 10.8 %RE @ 44.12 ft
Y Coord.(Lat/North): Unavailable
Operator / Unit: / TG1807
Elevation: Unavailable



Dominant
400_SO4_DL14
RAW
400_SO4_DL14
POSITIVE
400_SO4_DL14
DYEFLUID
400_SO4_DL14
FALSEPOS
400_SO4_DL14
UNKNOWNI
400_SO4_DL14
UNKNOWNII
400_SO4_DL14
goodness of fit
Depth (ft)
%RE
ADVANCED DATA ANALYSIS - WWW.DAKOTATECHNOLOGIES.COM



Cluster Plot



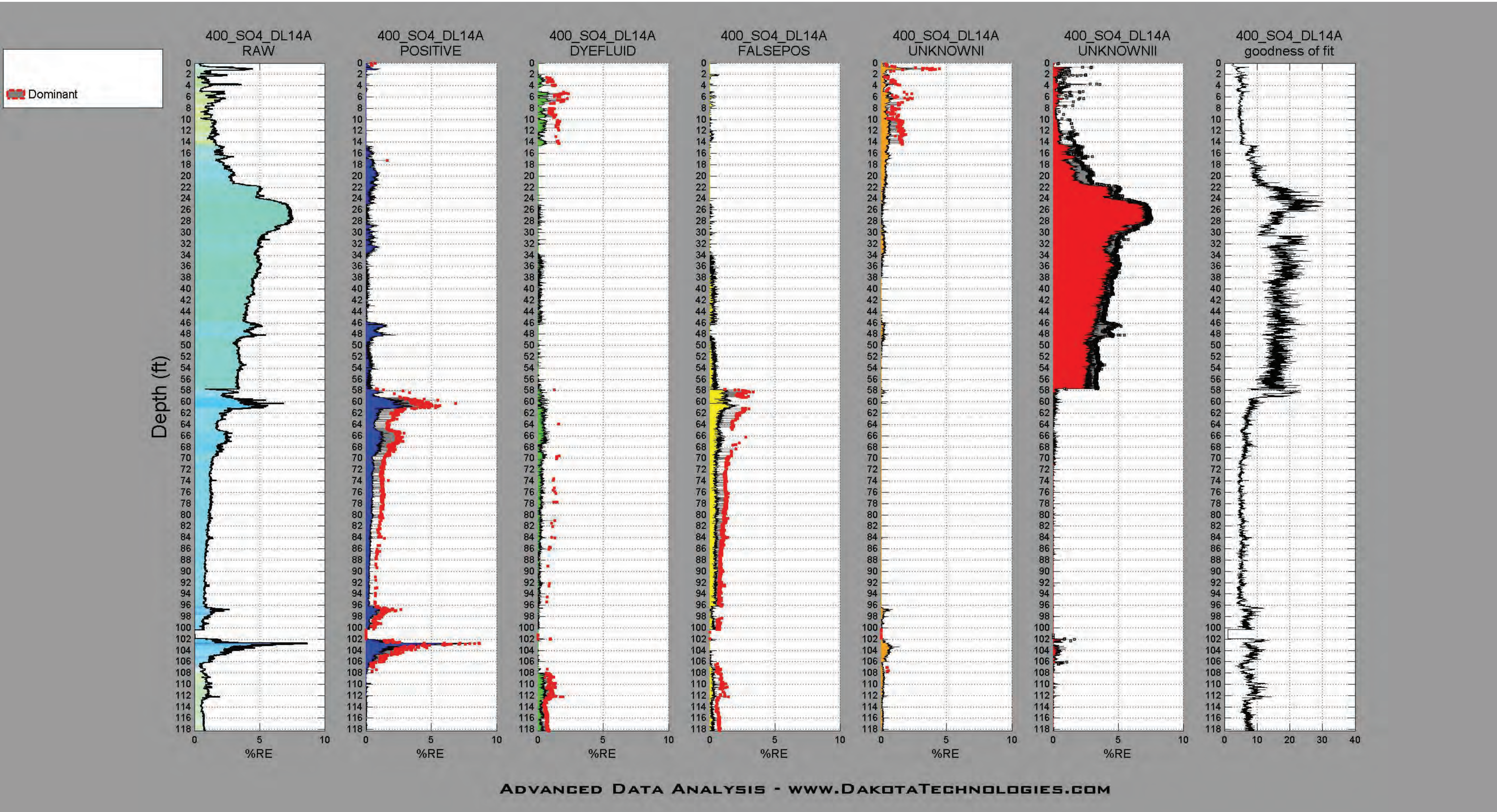
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

DyeLIF By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.6.22)

Log: **400-SO4-DL14A**

Site:	Date & Time: **2021-10-20 07:25 CDT**
Client: **Chase**	Job:
Final Depth: **118.21 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **8.7 %RE @ 102.81 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **/ TG1807**	Elevation: **Unavailable**



Dominant
400_SO4_DL14A
RAW
400_SO4_DL14A
POSITIVE
400_SO4_DL14A
DYEFLUID
400_SO4_DL14A
FALSEPOS
400_SO4_DL14A
UNKNOWNI
400_SO4_DL14A
UNKNOWNII
400_SO4_DL14A
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

ATTACHMENT A4

TECHNICAL MEMORANDUM FOR REHABILITATION OF EXISTING MONITORING WELLS

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CONTENTS

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TABLES

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ACRONYMS

DOE	U.S. Department of Energy
LRGA	lower Regional Gravel Aquifer
MRGA	middle Regional Gravel Aquifer
MW	monitoring well
N/A	not applicable
NTU	national turbidity unit
RI	remedial investigation
SU	standard unit
TOC	top of outside casing
UCRS	Upper Continental Recharge System
URGA	upper Regional Gravel Aquifer
WWR	well wizard rim

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A4.1. SCOPING AND WORK PLAN

The scoping and work plan for the C-400 Complex Remedial Investigation (RI)/Feasibility Study (DOE 2018 and 2020) identified existing monitoring wells (MWs) (and twinned and multi-port wells) located within 300 ft of the C-400 Complex Operable Unit boundary that could be sampled (as possible) for the RI. Site experience indicated that sampling of Upper Continental Recharge System (UCRS) MWs can be problematic because water levels often are insufficient to support pumping, and sampling of four multiport wells [with UCRS, Regional Gravel Aquifer, and McNairy Formation sample ports] in Sector 4 of the C-400 Complex (i.e., southeast corner) can be uncertain because of mechanical failures. At the request of the Kentucky Department for Environmental Protection, the scoping task assembled a summary of construction and most recent sampling information for the MWs in table format (Table A4.1).

An initial task of the RI was to assess the sampling systems of the multiport wells to determine which ports could be sampled and to redevelop all monitoring wells within the 300 ft buffer of the C-400 Complex, as possible. Beginning mid-November 2019 and extending through early January 2020, the RI groundwater sample crew performed well development as described in *Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2433&D2/R1 (DOE 2020). Table A4.2 summarizes the well development activities.

Where the dedicated pumps in the MWs could be removed, the groundwater sample crew brushed the screen interval with a rigid Teflon brush, using 2-inch and 4-inch diameter brushes, as appropriate. The groundwater sample crew used a small electric submersible pump (Hurricane Pump as manufactured by Proactive Industries) to overpump the wells in most cases. Pump systems could not be removed in four multiport wells. For these wells, the redevelopment consisted of pumping 3 gal of water from each sample port (as possible, see Table A4.2).

A4.2. REFERENCES

DOE (U.S. Department of Energy) 2018. *Scoping Document for the C-400 Complex Remedial Investigation/Feasibility Study at Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2424&D1, U.S. Department of Energy, Paducah, KY, February.

DOE 2020. *Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2433&D2/R1, U.S. Department of Energy, Paducah, KY, March.

Table A4.1. C-400 Well Assessment

Well	Screened Zone	Screened Top Elevation	Screened Base Elevation	Static Water Level Elevation	Date Last Sampled	Sample Equipment Present	Sample Equipment Functional	Datum	Datum Elevation	Beginning Water Lvl (ft)	Ending Water Lvl (ft)	Purge Amount (gal/30 min*)	Turbidity (NTU)	Notes
MW68	LRGA	281.74	276.74	342.43	10/5/1994	Yes	Yes	TOC	379.14	36.71	36.71	1	17.1	Apparent obstruction in well immediately below water level.
MW69	UCRS	345.71	340.71	331.99	12/22/1998	No	N/A	TOC	379.01	47.02	47.02	0.05	4	Used QED Portable Micropurge Pump.
MW157	UCRS	352.05	347.05	345.5	12/11/1997	No	N/A	TOC	382.05	36.55	36.56	0.12	42.7	Used QED Portable Micropurge Pump.
MW176	UCRS	349.09	342.09	N/A	N/A	No	N/A	TOC	381.59	N/A	N/A	N/A	N/A	No water was present. TD = 40.72 ft.
MW177	UCRS	340.58	335.58	337.24	5/6/1991	Yes	Yes	TOC	380.08	42.84	4	1	105	Beginning water level is ~ 0.2 ft above the top of the bladder pump.
MW178	URGA	316.64	311.64	332.61	3/20/2019	Yes	No	TOC	379.14	46.53	N/A	0	N/A	Blocked air line suspected.
MW212	UCRS	343.45	338.45	342.69	12/22/1998	Yes	Yes	TOC	379.31	36.62	36/72	1	60.2	N/A
MW219	UCRS	342.99	337.99	343.1	12/23/1998	Yes	Yes	TOC	379.76	36.66	37.62	1	20.0	N/A
MW405 PRT 1	UCRS	343.43	341.43	N/A	N/A	Yes	No	TOC	379.43	N/A	N/A	N/A	N/A	Blocked water line suspected.
MW405 PRT 2	URGA	319.43	317.43	N/A	10/6/2003	Yes	Yes	TOC	379.43	N/A	N/A	1	167	Pump outlet valve stuck open; splash hazard.
MW405 PRT 3	URGA	313.43	311.43	N/A	10/6/2003	Yes	Yes	TOC	379.43	N/A	N/A	1	73.5	Pump outlet valve stuck open; splash hazard.
MW405 PRT 4	URGA	307.43	305.43	N/A	10/6/2003	Yes	Yes	TOC	379.43	N/A	N/A	1	68.3	Pump outlet valve stuck open; splash hazard.
MW405 PRT 6	LRGA	293.43	291.43	N/A	3/15/2012	Yes	No	TOC	379.43	N/A	N/A	N/A	N/A	Bladder apparently failed.
MW405 PRT 7	McNairy	273.43	271.43	N/A	10/6/2003	Yes	Yes	TOC	379.43	N/A	N/A	0.6	60.3	Minimal water production. Possible bladder leak.
MW406 PRT 1	UCRS	343.18	341.18	N/A	N/A	Yes	Yes	TOC	379.18	N/A	N/A	1	12.0	Pumps slowly on each pump cycle.
MW406 PRT 2	URGA	319.18	317.18	N/A	10/11/2007	Yes	Yes	TOC	379.18	N/A	N/A	1	16.4	N/A
MW406 PRT 3	URGA	313.18	311.18	N/A	10/11/2007	Yes	Yes	TOC	379.18	N/A	N/A	1	2.7	Pump outlet valve stuck open; splash hazard.
MW406 PRT 4	URGA	307.18	305.18	N/A	10/11/2007	Yes	Yes	TOC	379.18	N/A	N/A	1	3.5	Pump outlet valve stuck open; splash hazard.

Table A4.1. C-400 Well Assessment (Continued)

Well	Screened Zone	Screened Top Elevation	Screened Base Elevation	Static Water Level Elevation	Date Last Sampled	Sample Equipment Present	Sample Equipment Functional	Datum	Datum Elevation	Beginning Water Lvl (ft)	Ending Water Lvl (ft)	Purge Amount (gal/30 min*)	Turbidity (NTU)	Notes
MW406 PRT 6	LRGA	293.18	291.18	N/A	10/11/2007	Yes	Yes	TOC	379.18	N/A	N/A	1	0.03	Bladder apparently failed.
MW406 PRT 7	McNairy	273.18	271.18	N/A	10/11/2007	Yes	Yes	TOC	379.18	N/A	N/A	1	14.4	N/A
MW407 PRT 1	URCS	343.37	341.37	N/A	N/A	Yes	Yes	TOC	379.37	N/A	N/A	1	14.9	N/A
MW407 PRT 2	URGA	319.37	317.37	N/A	10/11/2007	Yes	Yes	TOC	379.37	N/A	N/A	1	69.2	Pump outlet valve stuck open; splash hazard.
MW407 PRT 3	URGA	313.37	311.37	N/A	10/11/2007	Yes	Yes	TOC	379.37	N/A	N/A	1	52.3	Pump outlet valve stuck open; splash hazard.
MW407 PRT 5	MGRA	299.37	297.37	N/A	10/11/2007	Yes	Yes	TOC	379.37	N/A	N/A	0.4	27.8	Pump outlet valve stuck open; splash hazard. Minimal water production.
MW407 PRT 6	LRGA	293.37	291.37	N/A	10/11/2007	Yes	No	TOC	379.37	N/A	N/A	N/A	N/A	Bladder apparently failed.
MW407 PRT 7	McNairy	273.37	271.37	N/A	10/11/2007	Yes	Yes	TOC	379.37	N/A	N/A	0.6	18.1	Minimal water production/pump cycle.
MW408 PRT 1	UCRS	345.87	343.87	N/A	N/A	Yes	No	TOC	379.83	N/A	N/A	N/A	N/A	Pump doesn't work; not air line or bladder issue.
MW408 PRT 2	URGA	321.87	319.87	N/A	10/10/2007	Yes	Yes	TOC	379.83	N/A	N/A	1	136	Pump outlet valve stuck open sometimes; splash hazard.
MW408 PRT 3	URGA	315.87	313.87	N/A	10/10/2007	Yes	Yes	TOC	379.83	N/A	N/A	1	61.5	N/A
MW408 PRT 4	URGA	309.87	307.87	N/A	10/10/2007	Yes	Yes	TOC	379.83	N/A	N/A	1	29.5	Pump outlet valve stuck open; splash hazard.
MW408 PRT 6	LRGA	295.87	293.87	N/A	3/4/2012	Yes	No	TOC	379.83	N/A	N/A	N/A	N/A	Bladder apparently failed.
MW408 PRT 7	McNairy	275.87	273.87	N/A	10/10/2007	Yes	Yes	TOC	379.83	N/A	N/A	1	103	N/A

*Maximum period of 30 minutes

Table A4.2. C-400 Complex RI Well Rehabilitation

Well	Screened Zone	Screen Depth (ft bgs)		Date of Well Rehabilitation	Static Water Level		Well Brushing Period (minutes)	Overpumping Task			Final Water Quality Measurements			
		Top	Bottom		Datum	Depth (ft)		Pump Used	Pumping Period (minutes)	Total Purge Amount (gal)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH (SU)	Conductivity (µmhos/cm)
MW68	LRGA	100.50	105.50	12/30/2019	WWR	53.33	13	Development Pump	135	200	0.0	1.88	5.94	516
MW69	UCRS	36.30	41.30	12/30/2019	TOC	37.30	12	Dedicated Pump	93	4	8.1	1.88	5/67	537
MW71	URGA	70.77	75.77	11/13/2019	WWR	N/A	17	Development Pump	205	210	14.9	2.25	5.81	674
MW155	LRGA	90.65	95.65	12/5/2019	TOC	55.24	14	Development Pump	170	190	1.8	2.31	6.25	547
MW156	URGA	68.00	73.00	11/20/2019	TOC	56.07	13	Development Pump	142	180	6.9	0.05	6.30	394
MW157	UCRS	30.00	35.00	12/23/2019	TOC	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW175	MRGA	77.45	82.45	12/4/2019	TOC	55.22	14	Development Pump	199	180	6.5	3.34	5.85	455
MW176	UCRS	32.50	37.50	12/26/2019	TOC	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW177 1st Attempt	UCRS	43.10	48.10	11/19/2019	TOC	45.62	13	Dedicated Pump	275	1 (Pumped Dry)	N/A	N/A	N/A	N/A
MW177 2ndAttempt	UCRS	43.10	48.10	11/21/2019	TOC	N/A	N/A	Dedicated Pump	70	0	N/A	N/A	N/A	N/A
MW177 3rd Attempt	UCRS	43.10	48.10	11/25/2019	TOC	46.12	N/A	Development Pump	18	0	N/A	N/A	N/A	N/A
MW177 4th Attempt	UCRS	43.10	48.10	11/26/2019	TOC	N/A	N/A	Development Pump	2	0	N/A	N/A	N/A	N/A
MW178	URGA	65.60	70.60	11/19/2019	TOC	58.62	16	Development Pump	173	200	11.2	5.03	6.08	533
MW212	UCRS	36.25	46.25	11/13/2019	TOC	37.26	13	Development Pump	157	90	12.9	8.73	6.42	984
MW219 1st Attempt	UCRS	37.18	47.18	11/18/2019	TOC	38.06	15	Development Pump	258	6	N/A	N/A	N/A	N/A
MW219 2ndAttempt	UCRS	37.18	47.18	11/19/2019	TOC	37.86	N/A	Dedicated Pump	22	3.5	63.1	N/A	N/A	N/A
MW219 3rd Attempt	UCRS	37.18	47.18	11/20/2019	TOC	N/A	N/A	Dedicated Pump	55	20	14.7	1.96	6.71	364
MW219 4th Attempt	UCRS	37.18	47.18	12/9/2019	TOC	N/A	N/A	Dedicated Pump	70	4	2.6	N/A	N/A	N/A
MW341	MRGA	79.80	89.80	12/9/2019	TOC	54.74	14	Development Pump	170	200	0.0	3.25	6.12	523
MW342	MRGA	80.60	90.60	11/26/2019	TOC	53.70	14	Development Pump	183	200	9.1	2.36	5.94	757
MW343	LRGA	78.10	88.10	12/16/2019	TOC	51.61	15	Development Pump	161	200	5.1	2.67	5.71	799
MW405 PRT 1	UCRS	36.00	38.00	12/31/2019	TOC	N/A	N/A	Dedicated Pump	20	0	N/A	N/A	N/A	N/A
MW405 PRT 2	URGA	60.00	62.00	12/31/2019	TOC	N/A	N/A	Dedicated Pump	38	3	0.0	1.28	6.04	508

Table A4.2. C-400 Complex RI Well Rehabilitation (Continued)

Well	Screened Zone	Screen Depth (ft bgs)		Date of Well Rehabilitation	Static Water Level		Well Brushing Period (minutes)	Overpumping Task			Final Water Quality Measurements			
		Top	Bottom		Datum	Depth (ft)		Pump Used	Pumping Period (minutes)	Total Purge Amount (gal)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH (SU)	Conductivity (µmhos/cm)
MW405 PRT 3	URGA	66.00	68.00	12/31/2019	TOC	N/A	N/A	Dedicated Pump	28	3	63.3	0.89	6.31	333
MW405 PRT 4	URGA	72.00	74.00	12/31/2019	TOC	N/A	N/A	Dedicated Pump	33	3	82.5	0.50	6.48	501
MW405 PRT 5	MRGA	80.00	82.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	29	3	26.3	0.17	6.81	228
MW405 PRT 6	LRGA	86.00	88.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	25	0	N/A	N/A	N/A	N/A
MW405 PRT 7	McNairy	106.00	108.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	40	3	86.7	0.82	6.32	539
MW406 PRT 1	UCRS	36.00	38.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	34	3	276	0.08	6.33	219
MW406 PRT 2	URGA	60.00	62.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	33	3	79.0	0.12	6.40	139
MW406 PRT 3	URGA	66.00	68.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	40	3	55.4	1.14	6.45	292
MW406 PRT 4	URGA	72.00	74.00	1/2/2020	TOC	N/A	N/A	Dedicated Pump	49	3	16.7	1.52	6.71	216
MW406 PRT 5	MRGA	80.00	82.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	52	3	18.2	0.21	6.82	218
MW406 PRT 6	LRGA	86.00	88.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	21	0	N/A	N/A	N/A	N/A
MW406 PRT 7	McNairy	106.00	108.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	42	3	9.3	0.33	6.67	224
MW407 PRT 1	UCRS	36.00	38.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	52	3	8.8	0.43	6.63	480
MW407 PRT 2	URGA	60.00	62.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	39	3	68.1	0.79	7.05	289
MW407 PRT 3	URGA	66.00	68.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	36	3	47.7	0.40	6.82	305
MW407 PRT 4	URGA	72.00	74.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	41	3	50.2	0.13	7.02	254
MW407 PRT 5	MRGA	80.00	82.00	1/6/2020	TOC	N/A	N/A	Dedicated Pump	51	3	45.3	0.08	7.98	45
MW407 PRT 6	LRGA	86.00	88.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	19	0	N/A	N/A	N/A	N/A
MW407 PRT 7	McNairy	106.00	108.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	34	3	8.3	0.63	6.79	367
MW408 PRT 1	UCRS	34.00	36.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	17	0	N/A	N/A	N/A	N/A
MW408 PRT 2	URGA	58.00	60.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	43	3	11.6	1.03	6.81	2.84
MW408 PRT 3	URGA	64.00	66.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	32	3	21.3	0.83	6.91	317
MW408 PRT 4	URGA	70.00	72.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	42	3	19.6	0.63	6.72	461

Table A4.2. C-400 Complex RI Well Rehabilitation (Continued)

Well	Screened Zone	Screen Depth (ft bgs)		Date of Well Rehabilitation	Static Water Level		Well Brushing Period (minutes)	Overpumping Task			Final Water Quality Measurements			
		Top	Bottom		Datum	Depth (ft)		Pump Used	Pumping Period (minutes)	Total Purge Amount (gal)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH (SU)	Conductivity (µmhos/cm)
MW408 PRT 4	URGA	70.00	72.00	1/7/2020	TOC	N/A	N/A	Dedicated Pump	42	3	19.6	0.63	6.72	461
MW408 PRT 5	MRGA	78.00	80.00	1/8/2020	TOC	N/A	N/A	Dedicated Pump	66	3	18.0	0.28	8.22	172
MW408 PRT 6	LRGA	84.00	86.00	1/8/2020	TOC	N/A	N/A	Dedicated Pump	17	0	N/A	N/A	N/A	N/A
MW408 PRT 7	McNairy	104.00	106.00	1/8/2020	TOC	N/A	N/A	Dedicated Pump	43	3	49.9	0.48	7.44	338
MW421 PRT1	MRGA	71.00	73.00	12/9/2019	TOC	52.51	17	Development Pump	145	200	0.0	4.41	5.89	847
MW421 PRT 2	MRGA	79.00	81.00	12/10/2019	TOC	53.37	11	Development Pump	156	220	0.0	3.55	5.90	743
MW421 PRT 3	LRGA	83.00	85.00	12/18/2019	TOC	53.30	8	Development Pump	169	210	0.0	3.25	5.84	702
MW422 PRT 1	MRGA	71.00	73.00	12/4/2019	TOC	52.43	12	Development Pump	171	210	0.1	3.60	5.87	918
MW422 PRT 2	MRGA	79.00	81.00	12/23/2019	TOC	52.51	12	Development Pump	144	200	0.0	3.43	5.87	741
MW422 PRT 3	LRGA	83.00	85.00	12/19/2019	TOC	52.92	12	Development Pump	142	200	0.0	2.92	5.97	665
MW423 PRT 1	MRGA	70.83	72.83	11/21/2019	TOC	52.17	7	Development Pump	201	210	0.0	2.95	5.72	838
MW423 PRT 2	MRGA	78.83	80.83	12/16/2019	TOC	52.27	11	Development Pump	130	150	0.0	3.10	5.83	500
MW423 PRT 3	LRGA	82.83	84.83	12/19/2019	TOC	52.71	9	Development Pump	176	200	0.0	2.73	5.78	726
MW424 PRT 1	MRGA	71.00	73.00	11/20/2019	TOC	N/A	N/A*	Dedicated Pump	84	15	0.0	2.61	5.73	817
MW424 PRT 2	MRGA	79.00	81.00	12/10/2019	TOC	54.05	9	Development Pump	165	210	0.0	2.50	5.71	762
MW424 PRT 3	LRGA	83.00	85.00	12/11/2019	TOC	54.20	11	Development Pump	136	200	0.0	2.49	5.68	728
MW425 PRT 1	MRGA	71.00	73.00	11/26/2019	TOC	53.85	5	Development Pump	150	170	3.0	6.30	5.84	973

Table A4.2. C-400 Well Rehabilitation (Continued)

Well	Screened Zone	Screen Depth (ft bgs)		Date of Well Rehabilitation	Static Water Level		Well Brushing Period (minutes)	Overpumping Task			Final Water Quality Measurements			
		Top	Bottom		Datum	Depth (ft)		Pump Used	Pumping Period (minutes)	Total Purge Amount (gal)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH (SU)	Conductivity (µmhos/cm)
MW425 PRT 2	MRGA	79.00	81.00	11/25/2019	TOC	53.94	9	Development Pump	191	200	0.7	2.24	5.83	776
MW425 PRT 3	LRGA	83.00	85.00	12/3/2019	TOC	54.18	13	Development Pump	155	190	4.4	2.52	5.90	711
MW505	URGA	65.00	70.00	11/14/2019	TOC	55.42	13	Development Pump	198	220	2.9	2.74	6.09	533
MW506	MRGA	77.00	82.00	12/11/2019	TOC	56.20	15	Development Pump	168	190	8.9	3.01	6.16	528
MW507	LRGA	90.00	95.00	12/5/2019	TOC	55.22	12	Development Pump	202	200	0.0	2.32	6.14	533

*Could not pull dedicated pump and brush well screen.
µmhos/cm = micromhos per centimeter
mg/L = milligrams per liter

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ATTACHMENT A5

TECHNICAL MEMORANDUM FOR COLLOIDAL BORESCOPE INVESTIGATION

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ACRONYMS

LRGA	lower Regional Gravel Aquifer
MRGA	middle Regional Gravel Aquifer
MW	monitoring well
RGA	Regional Gravel Aquifer
RI	remedial investigation
URGA	upper Regional Gravel Aquifer

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A5.1. INTRODUCTION

The C-400 Complex remedial investigation (RI) performed four suites of colloidal borescope tests in up to 22 Regional Gravel Aquifer (RGA) monitoring wells (MWs) to measure groundwater flow directions during the field investigation (Figure A5.1). Each suite of tests extended over several weeks, and the suites centered on the dates May 9, 2021; August 15, 2021; December 21, 2021; and February 13, 2022. The colloidal borescope tests assess groundwater flow characteristics in the upper RGA (URGA), middle RGA (MRGA), and lower RGA (LRGA) across the C-400 Complex OU.

A5.2. COLLOIDAL BORESCOPES

The C-400 Complex RI field crew used Geotech Colloidal Borescopes, which are powered by rechargeable power packs; and Dell Latitude 14/Rugged 5414 computers with AquaLITE software to run the well tests and to store the test measurements. Each test was performed at the mid-point depth of the well screen. Typically, tests were run for a minimum of 8 hours. Computer and colloidal borescope failures resulted in shorter periods of useful test data in some cases. The groundwater flow directions from the colloidal borescope tests are compass azimuths, relative to magnetic north.

A5.3. COLLOIDAL BORESCOPE RECORD PREPARATION

The colloidal borescope tests commonly document thousands of measurements of flow direction and rate for small particles (i.e., colloids) in the groundwater flow stream. Measurements result from one or more interrogations of each particle, with greater confidence placed on multiple interrogations.

For the RI colloidal borescope tests, the data were processed uniformly. Test results were loaded into a Microsoft Excel worksheet and each test was sorted by the number of test counts. Azimuths of records of three counts[1] were plotted for inspection. Where sufficient data were available and defined a trend, the mode of the 3-count data set was used as the groundwater flow direction. When the 3-count data set was too limited, records of other count data were added in the assessment.

In most cases, the MWs produced test results that did not define an unambiguous trend. Many wells were re-tested several times in an attempt to get better results. This technical memorandum provides only the results for the best test in each well for each of the four test suites. The tests are documented in the accompanying Excel files *1ST QTR measurements*, *2ND QTR measurements*, *3RD QTR measurements*, and *4TH QTR measurements*.

Some MWs repeatedly produced unambiguous test results with similar azimuths over several of the test suites. These results were used in addition to water level measurements to contour the RGA potentiometric surfaces of the C-400 Complex RI report.

Groundwater flow rate measurements were less distinctive and were not quantitatively assessed for this RI.

[1] Lower-count records frequently contain false records produced by electrical, mechanical, or computer failure (i.e., source undetermined). These records sometimes were easily identified as well-populated trends of distinct azimuth.

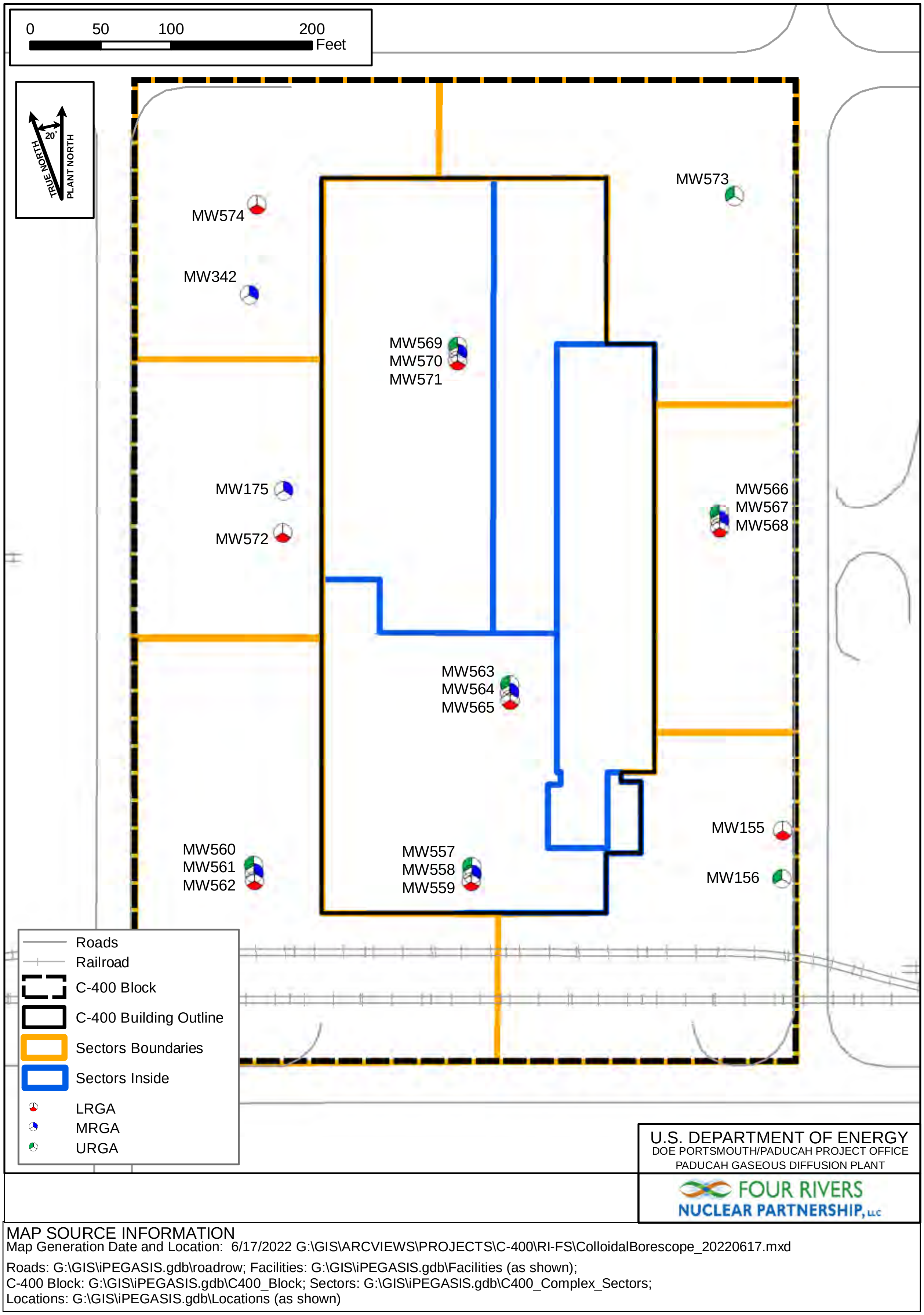

Figure A5.1. Locations of Colloidal Borescope Tests

A5.4. RGA GROUNDWATER FLOW DIRECTION

The Microsoft Excel file, *SUMMARY OF CB TESTS*, reports the test results and identifies tests with low uncertainty that were used in the preparation of the RGA potentiometric surfaces.

In general, LRGA monitoring wells provided colloidal borescope tests of flow direction measurements with less uncertainty than MRGA and URGA wells. More shallow MRGA and URGA wells—south-central well cluster MW557 (URGA) and MW558 (MRGA), southwest well cluster MW560 (URGA) and MW561 (MRGA), and MW574 (URGA) located outside of the northwest corner of the C-400 Cleaning Building—are exceptions to this trend.

Colloidal borescope tests of greater uncertainty often exhibit oscillatory trends symptomatic of low groundwater flow rate, which may be indicative of lower hydraulic conductivity or the result of poor well connection to the aquifer. In the case of the MWs installed for the RI, the MWs were developed robustly, and problems due to well connection with the aquifer are unlikely.

Collectively, the colloidal borescope tests indicate that the groundwater flow rate/hydraulic conductivity is greatest in the lower RGA, and areas of greater groundwater flow in the upper and middle RGA occur under the south end of C-400 Complex and off the southwest and northwest corners of the building. Appendix A provides a summary and raw data of the colloidal borescope tests.

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ATTACHMENT A6

TECHNICAL MEMORANDUM FOR PRESSURE TRANSDUCER DATA COLLECTION

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CONTENTS

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ACRONYMS

LRGA	lower Regional Gravel Aquifer
MRGA	middle Regional Gravel Aquifer
MW	monitoring well
RGA	Regional Gravel Aquifer
RI	remedial investigation
UCRS	Upper Continental Recharge System
URGA	upper Regional Gravel Aquifer

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A6.1. INTRODUCTION

The C-400 Complex remedial investigation (RI) set up and maintained pressure transducers/data logger assemblies in 24 Regional Gravel Aquifer (RGA) monitoring wells (MWs) and two Upper Continental Recharge System (UCRS) piezometers to provide a nearly continuous record of groundwater levels during the field investigation. For the RGA MWs, the compiled pressure transducer record extends from April 28, 2021,[1] through March 1, 2022, a period of 10 months. In the UCRS piezometers, the pressure transducer record covers the period May 27, 2021, through March 1, 2022, a period of 9 months. The RGA record defines a nearly year-long cycle of highest water level in early June and lowest water level in late December/early January. The UCRS piezometers document that the gravel backfill under the C-400 slab was unsaturated during the period of record.

A6.2. PRESSURE TRANSDUCER ASSEMBLIES

All pressure transducer/data logger assemblies used for the C-400 Complex RI were Level Troll 500 systems, as manufactured by *In-Situ* Inc. Calibration was also provided by *In-Situ* Inc. The field crew used a Dell Latitude 14/Rugged 5414 computer to set up and download the pressure transducers.

A6.3. WATER LEVEL RECORD

The data loggers interrogated the pressure transducers every 15 minutes, which provided a nearly continuous record for 9 months in the UCRS piezometers and 10 months in the RGA MWs. Figure A6.1 is a map of the MW and piezometer locations equipped with pressure transducers during the C-400 Complex RI.

A6.3.1 UCRS

For the two UCRS piezometers, MW584 and MW585, the records show only barometric pressure fluctuations; no water accumulated in the piezometers (the pressure transducers were set at the bottom of the piezometer screens.). During the period of deployment, land surface barometric pressure, as measured hourly by the National Weather Service at Barkley Regional Airport (located approximately 4 miles southeast of the Paducah Gaseous Diffusion Plant), ranged from 29.34 to 30.62 inches of mercury. Adjustments in the pressure baseline are evident when the pressure transducers were disturbed and/or the settings were adjusted during data downloads.

A6.3.2 RGA

Pressure transducers were set up in 24 RGA MWs in the upper RGA (URGA), middle RGA (MRGA), and lower RGA (LRGA) to monitor both lateral and vertical trends in hydraulic potential (i.e., measured as water level) over the 10-month period. The pressure transducer water levels were rectified to depth-to-water measurements taken at the beginning and end of record, set up and take down of the pressure

[1] The pressure transducer record for MW342 begins on May 27, 2021.

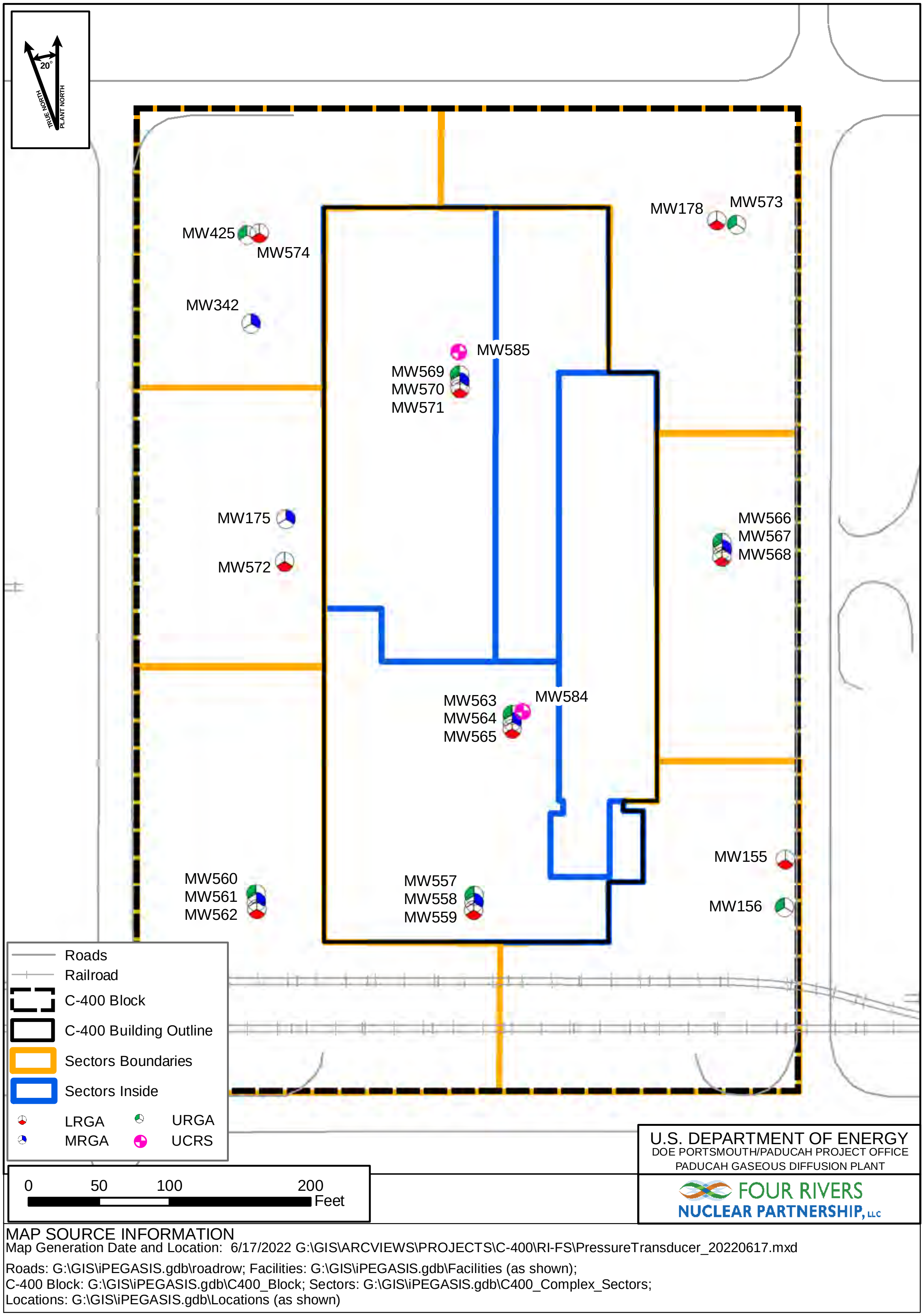

Figure A6.1. Pressure Transducer Locations

transducers for colloidal borescope tests, and quarterly water level measurement suites (*WL Measurements*, Microsoft Excel file).

All RGA records are similar, measuring a 5.4 ft difference between the seasonal high water level, which occurs in early June; and the seasonal low water level, which occurs in late December and early January. Significant observations include the following:

- There is no measureable vertical hydraulic gradient in the RGA in the C-400 Complex Operable Unit.

- From storage in the UCRS, recharge appears to be consistent through the 10 months of record.

- No episodic recharge events associated with a period of higher rainfall occur. The most notable spike in the records arises on October 28, 2021, and is a response to a barometric pressure event. Rainfall was minimal at the time (no features are present that allow direct flow of precipitation to the RGA).

The seasonal high/low cycle is in response to the annual flood/low stage cycle that occurs on the Ohio River, the regional discharge feature for the area groundwater flow systems.

The graphs of the piezometer data (files *PT SOUTH*, *PT MID*, and *PT NORTH*) are normalized to a common water elevation range of 323–330 ft, above mean sea level to facilitate comparison of the hydraulic potential between wells. Groundwater elevations from water level measurements in the same well are shown as red dots on the graphs.

Water level measurements, along with the groundwater elevations, are noted in the *PT SOUTH, PT MID, and PT NORTH* files; and the summary companion file, *WL Msmnts*. Not all water level measurements were used, and many water level measurements were made during colloidal borescope tests in the same well when the pressure transducer had been removed. In some cases, groundwater elevations derived from water level measurements could not be rectified with the pressure transducer record. In those cases, an assumption was made that an error occurred in the water level measurement.[2]

There are a few occurrences where a water level measurement in the same well is not available for a period of the pressure transducer record. In those instances, a water level measurement from an adjacent well is used to rectify the pressure transducer record to groundwater elevation. The pressure transducer records indicate where measurements in adjacent wells were used.

[2] Manual water level measurements during the C-400 Complex RI were extraordinarily difficult. Significant noise and diminished lighting challenged accurate measurements and documentation.

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APPENDIX A

TECHNICAL MEMORANDA FILES (CD)

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APPENDIX B

FATE AND TRANSPORT MODELING

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CONTENTS

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FIGURES

TABLES

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ACRONYMS

amsl	above mean sea level
COC	contaminant of concern
CSM	conceptual site model
DAF	dilution attenuation factor
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EVS	environmental visualization system
FS	feasibility study
gpm	gallons per minute
HU	hydrogeological unit
MCL	maximum contaminant level
MW	monitoring well
NAL	no action level
OU	operable unit
PGDP	Paducah Gaseous Diffusion Plant
RAIS	risk assessment information system
RG	remedial guide
RGA	Regional Gravel Aquifer
RI	remedial investigation
RSL	regional screening level
SSL	soil screening level
UCRS	Upper Continental Recharge System
USGS	U.S. Geological Survey
WAG	waste area grouping

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B.1 INTRODUCTION

This appendix presents an evaluation of the primary migration pathway for contaminants of concern (COCs) in soil within the Upper Continental Recharge System (UCRS) to assess whether or not they represent a possible source of contamination to Regional Gravel Aquifer (RGA) groundwater at the C-400 Complex Operable Unit (OU). The evaluation included screening of UCRS soil data to evaluate leachability and three-dimensional modeling using an environmental visualization system (EVS) to identify possible source areas in the UCRS soil with the potential to impact RGA groundwater.

In addition, this document presents two groundwater modeling evaluations conducted to support a future C-400 feasibility study (FS). The first was conducted using MODFLOW (Harbaugh 2005) to simulate groundwater flow conditions and estimate design parameters for a pump-and-treat remedial scenario. The second was conducted using REMChlor-MD to estimate remediation restoration time frames.

The contents of this report are as follows:

- Section B.2 discusses the technical approach used for evaluating UCRS soil COC leachability and its potential to impact RGA groundwater.

- Section B.3 discusses the three-dimensional groundwater modeling conducted to evaluate a pump-and-treat remedial scenario to support a future FS.

- Section B.4 discusses modeling conducted to evaluate the impacts of matrix diffusion on remedial restoration time frame.

- Section B.5 provides references used in the report.

- Attachment B1 provides an evaluation of the dilution attenuation factor (DAF).

- Attachment B2 includes a summary of the UCRS soil screening.

- Attachment B3 includes MODFLOW Modeling files in electronic format.

- Attachment B4 includes REMChlor-MD Modeling files in electronic format.

B.2 UCRS LEACHABILITY EVALUATION

This section presents a summary of the multistage decision process established to evaluate the leachability of contaminants in UCRS soils and their potential for impacting the RGA groundwater beneath the C-400 Complex OU. The steps in the decision-making process are as follows:

1. Screening of sector-specific soil sampling results against the Paducah Site project-specific remedial guide (RG) soil screening levels (SSLs);

2. Review of the soil constituents that are not screened from further modeling to identify possible source areas that could potentially impact RGA groundwater by evaluating spatial distribution using EVS modeling;

3. Further analysis of possible source area constituent soil data laboratory detection limits to evaluate uncertainty in findings of the data screening and EVS modeling; and

4. Assessing the applicability of previous modeling efforts, documented in the Waste Area Grouping (WAG) 6 Remedial Investigation (RI) Report, to estimate current impacts to groundwater (DOE 1999).

The RG SSLs were back-calculated from maximum contaminant levels (MCLs) [or no action levels (NALs), if an MCL was not available] using the site-specific DAF. The DAF for the C-400 Complex OU was identified from a deterministic calculation and set at 22 (Attachment B1 to Appendix B, Dilution Attenuation Factor Evaluation).

B.2.1 METHODOLOGY

To establish which soil constituents posed the potential to impact RGA groundwater beneath the C-400 Complex OU, the following were considered.

- Groundwater impacts in the vicinity of the C-400 Complex OU, as indicated by detections in RGA groundwater samples;

- Potential for subsurface migration at levels above MCLs or risk-based values, as determined by the number of detected values and the average of detected values above the SSL in UCRS soil samples;

- Size and continuity of possible source areas, as measured by number and positioning of detections in soil samples in the UCRS; and

- Results of previous fate and transport modeling and plume characterization efforts.

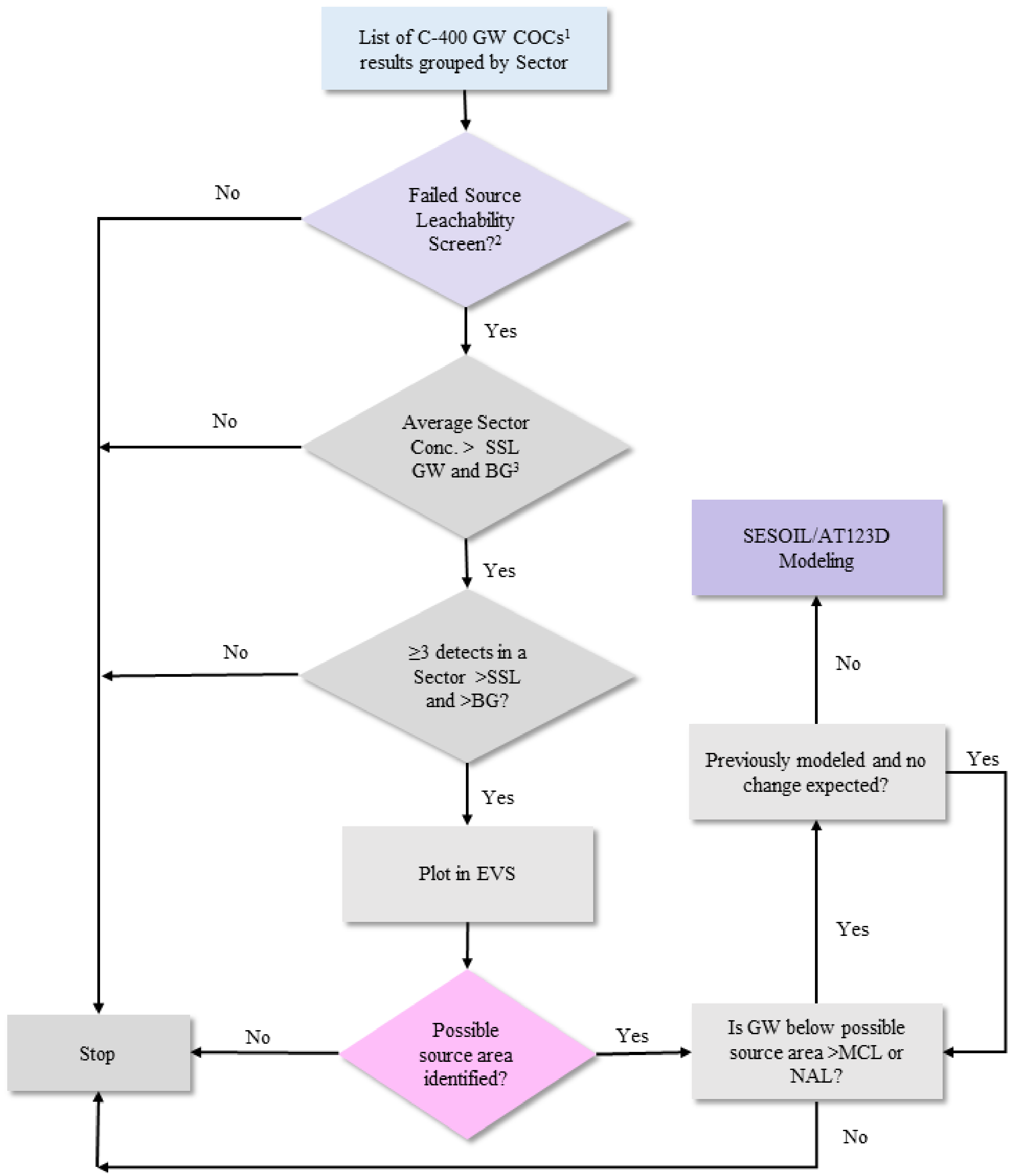
B.2.1.1 Screening Process

Only soil constituents identified in the risk assessment as C-400 groundwater COCs (both current and historical) were included in the screening process. For each sector, soil analytical results for constituents identified in the source leachability screen were compared to the RG SSL values and provisional background values (if available). The screening process is depicted in the flow chart in Figure B.1 and the steps are listed as follows:

1. The soil analytical data for the C-400 Complex OU was pre-screened against the list of 73 groundwater COCs provided by the risk assessment (Appendix C).

2. The UCRS soil data (including surface, subsurface, and deep samples), pre-screened to groundwater COCs in Step 1, were then screened by sector against the list of constituents identified for potential leachability to RGA groundwater as part of the risk assessment, (Appendix C) using a DAF of 20. Constituents were considered to fail the source leachability screen if they exceeded the DAF 20 groundwater protection screening level in any surface, subsurface, or deep soil samples (see Tables C1.18 through C1.45). For Sectors 1A to 1D, constituents failed the source leachability screen if they exceeded the DAF 20 groundwater protection screening level in any subsurface or deep samples. McNairy soil protection of groundwater screening results were not considered in this evaluation.

C-400 Complex OU RG SSLs were calculated based on the MCL or residential groundwater-use NAL and a site-specific DAF of 22.



1. RGA COCs identified from the risk assessment (Appendix C).
2. The protection of groundwater screen results are shown in Appendix C, Tables C1.18 through C1.45. If a COC failed the protection of groundwater screen (using a DAF of 20) at subsurface or deep soils for Sector 1 or for surface, subsurface, or deep soils for other sectors, it was considered to fail this source leachability screen.
3. Evaluate by sector (Sectors 1A–1D evaluated as a single sector; use all samples from ground surface to water table; site-specific SSLs; nondetected values included at one-half the reporting limit), using the results in Appendix C.

BG – background
GW – groundwater

Figure B.1. Flow Chart of UCRS Soil Screening Process

3. For each soil constituent and sector that passed screening Steps 1 and 2, the average concentration in each sector was compared to the RG SSL, and provisional background concentrations were provided in Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health, DOE/LX/07-0107&D2/R12/V1, (Risk Methods Document) (DOE 2021). The calculations included nondetects, which were replaced with half the laboratory detection limit.1 The use of half the detection limit is not always suitable for calculating more advanced statistics; however, for calculating the mean of a dataset with < 70% censoring (i.e., < 70% nondetects), it has been shown to generate an acceptably low amount of bias compared to other methods (Antweiler and Taylor 2008). For datasets with > 70% censoring, the use of one half of the detection limit for nondetects may result in a significant upward bias (i.e., + 45%), which could cause some averages to exceed the SSLs erroneously when using this method (Antweiler and Taylor 2008). Underestimation of the average using the half detection limit substitution method is unlikely. If the sector-specific average concentration of each soil constituent did not exceed the SSL and background, the constituent was screened from further evaluation in that sector.

4. For constituents that passed screening Step 4, the number of samples with values reported above the detection limit that exceeded the SSL and background concentrations was counted. If at least three sample results within a sector exceeded the SSL and background concentrations, further evaluation for possible source zones was conducted using the EVS model to view the sample results in three dimensions.

5. For all soil constituents that passed screening Step 5, the combined UCRS data set for all sectors were mapped in three dimensions using EVS modeling and the volume of soil above the RG SSL, which was estimated by kriging. If the EVS models demonstrated substantive volumes of soil above the RG SSL, indicated by a grouping of three or more distinct but adjacent sample results above the RG SSL, the zones were identified as possible source areas that could potentially impact RGA groundwater and were further evaluated as part of screening Step 7.

6. All COCs that passed screening Step 6 were comprehensively evaluated to determine whether fate and transport modeling was warranted. Elements of the evaluation included the following:

   a. Spatial distribution of the possible source area(s);
   b. Uncertainties related to characterization of the possible source area concentration below the RG SSL;
   c. Known impacts to groundwater from the C-400 Complex OU; and
   d. Previous fate and transport modeling conducted for the C-400 Complex OU.

B.2.1.2 RG SSL Determination

The RG SSLs were determined using the U.S. Environmental Protection Agency (EPA)-established formulas listed below, which are consistent with those used in the Risk Methods Document (DOE 2021). If an MCL is established for the chemical, then the RG SSLs are based on the MCL; if not, they are based on the residential NAL for groundwater use.

[1] Although EPA's ProUCL statistical software is recommended by the Risk Methods Document to determine exposure point concentrations (EPCs), the EPC calculation methodology of computing a 95% upper confidence level is not applicable to fate and transport modeling because it is designed to be fully protective of human health. Averages were computed in this case to assess leaching to groundwater and are consistent with previous modeling efforts conducted at the Paducah Site (DOE 2013).

For nonradionuclides, the RG SSL was calculated using the following formula.

$$RG\ SSL = C_w \times DAF \ \times \left(K_d + \left(\frac{\theta_w + \theta_a H'}{\rho_b} \right) \right)$$

Where:

RG SSL = project-specific RG SSL in soil (mg/kg)
C_w = target concentration in the aquifer (mg/L)
DAF = site-specific DAF (unitless)
K_d = site-specific soil-water distribution coefficient (L/kg)
θ_w = site-specific water-filled porosity (unitless)
θ_a = site-specific air-filled porosity (unitless)
H' = dimensionless Henry's law coefficient (chemical-specific)
ρ_b = site-specific dry soil bulk density (kg/L)

C_w was either the MCL (if available) or the residential NAL (Appendix C). C_w values for individual COCs are provided in Table B.1. The DAF was set to 22, as described in Attachment B1, Dilution Attenuation Factor Evaluation. K_d values (Table B.2) for each chemical were based on tabulated K_{oc} and K_d values in the Risk Assessment Information System (RAIS) online calculator and on laboratory testing of C-400 soil boring data, where available (RAIS 2022). The water-filled and air-filled porosity were set to 0.322 and 0.0189, respectively. The air-filled porosity was based on the median value for the UCRS C-400 soil samples, and the water-filled porosity was calculated by subtracting the air-filled porosity from the average overall porosity of the UCRS soil samples in the C-400 Complex OU. The dry soil bulk density was based on the average bulk density of UCRS soil samples in the C-400 Complex OU and was set to 1.8 kg/L. The source of the dimensionless Henry's law coefficient (Table B.1) was the EPA regional screening levels (RSLs) for Chemical Contaminants at Superfund Sites online tables (EPA 2022).

For radionuclides, the RG SSL was calculated using the following formula.

$$RG\ SSL = C_w \times DAF \ \times \frac{\left(K_d + \left(\frac{\theta_w}{\rho_b} \right) \right)}{1{,}000}$$

Where:

RG SSL = project-specific RG SSL in soil (pCi/g)
C_w = target concentration in the aquifer (pCi/L)
DAF = site-specific DAF (unitless)
K_d = site-specific soil-water distribution coefficient (L/kg)
θ_w = site-specific water-filled porosity (unitless)
ρ_b = site-specific dry soil bulk density (kg/L)

C_w was either the MCL (if available) or the residential NAL (Appendix C). C_w values for individual COCs are provided in Table B.3 for radionuclides. The DAF was set to 22, as described in Attachment B1 to Appendix B, Dilution Attenuation Factor Evaluation. K_d values for each chemical were based on tabulated K_{oc} and K_d values in RAIS and on laboratory testing of C-400 boring soil samples, where available (Table B.2) (RAIS 2022). The water-filled porosity (0.322) was based on C-400 soil samples, as was the dry soil bulk density (1.8 kg/L).

Table B.1. List of Chemical-specific SSL Calculation Parameters for Nonradionuclides

Chemical	Target C_w—Resident NAL[a] (mg/L)	Target C_w—MCL[a] (mg/L)	K_d[b] (L/kg)	H'[c]	NAL SSL (mg/kg)	MCL SSL (mg/kg)	Selected RG SSL (mg/kg)
Chlorobenzene	7.77E-03	1.00E-01	1.56E-01	1.27E-01	5.71E-02	7.34E-01	7.34E-01
Benzene	4.55E-04	5.00E-03	9.71E-02	2.27E-01	2.77E-03	3.05E-02	3.05E-02
Ethylbenzene	1.50E-03	7.00E-01	2.97E-01	3.22E-01	1.57E-02	7.31E+00	7.31E+00
Toluene	1.10E-01	1.00E+00	1.56E-01	2.71E-01	8.11E-01	7.38E+00	7.38E+00
Dimethylbenzene	1.93E-02	1.00E+01	2.55E-01	2.71E-01	1.84E-01	9.52E+01	9.52E+01
Total polycyclic aromatic hydrocarbons (PAHs)[d]	2.51E-05	2.00E-04	3.91E+02	1.87E-05	2.12E-01	1.69E+00	1.69E+00
Bis(2-ethylhexyl)phthalate	5.56E-03	6.00E-03	7.97E+01	1.10E-05	9.60E+00	1.04E+01	1.04E+01
Di-n-octylphthalate	2.01E-02	N/A	9.38E+01	1.05E-04	4.09E+01	N/A	4.09E+01
Naphthalene	1.17E-04	N/A	1.03E+00	1.80E-02	3.07E-03	N/A	3.07E-03
Pentachlorophenol	4.13E-05	1.00E-03	3.94E-01	1.00E-06	5.15E-04	1.25E-02	1.25E-02
Hexachlorocyclopentadiene	4.12E-05	5.00E-02	9.35E-01	1.10E+00	1.01E-03	1.22E+00	1.22E+00
N-Nitroso-di-n-propylamine	1.08E-05	N/A	1.83E-01	2.20E-04	8.55E-05	N/A	8.55E-05
p-Nitroaniline	3.78E-03	N/A	7.27E-02	5.15E-08	2.08E-02	N/A	2.08E-02
2,4-Dimethylphenol	3.55E-02	N/A	3.28E-01	3.89E-05	3.92E-01	N/A	3.92E-01
1,1,2-Trichloroethane	4.15E-05	5.00E-03	4.04E-02	3.37E-02	2.00E-04	2.41E-02	2.41E-02
1,2-Dichloroethane	1.71E-04	5.00E-03	2.64E-02	4.82E-02	7.74E-04	2.26E-02	2.26E-02
Carbon tetrachloride	4.55E-04	5.00E-03	2.92E-02	1.13E+00	2.20E-03	2.42E-02	2.42E-02
cis-1,2-Dichloroethylene	3.61E-03	7.00E-02	2.64E-02	1.67E-01	1.64E-02	3.19E-01	3.19E-01
Tetrachloroethylene	4.06E-03	5.00E-03	6.32E-02	7.24E-01	2.22E-02	2.74E-02	2.74E-02
trans-1,2-Dichloroethylene	9.29E-03	1.00E-01	2.64E-02	3.83E-01	4.28E-02	4.60E-01	4.60E-01
Trichloroethylene	2.83E-04	5.00E-03	4.04E-02	4.03E-01	1.39E-03	2.46E-02	2.46E-02
1,1-Dichloroethylene	2.85E-02	7.00E-03	2.12E-02	1.07E+00	1.33E-01	3.25E-02	3.25E-02
Chloroethane	8.34E-01	N/A	1.45E-02	4.54E-01	3.64E+00	N/A	3.64E+00
Chloroform	2.21E-04	8.00E-02	2.12E-02	1.50E-01	9.81E-04	3.55E-01	3.55E-01
Methylene chloride	1.07E-02	5.00E-03	1.45E-02	1.33E-01	4.59E-02	2.14E-02	2.14E-02
Vinyl chloride	1.88E-05	2.00E-03	1.45E-02	1.14E+00	8.50E-05	9.04E-03	9.04E-03
Bromodichloromethane	1.34E-04	8.00E-02	2.12E-02	8.67E-02	5.93E-04	3.54E-01	3.54E-01
Dibromochloromethane	8.71E-04	8.00E-02	2.12E-02	3.20E-02	3.84E-03	3.53E-01	3.53E-01
1,4-Dioxane	4.59E-04	N/A	1.75E-03	1.96E-04	1.83E-03	N/A	1.83E-03
Total polychlorinated biphenyls (PCBs)[d]	4.36E-05	5.00E-04	8.69E+01	1.16E-02	8.22E-02	9.42E-01	9.42E-01
Aluminum	2.00E+00	N/A	1.50E+03	N/A	6.49E+04	N/A	6.49E+04
Antimony	7.79E-04	6.00E-03	4.50E+01	N/A	7.62E-01	5.87E+00	5.87E+00
Arsenic	5.17E-05	1.00E-02	2.90E+01	N/A	3.26E-02	6.31E+00	6.31E+00

Table B.1. List of Chemical-specific SSL Calculation Parameters for Nonradionuclides (Continued)

Chemical	Target C_w—Resident NAL[a] (mg/L)	Target C_w—MCL[a] (mg/L)	K_d[b] (L/kg)	H'[c]	NAL SSL (mg/kg)	MCL SSL (mg/kg)	Selected RG SSL (mg/kg)
Barium	3.77E-01	2.00E+00	4.10E+01	N/A	3.36E+02	1.78E+03	1.78E+03
Beryllium	2.46E-03	4.00E-03	7.90E+02	N/A	4.21E+01	6.84E+01	6.84E+01
Cadmium	9.22E-04	5.00E-03	7.50E+01	N/A	1.50E+00	8.13E+00	8.13E+00
Chromium	3.50E-05	1.00E-01	1.02E+03	N/A	7.73E-01	2.21E+03	2.21E+03
Cobalt	6.01E-04	N/A	4.50E+01	N/A	5.88E-01	N/A	5.88E-01
Copper	7.99E-02	1.30E+00	3.50E+01	N/A	6.08E+01	9.90E+02	9.90E+02
Fluoride	7.99E-02	4.00E+00	1.50E+02	N/A	2.60E+02	1.30E+04	1.30E+04
Iron	1.40E+00	N/A	2.50E+01	N/A	7.63E+02	N/A	7.63E+02
Lead	1.50E-02	1.50E-02	9.00E+02	N/A	2.92E+02	2.92E+02	2.92E+02
Manganese	4.34E-02	N/A	6.50E+01	N/A	6.12E+01	N/A	6.12E+01
Molybdenum	9.98E-03	N/A	2.00E+01	N/A	4.36E+00	N/A	4.36E+00
Nickel	3.92E-02	N/A	6.50E+01	N/A	5.53E+01	N/A	5.53E+01
Nitrate as Nitrogen[e]	3.19E+00	1.00E+01	N/A	N/A	N/A	N/A	N/A
Nitrite as Nitrogen[e]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium	9.98E-03	5.00E-02	5.00E+00	N/A	1.12E+00	5.61E+00	5.61E+00
Silver	9.41E-03	N/A	8.30E+00	N/A	1.73E+00	N/A	1.73E+00
Strontium	1.20E+00	N/A	3.50E+01	N/A	9.14E+02	N/A	9.14E+02
Uranium	3.99E-04	3.00E-02	8.57E+02	N/A	7.40E+00	5.57E+02	5.57E+02
Vanadium	8.64E-03	N/A	1.00E+03	N/A	1.87E+02	N/A	1.87E+02
Zinc	6.00E-01	N/A	6.20E+01	N/A	8.07E+02	N/A	8.07E+02

N/A = not available/not applicable
[a] NALs and MCLs were developed in the risk assessment and are presented in Appendix C.
[b] K_d values were selected from the following sources in order of priority.
- Site-specific K_d measurements for chromium, and uranium.
- RAIS, K_d values for inorganics, and K_{oc} values for organics (RAIS 2022) multiplied by site-specific fraction of organic carbon (f_{oc}) (RAIS 2022).

[c] H' values selected from the EPA RSLs tables (EPA 2022). The tables selected were for hazard index = 0.1.
[d] Benzo[*a*]pyrene was used as a surrogate for total PAHs; Aroclor 1254 was used as a surrogate for Total PCBs.
[e] No K_d value was available for nitrate or nitrite in RAIS.

Table B.2. List of Site-specific K_d Calculation Parameters

Chemical	Site-Specific f_{oc}[a]		RAIS Values[b]		Site-Specific K_d by Hydrogeological Unit (HU) (L/kg)[c]		Selected K_d for SSL[d]
	HU1	HU2 and HU3	K_{oc} (L/Kg)	K_d (L/kg)	HU1	HU2 and HU3	
Chlorobenzene	1.26E-03	6.66E-04	2.34E+02	4.68E-01	2.94E-01	1.56E-01	1.56E-01
Benzene	1.26E-03	6.66E-04	1.46E+02	2.92E-01	1.83E-01	9.71E-02	9.71E-02
Ethylbenzene	1.26E-03	6.66E-04	4.46E+02	8.92E-01	5.60E-01	2.97E-01	2.97E-01
Toluene	1.26E-03	6.66E-04	2.34E+02	4.68E-01	2.94E-01	1.56E-01	1.56E-01
Dimethylbenzene	1.26E-03	6.66E-04	3.83E+02	7.66E-01	4.81E-01	2.55E-01	2.55E-01
Total PAHs[e]	1.26E-03	6.66E-04	5.87E+05	1.17E+03	7.37E+02	3.91E+02	3.91E+02
Bis(2-ethylhexyl)phthalate	1.26E-03	6.66E-04	1.20E+05	2.39E+02	1.50E+02	7.97E+01	7.97E+01
Di-n-octylphthalate	1.26E-03	6.66E-04	1.41E+05	2.82E+02	1.77E+02	9.38E+01	9.38E+01
Naphthalene	1.26E-03	6.66E-04	1.54E+03	3.09E+00	1.94E+00	1.03E+00	1.03E+00
Pentachlorophenol	1.26E-03	6.66E-04	5.92E+02	1.18E+00	7.43E-01	3.94E-01	3.94E-01
Hexachlorocyclopentadiene	1.26E-03	6.66E-04	1.40E+03	2.81E+00	1.76E+00	9.35E-01	9.35E-01
N-Nitroso-di-n-propylamine	1.26E-03	6.66E-04	2.75E+02	5.51E-01	3.46E-01	1.83E-01	1.83E-01
Phenol	1.26E-03	6.66E-04	1.87E+02	3.74E-01	2.35E-01	1.25E-01	1.25E-01
p-Nitroaniline	1.26E-03	6.66E-04	1.09E+02	2.18E-01	1.37E-01	7.27E-02	7.27E-02
2,4-Dimethylphenol	1.26E-03	6.66E-04	4.92E+02	9.84E-01	6.17E-01	3.28E-01	3.28E-01
1,1,2-Trichloroethane	1.26E-03	6.66E-04	6.07E+01	1.21E-01	7.62E-02	4.04E-02	4.04E-02
1,2-Dichloroethane	1.26E-03	6.66E-04	3.96E+01	7.92E-02	4.97E-02	2.64E-02	2.64E-02
1,2-Dichloroethene	1.26E-03	6.66E-04	3.96E+01	7.92E-02	4.97E-02	2.64E-02	2.64E-02
Carbon tetrachloride	1.26E-03	6.66E-04	4.39E+01	8.78E-02	5.51E-02	2.92E-02	2.92E-02
cis-1,2-Dichloroethylene	1.26E-03	6.66E-04	3.96E+01	7.92E-02	4.97E-02	2.64E-02	2.64E-02
Tetrachloroethylene	1.26E-03	6.66E-04	9.49E+01	1.90E-01	1.19E-01	6.32E-02	6.32E-02
trans-1,2-Dichloroethylene	1.26E-03	6.66E-04	3.96E+01	7.92E-02	4.97E-02	2.64E-02	2.64E-02
Trichloroethylene	1.26E-03	6.66E-04	6.07E+01	1.21E-01	7.62E-02	4.04E-02	4.04E-02
1,1-Dichloroethane	1.26E-03	6.66E-04	3.18E+01	6.36E-02	3.99E-02	2.12E-02	2.12E-02
1,1-Dichloroethylene	1.26E-03	6.66E-04	3.18E+01	6.36E-02	3.99E-02	2.12E-02	2.12E-02
Chloroethane	1.26E-03	6.66E-04	2.17E+01	4.35E-02	2.73E-02	1.45E-02	1.45E-02
Chloroform	1.26E-03	6.66E-04	3.18E+01	6.36E-02	3.99E-02	2.12E-02	2.12E-02
Methylene chloride	1.26E-03	6.66E-04	2.17E+01	4.35E-02	2.73E-02	1.45E-02	1.45E-02
Vinyl chloride	1.26E-03	6.66E-04	2.17E+01	4.35E-02	2.73E-02	1.45E-02	1.45E-02
Bromodichloromethane	1.26E-03	6.66E-04	3.18E+01	6.36E-02	3.99E-02	2.12E-02	2.12E-02
Dibromochloromethane	1.26E-03	6.66E-04	3.18E+01	6.36E-02	3.99E-02	2.12E-02	2.12E-02
1,4-Dioxane	1.26E-03	6.66E-04	2.63E+00	5.27E-03	3.30E-03	1.75E-03	1.75E-03
Chloroethane	1.26E-03	6.66E-04	2.17E+01	4.35E-02	2.73E-02	1.45E-02	1.45E-02

Table B.2. List of Site-specific K_d Calculation Parameters (Continued)

Chemical	Site-Specific f_{oc}[a]		RAIS Values[b]		Site-Specific K_d by HU (L/kg)[c]		Selected K_d for SSL[d]
	HU1	HU2 and HU3	K_{oc} (L/Kg)	K_d (L/kg)	HU1	HU2 and HU3	
PCBs[e]	1.26E-03	6.66E-04	1.31E+05	2.61E+02	1.64E+02	8.69E+01	8.69E+01
Actinium-228	1.26E-03	6.66E-04	N/A	1.70E+03	N/A	N/A	1.70E+03
Aluminum	1.26E-03	6.66E-04	N/A	1.50E+03	N/A	N/A	1.50E+03
Americium-241	1.26E-03	6.66E-04	N/A	4.00E+00	N/A	N/A	4.00E+00
Antimony	1.26E-03	6.66E-04	N/A	4.50E+01	N/A	N/A	4.50E+01
Arsenic	1.26E-03	6.66E-04	N/A	2.90E+01	N/A	N/A	2.90E+01
Barium	1.26E-03	6.66E-04	N/A	4.10E+01	N/A	N/A	4.10E+01
Beryllium	1.26E-03	6.66E-04	N/A	7.90E+02	N/A	N/A	7.90E+02
Cadmium	1.26E-03	6.66E-04	N/A	7.50E+01	N/A	N/A	7.50E+01
Cesium-137	1.26E-03	6.66E-04	N/A	1.20E+03	N/A	N/A	1.20E+03
Chromium	1.26E-03	6.66E-04	N/A	8.50E+02	1.02E+03	8.48E+03	1.02E+03
Cobalt	1.26E-03	6.66E-04	N/A	4.50E+01	N/A	N/A	4.50E+01
Copper	1.26E-03	6.66E-04	N/A	3.50E+01	N/A	N/A	3.50E+01
Fluoride	1.26E-03	6.66E-04	N/A	1.50E+02	N/A	N/A	1.50E+02
Iron	1.26E-03	6.66E-04	N/A	2.50E+01	N/A	N/A	2.50E+01
Lead	1.26E-03	6.66E-04	N/A	9.00E+02	N/A	N/A	9.00E+02
Lead-210	1.26E-03	6.66E-04	N/A	1.50E+02	N/A	N/A	1.50E+02
Lead-212	1.26E-03	6.66E-04	N/A	1.50E+02	N/A	N/A	1.50E+02
Manganese	1.26E-03	6.66E-04	N/A	6.50E+01	N/A	N/A	6.50E+01
Molybdenum	1.26E-03	6.66E-04	N/A	2.00E+01	N/A	N/A	2.00E+01
Neptunium-237	1.26E-03	6.66E-04	N/A	2.00E-01	N/A	N/A	2.00E-01
Nickel	1.26E-03	6.66E-04	N/A	6.50E+01	N/A	N/A	6.50E+01
Nitrate as Nitrogen[f]	1.26E-03	6.66E-04	N/A	N/A	N/A	N/A	N/A
Nitrite as Nitrogen[f]	1.26E-03	6.66E-04	N/A	N/A	N/A	N/A	N/A
Plutonium-239	1.26E-03	6.66E-04	N/A	5.00E+00	N/A	N/A	5.00E+00
Potassium-40	1.26E-03	6.66E-04	N/A	1.30E+01	N/A	N/A	1.30E+01
Radium-226	1.26E-03	6.66E-04	N/A	1.00E+00	N/A	N/A	1.00E+00
Radon-222[f]	1.26E-03	6.66E-04	N/A	N/A	N/A	N/A	N/A
Selenium	1.26E-03	6.66E-04	N/A	5.00E+00	N/A	N/A	5.00E+00
Silver	1.26E-03	6.66E-04	N/A	8.30E+00	N/A	N/A	8.30E+00
Strontium	1.26E-03	6.66E-04	N/A	3.50E+01	N/A	N/A	3.50E+01
Technetium-99	1.26E-03	6.66E-04	N/A	N/A	2.40E+00	1.69E+00	1.69E+00
Thorium-228	1.26E-03	6.66E-04	N/A	2.00E+01	N/A	N/A	2.00E+01

Table B.2. List of Site-specific K_d Calculation Parameters (Continued)

Chemical	Site-Specific f_{oc}[a]		RAIS Values[b]		Site-Specific K_d by HU (L/kg)[c]		Selected K_d for SSL[d]
	HU1	HU2 and HU3	K_{oc} (L/Kg)	K_d (L/kg)	HU1	HU2 and HU3	
Thorium-230	1.26E-03	6.66E-04	N/A	2.00E+01	N/A	N/A	2.00E+01
Thorium-234	1.26E-03	6.66E-04	N/A	2.00E+01	N/A	N/A	2.00E+01
Uranium	1.26E-03	6.66E-04	N/A	4.50E+02	8.57E+02	8.57E+02	8.57E+02
Uranium-233/234	1.26E-03	6.66E-04	N/A	4.00E-01	N/A	N/A	4.00E-01
Uranium-234	1.26E-03	6.66E-04	N/A	4.00E-01	N/A	N/A	4.00E-01
Uranium-235	1.26E-03	6.66E-04	N/A	4.00E-01	N/A	N/A	4.00E-01
Uranium-235/236	1.26E-03	6.66E-04	N/A	4.00E-01	N/A	N/A	4.00E-01
Uranium-238	1.26E-03	6.66E-04	N/A	4.00E-01	N/A	N/A	4.00E-01
Vanadium	1.26E-03	6.66E-04	N/A	1.00E+03	N/A	N/A	1.00E+03
Zinc	1.26E-03	6.66E-04	N/A	6.20E+01	N/A	N/A	6.20E+01

N/A = not available/not applicable

[a] f_{oc} = Fraction of organic carbon, determined by taking the median f_{oc} values measured in C-400 soil borings over the selected HUs within the UCRS. HU2 and HU3 were grouped together to calculate the median because their distributions were not significantly different ($p > 0.05$, nonparametric analysis of variance on ranks followed by Dunn's post-hoc test).

[b] K_d values from RAIS are calculated for organic chemicals using an f_{oc} of 0.002.

[c] K_d is calculated for organic chemicals using site-specific $f_{oc,}$ the K_{oc} value from RAIS and the formula f_{oc} x K_{oc}.

[d] K_d values were selected for the SSL by using the minimum of the site-specific K_d value across HU1, 2, and 3 if available or the K_d from RAIS if no site-specific K_d was available. The minimum K_d across the UCRS was selected to be protective during the groundwater leachability screening process, with the understanding that variations of K_d across HUs with depth would be captured in subsequent SESOIL modeling if warranted.

[e] Benzo[*a*]pyrene was used as a surrogate for Total PAHs; Aroclor 1254 was used as a surrogate for Total PCBs.

[f] Nitrate, nitrite, and radon-222 did not have K_d values available on RAIS.

Table B.3. List of Chemical-specific SSL Calculation Parameters for Radionuclides

Radionuclide	Target C_w[a] —Resident NAL (pCi/L)	Target C_w[a] —MCL (pCi/L)	K_d[b] (L/kg)	NAL SSL (pCi/g)	MCL SSL (pCi/g)	Selected RG SSL (pCi/g)
Actinium-228	2.77E+01	N/A	1.70E+03[b1]	1.02E+03	N/A	1.02E+03
Americium-241	5.04E-01	1.50E+01	1.90E+03[b2]	2.07E+01	6.17E+02	6.17E+02
Cesium-137+D	1.71E+00	2.00E+02	2.80E+02[b2]	1.04E+01	1.21E+03	1.21E+03
Lead-210	5.91E-02	N/A	1.50E+02[b1]	1.92E-01	N/A	1.92E-01
Lead-212	2.08E+00	N/A	1.50E+02[b1]	6.76E+00	N/A	6.76E+00
Neptunium-237+D	7.63E-01	1.50E+01	7.00E+01[b2]	1.16E+00	2.28E+01	2.28E+01
Plutonium-239	3.87E-01	1.50E+01	5.50E+02[b2]	4.61E+00	1.79E+02	1.79E+02
Potassium-40	2.12E+00	N/A	1.30E+01[b1]	6.05E-01	N/A	6.05E-01
Radium-226	1.36E-01	5.00E+00	1.00E+00[b1]	3.48E-03	1.28E-01	1.28E-01
Radon-222	N/A	N/A	N/A[b1]	N/A	N/A	N/A
Technetium-99	1.90E+01	9.00E+02	1.65E+00[b3]	7.53E-01	3.57E+01	3.57E+01
Thorium-228	4.85E-01	N/A	3.20E+03[b2]	3.36E+01	N/A	3.36E+01
Thorium-230	5.72E-01	1.50E+01	3.20E+03[b2]	3.96E+01	1.04E+03	1.04E+03
Thorium-234	2.26E+00	N/A	3.20E+03[b2]	1.56E+02	N/A	1.56E+02
Uranium-233/234	7.39E-01	1.02E+01	8.57E+02[b1]	1.37E+01	1.90E+02	1.90E+02
Uranium-234	7.39E-01	1.02E+01	8.57E+02[b1]	1.37E+01	1.90E+02	1.90E+02
Uranium-235+D	7.28E-01	4.66E-01	8.57E+02[b1]	1.35E+01	8.65E+00	8.65E+00
Uranium-235/236	7.28E-01	4.66E-01	8.57E+02[b1]	1.35E+01	8.65E+00	8.65E+00
Uranium-238+D	6.01E-01	9.99E+00	8.57E+02[b1]	1.11E+01	1.85E+02	1.85E+02

N/A = not available/not applicable
[a] NALs and MCLs were selected as part of the risk assessment and are presented in Appendix C.
[b] The K_d values for radionuclides were selected from multiple sources based on the following priorities:
[1] Site-specific K_d measurements (only available for technetium-99 and uranium).
[2] The 2021 Risk Methods Document (page A-58) suggested K_d values for radionuclides.
[3] K_d values from the RAIS (RAIS 2022).

B.2.2 UCRS SOIL SCREENING

This section describes the results of the C-400 UCRS soil analytical data screening.

B.2.2.1 Soil Contaminant Screening

The first screening step, as outlined in Section B2.1.1 above, was to compare the list of analytes measured in C-400 UCRS soil samples with the list of 73 RGA groundwater COCs identified for the C-400 Complex OU. This comparison revealed the following nine RGA groundwater COCs for which there were no soil analytical data available.

- nitrate as nitrogen
- nitrite as nitrogen
- strontium
- actinium-228
- lead-212
- plutonium-239
- potassium-40

- radon-222
- thorium-234

These nine chemicals were excluded from screening, leaving 64 RGA groundwater COCs for sector-based screening—60 individual chemicals and 4 grouped chemicals (Total PCBs, Total PAHs, uranium-233/234, and uranium-235/236). This list of COCs that were measured in the UCRS with RG SSL and provisional background values is presented in Table B.4.

Table B.4. C-400 Soil Screening Levels for COCs Evaluated for Leachability

Chemical	Units	RG SSL[a]	Provisional Background[a]
Metals			
Arsenic	mg/kg	6.31E+00	7.90E+00
Chromium	mg/kg	2.21E+03	4.30E+01
Lead	mg/kg	2.92E+02	2.30E+01
Uranium	mg/kg	5.57E+02	4.60E+00
Aluminum	mg/kg	6.49E+04	1.20E+04
Antimony	mg/kg	5.87E+00	2.10E-01
Barium	mg/kg	1.78E+03	1.70E+02
Beryllium	mg/kg	6.84E+01	6.90E-01
Cadmium	mg/kg	8.13E+00	2.10E-01
Cobalt	mg/kg	5.88E-01	1.30E+01
Copper	mg/kg	9.90E+02	2.50E+01
Fluoride	mg/kg	1.30E+04	N/A
Iron	mg/kg	7.63E+02	2.80E+04
Manganese	mg/kg	6.12E+01	8.20E+02
Molybdenum	mg/kg	4.36E+00	N/A
Nickel	mg/kg	5.53E+01	2.20E+01
Selenium	mg/kg	5.61E+00	7.00E-01
Silver	mg/kg	1.73E+00	2.70E+00
Vanadium	mg/kg	1.87E+02	3.70E+01
Zinc	mg/kg	8.07E+02	6.00E+01
Radionuclides			
Cesium-137	pCi/g	1.21E+03	2.80E-01
Neptunium-237	pCi/g	2.28E+01	1.00E-01
Technetium-99	pCi/g	3.57E+01	2.80E+00
Uranium-233/234	pCi/g	1.90E+02	1.20E+00
Uranium-235/236	pCi/g	8.65E+00	6.00E-02
Uranium-238	pCi/g	1.85E+02	1.20E+00
Americium-241	pCi/g	6.17E+02	N/A
Lead-210	pCi/g	1.92E-01	N/A
Radium-226	pCi/g	1.28E-01	1.50E+00
Thorium-228	pCi/g	3.36E+01	N/A
Thorium-230	pCi/g	1.04E+03	1.40E+00
Uranium-234	pCi/g	1.90E+02	1.20E+00
Uranium-235	pCi/g	8.65E+00	6.00E-02
Plutonium-239/240	pCi/g	1.79E+02	2.50E-02
Organics (PCBs)			
Total PCBs[b]	µg/kg	9.42E+02	N/A
Organics (Semivolatile)			
Total PAHs[c]	mg/kg	1.69E+00	N/A
Bis(2-ethylhexyl)phthalate	µg/kg	1.04E+04	N/A
Di-n-octylphthalate	µg/kg	4.09E+04	N/A

Table B.4. C-400 Soil Screening Levels for COCs Evaluated for Leachability (Continued)

Chemical	Units	RG SSL[a]	Provisional Background[a]
Naphthalene	µg/kg	3.07E+00	N/A
Pentachlorophenol	µg/kg	1.25E+01	N/A
Hexachlorocyclopentadiene	µg/kg	1.22E+03	N/A
N-Nitroso-di-n-propylamine	µg/kg	8.55E-02	N/A
p-Nitroaniline	µg/kg	2.08E+01	N/A
2,4-Dimethylphenol	µg/kg	3.92E+02	N/A
Organics (Volatile)			
1,2-Dichloroethane	µg/kg	2.26E+01	N/A
Trichloroethene (TCE)	µg/kg	2.46E+01	N/A
Vinyl chloride	µg/kg	9.04E+00	N/A
cis-1,2-Dichloroethene	µg/kg	3.19E+02	N/A
trans-1,2-Dichloroethene	µg/kg	4.60E+02	N/A
1,1-Dichloroethene	µg/kg	3.25E+01	N/A
Chlorobenzene	µg/kg	7.34E+02	N/A
Benzene	µg/kg	3.05E+01	N/A
Ethylbenzene	µg/kg	7.31E+03	N/A
Toluene	µg/kg	7.38E+03	N/A
1,2-Dimethylbenzene	µg/kg	9.52E+04	N/A
1,1,2-Trichloroethane	µg/kg	2.41E+01	N/A
Carbon tetrachloride	µg/kg	2.42E+01	N/A
Tetrachloroethene	µg/kg	2.74E+01	N/A
Chloroethane	µg/kg	3.64E+03	N/A
Chloroform	µg/kg	3.55E+02	N/A
Methylene chloride	µg/kg	2.14E+01	N/A
Bromodichloromethane	µg/kg	3.54E+02	N/A
Dibromochloromethane	µg/kg	3.53E+02	N/A
1,4-Dioxane	µg/kg	1.83E+00	N/A

N/A = not available or not applicable; not used in this screening.
[a] Site-specific SSL calculated using the MCL for C_w if available or the resident NAL if not. MCLs and resident NALs are from Appendix C. The provisional background is also available in these tables.
[b] Aroclor 1254 was used as a surrogate for Total PCBs because it was, historically, the dominant aroclor detected at C-400.
[c] Benzo[a]pyrene was used as a surrogate for Total PAHS per the Risk Methods Document (DOE 2021).

For the next step of sector-based screening (source leachability screen), soil COCs that were not identified as potentially leachable source material in the risk assessment sector-specific groundwater protection screening (Appendix C) were screened out from consideration for modeling. Then, the average concentration for each remaining COC for each remaining sector was compared to the SSL and provisional background values.

The average values of the soil constituents for each sector were calculated using both detected values and nondetect values, with nondetect values set to half the laboratory method detection limit. If the average value of the soil constituent for the sector was above the background value and the RG SSL, then the soil constituent was retained for further investigation of potential source areas.

B.2.2.2 Screening for Possible Source Areas

If the sector average for a COC was found to be above both the SSL and provisional background, then the number of detects exceeding the SSL and the number of detects exceeding the provisional background were counted for each sector. If the average soil constituent concentration was found to be above both the background value and the RG SSL, and at least three detects in a sector were above both the background and the SSL, then the soil constituent was subsequently evaluated by examining the spatial distribution of soil analytical results in three dimensions using EVS modeling. The results of previous modeling efforts reported in the WAG 6 RI and the Soils OU were also taken into account when deciding whether further fate and transport modeling was necessary (DOE 1999, DOE 2011).

Soil screening was conducted using the EVS database, which is different from the database used for the risk assessment screening tables in Section 4 because the EVS database is tailored for spatial modeling of soil contaminants. The following are some key differences of the EVS database.

- Only soil samples were included (no concrete cores).

- Samples from the top 60 ft below ground surface are included, regardless of which HU they were collected from. This was done to exclude samples below the approximate depth of the water table.

- Grid samples (sample ID ending in "G##," where ## is a number) were included.

Because of these differences, sample counts in the screening tables in this section are different than those in Section 4 and Appendix C. The analyses in this section are intended as a complement to those in Section 4 but do not compare directly because the objectives of the two analyses are different (screening risk evaluation vs. soil leachate screening).

A total of 17 sector and soil constituent combinations were identified where the overall average concentration of a soil constituent exceeds both the respective SSL and the background level and where there is at least one sector that had three soil samples above both the SSL and the background level (Table B.5). A complete listing of the screening results is provided in Attachment B2.

The following COCs were identified in the possible source areas screening.

- 1,4-dioxane—2 sectors exceeded
- TCE—6 sectors exceeded
- vinyl chloride—2 sectors exceeded
- naphthalene—4 sectors exceeded
- technetium-99—3 sectors exceeded

B.2.3 EVS MODELING

The COCs retained in the screening process, with the exception of TCE and vinyl chloride, were further evaluated by modeling the spatial distribution of UCRS COCs using EVS modeling, along with consideration of previous plume mapping and fate and transport modeling efforts in the WAG 6 RI and Soils OU RI (DOE 1999, DOE 2011).

Two of the COCs retained from the screening process, TCE and technetium-99, have been delineated in the RGA as part of the sitewide plume evaluation (FRNP 2021). A review of these plumes indicates that the principal source(s) of both TCE and technetium-99 at the Paducah Gaseous Diffusion Plant (PGDP) originate at the C-400 Complex OU. The highest concentration portions of these plumes are co-located and migrate through the RGA from the C-400 Complex OU toward the northwest corner of the Paducah Site controlled access area.

Three of the COCs retained from the screening process (technetium-99, TCE, vinyl chloride) were modeled previously as part of the WAG 6 RI (DOE 1999). TCE was subsequently modeled as part of the Soils OU

Table B.5. Sector Soil Constituent Combinations Identified for EVS Modeling

Sector	Analyte	Units	Nondetect Range (Min—Max)		Max Detected Value	Average Concentration	Fraction of Detects	RG SSL	Background	Fraction of SSL Exceedances	Fraction of Background Exceedances
S02	1,4-Dioxane	µg/kg	4.41E+01	4.04E+02	5.52E+01	3.80E+01	6/88	1.83E+00	N/A	6/88	N/A
S1C	1,4-Dioxane	µg/kg	4.37E+01	4.13E+02	1.33E+02	3.59E+01	3/87	1.83E+00	N/A	3/87	N/A
S04	Naphthalene	µg/kg	4.30E+00	5.00E+02	3.67E+02	3.44E+01	7/251	3.07E+00	N/A	7/251	N/A
S05	Naphthalene	µg/kg	3.41E+01	5.00E+02	1.53E+02	9.15E+01	6/153	3.07E+00	N/A	6/153	N/A
S07	Naphthalene	µg/kg	3.46E+01	4.15E+02	1.40E+02	4.29E+01	3/70	3.07E+00	N/A	3/70	N/A
S1B	Naphthalene	µg/kg	3.47E+01	4.39E+01	3.13E+01	1.96E+01	3/88	3.07E+00	N/A	3/88	N/A
S06	Technetium-99	pCi/g	-2.04E+00	3.42E+00	1.61E+03	5.25E+01	25/61	3.65E+01	2.80E+00	8/61	25/61
S1A	Technetium-99	pCi/g	-1.71E+00	2.84E+00	8.56E+02	9.98E+01	6/27	3.65E+01	2.80E+00	4/27	6/27
S1C	Technetium-99	pCi/g	-2.55E+00	2.27E+00	1.39E+03	9.01E+01	44/84	3.65E+01	2.80E+00	25/84	44/84
S03	TCE	µg/kg	9.58E-01	1.07E+02	3.01E+03	1.33E+02	39/50	2.46E+01	N/A	16/50	N/A
S04	TCE	µg/kg	4.40E-01	3.60E+02	5.62E+06	1.68E+04	556/694	2.46E+01	N/A	350/694	N/A
S05	TCE	µg/kg	8.84E-01	1.11E+02	1.44E+05	1.17E+03	62/162	2.46E+01	N/A	31/162	N/A
S1A	TCE	µg/kg	1.18E+00	1.46E+02	2.05E+03	2.36E+02	21/28	2.46E+01	N/A	9/28	N/A
S1B	TCE	µg/kg	9.03E-01	1.18E+02	5.54E+03	2.18E+02	70/88	2.46E+01	N/A	35/88	N/A
S1D	TCE	µg/kg	8.42E-01	1.89E+00	9.47E+02	3.89E+01	30/53	2.46E+01	N/A	6/53	N/A
S04	Vinyl chloride	µg/kg	4.60E-01	5.20E+03	5.63E+02	5.49E+01	27/679	9.04E+00	N/A	9/679	N/A
S05	Vinyl chloride	µg/kg	8.70E-01	2.24E+03	4.79E+02	1.57E+01	9/162	9.04E+00	N/A	4/162	N/A

N/A = no background value available for this chemical

RI (DOE 2011). The results of these modeling efforts are discussed as part of the evaluations below for each individual COC.

B.2.3.1 Technetium-99

Technetium-99 exceedances estimated through EVS modeling were concentrated mostly in the center of the C-400 building footprint (Figure B.2). A review of the high fraction of exceedances for technetium-99 in Sector 1C confirms the presence of a soil source of technetium-99 below the C-400 Complex OU (Table B.5). The impacts of this UCRS source to RGA groundwater are documented in the sitewide plume evaluation and mapping, which show that the existing technetium-99 plume at the site originates beneath the C-400 Complex OU (FRNP 2021). Modeling was previously conducted for the WAG 6 RI for Sectors 5, 6, and 7; however, it did not include the impacts below Sector 1 (DOE 1999). Furthermore, the "Technical Memorandum—Groundwater Plume Analytics™ Services Including a Ricker Method® Plume Stability Analysis and Well Sufficiency Analysis™ Paducah Gaseous Diffusion Plant, Paducah, Kentucky" determined the technetium-99 mass and average technetium-99 concentration were all decreasing in the technetium-99 plume (EarthCon 2017). Consequently, fate and transport modeling for assessing current or future levels of contaminant exposure originating from the C-400 Complex OU is not needed for decision-making in a future FS.

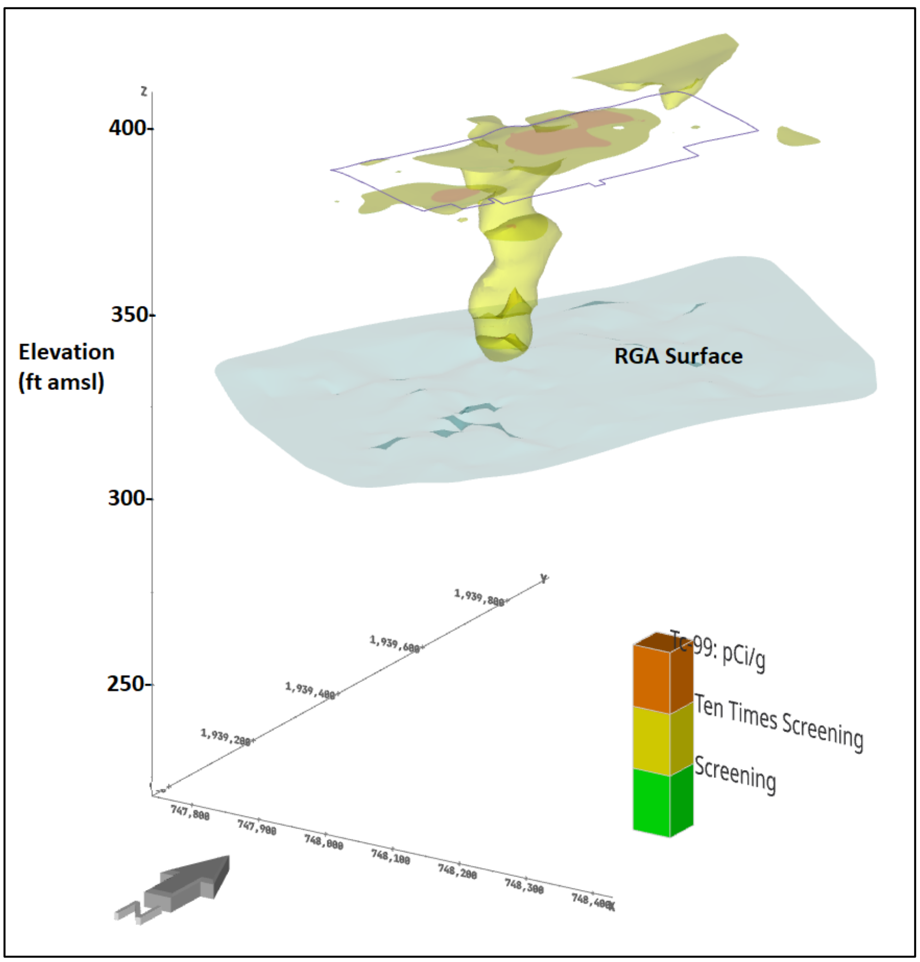


Figure B.2. Estimated Extent of Soil Contamination above the SSL for Technetium-99

B.2.3.2 TCE and Vinyl Chloride

Similar to technetium-99, the fraction of exceedances of the SSL for TCE confirms soil sources of TCE at the C-400 Complex OU, with the largest fraction of exceedance for Sector 4. The impacts of this UCRS source to RGA groundwater is documented in the sitewide plume evaluation and mapping, which shows the existing TCE plume at the site originates beneath the C-400 Complex OU (FRNP 2021). Modeling for assessing current or future levels of contaminant exposure originating from the C-400 Complex is not needed for decision-making in a future FS for the following reasons.

- Modeling for TCE was previously conducted for the WAG 6 RI for Sectors 3–7 using concentrations generally representative of current conditions (DOE 1999). The predicted time to reach maximum concentrations at the U.S. Department of Energy (DOE) property boundary was approximately 96–112 years. In the Soils OU RI, TCE modeling was conducted for the C-400 Technetium Storage Tank Area (SWMU 47), which represents only a small fraction of the soils at the C-400 Complex OU; the estimated time to reach maximum predicted groundwater concentration at the DOE property boundary was approximately 31 years (DOE 2011).

- The TCE plume is fully delineated and long-term monitoring of TCE indicates the TCE plume is stable and has been fully developed for decades (FRNP 2021).

Vinyl chloride was also excluded from modeling because it is a degradation breakdown product of TCE and is, therefore, co-located with the TCE plume. Furthermore, high detection limits (up to 575 times the SSL) for vinyl chloride were observed in sectors with high TCE contamination. This indicates that the comingled TCE/vinyl chloride contamination resulted in high detection limits for vinyl chloride due to dilution in samples with high TCE detects, precluding accurate delineation of vinyl chloride down to the SSL in TCE source areas. This was also the case in groundwater, with all vinyl chloride detection limits exceeding the residential groundwater NAL and with a detection frequency in groundwater of 3.5% (29 detects in 833 samples). Vinyl chloride was modeled for the WAG 6 RI, and the estimated time to reach maximum concentration at the DOE property boundary was approximately 61 years (DOE 1999).

B.2.3.3 1,4-Dioxane

Detection limits for 1,4-dioxane are 22–4,100 times higher than the SSL, causing exceedances in the screening process due to nondetects. The highest rate of detects per sector for 1,4-dioxane is 6.8% (6 detects in 88 samples in the EVS database) in Sector 2. Because of the low fraction of detects and high detection limits, in addition to the spatially discrete nature of detects (Figure B.3), no 1,4-dioxane source areas could be delineated. Furthermore, the detection limit of 1,4-dioxane in groundwater was higher than the groundwater residential NAL, and the detection rate in groundwater in the RGA was 1 detection out of 191 samples—or 0.05%. Because of these factors, the presence of 1,4-dioxane in soils and groundwater at concentrations above the screening levels could not be fully assessed, and no possible source areas in soil could be quantitatively established; therefore, 1,4-dioxane was not modeled.

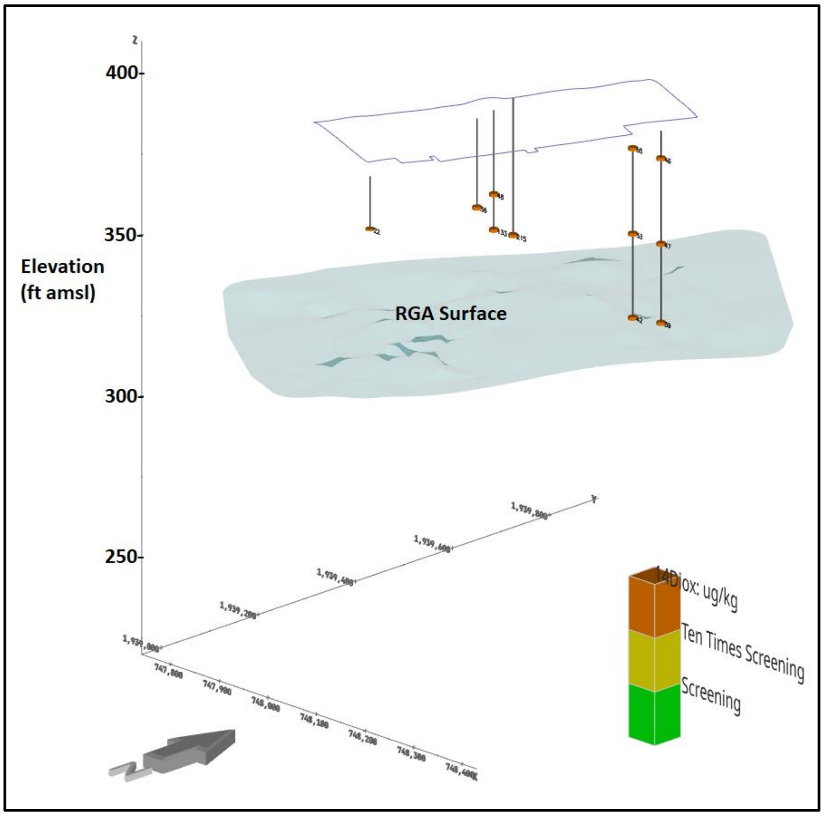


Figure B.3. Location of Soil Samples with Detected Concentrations of 1,4-dioxane

B.2.3.4 Naphthalene

Detection limits for naphthalene are 1.4–47 times higher than the SSL, causing exceedances in the screening process that are due to nondetects. The highest rate of detects per sector for naphthalene is 4.3% (3 detects in 70 samples in the EVS database) in Sector 7. Because of the low fraction of detects and high detection limits, in addition to the spatially discrete nature of detects (Figure B.4), no naphthalene source areas could be delineated. Furthermore, naphthalene detection limits in groundwater were higher than the groundwater residential NAL, and the detection rate in groundwater was 0 detections out of 256 samples—0%. Naphthalene is not a current groundwater COC but was initially included because it is a historical groundwater COC; however, based on the current evidence, naphthalene does not appear to be a threat to groundwater at the C-400 Complex OU and was not modeled.

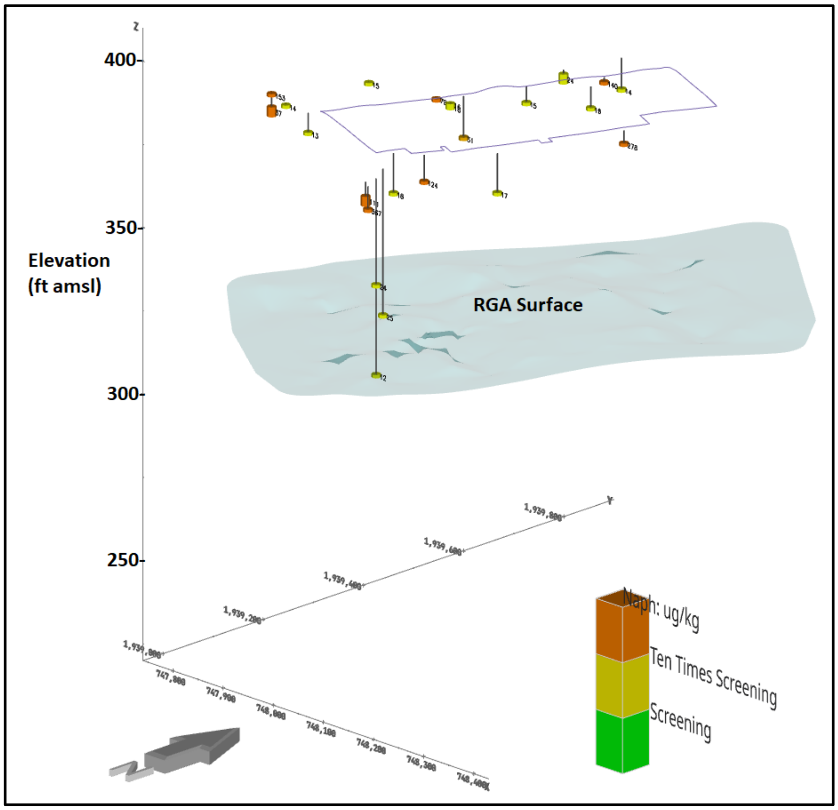


Figure B.4. Location of Soil Samples with Detected Concentrations of Naphthalene

B.2.4 SUMMARY OF SCREENING RESULTS

Screening was applied to current and historical groundwater COCs at the C-400 Complex OU area to evaluate which COCs were likely to result in impacts to groundwater in the RGA. Five distinct COCs were identified based on this screening process; however, further evaluation of the data determined that none of the identified COCs required further fate and transport modeling.

Two compounds, naphthalene and 1,4-dioxane, did not require modeling because they screened through due to detection limits above the screening levels. The low frequency of detects for both compounds resulted in no possible source areas being identified for either COC and, therefore, they were not modeled.

Technetium-99, TCE, and vinyl chloride were not modeled because they represent stable soil sources with no change in plume characteristics, which have been previously modeled as part of the WAG 6 RI (DOE 1999).

B.3 MODFLOW PUMP-AND-TREAT ALTERNATIVE MODELING

Modeling was performed to simulate groundwater flow conditions in the RGA to support assessment of a pump-and-treat remedial scenario for the C-400 Complex OU at PGDP. The objective of this modeling effort was to demonstrate hydraulic capture under the pump-and-treat remediation scenario and estimate design extraction rates. This groundwater flow modeling was developed from the framework used in the *2016 Update of the Paducah Gaseous Diffusion Plant Sitewide Groundwater Flow Model*, DOE/LX/07-2415&D2 (DOE 2017).[2]

B.3.1 TECHNICAL APPROACH

The 2016 Sitewide Groundwater Flow Model framework served as a basis to simulate current site conditions for use in estimating groundwater flow conditions under potential future remedial scenarios. The 2016 modeling was conducted using MODFLOW 2005, a widely used and accepted finite-difference code developed by the U.S. Geological Survey (USGS) (Harbaugh 2005). The 2016 model domain extended from the Terrace Deposits south of the site to the Ohio River north of the site. The model consisted of three layers, representing the RGA with a variable hydraulic conductivity field calibrated using pilot points. Consistent with the conceptual site model (CSM), the Ohio River and the lower reaches of Bayou Creek and Little Bayou Creek were in direct communication with the RGA and acted as discharge boundaries. These surface water bodies were represented in the model with river boundary conditions. The model was calibrated to two stress periods: December 1997 prior to implementation of groundwater extraction systems, and September 2014 during active groundwater extraction in the Northeast Plume and Northwest Plume.

Model limitations of the 2016 Sitewide Groundwater Flow Model are summarized in the model update report and include its formulation and calibration as a steady-state model, its regional scale, and its limited domain, which does not include portions of the site south of the RGA (DOE 2017). More specific limitations are summarized in Section 7.2 of the 2016 Sitewide Groundwater Flow Model update report (DOE 2017).

As configured, the 2016 model provided a representation of the groundwater flow system within the PGDP Hydrologic Basin for steady-state conditions, which typically occur during the drier months of the year (July–October). During wetter months of the year, the steady-state model is a less valid representation of site conditions, due primarily to transient conditions caused by more variable Ohio River stages.

The following updates and revisions to the 2016 model input were implemented for this evaluation.

- Heads in the Ohio River and lower reaches of Bayou Creek and Little Bayou Creek were adjusted to reflect average steady-state Ohio River levels measured since the completion of the Olmsted Dam in 2018;

- Northeast Plume and Northwest Plume extraction well flow rates were set to zero to evaluate the effectiveness of potential remedial alternatives at the C-400 Complex OU in the absence of other remediation at the site;

- Ambient recharge rates from precipitation were adjusted to simulate conditions during both seasonally dry and seasonally wet periods; and

- A new recharge zone was added to simulate recharge over the soil cap that may potentially be included at the C-400 Complex in a pump-and-treat remedial alternative.

[2] Although EPA has not concurred on the use of the updated model and the model report identifies several uncertainties, the 2016 groundwater flow model best represents the current site conditions and understanding of groundwater flow at PGDP (DOE 2017). The framework from the 2016 model update is used for near-field assessment (inside the C-400 Complex OU) where the model uncertainties have lower potential impact on the modeling results; far-field assessment is performed qualitatively.

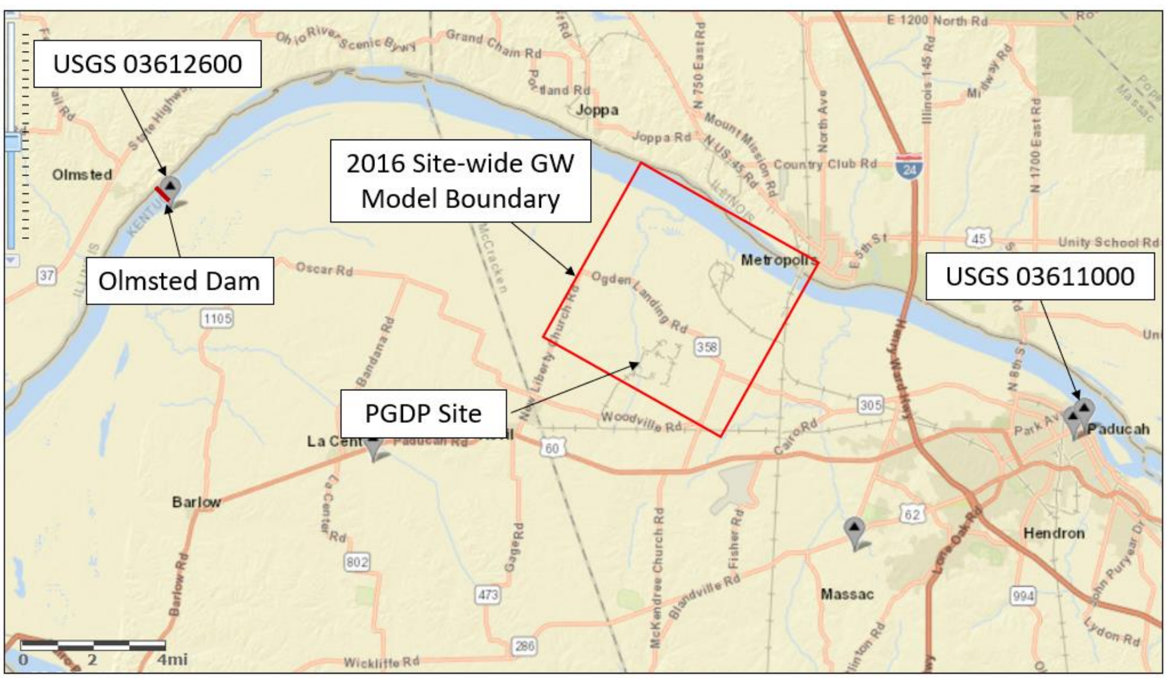
In addition, particles to evaluate groundwater capture by a potential pump-and-treat scenario were added to calculate flow paths using MODPATH, a particle tracking post-processing package for MODFLOW (Pollock 1994).

The 2016 Sitewide Groundwater Flow Model boundary conditions (i.e., Ohio River stage elevation and recharge) were evaluated to determine appropriate adjustments for simulating average groundwater flow conditions following dam construction. The 2016 Sitewide Groundwater Flow Model with revisions was used to simulate average conditions during seasonally dry and seasonally wet periods and to evaluate groundwater capture and pumping rates for a pump-and-treat remedial scenario. Groundwater flow modeling was performed using MODFLOW 2005, a widely used and accepted finite-difference code developed by the USGS (Harbaugh 2005). To evaluate groundwater capture, pathlines were evaluated using MODPATH.

B.3.2 DATA ANALYSIS

B.3.2.1 Ohio River Stage

The USGS maintains two Ohio River gauging stations in the vicinity of PGDP: the Ohio River at Paducah, Kentucky (Paducah Station, USGS 03611000) located approximately 8 miles east of the 2016 Sitewide Groundwater Flow Model domain, and the Ohio River at Olmsted, IL (Olmsted Station, USGS 03612600) located approximately 14 miles west of the model domain. The Olmsted Dam is also located approximately 14 miles downstream of the model domain—just downstream of the Olmsted Station (Figure B.5). To evaluate the Ohio River stage post-dam construction, data recorded at the Paducah Station and the Olmsted Station were reviewed. River elevation data for the Olmsted and Paducah Stations for years 2013–2021 are presented in Figure B.6. The Ohio River level during the seasonally dry period (July–October) is estimated from the chart to be approximately 302 ft above mean sea level (amsl).



Source: [Water Resources of the United States—National Water Information System (NWIS) Mapper (usgs.gov)]

Figure B.5. Location of USGS Gauging Stations—Ohio River at Olmsted, IL (03612600) and Ohio River at Paducah, KY (03611000)

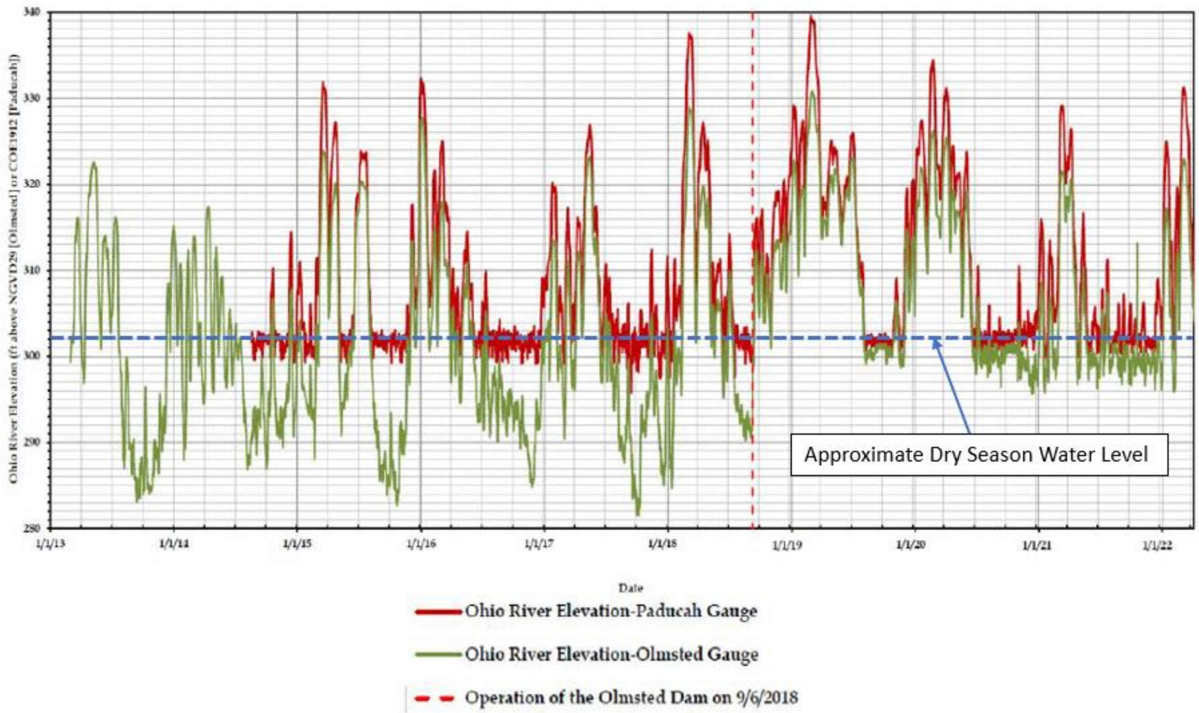


Figure B.6. Ohio River Level for the Olmsted and Paducah Stations from 2013 to 2021

B.3.2.2 Precipitation and Model Recharge

In the 2016 Sitewide Groundwater Flow Model, the primary source of recharge to groundwater was from rainfall infiltration. Secondary sources of recharge such as outfalls and leaky underground piping were associated with plant operations. To evaluate the 2016 model calibrated recharge rates for the period 2014 (model stress period 2) as input for the current model simulations, rainfall measured in the Paducah area for the period 1991–2021 was reviewed (NOAA 2022). The average annual precipitation for the period 1991–2021 was 50.28 inches, with a minimum and maximum of 30.05 inches and 74.85 inches, respectively. Annual precipitation for 2014 was 46.84 inches; therefore, the recharge rates estimated in stress period 2 of the 2016 model were assumed to be a reasonable approximation to estimate average groundwater flow under seasonally dry conditions. Site operations and water use have remained generally steady since uranium enrichment operations at the site ended in 2013. Consequently, anthropogenic recharge to groundwater is assumed to have been relatively constant since 2013.

B.3.2.3 Steady-state and Transient Flow Conditions

The 2016 Sitewide Groundwater Flow Model was calibrated to steady-state conditions; model uncertainties related to the use of the model for simulating transient conditions associated with high river levels were identified. Potentiometric maps from quarterly sitewide synoptic water level events from November 2020–August 2021 and continuous monitoring well (MW) water level data from August 2020–July 2021 were used to evaluate the seasonal variability of sitewide groundwater flow conditions and the impacts of transient river levels on MW water levels across the model domain (DOE 2022). The potentiometric maps and continuous water level data indicate that seasonal variation in gradients is apparent for water levels in MWs located closer to the river (e.g., MW474) during extended periods of high river levels (e.g., February 2021–May 2021). In the southern portion of the model domain, water levels fluctuate approximately 5 ft seasonally, and the groundwater flow direction and gradients are generally consistent. Because the flow direction and gradients are consistent, the increased water levels at the C-400 Complex

OU during seasonally wet conditions can be reasonably simulated using the steady-state model, with an increase in dry condition ambient recharge.

B.3.3 MODEL INPUT

Groundwater flow modeling was performed using MODFLOW 2005 (Version 1.12.00), and particle tracking was performed using MODPATH (Version 4.00 [V4, Release 3, 7-2003]). Model input and output was managed using the graphical user interface program Groundwater Vistas (Version 8.06, Build 44). The 2016 Sitewide Groundwater Flow Model input file named PGDP_RGA_CAL_2016_Run39_PU_Matrices.GWV (Run 39_PU) was copied and renamed PGDP_RGA_CAL_2016_Run42_SP2_Alt4_Q.GWV (Run 42) for the dry condition simulation and PGDP_RGA_CAL_2016_Run44_SP2_Alt4_Q.GWV (Run 44) for the wet condition simulation. The second stress period from the 2016 model, calibrated to September 2014 site data, was used to simulate groundwater flow conditions under a pump-and-treat scenario.

Revisions to the 2016 Sitewide Groundwater Flow Model included the following:

- Constant head values for the river cells in layers 1, 2, and 3 (reach 1), representing the Ohio River, were revised to represent average water levels observed during the period July–August when river levels are relatively constant and representative of steady-state conditions.

- The ambient recharge for Zone 102 and Zone 112 used to simulate dry conditions was 4.3 inches per year (in/year) in Run 42, which was unchanged from the 2016 model stress period 2. These recharge rates were increased by 25% (5.4 in/year) in Run 44 to simulate wet conditions.

- Two pumping wells were added to the model in the locations that are just down gradient from known source areas of TCE (in the southeast) and technetium-99 (in the northwest). The well screens were specified at the top of layer 1 and the bottom of layer 3 to represent wells fully screened in the RGA. The estimated pumping rates were 15 gallons per minute (gpm) for the dry condition model and 20 gpm in the wet condition model.

- A new recharge zone (Zone 130) was added to stress period 2 to simulate recharge over a soil cap potentially installed at the C-400 Complex as part of a pump-and-treat remedial alternative. For the dry condition simulation, the recharge was specified to be 15% of the average annual precipitation (45 in/year) based on professional judgement. For the wet condition simulation, the dry condition cap recharge was increased by 25%, consistent with the increase in ambient recharge.

- Particles were placed along the boundary of the C-400 Complex OU at the top middle and bottom of each model layer.

Revised model input is summarized in Table B.6.

Table B.6. C-400 Complex OU Pump-and-Treat MODFLOW Model Input

Model Run	Pump-and-Treat Alternative	Cap Recharge Zone[a] (ft/day)	Cap Recharge Zone[a] (in/year)	Ambient Recharge[b] (ft/day)	Ambient Recharge[b] (in/year)	Extraction Well Flow Rate (cfd)	Extraction Well Flow Rate (gpm)	Ohio River Water Level (ft amsl)
Run 42	Dry conditions[c]	0.00167	7.3	0.00098	4.3	2888	15	302
Run 44	Wet conditions[d]	0.00209	9.2	0.00122	5.4	3850	20	302

[a] Cap recharge is assigned to Zone 130 and assumed to be 15% of average annual precipitation (50.28 in/year).
[b] Ambient recharge off-site and within the plant area is specified in Zones 102 and 112, respectively.
[c] Dry conditions (Run 42) are simulated with 2016 Sitewide Groundwater Flow Model Stress Period 2 recharge, with added C-400 soil cap recharge on the C-400 Complex OU.
[d] Wet conditions (Run 44) are simulated with ambient and C-400 soil cap recharge increased by 50%.

B.3.4 MODEL RESULTS

The model-simulated potentiometric contours and forward particle tracks from particles starting at the C-400 Complex OU boundary for seasonally dry and seasonally wet conditions, with extraction wells at C-400 with a total pumping rate of 30 gpm and 40 gpm, respectively (presented in Figure B.7 and Figure B.8). The model input and output files are provided in Attachment B3. The modeling results indicate that water levels in the vicinity of the C-400 Complex OU are approximately 5 ft higher than water levels simulated in the 2016 Sitewide Groundwater Flow Model stress period 2 due to higher elevation specified at the river and reducing the northeast and northwest extraction wells pumping rates to zero. Simulated water levels are approximately 5 ft higher between the dry condition (Run 42) and wet condition (Run 44) simulations, consistent with the seasonal variation observed at the C-400 Complex OU. Forward particle tracks from particles released at the boundary of the C-400 Complex indicate that for both the dry condition and wet condition simulation, C-400 Cleaning Building groundwater is fully captured by pumping from the extraction wells.

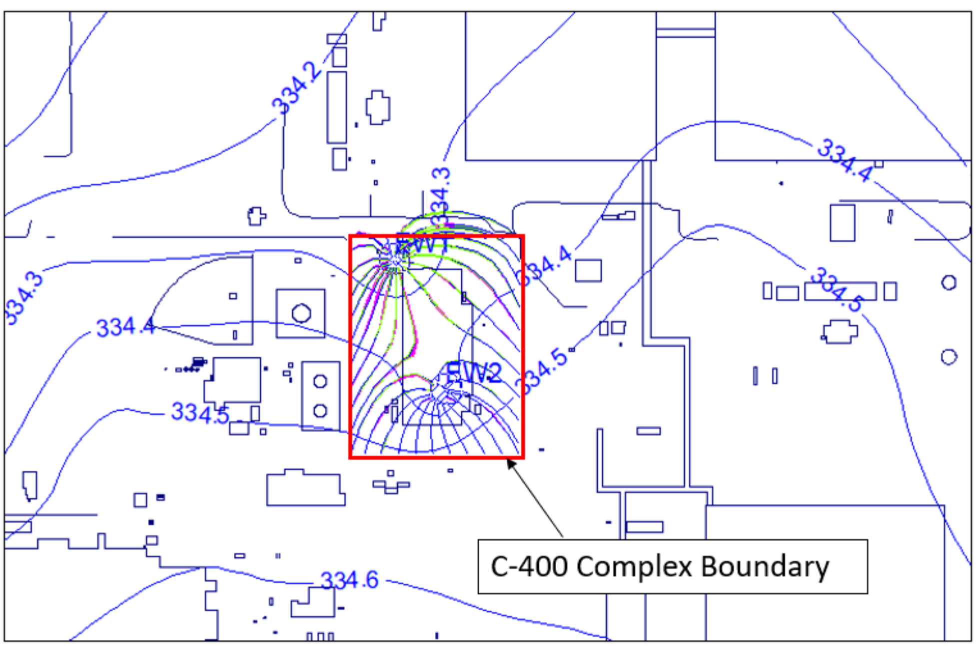


Figure B.7. Potentiometric Contours and Particle Tracks Simulated during Dry Conditions (Run 42)

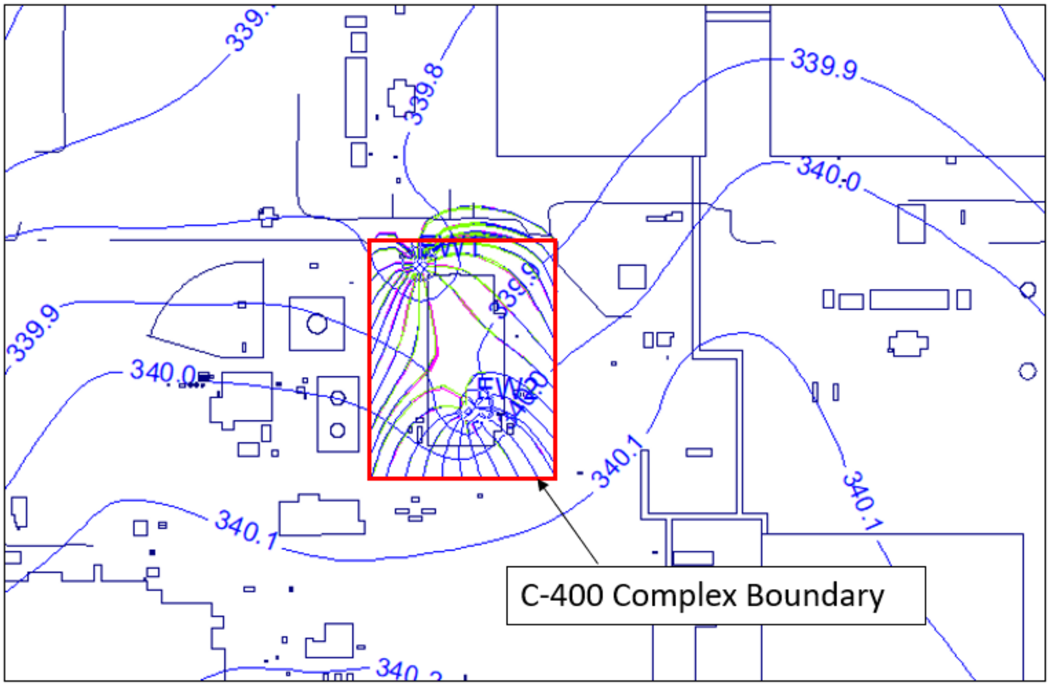


Figure B.8. Potentiometric Contours and Particle Tracks Simulated during Wet Conditions (Run 44)

The model results indicate that, under dry conditions, C-400 groundwater was captured with two fully penetrating extraction wells pumping at 15 gpm each. Under seasonally wet conditions, groundwater capture was accomplished with extraction well flow rates of 20 gpm; therefore, it is recommended that a pump-and-treat alternative evaluated as part of a future FS include two extraction wells with design flow rates of 20 gpm each.

B.4 MATRIX DIFFUSION MODELING

Groundwater fate and transport modeling was performed to estimate the restoration time frame for potential remedial alternatives being considered for a future FS. The modeling simulated TCE concentration in the RGA aquifer downgradient from the confirmed/probable source zone identified in the southeast portion of the C-400 Complex OU. The fate and transport modeling was performed using REMChlor-MD, a Microsoft® Excel-based tool developed for the Environmental Security Technology Certification Program, which includes effects of back diffusion of contaminant mass from lower-permeability soils (recognized as an important factor in attenuation processes) (Falta and Wang 2017; Falta et al. 2018). The model simulates groundwater flow and transport in the higher-permeability advection-dominated RGA aquifer and back diffusion from the lower-permeability diffusion-dominated McNairy formation. Model results estimate the restoration time frames for TCE associated with remedial alternatives at the C-400 Complex area. Similar results expected for TCE breakdown products *cis*- and *trans*-1,2-dichloroethene can be used for decision-making in a future FS.

B.4.1 TECHNICAL APPROACH

The objective of the matrix diffusion modeling is to estimate the restoration time frame, which is defined as the time required for TCE concentrations at a downgradient observation well to decrease below the 5 microgram per liter (µg/L) MCL. The first step in the analysis was to compile measurements of soil characteristics, water quality, and geochemistry collected at the C-400 Complex. Next, each measurement was evaluated and incorporated as model input to develop a model configuration representative of the C-400 Complex CSM. Finally, model results were processed and used to estimate the restoration time frame associated with a pump-and-treat scenario being considered as a remedial alternative in a future FS.

The REMChlor-MD model domain was aligned with the predominant groundwater flow direction beneath the C-400 Complex area (Figure B.9). The domain was approximately 750 ft [230 meter (m)] long in the direction parallel to groundwater flow and 470-ft (145 m) wide. The model domain was 40-ft (12 m) thick to accommodate an even number of 0.5-meter cells, which is slightly thicker than the average thickness of the RGA beneath the C-400 Complex estimated using C-400 soil boring lithology data [38.7 ft (11.80 meters; Attachment B1)]. The domain extended to the northern boundary of the C-400 Complex to provide an estimate of downgradient TCE concentrations following remediation. Cells within the model domain were approximately 16 ft by 16 ft (5 m by 5 m) in the horizontal direction and 1.6 ft (0.5 m) in the vertical direction; the entire domain consisted of 32,016 cells. An observation well was positioned approximately 650 ft (200 m) downgradient of the confirmed/probable source zones to predict TCE concentrations at the C-400 Complex downgradient boundary.

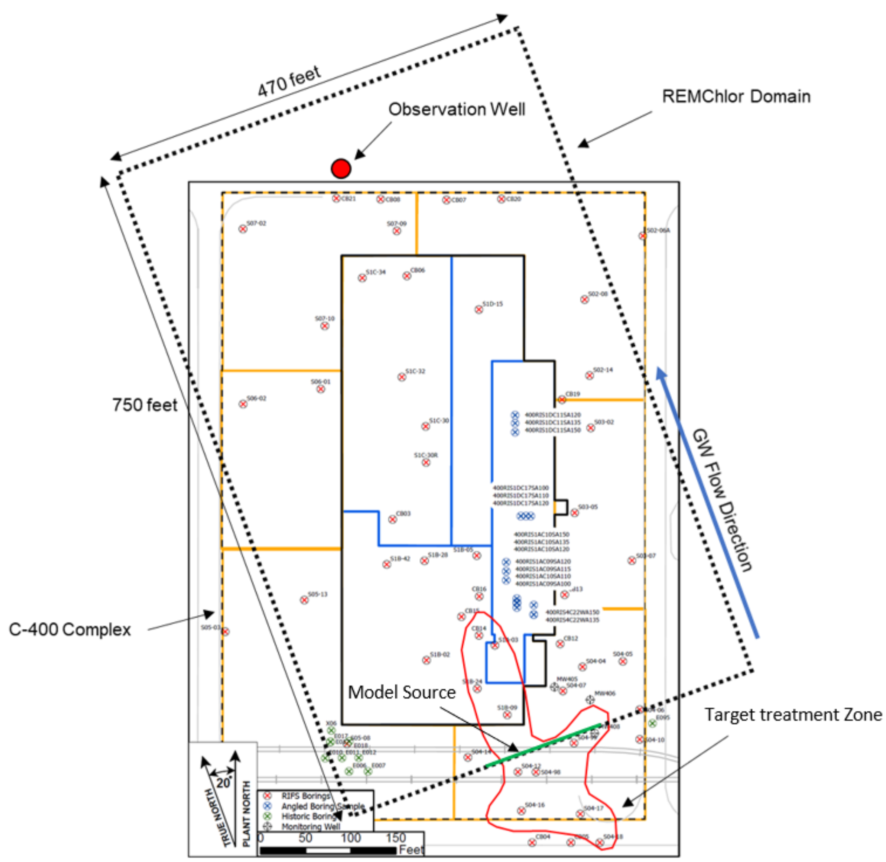


Figure B.9. REMChlor-MD Domain over the C-400 Complex OU Area

B.4.2 MODEL INPUT

Matrix diffusion modeling was performed using REMChlor-MD. Inputs to the model included the following:

- The physical and chemical properties of the RGA and McNairy formations were assigned based on measurements and observations collected from the C-400 Complex area. Physical properties included soil hydraulic conductivity (*K*), porosity, bulk density, and the thickness of each unit (Attachment B1). The McNairy soil horizontal *K* was calculated using the geometric mean of permeameter measurements performed on McNairy soil samples within the C-400 Complex OU; horizontal *K* was assumed to be an order of magnitude higher than the measured vertical *K*. Chemical properties (specified by unit) included the site-specific soil organic carbon fraction (f_{oc}) and soil partitioning coefficients (K_ds) for TCE (Section B.2).

- The hydraulic gradient across the model domain was estimated based on the proposed pumping rate associated with pump-and-treat remedial scenario (Section B.3). The gradient of 0.00074 ft/ft was calculated using the Darcy flow equation; the input included the 40 gal per minute (gpm) flow rate through the model domain (Section B.3), RGA hydraulic conductivity estimated for C-400 (555 ft/day; Attachment B1), and the cross-sectional aquifer area perpendicular to the groundwater flow (18,729 ft^2—model domain width multiplied by thickness).

- The size and location of the modeled TCE source zone within the RGA was specified based on the confirmed/probable source zone. The source zone was 125-ft (38 m) wide, centered along the upgradient boundary of the REMChlor-MD domain (Figure B.9) and spanning the entire 40-ft (12 m) thickness of the RGA.

- The initial aqueous TCE concentration in the RGA source zone was defined as 33 mg/L (33,000 µg/L) to correlate with the confirmed/probable source zone. The initial TCE mass in soil within the source zone area (44.5 kg) was calculated using the source zone soil mass (kg), the initial source zone TCE concentration (33 mg/L), and the site-specific TCE partitioning coefficient [Kd (L/kg)] in the RGA soils (Section B.2).

- A longitudinal dispersivity value of 5.3 m was assigned for the RGA soils based on the expected length of the plume—set equal to the longitudinal extent of the confirmed/probable source zone.

- Since the development of this source zone, matrix diffusion of TCE from contaminated high-permeability RGA soils into the underlying low-permeability McNairy soils has occurred. This period between a source release and remediation, defined as the loading period, is the period between the start of the REMChlor-MD simulation and the first year of remediation. Historically, use of TCE beginning in 1953 increased from 2,000 to >15,000 gal/month in 1973 when evidence of a TCE transfer truck leak and compromised TCE degrease tank was reported. Assuming the TCE source area was present by 1974, the loading period for the TCE release in Sector 4 was approximately 51 years long—beginning in 1974 and ending in 2028 (the last year of target confirmed/probable source zone remediation).

- The efficiency of TCE removal from the RGA source zone was assumed to be 95% and associated with targeted source treatment.

The REMChlor-MD model input is summarized in Table B.7 and input and output files are included in Attachment B4.

Table B.7. C-400 REMChlor-MD Model Input Parameters

Parameter	Value	Units	Source
RGA Characteristics			
RGA Horizontal K	169.02	m/day	Attachment B1
RGA Porosity (Θ_H)	0.283	--	Attachment B1
RGA Bulk Density	1888	kg/m^3	Attachment B1
RGA TCE K_d	0.04	L/kg	Section B.2
RGA f_{oc}	6.66E-04	--	Median of RGA f_{oc} measurements from borings collected at the C-400 Complex
RGA Hydraulic Gradient (i)	0.00074	m/m	Calculated using the Darcy flow equation
Longitudinal Dispersivity	5.3	m	Based on the expected length of the plume
RGA Thickness (B)	11.80	m	Attachment B1
McNairy Characteristics			
McNairy Horizontal K	5.59E-03	m/day	Order of magnitude greater than vertical *K* measurements
McNairy Porosity (Θ_L)	0.472	--	Attachment B1
McNairy Bulk Density	1419	kg/m^3	Attachment B1
McNairy TCE K_d	0.08	L/kg	Section B.2
McNairy f_{oc}	1.27E-03	--	Median of McNairy f_{oc} measurements from borings collected at the C-400 Complex
Site Layout and Dimensions			
Domain Length (x-direction)	230	m	Length of C-400 Complex; extends downgradient of northern boundary of the complex
Cell Size (x-direction)	5	m	Professional judgement
Domain Width (y-direction)	145	m	Width of C-400 Complex
Cell Size (y-direction)	5	m	Professional judgement
Domain Thickness (z-direction)	12	m	Average thickness of RGA beneath C-400 Complex
Cell Size (z-direction)	0.5	m	Highest vertical discretization feasible with model setup
Obs. Well X-Value (L_{obs})	200	m	Downgradient (north) of C-400 Complex area boundary
Obs. Well Y-Value	0	m	Center of domain
Remediation Time Frame			
Start date of McNairy Loading	1974	--	Assumes one year after significant TCE use and leakage in 1973
Start date of Remediation	2025	--	Estimated starting year of remediation
End date of Remediation	2028	--	3-year remediation time frame associated with a pump-and-treat alternative
TCE Source Zone Characteristics			
Initial Aqueous Concentration	33000	µg/L	C-400 Complex RI estimated confirmed/probable source zone requiring treatment based on TCE = 33,000 µg/L
Source Zone Width	38	m	Based on the confirmed/probable source zone
Source Zone Length	69	m	Based on the confirmed/probable source zone
Source Zone Thickness	12	m	Confirmed/probable source zone extends from the bottom of the UCRS to the top of the McNairy
Source Zone Area	2089	m^2	Based on the confirmed/probable source zone
Source Zone Volume	25070	m^3	Source zone area multiplied by source zone thickness
Initial TCE Soil Mass	44.5	kg	Based on equilibrium soil condition
Microbial Yields	0	--	No microbial degradation; protective approach to estimate the maximum potential restoration time frame
Plume Decay Rate	0	/year	Protective approach to estimate the maximum potential restoration time frame

Table B.7. C-400 REMChlor-MD Model Input Parameters (Continued)

Parameter	Value	Units	Source
Transport Properties			
Molecular Diffusion Coefficient (D_m)	9.10E-06	cm^2/s	Representative of TCE
Percent of Source Mass Removed	95	%	Assumes 95% TCE removal from RGA remediation zone
Years Remediation Started/Ended	3	years	3-year remediation time frame associated with a pump-and-treat alternative
Mass Flux/Remaining Mass Term	0	--	Protective approach to estimate the maximum potential restoration time frame; represents a source that is constant over time until the source is depleted/remediated
Natural Source Decay Rate	0	/year	Protective approach to estimate the maximum potential restoration time frame

B.4.3 MODEL RESULTS

The results of the baseline matrix diffusion model, presented in Figure B.10, indicate TCE concentrations in the downgradient observation well at the C-400 Complex OU are characterized by a rapid decrease after confirmed/probable source zone remediation (several orders of magnitude over a few years), followed by a longer period of flatter tailing. This trend emphasizes that low levels of TCE, above the MCL, will persist in RGA groundwater at the C-400 Complex OU for long periods of time, even with effective remediation of the source zone, with concentrations controlled by diffusion rather than advection forces. TCE concentrations within the C-400 Complex OU will decrease below the MCL (5 µg/L) approximately 280 years after source zone remediation is complete.

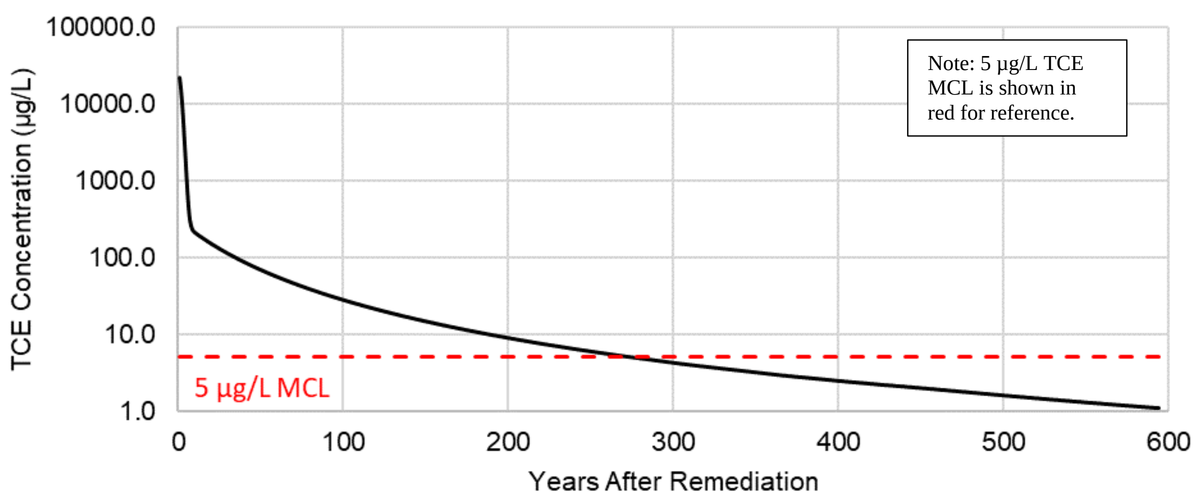


Figure B.10. TCE Concentrations at the Downgradient Observation Well

A sensitivity analysis was performed to determine the relative influence of select model input parameters on the restoration time frame results. The number of years until TCE concentrations in the downgradient observation well reached 5 µg/L MCL was used as the metric for analysis of parameter influence. Model input parameters analyzed include the hydraulic gradient across the RGA, the soil K_d values, the RGA hydraulic conductivity, and initial source zone TCE concentration. Each parameter was modified above and below its calibrated value while holding constant all other parameter values. The minimum and maximum values were adjusted as follows:

- The hydraulic gradient was varied from its ambient value under current conditions (0.00039 ft/ft; Attachment B1) to 0.0011 ft/ft (an equivalent increase above the calculated pump-and-treat gradient of 0.00074 ft/ft, Section B.4.2);

- K_d was varied from 0.004 to 0.4 in RGA soil and from 0.008 to 0.8 in McNairy soil—both an order of magnitude below and above the site-specific value (Section B.2);

- RGA *K* varied from 96–750 ft/day—the minimum and maximum values measured from RGA pumping tests (Attachment B1);

- Initial source zone TCE concentration was varied from 11 mg/L (representing 1% TCE solubility) to 81.3 mg/L (the maximum observed concentration in the source zone); and

- Initial source zone TCE mass varied from 9.97–184.75 kg—the soil mass associated with the average and maximum soil concentrations observed in the C-400 Complex area.

The results of the sensitivity analysis for the C-400 Complex modeling are summarized in Table B.8. The shaded values indicate the adjusted parameter for each modeled scenario, with all other parameters held constant at their measured or calculated values. The parameters with the strongest influence on the restoration time frame were the hydraulic gradient and the hydraulic conductivity of the RGA soils, which together govern the rate of groundwater flow and TCE transport through the C-400 Complex. The initial groundwater concentration of TCE in the source zone also played an important role in the restoration time frame because the rate of TCE mass loading to the downgradient McNairy soils is also controlled by the concentration of TCE moving through the RGA soils. The K_d values of the RGA and McNairy soils had a relatively low influence on the time to achieve the MCL, and the influence of the initial source zone TCE mass was negligible.

B.4.4 CONCLUSION

The estimated restoration time frame for TCE in RGA groundwater within the C-400 Complex area, defined as the time required for TCE concentrations at an observation well located at the downgradient boundary of the C-400 Complex OU to decrease below the 5 μg/L MCL, is 280 years following targeted source zone removal. The configuration of the modeled TCE source zone in the RGA was based on the confirmed/probable source zone in Sector 4 of the C-400 Complex area (Figure 4.56). Although there is uncertainty in the estimates of the initial source zone TCE mass, the model results were not sensitive to this input parameter. The assumed efficiency for targeted remediation within the confirmed/probable source zone was 95% TCE mass removal. The simulated hydraulic gradient across the C-400 Complex was based on a pumping rate estimated for a pump-and-treat scenario. The restoration time frame for other remedial scenarios that might be considered for a future FS, which include barrier walls for hydraulic containment, would likely be at least the time estimated for a pump-and-treat alternative because ambient hydraulic gradients within the barrier wall will likely be lower. Furthermore, the TCE source zone used in the REMChlor-MD model does not incorporate other smaller TCE sources across the C-400 Complex OU, or the TCE source zone in the McNairy Formation, which would contribute TCE mass to the underlying McNairy soils and potentially elongate the restoration time frame. As a result, the calculated 280-year restoration time frame provides a minimum estimate of TCE cleanup time to meet its MCL within the C-400 Complex OU boundary based on reasonable assumptions and site conditions for potential remedial alternatives being considered in a future FS. Similar results (expected for TCE breakdown products *cis*- and *trans*-1,2-dichloroethene) can be used for decision-making in a future FS. These estimated time frames begin at the completion of source removal, initiation of the pump-and-treat portion of an alternative, and do not account for the time to complete 95% TCE reduction in the source zone. The approximate time to complete targeted source zone removal will be discussed in a future FS report, if applicable.

Table B.8. Sensitivity Analysis of the Restoration Time Frame at the C-400 Complex OU Area

Scenario	K_d (L/kg)	Gradient (ft/ft)	RGA K (ft/day)	TCE Conc. (mg/L)	TCE Mass (kg)	Time to MCL (years)	Description	Basis
1	0.04 RGA; 0.08 McN	0.00074	555	33	44.49	280	Baseline	Most likely values
2	0.004 RGA; 0.008 McN	0.00074	555	33	44.49	266	Minimum values	Order of magnitude below site-specific values
3	0.4 RGA; 0.8 McN	0.00074	555	33	44.49	366	Maximum values	Order of magnitude above site-specific values
4	0.04 RGA; 0.08 McN	0.000391	555	33	44.49	392	Minimum value	Observed ambient hydraulic gradient at the C-400 Complex (Section B.3)
5	0.04 RGA; 0.08 McN	0.001089	555	33	44.49	227	Maximum value	Hydraulic gradient equidistant above the most likely value as the minimum value is below
6	0.04 RGA; 0.08 McN	0.00074	96	33	44.49	719	Minimum value	Minimum horizontal K calculated in Attachment B1
7	0.04 RGA; 0.08 McN	0.00074	750	33	44.49	238	Maximum value	Maximum horizontal K calculated in Attachment B1
8	0.04 RGA; 0.08 McN	0.00074	555	11	44.49	154	Minimum value	TCE concentrations associated with 1% of aqueous TCE solubility
9	0.04 RGA; 0.08 McN	0.00074	555	81.3	44.49	438	Maximum value	Maximum observed TCE concentration at the C-400 Complex
10	0.04 RGA; 0.08 McN	0.00074	555	33	9.97	280	Minimum value	Soil concentration based on average observed historical soil TCE concentrations in the confirmed/probable source zone
11	0.04 RGA; 0.08 McN	0.00074	555	33	184.75	280	Maximum value	Soil concentration based on maximum observed historical TCE concentration in the confirmed/probable source zone

The shaded values indicate the adjusted parameter for each scenario, with all other parameters held constant at their measured or calculated values.

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ATTACHMENT B1

DILUTION ATTENUATION FACTOR EVALUATION

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CONTENTS

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B1.1. DILUTION ATTENUATION FACTOR EVALUATION

The maximum soil concentrations in the UCRS that are protective of RGA groundwater quality are estimated by combining the DAF (unitless) calculations with contaminant-specific distribution coefficients (K_d) (units of volume/mass). The DAF is a measure of how much the concentration of a soil constituent in the UCRS is diluted or attenuated by vertical migration through the UCRS, coupled with the horizontal migration through the RGA.

The DAF was calculated by comparing the volume of contaminated groundwater passing vertically through a UCRS source area with the volume of clean RGA groundwater flowing beneath the source area and mixing with the UCRS water. Groundwater flow velocity in the RGA is higher than groundwater flow velocity in the UCRS; thus, mixing the two waters will result in much lower RGA groundwater contaminant concentrations relative to the initial UCRS groundwater contaminant concentrations. The reduction in groundwater concentrations in the RGA is proportional to the ratio of the volume of clean RGA groundwater to contaminated UCRS groundwater.The DAF calculates the impact on the concentration from the relative rates of vertical migration of contaminated UCRS water and the horizontal rate of migration of clean RGA groundwater to yield a concentration of the blended diluted/attenuated water.

To complete the evaluation, the K_d of the constituent must be factored into the analysis. K_d represents the ratio of contamination adhered to soil particles relative to that dissolved in groundwater.

Starting with a target-acceptable RGA groundwater contaminant concentration below the source area (e.g., MCLs, site-specific risk-based concentrations), the maximum acceptable UCRS groundwater contaminant concentration can be calculated. When this result is combined with the K_d, this calculation will yield the maximum acceptable UCRS soil contaminant concentration that is protective of RGA groundwater quality at the target concentration.

Once calculated, the maximum UCRS soil contaminant concentrations were used as site-specific RG SSLs to screen the soil constituents that may pose a threat to groundwater. Soil contaminants found at concentrations below the RG SSLs were screened from further evaluation of impacts to groundwater. Sectors with soil contamination above the RG SSLs were then subjected to additional evaluation to estimate the potential for impacts to groundwater. This evaluation is summarized in Appendix B and includes the following:

- Comparing the nature of the constituent against the constituents found to have an impact on the RGA groundwater at PGDP to identify whether or not there is evidence of these soil concentrations have an impact on the RGA groundwater;

- Evaluating the horizontal and vertical spatial distribution of soil constituent concentrations, using EVS modeling to identify hot spots that may need to be addressed;

- Evaluating soil data detections limits relative to the RG SSLs to refine interpretation of the EVS model results; and

- Assessing the applicability of previous modeling efforts, such as that conducted in the WAG 6 RI Report, to estimate current impacts to RGA groundwater (DOE 1999).

This attachment discusses the derivation of the DAF and the finding that the deterministic DAF for the UCRS and RGA at the C-400 Complex is calculated at 22 (unitless).

B1.2. METHODOLOGY

The DAF calculation recognizes that vertical mixing of UCRS and RGA groundwater does not immediately occur throughout the entire RGA thickness and that mixing primarily occurs in the upper portions of the RGA below the source area (deemed the mixing depth). The DAF for the C-400 Complex is calculated using the following equation:

$$DAF = 1 + \frac{Kid}{IL} \qquad \text{(EPA 1996)}$$

Where:

i = horizontal hydraulic gradient (m/m)
d = mixing zone depth (m)
I = infiltration rate (m/year)
L = length of source area parallel to groundwater flow (m)
K = aquifer hydraulic conductivity (m/year)

The following equation is used for calculating the aquifer mixing zone depth—d.

$$d = (0.0112\ L^2)^{0.5} + d_a \left\{ 1 - e^{\left[\frac{(-LI)}{(Kid_a)}\right]} \right\} \qquad \text{(EPA 1996)}$$

Where:

d_a = aquifer thickness (m)

The first term in the equation predicts the depth of the mixing due to vertical dispersivity along the length of the groundwater flow path.

$$\left(0.0112\ L^2\right)^{0.5}$$

The second term in the equation estimates the depth of mixing due to the downward velocity of infiltrating water.

$$d_a \left\{ 1 - e^{\left[\frac{(-LI)}{(Kid_a)}\right]} \right\}$$

The presence of L (i.e., length of source area parallel to groundwater flow) in d (i.e., mixing zone depth) in the DAF equation is notable. The incorporation of L in d results in L being in both the numerator and denominator of the DAF equation. Consequently, L is a relatively insensitive input parameter in the DAF calculation.

B1.3. DAF CALCULATIONS

Assuming an L of 1 m, and using the input parameters provided in Table B1.1, the DAF calculated for C-400 Complex UCRS source areas is 22. The stratigraphic thickness in the total RGA aquifer thickness (11.80 m) includes RGA HU5 and HU4, which are considered part of the RGA flow system. The aquifer thickness in the C-400 Complex area was estimated using C-400 soil boring lithology data. The HU top and bottom elevations were identified using lithology data from 151 borings drilled during the C-400 Complex RI. The combined thickness of HU4 and HU5 was calculated by summing the average thickness of each unit.

Table B1.1. DAF Input Parameter Values

Parameter	Description	Value	Source
K	Horizontal hydraulic conductivity	6.17E-4 m/year; 555 ft/day	Calculated using a “tracer test” analysis and TCE data from MW155 and MW341
i	Horizontal hydraulic gradient	3.91E-04 m/m, 3.91E-04 ft/ft	Median value measured between MW156 and MW341
I	Infiltration rate	0.1301 m/year, 5.12 inches/year	Calculated using Darcy Equation (q=Ki), assuming I is equal to q K = HU3 lithology weighted geomean of C-400 Complex RI/FS permeameter test i = vertical gradient measured in MW156/MW157 well pair
d_a	Aquifer thickness (HU4+HU5)	11.80 m, 38.71 ft	Calculated using C-400 soil boring lithology data

The RGA horizontal hydraulic gradients from between upgradient MW156 and downgradient MW341 was calculated using long-term historical synoptic water level data collected June 2003–October 2011. The maximum and minimum hydraulic gradients were 2.12E-4 ft/ft and 8.48E-4 ft/ft, respectively. Because a histogram of these data demonstrated a skewed data distribution, the median gradient of 3.91E-4 ft/ft was used as the measurement of central tendency.

Horizontal hydraulic conductivity was estimated using two methods. The first calculation method relied on historical pumping test data for two wells located near the C-400 Complex—MW79 located approximately 1,374 ft northwest and MW108 located approximately 1,730 ft southeast. For MW79, the minimum and maximum hydraulic conductivity values were 96 ft/day and 117 ft/day, respectively; the average was 106.5 ft/day (DOE 2017). For MW108, the minimum and maximum values were 570 ft/day and 750 ft/day, respectively; the average was 660 ft/day. These data were used to bound the range of hydraulic conductivity at the C-400 Complex and in calculating the minimum and maximum DAF (Table B1.2).

The second set of calculations relied on TCE concentration trend plots from upgradient MW156 and downgradient MW341 to estimate the seepage velocity between the two wells. Horizontal hydraulic conductivity was then calculated using the gradient between the two wells and measured RGA porosity. TCE concentration data from 1991–2021 were used to generate trend plots. The time lag between the two trend plots, which was adjusted to obtain a best match between the two curves based on visual inspection, was estimated to be 800 days. The distance between the wells, calculated using the monitoring well coordinates, was 613.4 ft. The mean RGA porosity, calculated using data collected during the C-400 Complex RI, was 0.283. This value represents total porosity and is assumed to represent effective porosity, which could be lower. The median gradient between MW156 and MW341 (3.91E-4 ft/ft) was used to calculate a horizontal hydraulic conductivity value of 555 ft/day (6.17E+04 m/day).

Infiltration into the UCRS was calculated as the product of observed vertical gradients in HU3; vertical hydraulic conductivity in HU3 estimated from permeameter test data collected during the C-400 Complex RI. Vertical hydraulic gradients between the UCRS and the RGA indicate that groundwater movement is primarily downward, and water level measurements in UCRS monitoring wells indicate saturated conditions in HU3 and unsaturated or perched water level conditions in HU1 and HU2.

The vertical gradient in HU3 was calculated using synoptic water level elevation data collected June 2003–October 2011 in co-located UCRS and RGA monitoring wells MW157 and MW156. The vertical hydraulic gradient was calculated as the groundwater head difference between the RGA and McNairy well screened interval divided by the distance between the screen midpoint in the UCRS MW157 and the top of the RGA. The gradient was calculated for each synoptic event and summary statistics were generated. The minimum, average, and maximum vertical gradient was 0.54, 0.86, and 1 (unit gradient) (ft/ft), respectively

To calculate HU3 vertical hydraulic conductivity, C-400 UCRS permeameter data from a set of representative soil borings were grouped by soil sample based on their unified soil classification system designation. For each soil type, the median hydraulic conductivity was calculated. For the set of representative borings, HU3 lithology percentage was calculated from the boring logs by summing the total thickness of each soil type observed in HU3 in each boring and then dividing by the total thickness of HU3 (the sum of HU3 thickness observed in each boring). The percent lithology was used with the median hydraulic conductivities to calculate a weighted average of the permeameter data. The infiltration rate was calculated as the product of the vertical gradient (minimum, mean, and maximum) and the weighted geometric mean of the hydraulic conductivity (1.36E-03 ft/day). The minimum, average and maximum infiltration rates were 3.23, 5.12, and 5.98 in/year (0.0820, 0.1301, and 0.1518 m/year), respectively.

Based on expected minimum and maximum values for K, i, and I, DAF values for the C-400 Complex are expected to range between 4–93 (Table B1.2). These values provide an indication of the potential DAF range based on seasonal and spatial variability of site-specific input parameter values.

Table B1.2. Minimum and Maximum DAF Input Parameter Values

Parameter	Description	Minimum Value	Maximum Value
K	Horizontal hydraulic conductivity	1.07E+04 m/year, 96 ft/day (MW79 pumping test results)	8.34E+04 m/year; 750 ft/day (MW108 pumping test results)
i	Horizontal hydraulic gradient	2.12E-04 m/m, 2.12E-04 ft/ft	8.84E-04 m/m, 8.84E-04 ft/ft
I	Infiltration rate	0.0820 m/year, 3.23 inches/year	0.1518 m/year, 5.98 inches/year
d_a	Aquifer thickness (HU4 + RGA)	11.80 m, 38.7 ft	11.80 m, 38.7 ft

B1.4. SUMMARY

Deterministic evaluation of site conditions predicts a DAF of 22 for the C-400 Complex. Minimum and maximum deterministic predicted DAF values are 4 and 93, respectively.

The DAF of 22 estimated in this calculation was used to support screening of the C-400 Complex UCRS soil results to identify those sectors where constituents might present an impact to groundwater. The results of this screening are summarized in Appendix B.

B1.5. REFERENCES

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ATTACHMENT B2

UCRS SOIL SCREENING

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Table B2.1. UCRS Soil Screening

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1A	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.938	1.83	0.462	2.84	0.75	7/28	24	N/A	0	N/A	28	No
S1B	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.859	101	0.532	0.646	2.8	4/88	24	N/A	0	N/A	88	No
S1C	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.875	2.48	N/A	N/A	0.63	0/87	24	N/A	0	N/A	87	No
S1D	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.842	1.89	N/A	N/A	0.59	0/53	24	N/A	0	N/A	53	No
S02	1,1,2-Trichloroethane	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	24	N/A	0	N/A	88	No
S03	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.921	107	0.431	1.99	2.7	4/50	24	N/A	0	N/A	50	No
S04	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.808	1300	0.447	3.1	22	9/413	24	N/A	0	N/A	413	No
S05	1,1,2-Trichloroethane	VOA	µg/kg	Yes	Yes	0.87	2240	0.749	19.4	13	6/109	24	N/A	0	N/A	109	No
S06	1,1,2-Trichloroethane	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	24	N/A	0	N/A	64	No
S07	1,1,2-Trichloroethane	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	24	N/A	0	N/A	77	No
S1A	1,1-Dichloroethene	VOA	µg/kg	Yes	No	1.02	1.83	0.375	0.581	0.66	3/28	33	N/A	0	N/A	28	No
S1B	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.859	101	0.348	1.53	2.8	10/88	33	N/A	0	N/A	88	No
S1C	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.875	2.48	0.459	6.83	0.84	10/87	33	N/A	0	N/A	87	No
S1D	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	33	N/A	0	N/A	53	No
S02	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	33	N/A	0	N/A	88	No
S03	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.921	107	1.45	1.45	2.7	1/50	33	N/A	0	N/A	50	No
S04	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.802	4500	0.378	79.6	36	18/679	33	N/A	3	N/A	679	No
S05	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.87	2240	0.354	9.14	9.7	9/162	33	N/A	0	N/A	162	No
S06	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.888	113	0.798	5.28	1.7	2/64	33	N/A	0	N/A	64	No
S07	1,1-Dichloroethene	VOA	µg/kg	Yes	No	0.887	1.79	0.696	2.83	0.62	3/77	33	N/A	0	N/A	77	No
S1A	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	23	N/A	0	N/A	28	No
S1B	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	23	N/A	0	N/A	88	No
S1C	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	23	N/A	0	N/A	87	No
S1D	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	23	N/A	0	N/A	53	No
S02	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	23	N/A	0	N/A	88	No
S03	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	23	N/A	0	N/A	50	No
S04	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	23	N/A	0	N/A	413	No
S05	1,2-Dichloroethane	VOA	µg/kg	Yes	Yes	0.87	2240	0.496	1.55	13	2/109	23	N/A	0	N/A	109	No
S06	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	23	N/A	0	N/A	64	No
S07	1,2-Dichloroethane	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	23	N/A	0	N/A	77	No
S1A	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.938	1.83	0.711	0.711	0.67	1/28	95,243	N/A	0	N/A	28	No
S1B	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	95,243	N/A	0	N/A	88	No
S1C	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.875	2.48	0.463	4.67	0.74	8/87	95,243	N/A	0	N/A	87	No
S1D	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	95,243	N/A	0	N/A	53	No
S02	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.882	57.4	0.581	20.8	2.4	4/88	95,243	N/A	0	N/A	88	No
S03	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	95,243	N/A	0	N/A	50	No
S04	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.808	1300	0.315	22.1	23	4/413	95,243	N/A	0	N/A	413	No
S05	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.87	2240	0.409	17.1	13	9/109	95,243	N/A	0	N/A	109	No
S06	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.888	113	0.374	0.374	1.7	1/64	95,243	N/A	0	N/A	64	No
S07	1,2-Dimethylbenzene	VOA	µg/kg	Yes	No	0.887	1.79	0.768	4.74	0.64	2/77	95,243	N/A	0	N/A	77	No
S1A	1,4-Dioxane	VOA	µg/kg	Yes	Yes	46.9	91.6	N/A	N/A	33	0/28	1.8	N/A	0	N/A	28	No
S1B	1,4-Dioxane	VOA	µg/kg	Yes	Yes	43	5030	N/A	N/A	139	0/88	1.8	N/A	0	N/A	88	No
S1C	1,4-Dioxane	VOA	µg/kg	Yes	Yes	43.7	413	35.7	133	36	3/87	1.8	N/A	3	N/A	87	Yes
S1D	1,4-Dioxane	VOA	µg/kg	Yes	Yes	42.1	94.3	N/A	N/A	29	0/53	1.8	N/A	0	N/A	53	No
S02	1,4-Dioxane	VOA	µg/kg	Yes	Yes	44.1	404	32.8	55.2	38	6/88	1.8	N/A	6	N/A	88	Yes
S03	1,4-Dioxane	VOA	µg/kg	Yes	No	46.1	7360	N/A	N/A	205	0/50	1.8	N/A	0	N/A	50	No
S04	1,4-Dioxane	VOA	µg/kg	Yes	Yes	40.4	5880	22	22	72	1/207	1.8	N/A	1	N/A	207	No
S05	1,4-Dioxane	VOA	µg/kg	Yes	No	43.5	1650	N/A	N/A	38	0/109	1.8	N/A	0	N/A	109	No
S06	1,4-Dioxane	VOA	µg/kg	Yes	No	44.4	7460	215	215	280	1/58	1.8	N/A	1	N/A	58	No
S07	1,4-Dioxane	VOA	µg/kg	Yes	No	44.4	89.4	N/A	N/A	29	0/77	1.8	N/A	0	N/A	77	No
S1A	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	338	1700	N/A	N/A	215	0/28	392	N/A	0	N/A	28	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1B	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	347	439	N/A	N/A	195	0/88	392	N/A	0	N/A	88	No
S1C	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	338	7680	N/A	N/A	262	0/65	392	N/A	0	N/A	65	No
S1D	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	344	445	N/A	N/A	195	0/52	392	N/A	0	N/A	52	No
S02	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	365	3580	N/A	N/A	279	0/82	392	N/A	0	N/A	82	No
S03	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	360	7360	N/A	N/A	296	0/50	392	N/A	0	N/A	50	No
S04	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	332	3830	N/A	N/A	237	0/246	392	N/A	0	N/A	246	No
S05	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	341	3960	N/A	N/A	275	0/153	392	N/A	0	N/A	153	No
S06	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	350	14500	N/A	N/A	648	0/62	392	N/A	0	N/A	62	No
S07	2,4-Dimethylphenol	SVOA	µg/kg	Yes	No	346	4150	N/A	N/A	437	0/70	392	N/A	0	N/A	70	No
S1A	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	3040	18700	10,540	27/27	64,920	12000	0	9	27	No
S1B	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	2030	16200	9,513	85/85	64,920	12000	0	25	85	No
S1C	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	2020	27000	10,890	61/61	64,920	12000	0	27	61	No
S1D	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	2260	17800	9,544	51/51	64,920	12000	0	17	51	No
S02	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	1560	19500	10,560	83/83	64,920	12000	0	33	83	No
S03	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	1960	21300	10,630	49/49	64,920	12000	0	20	49	No
S04	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	865	23900	7,720	616/616	64,920	12000	0	80	616	No
S05	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	684	21200	10,460	106/106	64,920	12000	0	38	106	No
S06	Aluminum	METAL	mg/kg	Yes	Yes	N/A	N/A	2240	19900	9,001	62/62	64,920	12000	0	13	62	No
S07	Aluminum	METAL	mg/kg	Yes	No	N/A	N/A	2250	26700	10,420	72/72	64,920	12000	0	25	72	No
S1A	Americium-241	RADS	pCi/g	Yes	No	-0.389	0.604	N/A	N/A	0.04025	0/27	617	N/A	0	N/A	27	No
S1B	Americium-241	RADS	pCi/g	Yes	No	-0.24	0.355	N/A	N/A	0.02185	0/85	617	N/A	0	N/A	85	No
S1C	Americium-241	RADS	pCi/g	Yes	No	-0.207	0.497	N/A	N/A	0.023	0/61	617	N/A	0	N/A	61	No
S1D	Americium-241	RADS	pCi/g	Yes	No	-0.166	0.29	N/A	N/A	0.02527	0/51	617	N/A	0	N/A	51	No
S02	Americium-241	RADS	pCi/g	Yes	No	-0.181	0.447	0.659	0.659	0.02071	1/83	617	N/A	0	N/A	83	No
S03	Americium-241	RADS	pCi/g	Yes	No	-0.191	0.462	N/A	N/A	0.01631	0/50	617	N/A	0	N/A	50	No
S04	Americium-241	RADS	pCi/g	Yes	No	-0.247	0.661	0.696	2.02	0.01281	2/615	617	N/A	0	N/A	615	No
S05	Americium-241	RADS	pCi/g	Yes	No	-0.412	0.565	N/A	N/A	0.0318	0/107	617	N/A	0	N/A	107	No
S06	Americium-241	RADS	pCi/g	Yes	Yes	-0.244	0.754	0.01	39.3	1.5	10/61	617	N/A	0	N/A	61	No
S07	Americium-241	RADS	pCi/g	Yes	No	-0.239	0.78	3.99	3.99	0.11	1/73	617	N/A	0	N/A	73	No
S1A	Antimony	METAL	mg/kg	Yes	Yes	1.89	2.31	0.487	2.34	1.2	10/27	5.9	0.21	0	10	27	No
S1B	Antimony	METAL	mg/kg	Yes	Yes	2.01	21.9	0.394	18.8	1.5	20/85	5.9	0.21	1	20	85	No
S1C	Antimony	METAL	mg/kg	Yes	Yes	1.99	19.6	0.344	1.67	1.2	21/61	5.9	0.21	0	21	61	No
S1D	Antimony	METAL	mg/kg	Yes	Yes	1.85	22.7	0.417	5.2	1.4	8/51	5.9	0.21	0	8	51	No
S02	Antimony	METAL	mg/kg	Yes	Yes	2	22.4	0.386	1.54	1.3	16/83	5.9	0.21	0	16	83	No
S03	Antimony	METAL	mg/kg	Yes	Yes	1.96	11.1	0.402	2.1	1.2	14/49	5.9	0.21	0	14	49	No
S04	Antimony	METAL	mg/kg	Yes	Yes	1.87	2.48	0.394	5.84	1.1	63/130	5.9	0.21	0	63	130	No
S05	Antimony	METAL	mg/kg	Yes	Yes	1.99	21.9	0.395	5.09	1.2	48/106	5.9	0.21	0	48	106	No
S06	Antimony	METAL	mg/kg	Yes	Yes	2.01	22.6	0.26	71.02	5.6	26/62	5.9	0.21	4	26	62	No
S07	Antimony	METAL	mg/kg	Yes	Yes	1.97	21.9	0.356	2.34	1.3	25/72	5.9	0.21	0	25	72	No
S1A	Arsenic	METAL	mg/kg	Yes	Yes	N/A	N/A	0.736	8.17	3.3	27/27	6.3	7.9	1	1	27	No
S1B	Arsenic	METAL	mg/kg	Yes	Yes	1.11	1.15	0.407	19.6	3.1	82/85	6.3	7.9	5	3	85	No
S1C	Arsenic	METAL	mg/kg	Yes	Yes	N/A	N/A	0.353	18.1	3.5	61/61	6.3	7.9	10	6	61	No
S1D	Arsenic	METAL	mg/kg	Yes	Yes	1.12	1.12	0.692	12.4	3.4	50/51	6.3	7.9	4	3	51	No
S02	Arsenic	METAL	mg/kg	Yes	Yes	N/A	N/A	0.495	58.8	4.9	83/83	6.3	7.9	19	10	83	No
S03	Arsenic	METAL	mg/kg	Yes	Yes	N/A	N/A	0.725	13.1	4.1	49/49	6.3	7.9	11	9	49	No
S04	Arsenic	METAL	mg/kg	Yes	Yes	1.19	200	0.42	52.6	6.1	159/616	6.3	7.9	36	15	616	No
S05	Arsenic	METAL	mg/kg	Yes	Yes	1.04	5.4	0.431	20	4.6	103/106	6.3	7.9	18	8	106	No
S06	Arsenic	METAL	mg/kg	Yes	Yes	N/A	N/A	0.603	54.2	5.6	62/62	6.3	7.9	18	5	62	No
S07	Arsenic	METAL	mg/kg	Yes	Yes	1.11	1.11	0.579	22.3	5.0	71/72	6.3	7.9	21	11	72	No
S1A	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	14.2	155	46	27/27	1,782	170	0	0	27	No
S1B	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	6	200	49	85/85	1,782	170	0	2	85	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1C	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	5.89	1300	79	61/61	1,782	170	0	5	61	No
S1D	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	7.83	358	59	51/51	1,782	170	0	2	51	No
S02	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	6.97	2300	121	83/83	1,782	170	1	8	83	No
S03	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	13.8	652	92	49/49	1,782	170	0	7	49	No
S04	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	2.83	1620	51	616/616	1,782	170	0	17	616	No
S05	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	6.19	366	85	106/106	1,782	170	0	7	106	No
S06	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	7.9	400.75	71	62/62	1,782	170	0	3	62	No
S07	Barium	METAL	mg/kg	Yes	Yes	N/A	N/A	8.06	1330	93	72/72	1,782	170	0	5	72	No
S1A	Benzene	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	30	N/A	0	N/A	28	No
S1B	Benzene	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	30	N/A	0	N/A	88	No
S1C	Benzene	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	30	N/A	0	N/A	87	No
S1D	Benzene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	30	N/A	0	N/A	53	No
S02	Benzene	VOA	µg/kg	Yes	No	0.882	57.4	0.616	0.759	2.0	4/88	30	N/A	0	N/A	88	No
S03	Benzene	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	30	N/A	0	N/A	50	No
S04	Benzene	VOA	µg/kg	Yes	No	0.814	1300	0.347	4.02	22	6/413	30	N/A	0	N/A	413	No
S05	Benzene	VOA	µg/kg	Yes	No	0.87	2240	0.359	1.01	13	9/109	30	N/A	0	N/A	109	No
S06	Benzene	VOA	µg/kg	Yes	Yes	0.888	113	0.514	0.655	1.7	3/64	30	N/A	0	N/A	64	No
S07	Benzene	VOA	µg/kg	Yes	No	0.887	1.79	0.541	0.541	0.58	1/77	30	N/A	0	N/A	77	No
S1A	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.151	1.53	0.59	27/27	68	0.69	0	9	27	No
S1B	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.0981	2.62	0.62	85/85	68	0.69	0	26	85	No
S1C	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.109	1.96	0.65	61/61	68	0.69	0	19	61	No
S1D	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.158	2.14	0.69	51/51	68	0.69	0	23	51	No
S02	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.0981	2.92	0.64	83/83	68	0.69	0	27	83	No
S03	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.193	1.51	0.60	49/49	68	0.69	0	15	49	No
S04	Beryllium	METAL	mg/kg	Yes	No	0.593	0.593	0.096	1.89	0.50	129/130	68	0.69	0	23	130	No
S05	Beryllium	METAL	mg/kg	Yes	No	0.493	0.493	0.162	1.3	0.54	105/106	68	0.69	0	25	106	No
S06	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.132	1.08	0.51	62/62	68	0.69	0	11	62	No
S07	Beryllium	METAL	mg/kg	Yes	No	N/A	N/A	0.122	2.13	0.66	72/72	68	0.69	0	23	72	No
S1A	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.5	42.6	12.5	351	34	9/28	10,365	N/A	0	N/A	28	No
S1B	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.7	43.2	12.2	60.5	20	20/88	10,365	N/A	0	N/A	88	No
S1C	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	33.8	768	13.7	25.1	26	8/65	10,365	N/A	0	N/A	65	No
S1D	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.4	44.5	11.4	21.7	18	13/52	10,365	N/A	0	N/A	52	No
S02	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	36.5	358	N/A	N/A	28	0/82	10,365	N/A	0	N/A	82	No
S03	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	36	736	12.3	16.9	29	2/50	10,365	N/A	0	N/A	50	No
S04	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.4	3670	10.6	1770	120	23/246	10,365	N/A	0	N/A	246	No
S05	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.1	500	12.3	27	91	9/153	10,365	N/A	0	N/A	153	No
S06	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	Yes	35.2	1450	13	7000	186	7/62	10,365	N/A	0	N/A	62	No
S07	Bis(2-ethylhexyl)phthalate	SVOA	µg/kg	Yes	No	34.6	415	11.5	111	44	9/70	10,365	N/A	0	N/A	70	No
S1A	Bromodichloromethane	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	354	N/A	0	N/A	28	No
S1B	Bromodichloromethane	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	354	N/A	0	N/A	88	No
S1C	Bromodichloromethane	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	354	N/A	0	N/A	87	No
S1D	Bromodichloromethane	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	354	N/A	0	N/A	53	No
S02	Bromodichloromethane	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	354	N/A	0	N/A	88	No
S03	Bromodichloromethane	VOA	µg/kg	Yes	No	0.921	107	0.463	0.463	2.6	1/50	354	N/A	0	N/A	50	No
S04	Bromodichloromethane	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	354	N/A	0	N/A	413	No
S05	Bromodichloromethane	VOA	µg/kg	Yes	No	0.87	2240	N/A	N/A	13	0/109	354	N/A	0	N/A	109	No
S06	Bromodichloromethane	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	354	N/A	0	N/A	64	No
S07	Bromodichloromethane	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	354	N/A	0	N/A	77	No
S1A	Cadmium	METAL	mg/kg	Yes	No	0.191	0.241	0.0216	0.432	0.12	9/27	8.1	0.21	0	1	27	No
S1B	Cadmium	METAL	mg/kg	Yes	No	0.193	0.242	0.0252	0.204	0.09707	18/85	8.1	0.21	0	0	85	No
S1C	Cadmium	METAL	mg/kg	Yes	No	0.192	0.237	0.0233	0.24	0.0902	26/61	8.1	0.21	0	1	61	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1D	Cadmium	METAL	mg/kg	Yes	No	0.195	0.246	0.024	0.217	0.09024	18/51	8.1	0.21	0	1	51	No
S02	Cadmium	METAL	mg/kg	Yes	No	0.195	0.247	0.0232	1.12	0.15	46/83	8.1	0.21	0	11	83	No
S03	Cadmium	METAL	mg/kg	Yes	No	0.202	0.241	0.024	0.349	0.10	22/49	8.1	0.21	0	2	49	No
S04	Cadmium	METAL	mg/kg	Yes	Yes	0.192	0.25	0.0242	2.4	0.14	52/130	8.1	0.21	0	13	130	No
S05	Cadmium	METAL	mg/kg	Yes	No	0.188	0.246	0.0224	0.606	0.13	54/106	8.1	0.21	0	15	106	No
S06	Cadmium	METAL	mg/kg	Yes	Yes	0.013	0.24	0.013	16	0.96	41/62	8.1	0.21	3	16	62	No
S07	Cadmium	METAL	mg/kg	Yes	Yes	0.203	0.247	0.0252	1.7	0.14	52/72	8.1	0.21	0	10	72	No
S1A	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	24	N/A	0	N/A	28	No
S1B	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.859	101	0.409	3.31	2.8	3/88	24	N/A	0	N/A	88	No
S1C	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.875	2.48	0.485	0.485	0.63	1/87	24	N/A	0	N/A	87	No
S1D	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	24	N/A	0	N/A	53	No
S02	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	24	N/A	0	N/A	88	No
S03	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	24	N/A	0	N/A	50	No
S04	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	24	N/A	0	N/A	413	No
S05	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.87	2240	N/A	N/A	13	0/109	24	N/A	0	N/A	109	No
S06	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	24	N/A	0	N/A	64	No
S07	Carbon tetrachloride	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	24	N/A	0	N/A	77	No
S1A	Cesium-137	RADS	pCi/g	Yes	No	-0.0166	0.0387	0.133	0.643	0.04143	4/27	1,212	0.28	0	1	27	No
S1B	Cesium-137	RADS	pCi/g	Yes	No	-0.0268	0.0497	8.89	8.89	0.10	1/85	1,212	0.28	0	1	85	No
S1C	Cesium-137	RADS	pCi/g	Yes	No	-0.027	0.0202	N/A	N/A	-0.001231	0/61	1,212	0.28	0	0	61	No
S1D	Cesium-137	RADS	pCi/g	Yes	No	-0.0276	0.0286	N/A	N/A	-0.000124	0/51	1,212	0.28	0	0	51	No
S02	Cesium-137	RADS	pCi/g	Yes	No	-0.0314	0.08	0.0634	0.103	0.004135	3/83	1,212	0.28	0	0	83	No
S03	Cesium-137	RADS	pCi/g	Yes	No	-0.0199	0.0353	0.0537	0.157	0.0127	6/50	1,212	0.28	0	0	50	No
S04	Cesium-137	RADS	pCi/g	Yes	No	-0.0609	0.0434	0.025	2.82	0.005305	20/615	1,212	0.28	0	2	615	No
S05	Cesium-137	RADS	pCi/g	Yes	No	-0.0405	0.0361	0.0916	8.09	0.12	5/107	1,212	0.28	0	2	107	No
S06	Cesium-137	RADS	pCi/g	Yes	Yes	-0.0474	0.039	0.0508	3.42	0.20	17/61	1,212	0.28	0	12	61	No
S07	Cesium-137	RADS	pCi/g	Yes	No	-0.0777	0.038	0.0504	3.03	0.25	20/73	1,212	0.28	0	12	73	No
S1A	Chlorobenzene	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	734	N/A	0	N/A	28	No
S1B	Chlorobenzene	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	734	N/A	0	N/A	88	No
S1C	Chlorobenzene	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	734	N/A	0	N/A	87	No
S1D	Chlorobenzene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	734	N/A	0	N/A	53	No
S02	Chlorobenzene	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	734	N/A	0	N/A	88	No
S03	Chlorobenzene	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	734	N/A	0	N/A	50	No
S04	Chlorobenzene	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	734	N/A	0	N/A	413	No
S05	Chlorobenzene	VOA	µg/kg	Yes	No	0.87	2240	N/A	N/A	13	0/109	734	N/A	0	N/A	109	No
S06	Chlorobenzene	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	734	N/A	0	N/A	64	No
S07	Chlorobenzene	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	734	N/A	0	N/A	77	No
S1A	Chloroethane	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	3,638	N/A	0	N/A	28	No
S1B	Chloroethane	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	3,638	N/A	0	N/A	88	No
S1C	Chloroethane	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	3,638	N/A	0	N/A	87	No
S1D	Chloroethane	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	3,638	N/A	0	N/A	53	No
S02	Chloroethane	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	3,638	N/A	0	N/A	88	No
S03	Chloroethane	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	3,638	N/A	0	N/A	50	No
S04	Chloroethane	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	3,638	N/A	0	N/A	413	No
S05	Chloroethane	VOA	µg/kg	Yes	No	0.87	2240	N/A	N/A	13	0/109	3,638	N/A	0	N/A	109	No
S06	Chloroethane	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.9	0/64	3,638	N/A	0	N/A	64	No
S07	Chloroethane	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	3,638	N/A	0	N/A	77	No
S1A	Chloroform	VOA	µg/kg	Yes	Yes	1.02	1.83	0.434	1.5	0.74	5/28	355	N/A	0	N/A	28	No
S1B	Chloroform	VOA	µg/kg	Yes	Yes	0.859	101	0.361	7.23	3.2	30/88	355	N/A	0	N/A	88	No
S1C	Chloroform	VOA	µg/kg	Yes	Yes	0.875	2.48	0.406	3.53	0.77	17/87	355	N/A	0	N/A	87	No
S1D	Chloroform	VOA	µg/kg	Yes	Yes	0.842	1.89	0.378	1.09	0.61	9/53	355	N/A	0	N/A	53	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S02	Chloroform	VOA	µg/kg	Yes	Yes	0.882	57.4	0.368	2.43	2.0	8/88	355	N/A	0	N/A	88	No
S03	Chloroform	VOA	µg/kg	Yes	Yes	0.921	107	0.514	1.78	2.7	4/50	355	N/A	0	N/A	50	No
S04	Chloroform	VOA	µg/kg	Yes	Yes	0.814	1300	0.308	5.74	23	46/413	355	N/A	0	N/A	413	No
S05	Chloroform	VOA	µg/kg	Yes	Yes	0.87	2240	0.336	6.93	13	14/109	355	N/A	0	N/A	109	No
S06	Chloroform	VOA	µg/kg	Yes	Yes	0.888	113	0.388	1.68	1.7	6/64	355	N/A	0	N/A	64	No
S07	Chloroform	VOA	µg/kg	Yes	No	0.887	1.79	0.394	1.08	0.59	8/77	355	N/A	0	N/A	77	No
S1A	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	6.05	107	18	27/27	2,209	43	0	2	27	No
S1B	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.47	54.9	15	85/85	2,209	43	0	6	85	No
S1C	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.11	73.8	18	61/61	2,209	43	0	5	61	No
S1D	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.37	37.1	16	51/51	2,209	43	0	0	51	No
S02	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	4.67	64.8	17	83/83	2,209	43	0	5	83	No
S03	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.73	32	13	49/49	2,209	43	0	0	49	No
S04	Chromium	METAL	mg/kg	Yes	No	2.5	2.5	2.5	117	15	608/616	2,209	43	0	22	616	No
S05	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.57	71.8	17	106/106	2,209	43	0	5	106	No
S06	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	4.44	76.1	19	62/62	2,209	43	0	4	62	No
S07	Chromium	METAL	mg/kg	Yes	No	N/A	N/A	3.89	53.6	17	72/72	2,209	43	0	1	72	No
S1A	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	1.02	1.83	0.982	16.6	2.7	9/28	319	N/A	0	N/A	28	No
S1B	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.859	101	0.455	72.9	7.9	37/88	319	N/A	0	N/A	88	No
S1C	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.875	2.48	0.434	17.2	1.4	24/87	319	N/A	0	N/A	87	No
S1D	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.842	1.89	0.423	5.82	0.77	6/53	319	N/A	0	N/A	53	No
S02	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.882	57.4	0.516	0.859	2.0	2/88	319	N/A	0	N/A	88	No
S03	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.921	107	0.466	77.8	8.5	22/50	319	N/A	0	N/A	50	No
S04	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.67	2000	0.341	11000	174	278/653	319	N/A	47	N/A	653	No
S05	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.884	115	0.362	9110	201	53/162	319	N/A	10	N/A	162	No
S06	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	Yes	0.888	113	0.558	177	7.7	15/64	319	N/A	0	N/A	64	No
S07	*cis*-1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.887	1.79	0.537	3.09	0.62	6/77	319	N/A	0	N/A	77	No
S1A	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.558	32	6.9	27/27	0.59	13	26	2	27	No
S1B	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.368	125	6.1	85/85	0.59	13	84	5	85	No
S1C	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.728	172	9.5	61/61	0.59	13	61	6	61	No
S1D	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	1.02	17.3	5.2	51/51	0.59	13	51	2	51	No
S02	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.798	132	9.1	83/83	0.59	13	83	6	83	No
S03	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.676	65.8	8.3	49/49	0.59	13	49	8	49	No
S04	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.437	77.7	5.1	130/130	0.59	13	125	3	130	No
S05	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.333	25.3	6.7	106/106	0.59	13	104	8	106	No
S06	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.796	104	8.2	62/62	0.59	13	62	6	62	No
S07	Cobalt	METAL	mg/kg	Yes	Yes	N/A	N/A	0.794	52	8.1	72/72	0.59	13	72	10	72	No
S1A	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	1.1	12.7	5.1	27/27	990	25	0	0	27	No
S1B	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	0.72	122	6.9	85/85	990	25	0	1	85	No
S1C	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	0.921	114	7.9	61/61	990	25	0	1	61	No
S1D	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	1.31	19.2	6.0	51/51	990	25	0	0	51	No
S02	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	1.2	893	31	83/83	990	25	0	8	83	No
S03	Copper	METAL	mg/kg	Yes	No	N/A	N/A	1.5	17.2	6.7	49/49	990	25	0	0	49	No
S04	Copper	METAL	mg/kg	Yes	No	N/A	N/A	1	31.4	6.6	130/130	990	25	0	1	130	No
S05	Copper	METAL	mg/kg	Yes	No	N/A	N/A	1.41	35	7.9	106/106	990	25	0	2	106	No
S06	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	1.28	305	19	62/62	990	25	0	5	62	No
S07	Copper	METAL	mg/kg	Yes	Yes	N/A	N/A	1.57	261	12	72/72	990	25	0	3	72	No
S1A	Dibromochloromethane	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	353	N/A	0	N/A	28	No
S1B	Dibromochloromethane	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	353	N/A	0	N/A	88	No
S1C	Dibromochloromethane	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	353	N/A	0	N/A	87	No
S1D	Dibromochloromethane	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	353	N/A	0	N/A	53	No
S02	Dibromochloromethane	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	353	N/A	0	N/A	88	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S03	Dibromochloromethane	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	353	N/A	0	N/A	50	No
S04	Dibromochloromethane	VOA	µg/kg	Yes	No	0.808	1300	N/A	N/A	22	0/413	353	N/A	0	N/A	413	No
S05	Dibromochloromethane	VOA	µg/kg	Yes	No	0.87	2240	N/A	N/A	13	0/109	353	N/A	0	N/A	109	No
S06	Dibromochloromethane	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	353	N/A	0	N/A	64	No
S07	Dibromochloromethane	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	353	N/A	0	N/A	77	No
S1A	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	33.8	170	N/A	N/A	21	0/28	40,862	N/A	0	N/A	28	No
S1B	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	34.7	43.9	21.1	37.5	20	4/88	40,862	N/A	0	N/A	88	No
S1C	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	33.8	768	11.8	35.9	26	3/65	40,862	N/A	0	N/A	65	No
S1D	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	34.4	44.5	22.5	34.1	20	3/52	40,862	N/A	0	N/A	52	No
S02	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	36.5	358	25.5	27.2	28	2/82	40,862	N/A	0	N/A	82	No
S03	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	36	736	12.8	59.6	29	2/50	40,862	N/A	0	N/A	50	No
S04	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	33.2	3670	N/A	N/A	111	0/246	40,862	N/A	0	N/A	246	No
S05	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	34.1	500	17	35.5	91	2/153	40,862	N/A	0	N/A	153	No
S06	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	35.2	1450	N/A	N/A	76	0/62	40,862	N/A	0	N/A	62	No
S07	Di-n-octylphthalate	SVOA	µg/kg	Yes	No	34.6	415	N/A	N/A	44	0/70	40,862	N/A	0	N/A	70	No
S1A	Ethylbenzene	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	7,313	N/A	0	N/A	28	No
S1B	Ethylbenzene	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	7,313	N/A	0	N/A	88	No
S1C	Ethylbenzene	VOA	µg/kg	Yes	No	0.875	2.48	0.389	0.389	0.63	1/87	7,313	N/A	0	N/A	87	No
S1D	Ethylbenzene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	7,313	N/A	0	N/A	53	No
S02	Ethylbenzene	VOA	µg/kg	Yes	No	0.882	57.4	0.376	12.4	2.3	5/88	7,313	N/A	0	N/A	88	No
S03	Ethylbenzene	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	7,313	N/A	0	N/A	50	No
S04	Ethylbenzene	VOA	µg/kg	Yes	No	0.808	1300	0.349	23.2	23	5/413	7,313	N/A	0	N/A	413	No
S05	Ethylbenzene	VOA	µg/kg	Yes	No	0.87	2240	0.359	10.3	13	9/109	7,313	N/A	0	N/A	109	No
S06	Ethylbenzene	VOA	µg/kg	Yes	No	0.888	113	0.383	0.383	1.7	1/64	7,313	N/A	0	N/A	64	No
S07	Ethylbenzene	VOA	µg/kg	Yes	No	0.887	1.79	0.466	2.32	0.61	2/77	7,313	N/A	0	N/A	77	No
S1A	Fluoride	METAL	mg/kg	Yes	Yes	N/A	N/A	0.745	15.7	4.9	27/27	12,998	N/A	0	N/A	27	No
S1B	Fluoride	METAL	mg/kg	Yes	Yes	1.14	1.15	0.686	19.4	4.0	83/85	12,998	N/A	0	N/A	85	No
S1C	Fluoride	METAL	mg/kg	Yes	Yes	1.11	1.11	0.483	620	23	59/61	12,998	N/A	0	N/A	61	No
S1D	Fluoride	METAL	mg/kg	Yes	Yes	N/A	N/A	0.632	24.2	5.1	51/51	12,998	N/A	0	N/A	51	No
S02	Fluoride	METAL	mg/kg	Yes	No	N/A	N/A	0.742	81.9	9.9	83/83	12,998	N/A	0	N/A	83	No
S03	Fluoride	METAL	mg/kg	Yes	No	N/A	N/A	0.945	52.4	7.7	49/49	12,998	N/A	0	N/A	49	No
S04	Fluoride	METAL	mg/kg	Yes	No	N/A	N/A	0.48	36.9	5.8	130/130	12,998	N/A	0	N/A	130	No
S05	Fluoride	METAL	mg/kg	Yes	No	N/A	N/A	0.561	20.5	6.2	106/106	12,998	N/A	0	N/A	106	No
S06	Fluoride	METAL	mg/kg	Yes	Yes	N/A	N/A	0.717	31.2	8.3	56/56	12,998	N/A	0	N/A	56	No
S07	Fluoride	METAL	mg/kg	Yes	No	N/A	N/A	0.481	36.8	7.4	72/72	12,998	N/A	0	N/A	72	No
S1A	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	338	1700	N/A	N/A	215	0/28	1,222	N/A	0	N/A	28	No
S1B	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	347	439	N/A	N/A	195	0/88	1,222	N/A	0	N/A	88	No
S1C	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	338	7680	N/A	N/A	262	0/65	1,222	N/A	0	N/A	65	No
S1D	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	344	445	N/A	N/A	195	0/52	1,222	N/A	0	N/A	52	No
S02	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	365	3580	N/A	N/A	279	0/82	1,222	N/A	0	N/A	82	No
S03	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	360	7360	N/A	N/A	296	0/50	1,222	N/A	0	N/A	50	No
S04	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	332	3830	N/A	N/A	237	0/246	1,222	N/A	0	N/A	246	No
S05	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	341	3960	N/A	N/A	275	0/153	1,222	N/A	0	N/A	153	No
S06	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	352	14500	N/A	N/A	694	0/62	1,222	N/A	0	N/A	62	No
S07	Hexachlorocyclopentadiene	SVOA	µg/kg	Yes	No	346	4150	N/A	N/A	437	0/70	1,222	N/A	0	N/A	70	No
S1A	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	3790	35400	15,760	27/27	763	28000	27	3	27	No
S1B	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	2610	123000	16,710	85/85	763	28000	85	9	85	No
S1C	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	3050	66600	18,330	61/61	763	28000	61	12	61	No
S1D	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	1660	43600	17,980	51/51	763	28000	51	4	51	No
S02	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	2720	146000	18,710	83/83	763	28000	83	4	83	No
S03	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	5070	68200	17,470	49/49	763	28000	49	5	49	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S04	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	1290	120000	12,300	616/616	763	28000	616	21	616	No
S05	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	1570	48000	16,330	106/106	763	28000	106	7	106	No
S06	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	4610	59500	17,070	62/62	763	28000	62	6	62	No
S07	Iron	METAL	mg/kg	Yes	Yes	N/A	N/A	2990	71200	19,680	72/72	763	28000	72	13	72	No
S1A	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.67	14	5.9	27/27	292	23	0	0	27	No
S1B	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.32	26.1	5.7	85/85	292	23	0	1	85	No
S1C	Lead	METAL	mg/kg	Yes	No	N/A	N/A	0.96	34.2	8.0	61/61	292	23	0	3	61	No
S1D	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.26	15.7	5.8	51/51	292	23	0	0	51	No
S02	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.13	62.7	8.8	83/83	292	23	0	3	83	No
S03	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.48	19.7	7.3	49/49	292	23	0	0	49	No
S04	Lead	METAL	mg/kg	Yes	No	20	20	0.858	107	9.9	136/616	292	23	0	8	616	No
S05	Lead	METAL	mg/kg	Yes	No	N/A	N/A	0.907	49.2	8.7	106/106	292	23	0	2	106	No
S06	Lead	METAL	mg/kg	Yes	Yes	N/A	N/A	1.29	59.9	11	62/62	292	23	0	6	62	No
S07	Lead	METAL	mg/kg	Yes	No	N/A	N/A	1.18	56.5	9.4	72/72	292	23	0	3	72	No
S1A	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S1B	Lead-210	RADS	pCi/g	Yes	No	1.94	1.94	N/A	N/A	0.97	0/1	0.19	N/A	0	N/A	1	No
S1C	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S1D	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S02	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S03	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S04	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S05	Lead-210	RADS	pCi/g	Yes	No	-3.38	-3.38	N/A	N/A	-1.69	0/1	0.19	N/A	0	N/A	1	No
S06	Lead-210	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.19	N/A	0	N/A	0	No
S07	Lead-210	RADS	pCi/g	Yes	No	-0.827	-0.827	N/A	N/A	-0.4135	0/1	0.19	N/A	0	N/A	1	No
S1A	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	8.61	537	165	27/27	61	820	15	0	27	No
S1B	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	5.96	3010	165	85/85	61	820	49	2	85	No
S1C	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	7.98	8060	351	61/61	61	820	40	3	61	No
S1D	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	7.47	2170	240	51/51	61	820	31	2	51	No
S02	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	10.1	12800	647	83/83	61	820	62	14	83	No
S03	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	13.8	4670	492	49/49	61	820	34	7	49	No
S04	Manganese	METAL	mg/kg	Yes	Yes	2.5	2.5	3.58	3050	152	615/616	61	820	267	11	616	No
S05	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	4.5	2860	428	106/106	61	820	84	13	106	No
S06	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	10	3840	364	62/62	61	820	50	5	62	No
S07	Manganese	METAL	mg/kg	Yes	Yes	N/A	N/A	20.4	7230	389	72/72	61	820	58	4	72	No
S1A	Methylene chloride	VOA	µg/kg	Yes	Yes	4.81	9.09	1.82	4.36	3.3	5/28	21	N/A	0	N/A	28	No
S1B	Methylene chloride	VOA	µg/kg	Yes	Yes	4.3	503	2.43	167	13	6/88	21	N/A	1	N/A	88	No
S1C	Methylene chloride	VOA	µg/kg	Yes	Yes	4.37	12.4	1.9	3.16	3.1	4/87	21	N/A	0	N/A	87	No
S1D	Methylene chloride	VOA	µg/kg	Yes	Yes	4.21	9.43	1.88	5.92	3.1	7/53	21	N/A	0	N/A	53	No
S02	Methylene chloride	VOA	µg/kg	Yes	No	4.41	287	1.77	2.7	9.8	7/88	21	N/A	0	N/A	88	No
S03	Methylene chloride	VOA	µg/kg	Yes	No	4.61	535	1.96	3.73	13	6/50	21	N/A	0	N/A	50	No
S04	Methylene chloride	VOA	µg/kg	Yes	Yes	4.04	1300	1.7	164	25	75/413	21	N/A	1	N/A	413	No
S05	Methylene chloride	VOA	µg/kg	Yes	No	4.42	11200	1.66	6.99	65	40/109	21	N/A	0	N/A	109	No
S06	Methylene chloride	VOA	µg/kg	Yes	Yes	4.44	7.35	2.23	230	7.1	24/64	21	N/A	1	N/A	64	No
S07	Methylene chloride	VOA	µg/kg	Yes	No	4.44	8.9	2.2	10.1	3.1	21/77	21	N/A	0	N/A	77	No
S1A	Molybdenum	METAL	mg/kg	Yes	No	0.227	0.227	0.107	0.778	0.36	26/27	4.4	N/A	0	N/A	27	No
S1B	Molybdenum	METAL	mg/kg	Yes	No	0.201	0.232	0.0954	1.79	0.33	70/85	4.4	N/A	0	N/A	85	No
S1C	Molybdenum	METAL	mg/kg	Yes	No	0.201	0.223	0.0887	1.2	0.36	57/61	4.4	N/A	0	N/A	61	No
S1D	Molybdenum	METAL	mg/kg	Yes	No	0.218	0.224	0.107	1.21	0.34	49/51	4.4	N/A	0	N/A	51	No
S02	Molybdenum	METAL	mg/kg	Yes	No	0.198	0.242	0.0991	2.36	0.51	77/83	4.4	N/A	0	N/A	83	No
S03	Molybdenum	METAL	mg/kg	Yes	No	0.213	0.234	0.099	0.948	0.38	44/49	4.4	N/A	0	N/A	49	No
S04	Molybdenum	METAL	mg/kg	Yes	Yes	0.207	0.25	0.0915	5.92	0.46	120/130	4.4	N/A	1	N/A	130	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S05	Molybdenum	METAL	mg/kg	Yes	No	0.205	1.03	0.0979	2.53	0.49	102/106	4.4	N/A	0	N/A	106	No
S06	Molybdenum	METAL	mg/kg	Yes	Yes	0.228	0.228	0.0921	1.88	0.52	61/62	4.4	N/A	0	N/A	62	No
S07	Molybdenum	METAL	mg/kg	Yes	No	0.211	0.24	0.137	1.89	0.47	65/72	4.4	N/A	0	N/A	72	No
S1A	Naphthalene	SVOA	µg/kg	Yes	Yes	33.8	170	N/A	N/A	21	0/28	3.1	N/A	0	N/A	28	No
S1B	Naphthalene	SVOA	µg/kg	Yes	Yes	34.7	43.9	15.8	31.3	20	3/88	3.1	N/A	3	N/A	88	Yes
S1C	Naphthalene	SVOA	µg/kg	Yes	Yes	33.8	768	16.1	16.1	26	1/65	3.1	N/A	1	N/A	65	No
S1D	Naphthalene	SVOA	µg/kg	Yes	Yes	34.4	44.5	N/A	N/A	20	0/52	3.1	N/A	0	N/A	52	No
S02	Naphthalene	SVOA	µg/kg	Yes	No	36.5	358	278	278	30	1/82	3.1	N/A	1	N/A	82	No
S03	Naphthalene	SVOA	µg/kg	Yes	Yes	36	736	16.6	16.6	30	1/50	3.1	N/A	1	N/A	50	No
S04	Naphthalene	SVOA	µg/kg	Yes	Yes	4.3	500	11.9	367	34	7/251	3.1	N/A	7	N/A	251	Yes
S05	Naphthalene	SVOA	µg/kg	Yes	Yes	34.1	500	13.3	153	92	6/153	3.1	N/A	6	N/A	153	Yes
S06	Naphthalene	SVOA	µg/kg	Yes	Yes	35.2	1450	14.8	14.8	76	1/62	3.1	N/A	1	N/A	62	No
S07	Naphthalene	SVOA	µg/kg	Yes	Yes	34.6	415	14	140	43	3/70	3.1	N/A	3	N/A	70	Yes
S1A	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.207	0.559	N/A	N/A	0.02936	0/27	23	0.1	0	0	27	No
S1B	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.341	0.501	1.16	5.09	0.07129	3/85	23	0.1	0	3	85	No
S1C	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.359	0.59	1.47	4.78	0.28	6/61	23	0.1	0	6	61	No
S1D	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.361	0.398	N/A	N/A	-0.01918	0/51	23	0.1	0	0	51	No
S02	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.367	0.496	1.15	1.15	-0.01242	1/82	23	0.1	0	1	82	No
S03	Neptunium-237	RADS	pCi/g	Yes	No	-0.502	0.573	N/A	N/A	-0.02682	0/50	23	0.1	0	0	50	No
S04	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.434	0.618	0.153	8.1	0.01565	5/615	23	0.1	0	5	615	No
S05	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.373	0.343	3.54	3.54	0.005333	1/107	23	0.1	0	1	107	No
S06	Neptunium-237	RADS	pCi/g	Yes	Yes	-1.58	0.579	0.115	18.6	0.43	8/61	23	0.1	0	8	61	No
S07	Neptunium-237	RADS	pCi/g	Yes	Yes	-0.365	0.634	0.873	6.5	0.15	4/73	23	0.1	0	4	73	No
S1A	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	1.89	27.2	7.4	27/27	55	22	0	1	27	No
S1B	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	0.999	74.9	8.7	85/85	55	22	1	5	85	No
S1C	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	1.22	98.3	15	61/61	55	22	3	12	61	No
S1D	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	1.5	39.5	8.4	51/51	55	22	0	1	51	No
S02	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	1.93	1430	48	83/83	55	22	4	11	83	No
S03	Nickel	METAL	mg/kg	Yes	No	N/A	N/A	2.35	26	8.8	49/49	55	22	0	2	49	No
S04	Nickel	METAL	mg/kg	Yes	Yes	5	5	1.15	263	5.7	277/616	55	22	3	4	616	No
S05	Nickel	METAL	mg/kg	Yes	No	N/A	N/A	1.63	20.6	8.7	106/106	55	22	0	0	106	No
S06	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	2.52	135	17	62/62	55	22	5	9	62	No
S07	Nickel	METAL	mg/kg	Yes	Yes	N/A	N/A	1.46	231	16	72/72	55	22	2	5	72	No
S1A	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	338	1700	N/A	N/A	215	0/28	0.085	N/A	0	N/A	28	No
S1B	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	347	439	N/A	N/A	195	0/88	0.085	N/A	0	N/A	88	No
S1C	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	338	7680	N/A	N/A	262	0/65	0.085	N/A	0	N/A	65	No
S1D	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	344	445	N/A	N/A	195	0/52	0.085	N/A	0	N/A	52	No
S02	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	365	3580	N/A	N/A	279	0/82	0.085	N/A	0	N/A	82	No
S03	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	360	7360	N/A	N/A	296	0/50	0.085	N/A	0	N/A	50	No
S04	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	332	3830	N/A	N/A	237	0/246	0.085	N/A	0	N/A	246	No
S05	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	341	3960	N/A	N/A	275	0/153	0.085	N/A	0	N/A	153	No
S06	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	6.9	14500	N/A	N/A	636	0/62	0.085	N/A	0	N/A	62	No
S07	N-Nitroso-di-n-propylamine	SVOA	µg/kg	Yes	No	346	4150	N/A	N/A	437	0/70	0.085	N/A	0	N/A	70	No
S1A	Pentachlorophenol	SVOA	µg/kg	Yes	No	338	1700	N/A	N/A	215	0/28	12	N/A	0	N/A	28	No
S1B	Pentachlorophenol	SVOA	µg/kg	Yes	No	347	439	N/A	N/A	195	0/88	12	N/A	0	N/A	88	No
S1C	Pentachlorophenol	SVOA	µg/kg	Yes	No	338	7680	N/A	N/A	262	0/65	12	N/A	0	N/A	65	No
S1D	Pentachlorophenol	SVOA	µg/kg	Yes	No	344	445	N/A	N/A	195	0/52	12	N/A	0	N/A	52	No
S02	Pentachlorophenol	SVOA	µg/kg	Yes	No	365	3580	N/A	N/A	279	0/82	12	N/A	0	N/A	82	No
S03	Pentachlorophenol	SVOA	µg/kg	Yes	No	360	7360	N/A	N/A	296	0/50	12	N/A	0	N/A	50	No
S04	Pentachlorophenol	SVOA	µg/kg	Yes	No	332	3830	N/A	N/A	237	0/246	12	N/A	0	N/A	246	No
S05	Pentachlorophenol	SVOA	µg/kg	Yes	No	341	3960	N/A	N/A	275	0/153	12	N/A	0	N/A	153	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S06	Pentachlorophenol	SVOA	µg/kg	Yes	No	352	14500	N/A	N/A	694	0/62	12	N/A	0	N/A	62	No
S07	Pentachlorophenol	SVOA	µg/kg	Yes	No	346	4150	N/A	N/A	437	0/70	12	N/A	0	N/A	70	No
S1A	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.257	0.449	N/A	N/A	0.04323	0/27	179	0.025	0	0	27	No
S1B	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.26	0.477	1.12	1.12	0.01788	1/85	179	0.025	0	1	85	No
S1C	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.235	0.3	N/A	N/A	0.009093	0/61	179	0.025	0	0	61	No
S1D	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.149	0.273	N/A	N/A	0.006618	0/51	179	0.025	0	0	51	No
S02	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.367	0.556	2.06	3.33	0.08124	2/83	179	0.025	0	2	83	No
S03	Plutonium-239/240	RADS	pCi/g	Yes	No	-0.324	0.687	1.05	1.05	0.01096	1/50	179	0.025	0	1	50	No
S04	Plutonium-239/240	RADS	pCi/g	Yes	Yes	-0.301	0.579	0.0594	19.7	0.04081	8/616	179	0.025	0	8	616	No
S05	Plutonium-239/240	RADS	pCi/g	Yes	Yes	-0.362	0.521	12.5	12.5	0.12	1/107	179	0.025	0	1	107	No
S06	Plutonium-239/240	RADS	pCi/g	Yes	Yes	-0.307	0.669	0.0063	239	6.9	11/61	179	0.025	1	10	61	No
S07	Plutonium-239/240	RADS	pCi/g	Yes	Yes	-0.315	0.7	0.949	15	0.45	10/73	179	0.025	0	10	73	No
S1A	p-Nitroaniline	SVOA	µg/kg	Yes	No	338	1700	N/A	N/A	215	0/28	21	N/A	0	N/A	28	No
S1B	p-Nitroaniline	SVOA	µg/kg	Yes	No	347	439	N/A	N/A	195	0/88	21	N/A	0	N/A	88	No
S1C	p-Nitroaniline	SVOA	µg/kg	Yes	No	338	7680	N/A	N/A	262	0/65	21	N/A	0	N/A	65	No
S1D	p-Nitroaniline	SVOA	µg/kg	Yes	No	344	445	N/A	N/A	195	0/52	21	N/A	0	N/A	52	No
S02	p-Nitroaniline	SVOA	µg/kg	Yes	No	365	3580	N/A	N/A	279	0/82	21	N/A	0	N/A	82	No
S03	p-Nitroaniline	SVOA	µg/kg	Yes	No	360	7360	N/A	N/A	296	0/50	21	N/A	0	N/A	50	No
S04	p-Nitroaniline	SVOA	µg/kg	Yes	No	332	3830	N/A	N/A	237	0/246	21	N/A	0	N/A	246	No
S05	p-Nitroaniline	SVOA	µg/kg	Yes	No	341	3960	N/A	N/A	275	0/153	21	N/A	0	N/A	153	No
S06	p-Nitroaniline	SVOA	µg/kg	Yes	No	352	14500	N/A	N/A	694	0/62	21	N/A	0	N/A	62	No
S07	p-Nitroaniline	SVOA	µg/kg	Yes	No	346	4150	N/A	N/A	437	0/70	21	N/A	0	N/A	70	No
S1A	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.46	4.23	7.74	291	27	4/28	942	N/A	0	N/A	28	No
S1B	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.47	4.44	2.17	24.3	2.7	7/88	942	N/A	0	N/A	88	No
S1C	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.35	4.5	4.62	33.1	3.3	5/65	942	N/A	0	N/A	65	No
S1D	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.44	4.45	N/A	N/A	2.0	0/52	942	N/A	0	N/A	52	No
S02	Polychlorinated biphenyl	PPCB	µg/kg	Yes	No	3.63	22.5	1.85	86.2	6.5	14/82	942	N/A	0	N/A	82	No
S03	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.58	123	1.69	198	14	11/50	942	N/A	0	N/A	50	No
S04	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.36	100	1.19	999	16	64/246	942	N/A	1	N/A	246	No
S05	Polychlorinated biphenyl	PPCB	µg/kg	Yes	No	3.36	100	1.53	74	18	20/153	942	N/A	0	N/A	153	No
S06	Polychlorinated biphenyl	PPCB	µg/kg	Yes	Yes	3.55	5000	1.66	733	73	12/62	942	N/A	0	N/A	62	No
S07	Polychlorinated biphenyl	PPCB	µg/kg	Yes	No	3.51	733	2.13	12.7	11	11/70	942	N/A	0	N/A	70	No
S1A	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S1B	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	2.21	2.21	2.2	1/1	0.13	1.5	1	1	1	No
S1C	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S1D	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S02	Radium-226	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S03	Radium-226	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S04	Radium-226	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S05	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	1.21	1.21	1.2	1/1	0.13	1.5	1	0	1	No
S06	Radium-226	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	0.13	1.5	0	0	0	No
S07	Radium-226	RADS	pCi/g	Yes	Yes	N/A	N/A	1.33	1.33	1.3	1/1	0.13	1.5	1	0	1	No
S1A	Selenium	METAL	mg/kg	Yes	Yes	0.953	1.15	0.386	1.84	0.70	16/27	5.6	0.7	0	7	27	No
S1B	Selenium	METAL	mg/kg	Yes	Yes	0.989	1.15	0.422	4.35	1.1	74/85	5.6	0.7	0	59	85	No
S1C	Selenium	METAL	mg/kg	Yes	Yes	0.977	1.18	0.357	2.88	0.87	42/61	5.6	0.7	0	28	61	No
S1D	Selenium	METAL	mg/kg	Yes	Yes	0.975	1.13	0.355	2.9	1.0	41/51	5.6	0.7	0	29	51	No
S02	Selenium	METAL	mg/kg	Yes	Yes	0.974	5.51	0.4	2.71	0.96	69/83	5.6	0.7	0	43	83	No
S03	Selenium	METAL	mg/kg	Yes	Yes	1.01	1.14	0.396	3.02	0.98	44/49	5.6	0.7	0	32	49	No
S04	Selenium	METAL	mg/kg	Yes	Yes	1	200	0.364	8.32	4.5	137/596	5.6	0.7	1	102	596	No
S05	Selenium	METAL	mg/kg	Yes	Yes	0.941	5.66	0.387	4.74	1.3	95/106	5.6	0.7	0	72	106	No
S06	Selenium	METAL	mg/kg	Yes	Yes	1.01	5.62	0.417	2.4	1.1	51/62	5.6	0.7	0	37	62	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S07	Selenium	METAL	mg/kg	Yes	Yes	1.04	4.94	0.418	4.22	1.4	65/72	5.6	0.7	0	54	72	No
S1A	Silver	METAL	mg/kg	Yes	Yes	0.473	0.596	0.149	1.23	0.39	10/27	1.7	2.7	0	0	27	No
S1B	Silver	METAL	mg/kg	Yes	Yes	0.501	6	0.117	1.68	0.59	19/85	1.7	2.7	0	0	85	No
S1C	Silver	METAL	mg/kg	Yes	Yes	0.496	6.04	0.121	6.01	1.1	9/61	1.7	2.7	1	1	61	No
S1D	Silver	METAL	mg/kg	Yes	Yes	0.463	5.95	0.128	1.47	0.63	14/51	1.7	2.7	0	0	51	No
S02	Silver	METAL	mg/kg	Yes	Yes	0.499	5.99	0.104	9.44	0.69	32/83	1.7	2.7	2	2	83	No
S03	Silver	METAL	mg/kg	Yes	Yes	0.489	5.45	0.141	0.647	0.47	8/49	1.7	2.7	0	0	49	No
S04	Silver	METAL	mg/kg	Yes	Yes	0.466	6.21	0.109	9.97	0.62	24/130	1.7	2.7	4	3	130	No
S05	Silver	METAL	mg/kg	Yes	Yes	0.502	5.62	0.128	2.81	0.72	20/106	1.7	2.7	1	1	106	No
S06	Silver	METAL	mg/kg	Yes	Yes	0.531	5.79	0.022	6.91	0.97	29/62	1.7	2.7	3	3	62	No
S07	Silver	METAL	mg/kg	Yes	Yes	0.501	21.9	0.124	1.93	1.2	27/72	1.7	2.7	1	0	72	No
S1A	Technetium-99	RADS	pCi/g	Yes	Yes	-1.71	2.84	4.18	856	100	6/27	36	2.8	4	6	27	Yes
S1B	Technetium-99	RADS	pCi/g	Yes	Yes	-2	2.89	3.86	95.7	7.1	17/85	36	2.8	9	17	85	No
S1C	Technetium-99	RADS	pCi/g	Yes	Yes	-2.55	2.27	3.96	1390	90	44/84	36	2.8	26	44	84	Yes
S1D	Technetium-99	RADS	pCi/g	Yes	Yes	-1.87	2.76	5.91	14.6	0.41	2/51	36	2.8	0	2	51	No
S02	Technetium-99	RADS	pCi/g	Yes	Yes	-2.73	2.04	8.33	27.6	2.7	12/89	36	2.8	0	12	89	No
S03	Technetium-99	RADS	pCi/g	Yes	Yes	-1.92	3.44	3.92	19.6	0.76	3/50	36	2.8	0	3	50	No
S04	Technetium-99	RADS	pCi/g	Yes	Yes	-3.01	3.46	2.3	323	1.2	39/616	36	2.8	3	27	616	No
S05	Technetium-99	RADS	pCi/g	Yes	Yes	-2.64	3.15	4.51	416	6.3	14/107	36	2.8	2	14	107	No
S06	Technetium-99	RADS	pCi/g	Yes	Yes	-2.04	3.42	4.68	1610	53	25/61	36	2.8	8	25	61	Yes
S07	Technetium-99	RADS	pCi/g	Yes	Yes	-2.44	2.73	3.18	163	12	22/79	36	2.8	7	22	79	No
S1A	Tetrachloroethene	VOA	µg/kg	Yes	No	0.938	1.83	0.471	0.471	0.66	1/28	27	N/A	0	N/A	28	No
S1B	Tetrachloroethene	VOA	µg/kg	Yes	No	0.859	101	0.384	0.71	2.8	2/88	27	N/A	0	N/A	88	No
S1C	Tetrachloroethene	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	27	N/A	0	N/A	87	No
S1D	Tetrachloroethene	VOA	µg/kg	Yes	No	0.842	1.89	0.379	0.379	0.58	1/53	27	N/A	0	N/A	53	No
S02	Tetrachloroethene	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	27	N/A	0	N/A	88	No
S03	Tetrachloroethene	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	27	N/A	0	N/A	50	No
S04	Tetrachloroethene	VOA	µg/kg	Yes	No	0.808	2400	0.381	1.21	25	19/413	27	N/A	0	N/A	413	No
S05	Tetrachloroethene	VOA	µg/kg	Yes	Yes	0.87	2240	0.363	83.5	14	7/109	27	N/A	2	N/A	109	No
S06	Tetrachloroethene	VOA	µg/kg	Yes	No	0.888	113	N/A	N/A	1.7	0/64	27	N/A	0	N/A	64	No
S07	Tetrachloroethene	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	27	N/A	0	N/A	77	No
S1A	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S1B	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	0.809	0.809	0.81	1/1	34	N/A	0	N/A	1	No
S1C	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S1D	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S02	Thorium-228	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S03	Thorium-228	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S04	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	34	N/A	0	N/A	0	No
S05	Thorium-228	RADS	pCi/g	Yes	No	0.614	0.614	N/A	N/A	0.31	0/1	34	N/A	0	N/A	1	No
S06	Thorium-228	RADS	pCi/g	Yes	Yes	N/A	N/A	0.77	1.11	0.95	4/4	34	N/A	0	N/A	4	No
S07	Thorium-228	RADS	pCi/g	Yes	No	0.546	0.546	N/A	N/A	0.27	0/1	34	N/A	0	N/A	1	No
S1A	Thorium-230	RADS	pCi/g	Yes	Yes	0.293	0.66	0.569	3.85	0.99	20/27	1,039	1.4	0	6	27	No
S1B	Thorium-230	RADS	pCi/g	Yes	Yes	0.207	0.551	0.547	851	11	69/85	1,039	1.4	0	15	85	No
S1C	Thorium-230	RADS	pCi/g	Yes	Yes	0.145	0.875	0.533	2.29	0.91	45/61	1,039	1.4	0	13	61	No
S1D	Thorium-230	RADS	pCi/g	Yes	Yes	0.123	0.706	0.597	2	0.89	39/51	1,039	1.4	0	7	51	No
S02	Thorium-230	RADS	pCi/g	Yes	No	0.149	0.798	0.586	11.2	1.1	61/83	1,039	1.4	0	14	83	No
S03	Thorium-230	RADS	pCi/g	Yes	No	0.131	0.694	0.547	2.24	0.87	37/50	1,039	1.4	0	7	50	No
S04	Thorium-230	RADS	pCi/g	Yes	Yes	0.0402	0.9	0.0916	77.8	0.52	443/616	1,039	1.4	0	19	616	No
S05	Thorium-230	RADS	pCi/g	Yes	Yes	0.0963	0.754	0.537	54	1.6	90/107	1,039	1.4	0	27	107	No
S06	Thorium-230	RADS	pCi/g	Yes	Yes	0.261	0.759	0.459	10600	216	49/61	1,039	1.4	2	22	61	No
S07	Thorium-230	RADS	pCi/g	Yes	Yes	0.176	0.635	0.519	152	4.2	61/73	1,039	1.4	0	24	73	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1A	Toluene	VOA	µg/kg	Yes	No	0.938	1.83	0.672	29.6	2.1	6/28	7,377	N/A	0	N/A	28	No
S1B	Toluene	VOA	µg/kg	Yes	No	0.859	101	0.42	3.29	2.8	11/88	7,377	N/A	0	N/A	88	No
S1C	Toluene	VOA	µg/kg	Yes	No	0.875	2.22	0.367	3.74	0.70	15/87	7,377	N/A	0	N/A	87	No
S1D	Toluene	VOA	µg/kg	Yes	No	0.842	1.78	0.41	4.62	0.85	13/53	7,377	N/A	0	N/A	53	No
S02	Toluene	VOA	µg/kg	Yes	Yes	0.882	57.4	0.39	3920	92	16/88	7,377	N/A	0	N/A	88	No
S03	Toluene	VOA	µg/kg	Yes	No	0.921	107	0.371	4.72	2.8	11/50	7,377	N/A	0	N/A	50	No
S04	Toluene	VOA	µg/kg	Yes	No	0.818	1300	0.32	60.6	23	33/413	7,377	N/A	0	N/A	413	No
S05	Toluene	VOA	µg/kg	Yes	No	0.87	2240	0.389	14	13	32/109	7,377	N/A	0	N/A	109	No
S06	Toluene	VOA	µg/kg	Yes	No	0.91	113	0.341	6.54	1.9	16/64	7,377	N/A	0	N/A	64	No
S07	Toluene	VOA	µg/kg	Yes	No	0.887	1.78	0.5	8.26	0.74	12/77	7,377	N/A	0	N/A	77	No
S1A	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S1B	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S1C	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S1D	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S02	Total PAH	SVOA	mg/kg	Yes	No	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S03	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S04	Total PAH	SVOA	mg/kg	Yes	Yes	0.0341	0.5	0.0020823	0.1521759	0.04111	4/114	1.7	N/A	0	N/A	114	No
S05	Total PAH	SVOA	mg/kg	Yes	Yes	0.45	0.5	N/A	N/A	0.24	0/44	1.7	N/A	0	N/A	44	No
S06	Total PAH	SVOA	mg/kg	Yes	Yes	0.0079	0.008	0.0393	0.55619	0.15	2/4	1.7	N/A	0	N/A	4	No
S07	Total PAH	SVOA	mg/kg	Yes	Yes	N/A	N/A	NS	NS	NS	0/0	1.7	N/A	0	N/A	0	No
S1A	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	460	N/A	0	N/A	28	No
S1B	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	460	N/A	0	N/A	88	No
S1C	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	460	N/A	0	N/A	87	No
S1D	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	460	N/A	0	N/A	53	No
S02	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	460	N/A	0	N/A	88	No
S03	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.921	107	0.55	2.56	2.7	3/50	460	N/A	0	N/A	50	No
S04	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.802	1500	0.517	146	31	24/653	460	N/A	0	N/A	653	No
S05	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.87	2240	0.496	46.2	11	11/162	460	N/A	0	N/A	162	No
S06	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.888	113	0.798	5.28	1.7	2/64	460	N/A	0	N/A	64	No
S07	*trans* -1,2-Dichloroethene	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	460	N/A	0	N/A	77	No
S1A	Trichloroethene	VOA	µg/kg	Yes	Yes	1.18	146	0.686	2050	236	21/28	25	N/A	9	N/A	28	Yes
S1B	Trichloroethene	VOA	µg/kg	Yes	Yes	0.903	118	0.429	5540	218	70/88	25	N/A	35	N/A	88	Yes
S1C	Trichloroethene	VOA	µg/kg	Yes	Yes	0.875	127	0.474	699	24	50/87	25	N/A	14	N/A	87	No
S1D	Trichloroethene	VOA	µg/kg	Yes	Yes	0.842	1.89	0.397	947	39	30/53	25	N/A	6	N/A	53	Yes
S02	Trichloroethene	VOA	µg/kg	Yes	Yes	0.882	119	0.443	45.4	4.3	27/88	25	N/A	2	N/A	88	No
S03	Trichloroethene	VOA	µg/kg	Yes	Yes	0.958	107	0.407	3010	133	39/50	25	N/A	16	N/A	50	Yes
S04	Trichloroethene	VOA	µg/kg	Yes	Yes	0.44	360	0.338	5620000	16,750	556/694	25	N/A	350	N/A	694	Yes
S05	Trichloroethene	VOA	µg/kg	Yes	Yes	0.884	111	0.372	144000	1,167	62/162	25	N/A	31	N/A	162	Yes
S06	Trichloroethene	VOA	µg/kg	Yes	Yes	0.888	125	0.367	124	9.4	18/64	25	N/A	3	N/A	64	No
S07	Trichloroethene	VOA	µg/kg	Yes	Yes	0.887	1.79	0.466	440	11	29/77	25	N/A	2	N/A	77	No
S1A	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.232	377	39	27/27	557	4.6	0	6	27	No
S1B	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.269	409	8.4	85/85	557	4.6	0	3	85	No
S1C	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.171	99.4	5.5	61/61	557	4.6	0	6	61	No
S1D	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.356	6.8	1.1	51/51	557	4.6	0	1	51	No
S02	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.176	910	32	83/83	557	4.6	2	18	83	No
S03	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.34	29.7	2.6	49/49	557	4.6	0	7	49	No
S04	Uranium	METAL	mg/kg	Yes	Yes	100	1000	0.125	791	54	189/616	557	4.6	1	78	616	No
S05	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.373	89.8	4.6	106/106	557	4.6	0	18	106	No
S06	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.389	300	25	62/62	557	4.6	0	23	62	No
S07	Uranium	METAL	mg/kg	Yes	Yes	N/A	N/A	0.264	83.9	7.0	72/72	557	4.6	0	21	72	No
S1A	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.0836	0.666	0.615	42.1	6.7	18/27	190	1.2	0	8	27	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1B	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.00609	0.754	0.477	205	3.8	60/85	190	1.2	1	10	85	No
S1C	Uranium-233/234	RADS	pCi/g	Yes	Yes	0.0408	0.691	0.517	12	1.4	37/61	190	1.2	0	7	61	No
S1D	Uranium-233/234	RADS	pCi/g	Yes	Yes	0.092	0.65	0.551	3.18	0.75	33/51	190	1.2	0	6	51	No
S02	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.18	0.68	0.473	512	15	59/83	190	1.2	2	28	83	No
S03	Uranium-233/234	RADS	pCi/g	Yes	Yes	0.0596	0.831	0.521	35.8	1.9	26/50	190	1.2	0	13	50	No
S04	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.167	3.72	0.355	227	1.1	106/459	190	1.2	1	50	459	No
S05	Uranium-233/234	RADS	pCi/g	Yes	Yes	0.109	0.655	0.522	2900	29	90/107	190	1.2	1	38	107	No
S06	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.0549	0.582	0.454	413	19	46/61	190	1.2	2	31	61	No
S07	Uranium-233/234	RADS	pCi/g	Yes	Yes	-0.115	0.736	0.779	27.9	3.0	53/73	190	1.2	0	35	73	No
S1A	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S1B	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S1C	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S1D	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S02	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S03	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S04	Uranium-234	RADS	pCi/g	Yes	Yes	0.229	3.72	0.747	3.32	0.48	17/328	190	1.2	0	16	328	No
S05	Uranium-234	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	190	1.2	0	0	0	No
S06	Uranium-234	RADS	pCi/g	Yes	Yes	N/A	N/A	0.75	8.1	4.1	4/4	190	1.2	0	2	4	No
S07	Uranium-234	RADS	pCi/g	Yes	Yes	N/A	N/A	1.04	8.67	4.5	16/16	190	1.2	0	15	16	No
S1A	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S1B	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S1C	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S1D	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S02	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S03	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S04	Uranium-235	RADS	pCi/g	Yes	No	-0.0559	0.0506	0.0164	0.207	0.03959	330/484	8.6	0.06	0	70	484	No
S05	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S06	Uranium-235	RADS	pCi/g	Yes	No	N/A	N/A	NS	NS	NS	0/0	8.6	0.06	0	0	0	No
S07	Uranium-235	RADS	pCi/g	Yes	No	-0.0455	0.381	0.777	0.825	0.16	2/16	8.6	0.06	0	2	16	No
S1A	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.128	0.268	1.26	5.09	0.59	6/27	8.6	0.06	0	6	27	No
S1B	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.122	0.522	0.175	14.5	0.27	6/85	8.6	0.06	1	6	85	No
S1C	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.119	0.673	0.539	0.877	0.06594	3/61	8.6	0.06	0	3	61	No
S1D	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.0878	0.27	0.269	0.55	0.04074	2/51	8.6	0.06	0	2	51	No
S02	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.183	0.372	0.316	28.4	0.84	15/83	8.6	0.06	2	15	83	No
S03	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.136	0.517	1.06	1.57	0.09402	2/50	8.6	0.06	0	2	50	No
S04	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.316	0.612	0.0164	16.1	0.06762	339/615	8.6	0.06	1	79	615	No
S05	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.0899	0.488	0.187	177	1.8	17/107	8.6	0.06	1	17	107	No
S06	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.297	0.48	0.029	28	1.2	16/61	8.6	0.06	3	14	61	No
S07	Uranium-235/236	RADS	pCi/g	Yes	Yes	-0.312	0.514	0.563	1.12	0.14	8/73	8.6	0.06	0	8	73	No
S1A	Uranium-238	RADS	pCi/g	Yes	Yes	0.173	0.653	0.522	139	16	22/27	185	1.2	0	9	27	No
S1B	Uranium-238	RADS	pCi/g	Yes	Yes	0.0613	0.537	0.413	263	4.7	72/85	185	1.2	1	8	85	No
S1C	Uranium-238	RADS	pCi/g	Yes	Yes	-0.159	1	0.45	15	1.7	46/61	185	1.2	0	11	61	No
S1D	Uranium-238	RADS	pCi/g	Yes	Yes	0.179	0.465	0.306	2.45	0.91	46/51	185	1.2	0	9	51	No
S02	Uranium-238	RADS	pCi/g	Yes	Yes	-0.1	0.816	0.467	554	17	68/83	185	1.2	2	31	83	No
S03	Uranium-238	RADS	pCi/g	Yes	Yes	0.0698	0.502	0.439	38.6	2.3	40/50	185	1.2	0	14	50	No
S04	Uranium-238	RADS	pCi/g	Yes	Yes	-0.0688	1.71	0.31	330	1.9	425/487	185	1.2	1	140	487	No
S05	Uranium-238	RADS	pCi/g	Yes	Yes	0.302	0.673	0.368	3000	30	100/107	185	1.2	1	47	107	No
S06	Uranium-238	RADS	pCi/g	Yes	Yes	-0.077	0.801	0.465	440	21	54/61	185	1.2	2	33	61	No
S07	Uranium-238	RADS	pCi/g	Yes	Yes	-0.219	0.646	0.45	33.6	3.6	56/73	185	1.2	0	33	73	No
S1A	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	7.47	105	25	27/27	187	37	0	4	27	No
S1B	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	4.77	53.5	24	85/85	187	37	0	10	85	No

Table B2.1. UCRS Soil Screening (Continued)

Sector	Analyte	Type	Units	Groundwater Contaminant of Concern?	Failed Soil Leachability Screen?	Minimum Nondetect Detection Limit	Maximum Nondetect Detection Limit	Minimum Detected Value	Maximum Detected Value	Average Concentration Including 1/2 Detection Limits	Frequency of Detects	Soil Screening Level (SSL)	Background	Number of SSL Exceedances	Number of Background Exceedances	Total Number of Samples	Model in EVS?
S1C	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	4.34	76.9	27	61/61	187	37	0	14	61	No
S1D	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	4.23	57.9	26	51/51	187	37	0	10	51	No
S02	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	4.18	85.9	24	83/83	187	37	0	4	83	No
S03	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	4.93	39.3	22	49/49	187	37	0	1	49	No
S04	Vanadium	METAL	mg/kg	Yes	Yes	2.5	2.5	3.08	185	22	614/616	187	37	0	56	616	No
S05	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	3.44	62	26	106/106	187	37	0	14	106	No
S06	Vanadium	METAL	mg/kg	Yes	Yes	N/A	N/A	4.36	61.1	23	62/62	187	37	0	4	62	No
S07	Vanadium	METAL	mg/kg	Yes	No	N/A	N/A	5.02	49.2	24	72/72	187	37	0	4	72	No
S1A	Vinyl chloride	VOA	µg/kg	Yes	No	0.938	1.83	N/A	N/A	0.66	0/28	9.0	N/A	0	N/A	28	No
S1B	Vinyl chloride	VOA	µg/kg	Yes	No	0.859	101	N/A	N/A	2.8	0/88	9.0	N/A	0	N/A	88	No
S1C	Vinyl chloride	VOA	µg/kg	Yes	No	0.875	2.48	N/A	N/A	0.63	0/87	9.0	N/A	0	N/A	87	No
S1D	Vinyl chloride	VOA	µg/kg	Yes	No	0.842	1.89	N/A	N/A	0.59	0/53	9.0	N/A	0	N/A	53	No
S02	Vinyl chloride	VOA	µg/kg	Yes	No	0.882	57.4	N/A	N/A	2.0	0/88	9.0	N/A	0	N/A	88	No
S03	Vinyl chloride	VOA	µg/kg	Yes	No	0.921	107	N/A	N/A	2.6	0/50	9.0	N/A	0	N/A	50	No
S04	Vinyl chloride	VOA	µg/kg	Yes	Yes	0.46	5200	0.491	563	55	27/679	9.0	N/A	9	N/A	679	Yes
S05	Vinyl chloride	VOA	µg/kg	Yes	Yes	0.87	2240	0.593	479	16	9/162	9.0	N/A	4	N/A	162	Yes
S06	Vinyl chloride	VOA	µg/kg	Yes	Yes	0.888	113	5.88	5.88	1.7	1/64	9.0	N/A	0	N/A	64	No
S07	Vinyl chloride	VOA	µg/kg	Yes	No	0.887	1.79	N/A	N/A	0.59	0/77	9.0	N/A	0	N/A	77	No
S1A	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	3.25	84.6	23	27/27	807	60	0	1	27	No
S1B	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	3.14	70.3	19	85/85	807	60	0	1	85	No
S1C	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	2.61	89.7	23	61/61	807	60	0	3	61	No
S1D	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	1.84	67.7	21	51/51	807	60	0	1	51	No
S02	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	3.84	144	31	83/83	807	60	0	6	83	No
S03	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	6.74	239	33	49/49	807	60	0	5	49	No
S04	Zinc	METAL	mg/kg	Yes	Yes	N/A	N/A	3.91	927	39	130/130	807	60	1	9	130	No
S05	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	4.24	275	30	106/106	807	60	0	5	106	No
S06	Zinc	METAL	mg/kg	Yes	Yes	N/A	N/A	5.16	696	52	62/62	807	60	0	11	62	No
S07	Zinc	METAL	mg/kg	Yes	No	N/A	N/A	3.9	138	37	72/72	807	60	0	10	72	No

Notes:

Yellow highlighting indicates sector and chemical combinations that were recommended for EVS modeling.

N/A = not available/not applicable

NS = not sampled

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ATTACHMENT B3

MODFLOW MODEL FILES (CD)

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ATTACHMENT B3

MODFLOW MODEL FILES (CD)

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ATTACHMENT B4

REMCHLOR-MD MODEL FILES (CD)

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ATTACHMENT B4

REMChlor-MD MODEL FILES (CD)

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APPENDIX C

SCREENING RISK EVALUATION

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CONTENTS

FIGURES

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ACRONYMS

ABSgi	gastrointestinal absorption factor
AL	action level
amsl	above mean sea level
AOC	area of concern
ATSDR	Agency for Toxic Substances and Disease Registry
BERA	baseline ecological risk assessment
bgs	below ground surface
BHHRA	baseline human health risk assessment
BRA	baseline risk assessment
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
COE	U.S. Army Corps of Engineers
COPC	contaminants of potential concern
COPEC	contaminants of potential ecological concern
CSF	cancer slope factor
CSM	conceptual site model
DL	detection limit
DOE	U.S. Department of Energy
DQA	data quality analysis
DSR	data summary report
EF	exposure factor
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
FOD	frequency of detection
FOE	frequency of exceedance
FS	feasibility study
HI	hazard index
HMW	high molecular weight
HQ	hazard quotient
HU	hydrogeologic unit
IRIS	Integrated Risk Information System
IUR	inhalation unit risk
KDEP	Kentucky Department for Environmental Protection
LOAEL	lowest observed adverse effects levels
MCL	maximum contaminant level
MOC	media of concern
MRL	minimal risk level
NAL	no action level
NFA	no further action
NOAEL	no observed adverse effect level
NSDD	North-South Diversion Ditch
OU	operable unit
PAL	project action level
PGDP	Paducah Gaseous Diffusion Plant
POC	pathway of concern
POE	point of exposure

PPRTV	Provisional Peer Reviewed Toxicity Value
PRG	preliminary remediation goal
RAGS	Risk Assessment Guidance for Superfund
RAIS	Risk Assessment Information System
RfC	reference concentration
RfD	reference dose
RGA	Regional Gravel Aquifer
RGO	remedial goal option
RI	remedial investigation
RMD	risk methods document
RME	reasonable maximum exposure
ROD	record of decision
SAP	sampling and analysis plan
SERA	screening-level ecological risk assessment
SQL	sample quantitation limit
SRE	screening risk evaluation
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TEF	toxicity equivalence factor
TVA	Tennessee Valley Authority
UCL95	95% upper confidence limit
UCRS	Upper Continental Recharge System
VI	vapor intrusion
VISL	vapor intrusion screening levels
VOA	volatile organic analyte
VOC	volatile organic compound
WAG	waste area group
WKWMA	West Kentucky Wildlife Management Area
XRF	X-ray fluorescence

C.1. INTRODUCTION

This screening risk evaluation (SRE) has been prepared to satisfy Goal 4 of the C-400 Complex Operable Unit (OU), which is to conduct an SRE of the combined newly-generated data and historical data to complement the previously performed baseline human health risk assessment (BHHRA) (DOE 1999) and to conduct a screening-level ecological risk assessment (SERA) (Steps 1 and 2) (DOE 2019). Consistent with agreements reached during project scoping and because the C-400 Complex OU already has been subjected to a full baseline risk assessment (BRA) that concluded action needed to be taken, a new BRA will not be performed for this remedial investigation (RI). Together the SRE, the SERA, and the previous risk assessments constitute a full BRA, as documented in the C-400 Complex Remedial Investigation/Feasibility Study (RI/FS) Work Plan (DOE 2020b). This document presents a focused evaluation of the combined, newly-generated data and historical data.

This focused risk evaluation builds upon earlier investigations where baseline risks were previously evaluated. Together, this SRE and previous risk assessments and evaluations will provide updated information to the BRA.

C.1.1 OVERVIEW OF THE SCREENING RISK EVALUATION

This SRE utilizes information collected during the recently completed RI of the C-400 Complex OU to characterize the baseline risks posed to human health and ecological receptors from contact with contaminants in soil and groundwater. This SRE also uses information from previous investigations, risk assessments and evaluations, and fate and transport modeling to estimate the baseline risks posed to human health and ecological receptors through contact with media impacted by contaminants migrating from the C-400 Complex OU to the points of exposure (POEs) defined in *Site Management Plan Paducah Gaseous Diffusion Plant Paducah, Kentucky*, *Annual Revision—FY 2020*, DOE/LX/07-2444&D2/R1 (DOE 2020a). Generally, baseline risks are defined as those which may be present now or in the future in the absence of corrective or remedial actions.

The methods and presentations used in this SRE are primarily based on those presented in the following volumes of the risk methods document (RMD):

- *Methods for Conducting Human Health Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health*, DOE/LX/07-0107&D2/R12/V1 (Human Health RMD); and

- *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 2. Ecological*, DOE/LX/07-0107&D2/R3/V2 (Ecological RMD).

These volumes of the RMD integrate risk assessment guidance from the U.S. Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP) and incorporate instructions contained in regulatory agency comments on earlier risk assessments performed for the Paducah Gaseous Diffusion Plant (PGDP).

Because this SRE is intended to provide updated information to the existing BRA, some of the methods and presentations described in both volumes of the RMD were modified based on the objectives of the current evaluation (DOE 2019, DOE 2021). One of the modifications includes quantifying human health risk and hazard using a ratio-based approach and default no action levels (NALs) for PGDP. This ratio-based approach was established and approved for the *Addendum to the Remedial Investigation Report for* *the Burial Grounds Operable Unit Solid Waste Management Unit 4 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-0030&D2/R1/A1/R2 (DOE 2017a). This and other modifications to the RMD and presentations are noted herein, as applicable.

C.1.2 REPORT ORGANIZATION

This SRE has been organized into the following sections.

- Section 1, Introduction, provides the basis of the SRE and SERA.

- Section 2, Results of Previous Risk Assessments, summarizes the results of previous risk assessments that are useful in the understanding of potential risk posed to human health and the environment by constituents that have the potential to migrate from source areas.

- Section 3, Identification of Human Health Contaminants of Potential Concern (COPCs), provides the steps performed to determine what data would be included in the SRE. Summarizes how data were segregated per exposure unit and medium, as well as the identified COPCs in each exposure unit within a medium.

- Section 4, Human Health Exposure Assessment, provides a summary of the receptors, exposure routes, and the conceptual site model (CSM) utilized in the SRE. Also provides a description of the data selected for inclusion in the exposure assessment.

- Section 5, Human Health Toxicity Assessment, provides information on the noncarcinogenic and carcinogenic effects of identified COPCs in soil and groundwater.

- Section 6, Human Health Risk Characterization, presents the results of the risk characterization for soil and groundwater.

- Section 7, Uncertainty in the Risk Assessment, provides discussion and qualitative/quantitative analysis of uncertainties associated with the SRE.

- Section 8, Evaluation of Ecological Risks, presents the ecological CSM, contaminants of potential ecological concern (COPECs) and refined COPECs identified in the SERA.

- Section 9, Screening Risk Evaluation Summary and Conclusions, provides the selected contaminants of concern (COCs) for soil and groundwater, as well as conclusions of the human health SRE and SERA.

- Section 10, Remedial Goal Options (RGOs), presents the methods and resulting RGOs for identified COCs.

Because of their length, tables developed for the SRE are presented in Attachment C1 and tables developed for the SERA are presented in Attachment C2; however, as a result of past comments that such placement makes the information in the tables difficult to access, material presented in the tables has been summarized within this appendix. Similarly, in response to past comments, figures are presented in the text.

C.2. RESULTS OF PREVIOUS RISK ASSESSMENTS

Five previous reports contain risk assessment or risk evaluation results that are useful in developing the scope of this risk evaluation. As noted throughout this document, the SRE is a component of the BRA. Together, this SRE and the information contained in the reports listed in this section constitute the BRA for the C-400 Complex OU RI.

- Waste Area Group (WAG) 6 RI BHHRA and baseline ecological risk assessment (BERA)
- Vapor Intrusion (VI) Study
- C-400 Basement Slab and Subsurface Study
- Soils OU RI
- Groundwater OU FS

The remainder of this section of the SRE presents the results of the previous risk assessments and risk evaluations listed above. The methods used to estimate risk and hazard in the previous reports and this report are not necessarily consistent.

C.2.1 WAG 6 REMEDIAL INVESTIGATION REPORT (1999)

This section presents the results of the BRA conducted for WAG 6, which consisted of two parts: the BHHRA and the BERA. In these assessments, information collected during the WAG 6 RI was used to characterize the baseline risks posed to human health and the environment from contact with contaminants in soil and groundwater at solid waste management units (SWMUs) 11, 26, 40, 47, and 203, and at areas surrounding the C-400 building that were not part of any recognized SWMU. In addition, the results of fate and transport modeling (Section 5 of the WAG 6 RI Report) were used to estimate the baseline risks posed to human health and the environment through contact with media impacted by contaminants migrating from the various sources in WAG 6 (Note: “baseline” risks are those that may be present now or in the future in the absence of corrective or remedial actions.).

To facilitate data aggregation and to focus results on specific areas, the WAG 6 RI and BRA hypothetically subdivided and evaluated WAG 6 as nine sectors (Figure C.1). The sectors and their definitions are as follows:

- Sector 1—Area that is the footprint of the C-400 Cleaning Building;

- Sector 2—Area to the northeast of the C-400 Cleaning Building; sector contains SWMU 40;

- Sector 3—Area to the east of the C-400 Cleaning Building; sector does not contain a SWMU associated with WAG 6;

- Sector 4—Area to the southeast of the C-400 Cleaning Building; sector contains SWMU 11;

- Sector 5—Area to the southwest of the C-400 Cleaning Building; sector does not contain a SWMU associated with WAG 6, but includes a trichloroethene (TCE) spill site that has been treated with electrical resistance heating 20 ft below ground surface (bgs);

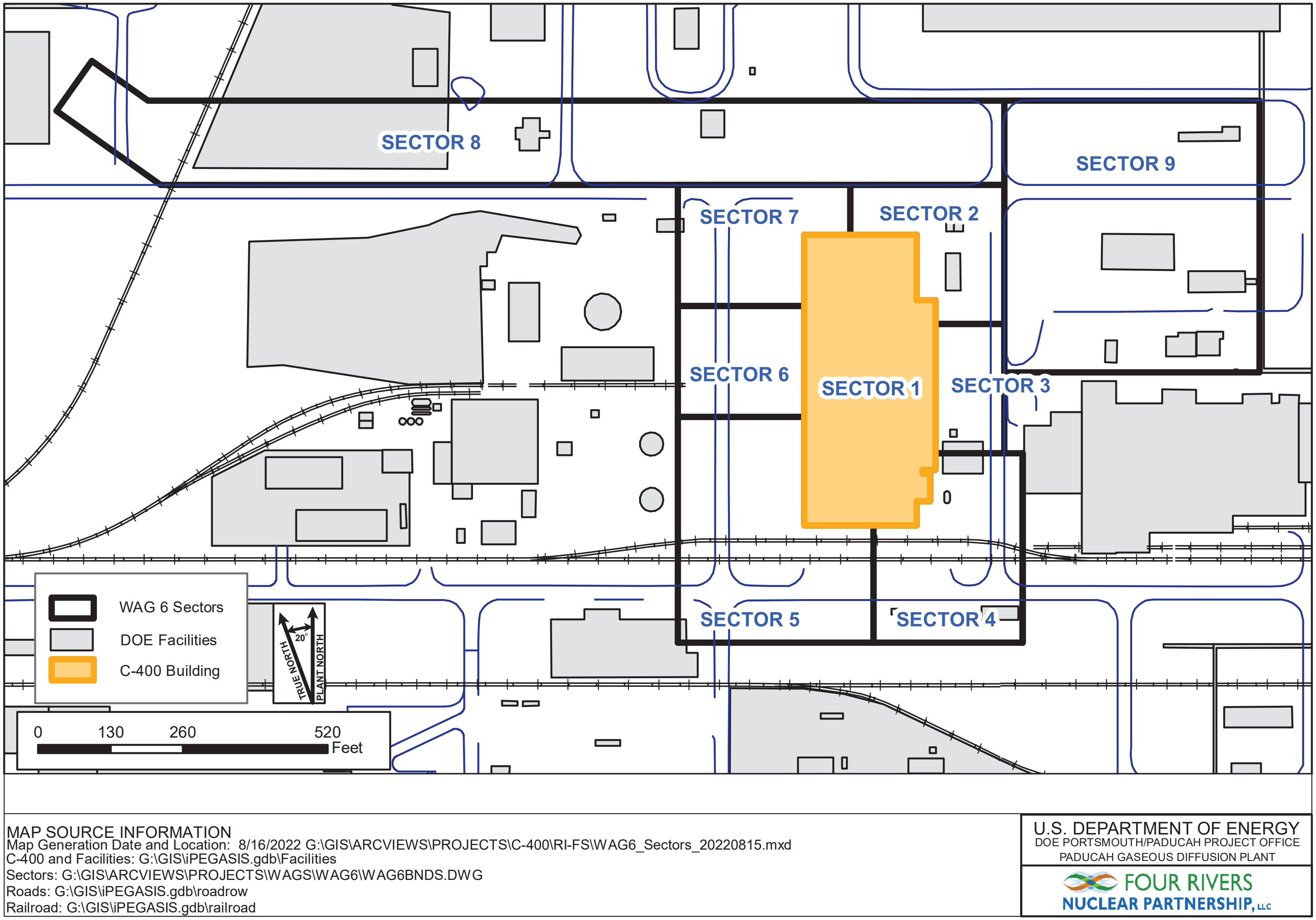

Figure C.1. WAG 6 Sectors for the C-400 Complex OU

- Sector 6—Area to the west of the C-400 Cleaning Building; sector contains SWMU 47;
- Sector 7—Area to the northwest of the C-400 Cleaning Building; sector contains SWMU 203;
- Sector 8—Area to the far north and far northwest of the C-400 Cleaning Building; sector contains SWMU 26; and
- Sector 9—Area to the far east and far northeast of the C-400 Cleaning Building; sector does not contain a SWMU associated with WAG 6.

Key findings from the WAG 6 BHHRA and BERA are presented in the following subsections.

C.2.1.1 WAG 6 Baseline Human Health Risk Assessment

Consistent with regulatory requirements and agreements contained in the approved human health risk assessment methods document (DOE 1996), the BHHRA was used to evaluate scenarios that encompass current use and several hypothetical future uses of the WAG 6 area and areas to which contaminants from WAG 6 may migrate. The scenarios assessed in the BHHRA were as follows.

- Current on-site industrial—direct contact with surface soil (soil found 0 to 1 ft bgs);
- Future on-site industrial—direct contact with surface soil at and use of groundwater drawn from aquifers below the WAG 6 area;
- Future on-site excavation scenario—direct contact with surface and subsurface soil (soil found 0 to 16 ft bgs);
- Future on-site recreational user—consumption of game exposed to contaminated surface soil;
- Future off-site recreational user—direct contact with surface water impacted by contaminants migrating from sources and consumption of game exposed to this surface water;
- Future on-site rural resident—direct contact with surface soil at and use of groundwater drawn from aquifers below the WAG 6 area, including consumption of vegetables that were hypothesized to be raised in this area; and
- Future off-site rural resident—use in the home of groundwater drawn from the regional gravel aquifer (RGA) at the U.S. Department of Energy (DOE) property boundary.

For all nine sectors of the WAG 6 area, the cumulative human health excess lifetime cancer risk (ELCR) and systemic toxicity exceeded the accepted standards of KDEP and EPA for one or more scenarios when assessed using default exposure parameters.

Observations of the BHHRA are presented here (Note: the observations from the BHHRA focus on the industrial use, the current and most plausible future land uses for the WAG 6 area.). See Volume 3 of the WAG 6 RI Report for more extensive discussions of each of the following observations.

- The use of the provisional lead reference doses (RfDs) provided by KDEP results in total hazard indices that exceed 1,000 for those locations where the maximum detected concentration of lead in soil exceeded its background concentration and for the use of groundwater at the WAG 6 area. However, when this provisional value is not included in the risk characterization, total hazard indices are markedly reduced. Due to the uncertainty in the results using the provisional lead RfDs, a better understanding of the risks presented by lead may be gained by comparing the representative exposure concentrations of lead in soil and groundwater to screening levels from KDEP and EPA. In these comparisons, the concentrations of lead in the RGA and McNairy Formation groundwater exceeded both the KDEP and EPA screening levels; however, the representative exposure concentrations of lead in surface and subsurface soil did not exceed either screening level. It was noted that the results of EPA's Integrated Exposure Uptake Biokinetic lead model indicated that the concentrations of lead in groundwater may be unacceptable.

- The dermal contact with soil exposure route poses considerable risk, primarily from contact with metals (predominantly beryllium) in soil. In fact, for all land use scenarios evaluated, the systemic toxicity and the ELCR posed through the soil dermal exposure route exceed those posed through the soil ingestion route. This is a direct result of using dermal absorption values that exceed gastrointestinal absorption values and may be too conservative. This observation indicates that the risk estimates from the dermal exposure route may be unrealistic and may overstate the real risk posed by this route of exposure. Although chemical-specific absorption values were used when available, default absorption values were used for most chemicals because chemical-specific values are lacking. Chemical-specific absorption values were available for polychlorinated biphenyls (PCBs), cadmium, and carbon disulfide and were used in this BHHRA. Remedial decisions based on the dermal contact with soil exposure route should be carefully considered in light of the uncertainty associated with risk from this exposure route.

- The current use scenario, industrial use, has risk that is unacceptable at each sector, except Sector 1 where contact with surface soil is not possible and throughout the WAG 6 area when assessed using KDEP default exposure parameters. At each location, the pathway driving systemic toxicity and ELCR is dermal contact with soil. The primary contaminants driving systemic toxicity and ELCR within this pathway are metals, chiefly beryllium, and polycyclic aromatic hydrocarbons (PAHs) for all locations.

- The risk associated with the most plausible future land use scenario, industrial use, is unacceptable at each location, except Sector 1 where contact with surface soil is not possible. As discussed in the BHHRA, the future industrial land use scenario is identical to the current industrial land use scenario except that in the future scenario, use of RGA and McNairy Formation groundwater is also evaluated. The addition of groundwater as a medium of exposure adds significantly to the risk for this scenario. If groundwater contribution is removed from the risk totals, the pathway driving systemic toxicity and ELCR is dermal contact with soil. As with the current industrial user, the primary contaminants driving systemic toxicity and ELCR within this pathway are metals, chiefly beryllium, and PAHs for all locations.

- Risks from use of groundwater drawn from both the RGA and the McNairy Formation exceed *de minimis* levels for all scenarios. For the RGA (excluding lead as a metal), the contaminants driving the ELCR were TCE, vinyl chloride, and lead-210, and the contaminants driving systemic toxicity were iron and TCE. For the McNairy Formation (excluding lead as a metal), the contaminants driving the ELCR were arsenic and lead-210, and the contaminants driving systemic toxicity were arsenic and iron.

- Unlike other assessments that have been performed for PGDP, where the inhalation of volatile organic analytes (VOAs) and particulates emitted from the soil exposure route have not been a pathway of concern (POC), in this assessment, this exposure route is a POC for the excavation worker for Sectors 4 and 5 and the entire WAG 6 area. The contaminant driving risk within this pathway and scenario combination at these locations is vinyl chloride.

- Of the analytes migrating from sources in WAG 6 soil and groundwater, the COCs determined using risk estimates for future residential groundwater users are 1,1-dichloroethene, 1,2-dichloroethene, 2,4-dinitrotoluene, carbon tetrachloride, n-nitroso-di-n-propylamine, tetrachloroethene, *trans*-l,2-dichloroethene, TCE, vinyl chloride, antimony, copper, iron, and manganese. There are no radionuclide COCs migrating from the WAG 6 area based upon risk estimates derived from the fate and transport modeling discussed in Section 5 of the WAG 6 RI Report; however, technetium-99 was not modeled and was assumed (without quantitation) to be a COC.

C.2.1.2 WAG 6 Baseline Ecological Risk Assessment

Consistent with regulatory guidance and the strategy for the ecological risk assessment of source units (DOE 1993), the BERA was used to evaluate risks under both current and potential future conditions to several nonhuman receptors that may come into contact with contaminated media at or migrating from sources in the WAG 6 area. In the BERA, as with the BHHRA, information collected during the WAG 6 RI and from the fate and transport information in Section 5 of the WAG 6 RI Report was used (Note: because the fate and transport information indicated that surface migration of contaminants from WAG 6 to creeks surrounding the Paducah Site is not significant, a quantitative assessment of risks from surface migration to these creeks was not included in the WAG 6 BERA.).

Because the WAG 6 area is located in the heavily industrialized portion of PGDP, the BERA project team concluded during problem formulation that it would not be appropriate to derive risk estimates for impacts to nonhuman receptors exposed to contamination in the WAG 6 area under current conditions; however, in an analysis to assess potential impacts to nonhuman receptors exposed to contaminants in surface soil in the future, if the industrial infrastructure were removed, and to estimate the potential impact of surface migration of contaminated media, several contaminants in surface soil were found to be at concentrations greater than those derived from ecological benchmarks for protection of nonhuman receptors.

Observations of the BERA are presented here (Note: the observations of the BERA focus on the potential risks to nonhuman receptors.). Please see Volume 3 of the WAG 6 RI Report for more extensive discussions of each of the following observations.

- Ten non-radionuclide COPECs (nine inorganics and PCBs) exceeded benchmarks for at least one receptor group. The inorganics were aluminum, arsenic, cadmium, chromium, iron, thallium, uranium, vanadium, and zinc. Of these, aluminum, iron, vanadium, and zinc were near background levels. Aluminum is unlikely to be a concern in the WAG 6 area, as the maximum aluminum concentration in any of the sectors was only 1.4 times background. Similarly, iron, vanadium, and zinc were near background levels (maximums of 1.3 times, 1.1 times, and 1.7 times background, respectively). Cadmium was of concern only for plants in Sector 6 and may have been related to a hot spot rather than a sector-wide concern. Arsenic was a concern only for shrews and plants in Sector 6. Chromium was of potential concern in all sectors except Sector 1 (Note: no COPECs were identified for Sector 1 because the location is covered by the C-400 building.). Thallium resulted in low exceedances [maximum hazard quotient (HQ) of 1.5] for plants in Sectors 3 and 5. Uranium resulted in plant exceedances in all sectors except Sector 1 and Sector 4. PCBs were a concern only for shrews and mice in Sector 3. While individuals in Sector 3 may be at risk from exposure to PCBs, population-level risks across a broader area appear unlikely given the lack of risk from PCBs in other sectors.

- Estimated doses from exposure to radionuclides in soil were below recommended dose rate limits for all receptors in all sectors; therefore, no unacceptable risks are expected from exposure to radionuclides.

- Uncertainty concerning the future condition, the bioavailability of various metals (e.g., aluminum at all sites was only slightly elevated above background), and use of only one line of evidence [comparison of exposures to the lowest observed adverse effects levels (LOAELs)] may have led to an overestimate of potential future ecological risks.

- A summary of analytes of potential ecological concern and receptors potentially at risk should future exposures occur is presented in Table 6.12 of the WAG 6 RI Report. Additional discussion of these results is presented in Section 2 of Volume 3 of the WAG 6 RI Report.

C.2.2 VAPOR INTRUSION STUDY (2017–2018)

DOE has completed investigation of the VI pathway at the C-400 VI Cleaning Building in accordance with the approved *C-400 Vapor Intrusion Study Work Plan to Support the Additional Actions for the CERCLA Five-Year Review at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2017b).

On January 27, 2018, February 10, 2018, and February 12, 2018, the sampling events were conducted to collect indoor air, sub-slab soil gas, and ambient air samples under the three scenarios as described in the work plan (i.e., fan off and doors closed; fan on and doors open; fan on and doors closed).

The VI study results showed that the VI pathway for TCE is complete, and that TCE concentrations exceeded the project action levels (PALs) in indoor air in the basement level southeast side and southeast office in the main floor of the building. The VI pathway is either incomplete (i.e., indoor air sampling result is nondetect) or is complete with indoor air sampling results below the PAL, at all other sampled locations. TCE concentrations measured in sub-slab gas were above EPA's commercial sub-slab soil gas vapor intrusion screening level (VISL) in the basement and main floor of the northeast, southeast, and south side of the building, indicating that TCE concentrations in indoor air greater than the PAL continue to be possible, particularly under fan off, closed door conditions. TCE concentrations in sub-slab soil gas were below EPA's commercial sub-slab soil gas VISL in the basement furnace room on the north end of the building and west side of the building under all scenarios.

Cumulative ELCR assuming chronic exposure by industrial workers was < 6.0E-06 at all individual locations and < 2.0E-06 when all three scenarios are combined. Cumulative hazards assuming chronic exposure by industrial workers was less than a hazard index (HI) of 1.0 at all individual locations except in the basement level near degreaser tanks under fan off, closed door conditions, and < 1.0 when all three scenarios are combined. It should be noted that the building is undergoing deactivation and is occupied by workers who are engaged in deactivation activities and are protected under DOE health and safety requirements.

The groundwater under C-400 Cleaning Building contains the highest concentrations of TCE at the Paducah Site. The volatile organic compound (VOC) concentrations in the C-400 Cleaning Building have been shown through this study not to pose an unacceptable risk to workers.

C.2.3 C-400 BASEMENT SLAB AND SUBSURFACE STRUCTURES DATA SUMMARY REPORT (2019)

The C-400 Cleaning Building is a component of the C-400 Complex OU. Per the requirements of the *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2017c), the C-400 Cleaning Building facility has undergone deactivation. Between July 2018 and September 2018, sampling of the C-400 Cleaning Building basement slab and subsurface structures was conducted to demonstrate physically that all hazardous materials required to support the demolition phase have been removed to levels that support the planned disposal paths and air dispersion calculations. The primary intent of this sampling was to support internal contractual requirements for deactivation under DOE Atomic Energy Act authority. The samples were collected in accordance with the sampling and analysis plan (SAP) (DOE 2018). The SAP was developed to be consistent with the procedures and protocols required by Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Toxic Substances Control Act, and the samples provide data that inform the nature and extent of contamination within the C-400 Complex OU, help characterization in the RI, and support decisions in the FS.

A data summary report (DSR) that describes the field investigation, data evaluation, risk evaluation, and summary and conclusions for the basement slab and subsurface structures sampling was submitted concurrently with the submittal of the *Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/7-2433&D2/R1, (C-400 Complex RI/FS Work Plan), as an appendix (DOE 2020b). Following is information summarized from the DSR.

Sampling locations were biased to areas where contamination was expected to be present (judgmental). Sampling included concrete floors and walls (including visibly stained locations); surface coatings on walls and floors; sludges in floor drains; and caulk. Samples were analyzed based on the following summarizations.

- Concrete samples were analyzed for VOCs, VOAs, semivolatile organic compounds (SVOCs), and semivolatile organic analytes, PCBs, metals, asbestos, and radionuclides.

- Caulk samples were analyzed for PCBs.

- Paint/coating samples were analyzed for anion (fluoride), metals, PCBs, and radionuclides.

- Liquid and sludge samples were analyzed for VOCs, radionuclides, metals, PCBs, and SVOCs.

Detected results for each location within the C-400 Cleaning Building basement and sub-grade areas were compared first with background values for surface soil, if available, and then with preliminary remediation goals (PRGs). In the narratives, an analyte had to have a result greater than background before being identified as exceeding a PRG. The PRGs selected for this screening are NALs for the child resident exposed to soil/sediment, the NALs and action levels (ALs) for the industrial worker exposed to soil/sediment, and NALs and ALs for the child resident exposed to groundwater. While the NALs and ALs are for exposure scenarios not applicable to contaminated concrete and other infrastructure, completing the evaluation using these screening values allows for identification of the contaminants that exceed their risk-based values by the greatest amount.

Results from concrete sampling were sufficient to characterize the nature and extent of contamination within the C-400 Basement Slab and Subsurface Structures and to assess the potential risk from direct exposure. No analyses in concrete exceeded industrial worker ALs. Analyses that exceeded both industrial worker NALs and background values (if available) were the metals, chromium, cobalt, and uranium; Total PCBs; and the radionuclides, neptunium-237, technetium-99, uranium-233/234, uranium-235/236, and uranium-238. Uncertainties regarding migration risk are due to unavailability of risk-based values to complete the comparison. Uncertainties regarding the use of background in the screening are due to background values being specific to surface soil, not concrete.

Results from paint, coating material, and caulk sampling were sufficient to characterize the nature and extent of contamination within the C-400 Basement Slab and Subsurface Structures and to assess the potential risk from direct exposure. Industrial worker ALs were exceeded in paint/coating for the metals, iron, lead, uranium; Total PCBs; and the radionuclides, neptunium-237, uranium-235/236, and uranium-238. Analyses that exceeded both industrial worker NALs and background values (if available) were the metals, arsenic, chromium, cobalt, iron, lead, and uranium; Total PCBs; and the radionuclides, cesium-137, neptunium-237, plutonium-239/240, technetium-99, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. Uncertainties regarding migration risk for paint, coating material, and caulk are due to the absence of suitable risk-based values necessary to complete the comparison.

Consistent with the July 2018 SAP, information was collected from open floor drains. A video borescope system was deployed into each accessible drain until refusal was encountered (approximately 10% of the total length of the drain lines were investigated). Liquid and sludge samples from the drains were collected when possible and analyzed. The results of the analyses indicate that VOCs, Total PCBs, total carcinogenic PAHs (Total PAHs), anion (fluoride), metals, and radionuclides are present at concentrations exceeding risk-based screening values in these media.

As summarized in the DSR, the sample results from all media are sufficient to support the future remedial decision. Subsurface drains that were not accessible at the time of July 2018 SAP implementation should be considered to be similar to, with respect to nature of contamination, the drains accessible for video borescoping and sampling.

C.2.4 SOILS OU REMEDIAL INVESTIGATION REPORT (2011)

This section presents the results the BHHRA and SERA conducted for the Soils OU. The Soils OU BHHRA and SERA were presented in the Soils OU RI Report as Appendix D and Appendix E, respectively. These assessments utilized information collected during the Soils OU RI, in addition to information collected during previous investigations to characterize the baseline risks posed to human and ecological receptors from contaminants in soil at SWMUs/AOCs.

- SWMU 11, C-400 TCE Leak Site
- SWMU 26, C-400 to C-404 Underground Transfer Line
- SWMU 40, C-403 Neutralization Tank
- SWMU 47, C-400 Technetium Storage Tank Area

Risks and hazards were not quantified for SWMU 11 or SWMU 40 in the BHHRA or SERA. At the time of the Soils OU RI, SWMU 11 was undergoing an interim remedial activity and the parties agreed that SWMU 11 would be more fully addressed after the operation was complete. SWMU 40 was reassigned to the C-400 Complex OU. As such, the following subsections focus on the risk assessment results for SWMU 26 and SWMU 47.

C.2.4.1 Soils OU Baseline Human Health Risk Assessment

The receptor-exposure scenarios assessed in the Soils OU BHHRA for SWMU 26 and SWMU 47 were as follows:

- Current on-site and off-site industrial workers—direct contact with surface soil (0 to 1 ft bgs);

- Future industrial worker—direct contact with surface soil (0 to 1 ft bgs);

- Future recreational user (teenager)—direct contact with surface soil (0 to 1 ft bgs);

- Future hypothetical rural resident—direct contact with surface soil, exposure to vapors in indoor air (based on soil gas concentrations modeled from soil), and use of groundwater drawn from the RGA (based on groundwater concentrations modeled from soil);

- Future outdoor worker—direct contact with surface and subsurface soil (0 to 10 ft bgs); and

- Future excavation worker—direct contact with surface and subsurface soil (0 to 10 ft bgs).

For soil at SWMU 26 and SWMU 47, the cumulative human health ELCR and systemic toxicity estimates exceeded the accepted standards of KDEP and EPA for one or more scenarios when assessed using default exposure parameters. The average lead concentration did not exceed the NAL at these SWMUs; therefore, lead was not considered further as a COPC nor as a COC. Radionuclide doses exceeded 15 mrem/year at SWMU 26 for future workers and future hypothetical rural residents. Based on the risk characterization, the following are the priority COCs identified for soil over all the direct contact receptor scenarios evaluated.

- SWMU 26—Arsenic, beryllium, cesium-137, cobalt, iron, mercury, neptunium-237, nickel, thallium, uranium, uranium-235, uranium-238, vanadium

- SWMU 47—arsenic, beryllium, cobalt, Total PAHs

The results of VI modeling for soil indicated the potential for very high risks/hazards via this pathway; therefore, the Soils OU BHHRA recommended that where VOCs are present in shallow soils and upper groundwater, the VI pathway should be considered for any future buildings (residential or commercial).

Two SWMUs (11 and 47) were identified with potential unacceptable contaminant concentrations in groundwater associated with migration from soil in these areas. Concentrations at potential POEs were modeled from soil using Seasonal Soil Compartment Model and Analytical Transient 1-, 2-, 3-Dimensional Model groundwater and transport modeling. The potential POEs as completed in the modeling are the SWMU boundary, the property boundary, and a downgradient RGA discharge point. The most stringent assumptions for risk estimates at the SWMU boundary were used for the risk estimates. For domestic use and VI scenarios, TCE at SWMU 47 was identified as a priority COC.

As described in the Soils OU BHHRA (Section D.6.5), the large number of assumptions used in the risk assessment could have introduced a great deal of uncertainty (DOE 2013). While it is theoretically possible that this led to underestimates of potential risk, the use of numerous upper-bound assumptions most likely resulted in conservative estimates of potential risks. Any individual's potential exposure and subsequent potential risk are influenced by their individual exposure and toxicity parameters and will vary on a case-by-case basis. Despite inevitable uncertainties associated with the steps used to derive potential risks, the use of numerous health-protective assumptions most likely resulted in a protective estimate of potential health risks for receptors that could be exposed to site contaminants at SWMUs/AOCs evaluated in the Soils OU (DOE 2013).

C.2.4.2 Soils OU Screening Level Ecological Risk Assessment

The Soils OU SERA assessed terrestrial receptor exposure to surface soil at the Soils OU SWMUs/AOCs (DOE 2013). Maximum and average surface soil (0 to 1 ft bgs) concentrations were compared to no further action (NFA) values from the Ecological RMD (DOE 2019) to calculate HQs. Constituents with HQs > 1 were identified as COPECs and constituents with HQs > 10 were identified as priority COPECs. Based on the SERA for the SWMUs within the C-400 Complex OU, the following priority COPECs were identified for surface soil:

- SWMU 26—antimony, selenium, Total PCBs, toluene, TCE, uranium
- SWMU 47—High molecular weight (HMW) PAHs, Total PCBs

As described in the Soils OU SERA (Section E.4), a number of uncertainties impact the potential usefulness of the results of this SERA (DOE 2013). An uncertainty in the screening assessments is that the ecological screening levels are protective of entire suites of receptors, some of which may not be present. The grassy areas of these SWMUs would be attractive to ecological receptors, but the areas are relatively small, and the surrounding industrial area may limit the extent to which ecological receptors use these areas. These uncertainties, combined with the results of the SERA, indicate the need for further evaluation of these sites. Risk managers may determine that sites do not need further evaluation (if exposure pathways are not complete or planned actions will eliminate the exposure pathway) or may recommend additional evaluation of the sites to better define the potential ecological risk indicated by the results. Alternatively, the benchmarks used in the screenings presented here and in the NFA levels in the Ecological RMD may be used as the ecologically based RGOs (DOE 2019).

C.2.5 GROUNDWATER OU FEASIBILITY STUDY REPORT (2001)

This section summarizes the risk assessments presented in Appendix B of the Groundwater OU FS (DOE 2001). The Groundwater OU contains SWMUs and AOCs that previously were grouped in WAGs 6, 26, 27, and 28. Groundwater OU FS. Hence, the findings for WAG 6 are relevant to the current assessment.

The BHHRA prepared as part of the Groundwater OU FS is summarized in Section 1.2.5.1 (DOE 2001). The BERA prepared as part of the Northwest Dissolved Phase Plume investigation (DOE 1994) is summarized in Section 1.2.5.2 of the Groundwater OU FS (DOE 2001).

C.2.5.1 Baseline Human Health Risk Assessment

Several BRAs have been performed for the Groundwater OU and the sources contributing contaminants to it. A list of reports presenting these assessments is provided in Section 1.2.6.1 of the Groundwater OU FS (DOE 2001). As a supplement to the previous assessments, a BHHRA was prepared as part of the Groundwater OU FS to reexamine the risks to human health from exposure to groundwater at and around PGDP using the most recent sampling information available.

C.2.5.1.1 Summary of exposure assessment

To facilitate data aggregation and to focus results on specific areas, the Groundwater OU BHHRA derived risk estimates for several area and depth data aggregates and individual sampling stations. The areas are as follows:

- Area a—inside TCE-contaminated area at C-400 building—inside industrialized area
- Area b—inside the Northwest TCE Plume—inside industrialized area (i.e., west main plant)
- Area c—inside the Northeast TCE Plume—inside industrialized area (i.e., east main plant)
- Area d—outside the TCE Plumes—south of C-400 in industrialized area
- Area e—inside the Northwest TCE Plume—outside industrialized area
- Area f—inside the Northeast TCE Plume—outside industrialized area
- Area g—outside the TCE Plumes—west of industrialized area (i.e., west of plume)
- Area h—outside the TCE Plumes—east of industrialized area (i.e., east of plume)
- Area i—outside the TCE Plumes—north of industrialized area (i.e., between the plumes)
- Area j—outside the TCE Plumes—Tennessee Valley Authority (TVA) area

- Area k—outside the TCE Plumes—south of industrialized area above terrace
- Area l—inside plant area—composed of Areas a, b, c, and d
- Area m—outside plant area—composed of Areas e, f, g, h, i, j, and k
- Area n—all groundwater—composed of Areas l and m

The depth classifications used were based upon a combination of the depth at which the sample was collected and the characteristics of the subsurface in the area of the sampling station. These groups and their definitions are summarized as follows:

- HU1—data from a sample collected in Hydrogeological Unit (HU)1

- HU2—data from a sample collected in HU2

- HU3—data from a sample collected in HU3

- HU4—data from a sample collected in HU4

- HU5—data from a sample collected in HU5

- HU6—data from a sample collected in HU6

- Other—data from a sample collected from an HU not included above (i.e., Terrace Gravel, Porters Creek Clay, Eocene Sands)

- Upper Continental Recharge System (UCRS)—data from samples assigned to HU1, HU2, or HU3

- RGA—data from samples assigned to HU4 or HU5

- McNairy Formation—data from samples assigned to HU6

Consistent with regulatory guidance and previous agreements, the BHHRA, utilizing sampling data, evaluated scenarios that encompass both current use and several hypothetical future uses of groundwater at PGDP. These scenarios and the exposure routes considered under each are as follows.

- Industrial worker—ingestion of groundwater, dermal contact with groundwater while showering, and inhalation of vapors emitted by groundwater while showering.

- Recreational user[1]—incidental ingestion of water while swimming in a pond filled with groundwater, dermal contact with water while swimming in a pond filled with groundwater, dermal contact with water while wading in a pond filled with groundwater, consumption of fish raised in a pond filled with groundwater, consumption of venison that used a pond filled with groundwater as a drinking water source, consumption of rabbit that used a pond filled with groundwater as a drinking water source, and consumption of quail that used a pond filled with groundwater as a drinking water source.

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[1] The language used to describe the exposure routes quantified for the recreational user is derived from the BHHRA report presented in Appendix B of the *Feasibility Study for the Groundwater Operable Unit at the Paducah Gaseous Diffusion Plant Paducah, Kentucky* (DOE 2001). As explained in that document, contaminant concentrations measured in Paducah Site groundwater were used to evaluate off-site exposures to recreational users by assuming that "…groundwater was used to fill recreational ponds and that biota used water from these ponds as a water supply." The pond scenarios were used as surrogates for exposure at potential discharge points along creeks or to ponds; mixing with surface water at discharge points was not considered.

- Rural resident[2]—ingestion of groundwater, dermal contact with groundwater while showering, inhalation of vapors emitted by groundwater during household use, inhalation of vapors emitted by groundwater while showering, consumption of vegetables, consumption of beef from cattle watered with groundwater, consumption of milk from cattle watered with groundwater, consumption of chickens and turkeys watered with groundwater, consumption of eggs from chickens watered with groundwater, and consumption of pork from swine watered with groundwater.

C.2.5.1.2 Land uses of concern

For the area assessment, not all area/depth classifications were found to have land use scenarios of concern for both systemic toxicity and ELCR; however, the RGA was found to be of concern for all uses in all areas, and the UCRS was found to be of concern for residential and industrial use in all areas where data were available and for recreational use in all but Areas c, f, h, and j.

The McNairy Formation had more areas where the land uses assessed were not of concern than the UCRS and RGA. Under the industrial worker scenario, Areas a, c, d, f, and i, were not of concern; under the recreational user, Areas a, c, d, f, h, and i were not of concern; and under the rural resident, Areas a, b, and f were not of concern (Note: Data were not available for the McNairy Formation in Areas a and b. Also, the McNairy Formation did not apply to Area k.).

Area k (i.e., groundwater taken to the south of PGDP on the terrace) was of concern for each land use for systemic toxicity and ELCR.

C.2.5.1.3 Contaminants of concern

Multiple COCs were found for each of the land uses. Combining the results for systemic toxicity and ELCR and considering the magnitude of the chemical-specific HIs and ELCRs, the following COCs were identified as "priority COCs" in UCRS groundwater across all use scenarios (excluding Area k):

- Inorganic chemicals—arsenic, antimony, beryllium, cadmium, chromium, iron, lead, manganese, nickel, and vanadium.

- Organic compounds—1,1-dichloroethene, benzene, chloroform, ethylbenzene, naphthalene, *trans*-1,2-dichloroethene, *cis*-1,2-dichloroethene, TCE, and vinyl chloride.

- Radionuclides—radon-222.

For Area k, the "priority COCs" in groundwater across all use scenarios were:

- Inorganic chemicals—antimony, beryllium, cadmium, iron, lead, manganese, and vanadium.

- Organic compounds—1,1-dichloroethene, 1,2-dichloroethene, naphthalene, *cis*-1,2-dichloroethene, TCE, and vinyl chloride.

- Radionuclides—radon-222.

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[2] The language used to describe the exposure routes quantified for the rural resident is derived from the BHHRA report presented in Appendix B of the *Feasibility Study for the Groundwater Operable Unit at the Paducah Gaseous Diffusion Plant* (DOE 2001). Contaminant concentrations measured in Paducah Site groundwater were used as surrogates without dilution or attenuation to evaluate potential exposures to a hypothetical off-site rural resident.

For the RGA, the following COCs were identified as "priority COCs" in RGA groundwater across all use scenarios:

- Inorganic chemicals—antimony, arsenic, beryllium, cadmium, chromium, iron, lead, manganese, molybdenum, and vanadium.
- Organic compounds—1,1-dichloroethene, acrylonitrile, carbon tetrachloride, aroclor-1254, tetrachloroethene, *cis*-1,2-dichloroethene, *trans*-l,2-dichloroethene, TCE, and vinyl chloride.
- Radionuclides—radium-226 and radon-222.

For the McNairy Formation, the following COCs were identified as "priority COCs" in McNairy Formation groundwater across all use scenarios:

- Inorganic chemicals—antimony, arsenic, beryllium, cadmium, chromium, iron, manganese, molybdenum, and vanadium.
- Organic compounds—TCE.
- Radionuclides—radon-222.

(Note: "Priority COCs" are those that present either a chemical-specific HI or ELCR at one or more areas across all land uses that exceeds 1 or 1×10^{-4}, respectively.).

C.2.5.1.4 Pathways of concern

All direct contact exposure routes (i.e., those involving ingestion, dermal contact, inhalation) and the sum of the biota consumption exposure routes were of concern for at least one area/depth classification combination; however, specific biota consumption routes were determined to not be of concern for some areas. Biota consumption routes for the recreational user not of concern in any area were consumption of venison, rabbit, and quail. Biota consumption routes for the resident not of concern in any area were consumption of eggs and consumption of pork. Biota consumption routes for the recreational user and resident that were of concern for virtually all area and depth classification combinations were the consumption of fish and consumption of vegetables, respectively.

C.2.5.1.5 Uncertainties

As discussed in Section 6 of the Groundwater OU FS BHHRA, the risk estimates could vary considerably if different assumptions were used in deriving the risk estimates or if better information was available for some parameters. Exhibit 6.3 of the BHHRA summarizes the uncertainties in the risk assessment and characterizes each as potentially having a small, moderate, or large effect. Most uncertainties were identified as having an effect estimate to be small. Four uncertainties were identified with an effect estimated to be moderate: characterization of exposure point concentration (EPC) for environmental media under future conditions (i.e., modeling); incorporation of biota fate and transport modeling into risk estimates; use of provisional or withdrawn toxicity values for systemic toxicity and ELCR; and derivation of toxicity values for chemicals. Only one uncertainty was identified with an effect estimated to be large, which is the use of provisional toxicity values for lead.

C.2.5.1.6 Overall conclusions

When the risk results and uncertainties are integrated, the conclusion reached during the earlier Site Investigation Phase II risk assessment is valid for this Groundwater OU BHHRA, as well. In general, the contamination problem posing the greatest risk from use of groundwater at PGDP is the presence of TCE and its breakdown products in the aquifer. Although several inorganic chemicals and some radionuclides contribute significantly to total risk, these contaminants may be related to sampling or other biases and be of less relative importance; however, the other contaminants and contamination in source areas need to be considered when developing remedies for groundwater contamination and its sources at PGDP, because modeling results indicate that unacceptable risks may develop if contaminants are allowed to continue to migrate from these source areas; however, because the modeling results are very uncertain, the appropriate risk management decision may be to address the TCE contamination in the short-term.

C.2.5.2 Groundwater OU FS Summary of 1994 Ecological Risk Assessment

The information provided in this section was obtained from the Groundwater OU FS, Appendix B, Attachment 9. Information in the Groundwater OU FS was obtained from the BERA for the Northwest Dissolved Phase Plume (DOE 1994). The Groundwater OU FS did not include additional ecological evaluation. At the time of the BERA, the Northwest Plume was described as a contaminant plume within RGA delimited by the presence of dissolved contaminants above background concentrations, particularly TCE and technetium-99.

The objectives of the BERA for the Northwest Dissolved Phase Plume were to evaluate the potential for adverse effects on ecological receptors exposed to substances dissolved in groundwater and to provide a basis for decisions concerning the need for remediation based on risks to non-human organisms. Risk is the likelihood of experiencing adverse effects. The assessment of risk for ecological receptors potentially exposed to substances in groundwater, which has been contaminated by releases at PGDP, focuses on identifying and evaluating the potential for harmful effects resulting from exposure to chemicals and radionuclides.

Data and model results show that the Northwest Plume is moving north-northeast toward the Ohio River and the Little Bayou Creek Assessment Area. At the time of the BERA there was no indication that the plume had reached the Little Bayou Creek Assessment Area; however, TCE and technetium-99 have subsequently been detected in surface water in the Little Bayou Creek Assessment Area but have not been detected upstream of the assessment area (DOE 1999). The downstream portion of the Little Bayou Creek assessment area in the vicinity of the Ohio River was considered in the BERA for the Northwest Dissolved Phase Plume. Three exposure pathways in the floodplain between the Ohio River and PGDP were evaluated in the BERA for the Northwest Dissolved Phase Plume: (1) groundwater discharge into the Ohio River, (2) pumped groundwater for use in aquaculture and irrigation, and (3) groundwater contribution to surface water resources such as seeps and springs in the vicinity of the Ohio River.

For the Northwest Dissolved Phase Plume BERA, five biotic communities with characteristics that meet one or more of the criteria for good assessment endpoints were chosen as assessment endpoints (EPA 1989a). The chosen endpoints were fish, benthic macroinvertebrates, herbivorous mammals, terrestrial mammals, and avian piscivores. Fish and benthic macroinvertebrates were selected as assessment endpoints for risk from exposure to contaminants in the Northwest Plume resulting from the subsurface discharge of groundwater to the Ohio River. Herbivorous mammals [e.g., cottontail rabbits (*Sylvilagus floridanus*)] were selected to evaluate risk from exposure to contaminants in the Northwest Plume resulting from the discharge of groundwater to the surface for crop irrigation and to seeps in the vicinity of the Ohio River. Piscivorous birds [e.g., great blue herons (*Ardea herodias*)] were selected to evaluate risk from exposure to contaminants in the Northwest Plume resulting from the discharge of groundwater to the surface for fish farms.

The risk characterization was performed for each assessment endpoint by (1) screening contaminants against toxicological benchmarks and background concentrations, (2) estimating the effects of the contaminants retained by the screening analysis, and (3) listing and discussing the uncertainties in the assessment.

Estimated future exposure concentrations and doses of TCE, technetium-99 and other organic compounds, and naturally occurring radionuclides at the contact point with the Ohio River do not exceed screening benchmarks for benthic macroinvertebrates. Conservative estimates of the sediment-pore water concentration for 13 inorganic substances exceed screening benchmarks; 8 exceed the chronic National Recommended Water Quality Criteria. Estimated future concentrations and doses of substances in Ohio River surface water (sediment-pore water diluted by a factor of 0.0004) do not exceed screening benchmarks for fish and other aquatic organisms.

Herbivorous mammals inhabiting land irrigated with groundwater may be exposed to toxic levels of aluminum, arsenic, TCE, and vinyl chloride. Terrestrial mammals living in natural areas are not expected to be exposed to toxic levels of contaminants from ingestion of groundwater pumped to the surface for irrigation or discharging naturally at seeps in the vicinity of the Ohio River. Fish-eating birds frequenting fish ponds irrigated with groundwater from the dissolved phase of the Northwest Plume may be exposed to toxic levels of aluminum, lead, bis(2-ethylhexyl) phthalate and dieldrin. For modeling purposes, groundwater was evaluated at full strength at the well location.

The BERA for the Northwest Dissolved Phase Plume (DOE 1994) confirms that, if groundwater discharges to the surface naturally or as a result of pumping for irrigation, then chemical contamination poses a potential hazard to ecological receptors. The magnitude of this hazard is judged to be minimal for the exposure scenarios evaluated in the BERA (DOE 1994); however, based on the “extensive” uncertainties, the BERA for the Northwest Dissolved Phase Plume concludes that exposure estimates are “unreasonable.” The BERA also concludes that findings of risk for terrestrial mammals and birds hypothetically exposed to groundwater pumped to the surface for irrigation and aquaculture, respectively, and for benthic macroinvertebrates exposed to groundwater potentially discharging to the Ohio River in the future are based on data that are not appropriate to support interpretation or remedial decisions.

With respect to the Groundwater OU FS, Surface Water OU RI/FS, and the pending remedial decisions for these OUs, the major uncertainty associated with the BERA for the Northwest Dissolved Phase Plume is whether the risk characterization results are representative of current and future risk to aquatic and terrestrial biota exposed to groundwater discharging to the surface in the upstream portions of the Little Bayou Creek Assessment Area.

The BERA concludes with a recommendation that because ecological risk from potential discharge of groundwater in the Northwest Plume to surface water in the upstream portions of the Little Bayou Creek Assessment Area was not evaluated directly in the BERA, potential risks associated with this scenario should be evaluated in the Surface Water OU BERA (DOE 1994).

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C.3. IDENTIFICATION OF HUMAN HEALTH CONTAMINANTS OF POTENTIAL CONCERN

This section describes the process used to determine the list of COPCs further evaluated in the exposure assessment and risk characterization screening in the SRE. This includes a description of the data evaluation steps that were used to ensure that the data were appropriate for use in SRE. A general description of the eight steps, as described in the Human Health RMD, and their uses and outcomes in relation to the SRE data set are provided in this section (DOE 2021). Additional details regarding data quality are provided in the data quality analysis (DQA) in Section 3 of this report.

This section also discusses the procedures used to segregate soil and groundwater data into separate exposure units for identification of COPCs per sector and groundwater unit. The screening levels used for identification of the COPCs are also included in this discussion.

C.3.1 SOURCES OF DATA

Data were examined to ensure that sampling methods were adequate for determining the nature and extent of contamination and were representative of current contaminant concentrations in surface and surface/subsurface soil and groundwater at the C-400 Complex OU. Historical data collected from 2000 onwards along with recently collected samples during 2021 and 2022 as part of the C-400 Complex OU RI were combined to develop the SRE dataset.

Data dated 2000 or later were included in the evaluation of quality. More specifically, groundwater data collected from 2012 to 2022 were included in the SRE database. The following soil data was included in the SRE data:

- Metals and radionuclides samples collected between 2000 and 2022;
- VOC samples collected between 2012 and 2022 for surface soil;
- VOC samples collected between 2000 and 2022 for deeper soils (unless identified as unrepresentative);
- SVOC samples collected between 2000 and 2022; and
- PCB samples collected between 2000 and 2022.

C.3.2 EVALUATION OF ANALYTICAL METHODS

Methods used to collect and analyze the selected surface soil and subsurface soil samples were evaluated to determine if they were EPA-approved methods. As described in the C-400 Complex RI/FS Work Plan and the DQA of this report, the analytical methods used for the soil and groundwater samples meet these requirements.

The data evaluation and COPC identification step include a comprehensive evaluation of the analytical data collected during the nature and extent definition for the C-400 Complex OU. The DQA identified the quality assurance/quality control-related issues to determine which data are useable for evaluations performed in the RI.

The C-400 Complex OU RI dataset included field-screening data such as X-ray fluorescence (XRF) data. The primary use of such data is for site characterization, but this survey-type data may play a role in risk-based decision-making; therefore, XRF data were included in the screening process of the risk assessment and was included in the calculation EPCs. Uncertainties associated with and including this data are discussed in the uncertainty section.

C.3.2.1 Evaluation of Sample Quantitation Limits

The sample quantitation limits (SQLs) for each analyte were examined to determine if they were below the concentration at which the contaminant may pose a threat to human health. If the SQL for an analyte was greater than the concentration that may pose a threat to human health and that analyte was not detected in any sample, then the data for that chemical were deemed of insufficient quality, and only a qualitative assessment for that chemical is presented. In the qualitative assessment, the maximum SQL was compared to its respective NAL. For non-detected analytes, one-half the maximum SQL was compared to its respective NAL.

The comparison of SQLs to direct contact human health screening levels are provided in Table C1.1, Table C1.2, and Table C1.3 for surface soil, surface and subsurface soil, and groundwater, respectively. Those chemicals and radionuclides that exceeded their respective screening levels are discussed further in the uncertainty section.

C.3.2.2 Evaluation of Data Qualifiers and Codes

The data used in the SRE were tagged with various qualifiers and codes. Tagged data were evaluated following the Risk Assessment Guidance for Superfund (RAGS) (EPA 1998). Generally, this resulted in the retention of all results for which the identity of the analyte was certain even if there was substantial uncertainty in the analyte concentration within an individual sample. The qualifiers and codes attached to the soil data used in the SRE are defined in Section 3 of this report.

Data rejected by validation were not used in the SRE. The majority of the RI soil data rejected by validation was related to either VOCs or SVOCs (150 of the 155 total data points for soil) and included:

- 1,2,4-trichlorobenzene—one datapoint was rejected;
- 1,4-dioxane—98 datapoints were rejected;
- 2,4,5-trichlorophenol—one datapoint was rejected;
- 2,4,6-trichlorophenol—one datapoint was rejected;
- 2,4-dichlorophenol—one datapoint was rejected;
- 2,4-dimethylphenol—two datapoints were rejected;
- 2-chlorophenol—one datapoint was rejected;
- 2-methylphenol—one datapoint was rejected;
- 2-nitrophenol—one datapoint was rejected;
- 3,3'-dichlorobenzidine—four datapoints were rejected;
- 4-chloro-3-methylphenol—two datapoints were rejected;
- 4-chlorobenzenamine—one datapoint was rejected;
- 4-nitrophenol—two datapoints were rejected;
- acetophenone—two datapoints were rejected;
- benzaldehyde—17 datapoints were rejected;
- bis(2-chloroethyl) ether—one datapoint was rejected;
- bis(2-chloroisopropyl) ether—one datapoint was rejected;
- caprolactam—three datapoints were rejected;
- hexachlorobutadiene—one datapoint was rejected;

- hexachlorocyclopentadiene—one datapoint was rejected;
- hexachloroethane—one datapoint was rejected;
- m+p methylphenol—one datapoint was rejected;
- naphthalene—one datapoint was rejected;
- nitrobenzene—one datapoint was rejected;
- n-nitroso-di-n-propylamine—two datapoints were rejected;
- pentachlorophenol—one datapoint was rejected; and
- phenol—two datapoints were rejected.

A relatively small number of radionuclide data was rejected (total of five datapoints) and two radionuclides were included in the rejected data [cesium-137 (two datapoints) and protectinium-231 (three datapoints)].

The majority of the RI soil data rejected by validation was related to 1,4-dioxane (69 of the 70 total data points for groundwater). The last rejected groundwater datapoint was the radionuclide, cesium-137.

The SRE did not identify the VOCs or SVOCs with rejected soil and groundwater data as COPCs except for 1,4-dioxane (in groundwater) and cesium-137 (in soil). A majority of the rejected datapoints (for both soil and groundwater) was rejected data associated with 1,4-dioxane; however, 1,4-dioxane was identified as a COPC and COC in groundwater. It is possible that the rejected data could affect the designation of 1,4-dioxane as a COPC, but this is unlikely because the 176 soil samples were evaluated in the SRE. When the number of datapoints that were rejected for cesium-137 is compared to the number of samples within the SRE, the soils dataset is relatively small and is unlikely to affect the results and conclusions of the SRE; therefore, the rejected data is unlikely to affect the human health and ecological evaluations of risk.

C.3.2.3 Elimination of Chemicals not Detected

Consistent with the RMDs, any analyte that was not detected with one-half the maximum SQL below its respective NAL and not detected in at least one sample was eliminated from further consideration in the identification of COPCs and not considered further in the SRE (DOE 2019, DOE 2021).

C.3.2.4 Examination of Toxicity of Detected Analytes

The following sections describe the methods for which chemical and radionuclide toxicity were evaluated. The first section discusses the methods used to develop screening criteria for direct contact. The second section discusses the methods used to develop the screening criteria for protection of groundwater. The third section provides a discussion of the selection of screening criteria used in the SERA.

C.3.2.4.1 Examination of toxicity of detected analytes—direct contact

For the data set created for the SRE, a comparison of the analyte's maximum detected concentration in the data set to that analyte's human health based screening value was performed. Human health risk-based NALs used in this comparison were taken from the Human Health RMD. For those chemicals and radionuclides without a screening level presented in the Human Health RMD, NALs were developed using the Risk Assessment Information System (RAIS) preliminary remedial goals calculator using the exposure factors (EFs) specified in Appendix B of the Human Health RMD (DOE 2021).

The selected screening criteria used to assess toxicity differed based on the media which was screened. The scenarios that were selected as the basis of the screening criteria include the following:

- Surface soil—Industrial worker NALs;
- Surface and Subsurface soil—Excavation worker NALs;

- Groundwater—Resident NALs.

To ensure that the soil risk-based screening criteria were protective of each scenario selected, routes of exposure used to develop the NALs for chemicals were ingestion of potentially contaminated media, dermal contact with potentially contaminated media, and inhalation of vapors and particulates emitted by potentially contaminated media. Direct contact exposure routes used to develop NALs for radionuclides were ingestion of potentially contaminated media, inhalation of vapors and particulates emitted by potentially contaminated media, and external exposure to ionizing radiation emitted by potentially contaminated media.

The groundwater risk-based screening criteria for chemicals included the following routes of exposure, which were also used to develop the criteria for chemicals: (1) ingestion of potentially contaminated potable water; (2) dermal contact with potentially contaminated water; (3) and inhalation of vapors emitted by potentially contaminated media. Direct contact exposure routes used to develop groundwater screening criteria for radionuclides were the ingestion of potentially contaminated media.

The target cancer risks and target HQs used in calculating the NALs for chemicals were set by regulatory agreement in the Human Health RMD at 1×10^{-6} and 0.1, respectively. The target cancer risks used in calculating the criteria for radionuclides were set by regulatory agreement in the Human Health RMD at 1×10^{-6}. In this screen, the lower calculation was used for the human health risk-based screening criteria; one was calculated for cancer effects from lifetime exposure, and the other was calculated for systemic toxicity in children.

For a subset of chemicals, toxicity information is not available to determine toxicity associated with concentrations detected at the Paducah Site. For this subset of chemicals, toxicity information from a suitable surrogate was selected. The chemicals for which surrogate toxicity information was selected and the selection reasoning includes the following:

- benzo(g,h,i)perylene—pyrene was selected for structural similarity and for having the lowest noncancer toxicity values among non-carcinogenic PAHs; pyrene is EPA Region 4's standard default surrogate.

- p-bromodiphenyl ether—diphenyl ether was selected for structural similarity.

- 2-chloroethylvinyl ether—chloromethyl methyl ether was selected for structural similarity. The recommended surrogate compound is an ether and includes a chlorine atom.

- 4-chlorophenyl phenyl ether—diphenyl ether was selected for structural similarity.

- 1,3-dichlorobenzene—1,2-dichlorobenzene was selected for structural similarity and a noncancer screening level lower than 1,2-dichlorobenzene and 1,4-dichlorobenzene.

- *cis*-1,3-dichloropropene and *trans*-1,3-dichloropropene—1,3-dichloropropene was selected because the screening level represents a 1,3-dichloropropene mixture that contains both the *cis*- and *trans*-1,3-dichloropropene isomers.

- dimethylphthalate—diethylphthalate was selected for its structural similarity.

- iodomethane—chloromethane was selected for its structural similarity.

- m+p methylphenol—p-cresol (4-methlyphenol) was selected because the isomer is the more toxic of the two isomers presented in the mixture (m-methylphenol and p-methylphenol).

- 2-nitrophenol and 4-nitrophenol—2,4-dinitrophenol was selected for its structural similarity.

For evaluation of carcinogenic PAHs, the toxicity equivalence factors (TEFs) presented in *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* were used (EPA 2005a). TEFs were applied to the concentrations of detected PAHs in each sample and that the total carcinogenic PAHs concentration in a sample was the sum of the products of each carcinogenic PAHs and its TEF. For samples in which PAHs are not detected, the value for the minimum detection limit (DL) of the PAHs with TEFs was used to represent the sample.

Derivation of Total PCBs [if this analyte (i.e., Total PCBs) was not reported in the data set], the detected concentrations of each PCB within a sample was summed. For samples in which no PCBs were detected, the value for the minimum DL of the PCBs was used to represent the sample.

For the derivation of total dioxins/furans, the TEFs presented in Volume 72, Number 90 of the *Federal Register*, dated May 10, 2007, for dioxin and dioxin-like compounds; and the toxic equivalency information were used. These TEFs were applied to both the concentrations of detected dioxins and furans and to one-half the sample quantitation limit of undetected dioxins and furans (when one or more dioxin or furan is detected). The total dioxin and furan concentration in a sample is the sum of the products of each dioxin and furan and the TEF. For samples in which no dioxin or furan was detected, the minimum DL for 2,3,7,8-tetrachlorodibenzo-p-dioxin was used to represent the sample.

C.3.2.4.2 Examination of protection of groundwater values

For the data set created for the SRE, a comparison of the analyte's maximum detected concentration in the data set to that analyte's protection of groundwater soil screening level (SSL) was performed. The chemical and radionuclide SSLs used in this comparison were referenced from the Human Health RMD (DOE 2021). If an analyte's SSL was not provided in the Human Health RMD, then the value was developed utilizing the RAIS preliminary remedial goals calculator.

The SSLs for chemical analytes were developed using the following equation referenced from the Human Health RMD.

$$SSL\left(\frac{mg}{kg}\right) = NAL_{water}\left(\frac{mg}{L}\right) x\ DAF\ x \left[K_d\left(\frac{L}{kg}\right) + \left(\frac{\theta_w\left(0.3\frac{L_{water}}{L_{soil}}\right) + \theta_a\left(\frac{L_{air}}{L_{soil}}\right) xH'}{\rho_b\left(1.5\frac{kg}{L}\right)}\right)\right]$$

Where:

$$\theta_a\left(\frac{L_{air}}{L_{soil}}\right) = n\left(\frac{L_{pore}}{L_{soil}}\right) - \theta_w\left(\frac{0.3\ L_{water}}{L_{soil}}\right);\ n\left(\frac{L_{pore}}{L_{soil}}\right) = 1 - \frac{\rho_b\left(\frac{1.5\ kg}{L}\right)}{\rho_s\left(\frac{2.65\ kg}{L}\right)}$$

K_d values for organic compounds were calculated from the organic carbon-water partition coefficient (K_{oc}) and the fraction of organic carbon in the soil (f_{oc}). These K_d values for organic compounds were calculated using the following equation:

$$K_d\left(\frac{L}{kg}\right) = f_{oc}\left(\frac{0.002g - carbon}{g - soil}\right) xK_{oc}\left(\frac{L}{kg}\right)$$

The K_d values for inorganic compounds were obtained from the EPA Soil Screening Guidance Exhibit C-4 and *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture* (Baes et al. 1984).

The target groundwater concentration selected for input into the SSL equation was the minimum risk-based residential groundwater NAL and the primary maximum contaminant level (MCL) for the analyte, if one is available. The assumptions used to develop the residential groundwater NAL are discussed in Section 3.2.4.1 of this report.

List of parameter definitions:

θ_a = air-filled soil porosity (L_{air}/L_{soil})
θ_w = water-filled soil porosity (L_{water}/L_{soil})
ρ_b = dry soil bulk density (g/cm^3)
ρ_s = soil particle density (g/cm^3)
C_{water} = target carcinogenic or non-carcinogenic action limit
DAF = dilution attenuation factor
H' = dimensionless Henry's Law Constant (H' at 25°C)
F_{oc} = organic carbon content of soil (g/g)
K_d = soil-water partition coefficient (L/kg)
K_{oc} = soil organic carbon-water partition coefficient (L/kg)
MCL = maximum contaminant level (µg/L)
n = total soil porosity (L_{pore}/L_{soil})
SL = groundwater screening level (µg/L)
SSL = soil screening level (mg/kg)

The MCL-based SSLs and risk-based SSLs were generated assuming a DAF of 1 and 20. The MCL-based SSL with a DAF of 20 and risk-based SSL with a DAF of 20 were calculated by multiplying the MCL-based SSL 1 and risk-based SSL 1 by 20. A site-specific DAF was also developed as part of the C-400 Complex OU RI. The site-specific DAF value was estimated as 22, and the details of its derivation are discussed in Section 5 of this report. The site-specific SSL including the site-specific DAF was developed by multiplying the SSL based on a DAF of 1 by 22.

The SSLs for radionuclide analytes were developed using the following equation from the Human Health RMD (DOE 2021).

$$SSL\left(\frac{pCi}{g}\right) = PRG\left(\frac{pCi}{L}\right) \times \ DAF \times \frac{\left[K_d\left(\frac{L}{kg}\right) + \left(\frac{\theta_w\left(\frac{0.3\ L_{water}}{L_{soil}}\right)}{\rho_b\left(\frac{1.5kg}{L}\right)}\right)\right]}{1{,}000}$$

K_d values for radionuclides were from the Human Health RMD (DOE 2021). If a K_d was not available in the Human Health RMD, the K_d value provided in the RAIS calculator was used to develop the radionuclide SSL. The K_d values provided in the RAIS calculator included values referenced from a combination of sources. If a value was provided in the Human Health RMD, it was selected as the K_d value. If not presented, the hierarchy described in the RAIS radionuclide PRG calculator was used to select the K_d value.

The target groundwater concentration selected for input into the SSL equation was the risk-based residential groundwater NAL and the primary MCL for the analyte, if one is available. The assumptions used to develop the residential groundwater NAL are discussed in Section 3.2.4.1 of this report.

The MCL-based SSLs and risk-based SSLs were generated assuming a DAF of 1 and 20. The MCL-based SSL with a DAF of 20 and risk-based SSL with a DAF of 20 were calculated by multiplying the MCL-based SSL 1 and risk-based SSL 1 by 20. A site-specific DAF was also developed as part of the C-400 Complex OU RI. The site-specific DAF value was estimated as 22 and the details of its derivation are discussed in Section 5.3 and Appendix B of this report. The site-specific SSL including the site-specific DAF was developed by multiplying the SSL based on a DAF of 1 by 22.

List of parameter definitions:

θ_w = water-filled soil porosity (L_{water}/L_{soil})
ρ_b = dry soil bulk density (kg/L)
PRG_r = target groundwater concentration (pCi/L)
DAF = dilution attenuation factor
K_d = soil-water partition coefficient (L/kg)
SSL = soil screening level (pCi/L)

C.3.2.5 Examination of Essential Nutrients

For the SRE, seven analytes known to be essential nutrients for humans and known to be toxic only at extremely high concentrations were removed from the data set. These analytes were calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium. Consistent with the Human Health RMD, no other analytes were removed from the data set based upon the essential nutrient screen.

C.3.2.6 Comparison of Site Concentrations/Activities to Background

Background concentrations for soil were taken from *Background Levels of Selected Radionuclides and Metals in Soils and Geologic Media at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* and were used for comparison to the soil data (DOE 1997). For comparison to surface soil data, the surface soil background values were selected. For comparison to the combined surface and subsurface soil data, the minimum surface soil and the subsurface soil background value were selected.

Background concentrations for groundwater were taken from *Background Concentrations of Naturally Occurring Inorganic Chemicals and Selected Radionuclides in the Regional Gravel Aquifer and McNairy Formation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* found in the Groundwater OU FS and were used for comparison to the groundwater data (DOE 2001).

C.3.3 RISK ASSESSMENT SPECIFIC DATA EVALUATION

The specific processes used to segregate soil and groundwater data for the selection COPCs are described in the following sections.

C.3.3.1 Soil, Brick, and Concrete

Soil data used in the SRE underwent the data quality assessment as described in Sections 3.1 and 3.2 of this report. As part of this process, data were screened against protective screening levels for identification of

COPCs in each soil media. Before identification of soil COPCs, the soils data was separated by media. Data were separated into:

- Surface soil (soil generally collected between 0 to 1 ft bgs);
- Surface and subsurface soil (0 to 16 ft bgs);
- Subsurface soil (> 1 to 16 ft bgs);
- Deep soil (> 16 ft bgs to the bottom of the RGA); and
- McNairy soil (collected within the McNairy Formation).

A subset of the surface soil samples were collected at a depth > 1 ft bgs due to asphalt and/or gravel covering the soil. As discussed in the C-400 Complex RI/FS Work Plan, once soil is encountered under the concrete, asphalt, etc., the soil sample was collected, and this sample depth was considered the surface soil sample. In addition to soil, historical brick and concrete samples and samples collected as part of the C-400 Complex RI/FS Work Plan were included in the SRE dataset. These samples included as part of surface soil media and were treated the same as soil samples for the purpose of identifying COPCs and for comparison of the protection of groundwater values.

Soil, brick, and concrete data were separated further into seven separate exposure units referred to as sectors. Sector 1 encompasses soil, brick, and concrete data collected within the C-400 building footprint and Sector 2 through Sector 7 encompass soil surrounding the building footprint. An outline of each sector is provided in Figure C.2.

Each soil depth was screened as described in the following:

- Surface soil, brick, and concrete data were screened against the industrial worker NALs and the provisional background values for surface soil, if available;

- Surface and subsurface soil data were screened against the excavation worker NALs and the minimum provisional background value from either surface soil or subsurface soil, if available;

- Subsurface soil data were screened against the protection of groundwater values (DAF of 1, DAF of 20, and the site-specific DAF);

- Deep soil data were screened against the protection of groundwater values (DAF of 1, DAF of 20, and the site-specific DAF); and

- McNairy Formation soil data were screened against the protection of groundwater values (DAF of 1 and the site-specific DAF).

For identification of COPCs, if an analyte was greater than its respective NAL and its provisional background value, if available, the analyte was identified as a COPC and progressed in the SRE. If below either the NAL or the provisional background value, if available, the analyte was not identified as a COPC and was excluded from further analysis.

For evaluation of protection of groundwater, the data were compared to each protection of groundwater value. If the analyte exceeded the site-specific DAF, additional investigation was performed that is discussed in Section 5 of this report.

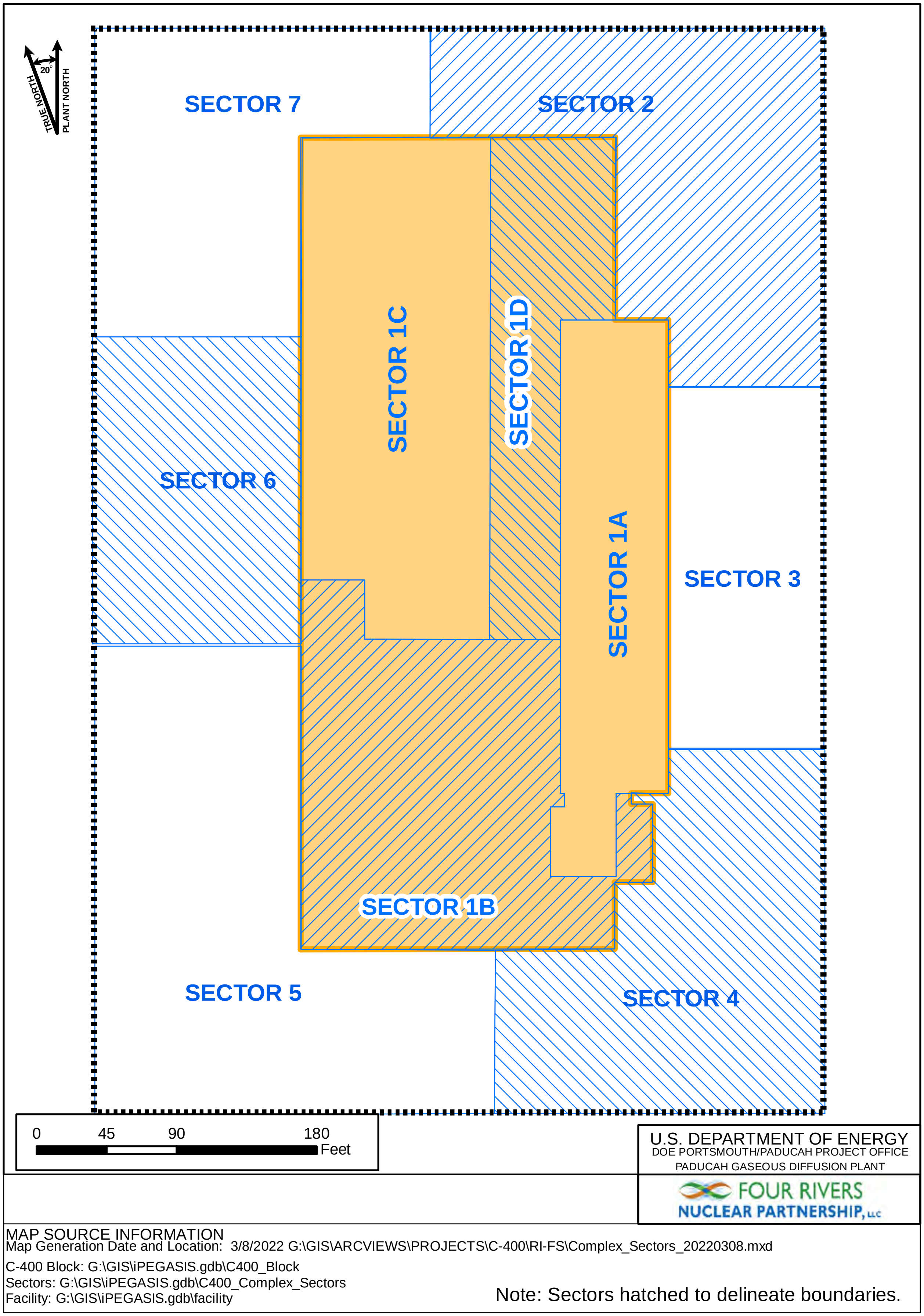

Figure C.2. C-400 Complex OU Sector Outlines

C.3.3.2 Groundwater

Groundwater data used in the SRE underwent the data quality assessment as described in Sections 3.1 and 3.2. As part of this process, data were screened against the appropriate screening level for identification of COPCs in groundwater. The groundwater data was separated into the UCRS, RGA, and McNairy Formation exposure units. The three groundwater exposure units were screened; however, the UCRS was not included in the identification of groundwater COPCs. The screening of the UCRS is discussed as part of the uncertainty section of the SRE (DOE 2021).

Identification of groundwater COPCs in the RGA and McNairy Formation exposure units consisted of screening data against the residential NAL and the provisional background for the RGA or McNairy exposure units, if available. The MCL has also been included as part of the screening tables; however, MCLs were not used to identify COPCs. If the analyte exceeded both its residential NAL and its provisional background value, the analyte was identified as a COPC and progressed in the SRE. If the values were below either the residential NAL or the provisional background value, if available, the analyte was not identified as a COPC and was excluded from further analysis.

C.3.4 SUMMARY

Surface soil, surface and subsurface soil, and groundwater were screened against their respective NALs, protection of groundwater values, and appropriate provisional background values, if available. The results of the screens are discussed in the subsequent sections for each media and for each exposure unit within each media. Identified COPCs and those analytes that exceed protection of groundwater values and the identified COPCs in each groundwater exposure unit are provided in this section.

C.3.4.1 Soil COPCs for Direct Exposure Scenarios

Soil analytes that exceeded their site-specific NALs and their provisional soil background values, if available, are discussed in the following sections. Analytes that exceeded their respective NAL and provisional background values were identified as COPCs and were added in the SRE.

C.3.4.1.1 Sector 1 soil

No surface soil was collected from Sector 1; however, brick and concrete samples collected from Sector 1 were evaluated for identification of COPCs. Consistent with the WAG 6 BRA, Sectors 1A−1D were evaluated as one sector. The results of the human health screening for the Sector 1 surface soil are provided in Table C1.4 and the results of the human health screening for the Sector 1 surface and subsurface soil are provided in Table C1.5

Surface soil COPCs:

- arsenic
- chromium
- cobalt
- uranium metal
- Total PCBs
- Total PAHs
- americium-241
- cesium-137
- neptunium-237

- plutonium-239/240
- radium-226
- strontium-90
- technetium-99
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- cobalt
- iron
- manganese
- thallium
- uranium metal
- Total PCBs
- Total PAHs
- americium-241
- cesium-137
- neptunium-237
- plutonium-239/240
- radium-226
- technetium-99
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.2 Sector 2 soil

The results of the human health screening for the Sector 2 surface soil are provided in Table C1.6 and the results of the human health screening for the Sector 2 surface and subsurface soil are provided in Table C1.7.

Surface soil COPCs:

- arsenic
- chromium
- uranium metal
- neptunium-237
- uranium-233/234
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- cobalt
- iron
- manganese
- nickel
- uranium metal
- uranium-233/234
- uranium-235/236
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.3 Sector 3 soil

The results of the human health screening for the Sector 3 surface soil are provided in Table C1.8 and the results of the human health screening for the Sector 3 surface and subsurface soil are provided in Table C1.9.

Surface soil COPCs:

- arsenic
- chromium
- TCE
- Total PAHs
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- cobalt
- manganese
- thallium
- TCE
- uranium metal
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.4 Sector 4 soil

The results of the human health screening for the Sector 4 surface soil are provided in Table C1.10 and the results of the human health screening for the Sector 4 surface and subsurface soil are provided in Table C1.11.

Surface soil COPCs:

- chromium
- Total PCBs
- uranium metal
- cesium-137
- neptunium-237
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- iron
- manganese
- TCE
- total dioxin/furans
- Total PAHs
- uranium metal
- cesium-137
- neptunium-237
- plutonium-239/240
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.5 Sector 5 soil

The results of the human health screening for the Sector 5 surface soil are provided in Table C1.12 and the results of the human health screening for the Sector 5 surface and subsurface soil are provided in Table C1.13.

Surface soil COPCs:

- arsenic
- chromium
- TCE
- Total PAHs
- uranium metal
- cesium-137
- neptunium-237
- radium-226
- thorium-230

- uranium-233/234
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- cobalt
- iron
- manganese
- Total PAHs
- TCE
- uranium metal
- cesium-137
- neptunium-237
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.6 Sector 6 soil

The results of the human health screening for the Sector 6 surface soil are provided in Table C1.14 and the results of the human health screening for the Sector 6 surface and subsurface soil are provided in Table C1.15.

Surface soil COPCs:

- arsenic
- chromium
- cobalt
- Total PAHs
- Total PCBs
- uranium metal
- americium-241
- cesium-137
- neptunium-237
- plutonium-239/240
- technetium-99
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- antimony
- arsenic
- chromium
- cobalt
- iron
- manganese
- thallium
- Total PAHs
- uranium metal
- americium-241
- cesium-137
- neptunium-237
- plutonium-239/240
- technetium-99
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.1.7 Sector 7 soil

The results of the human health screening for the Sector 7 surface soil are provided in Table C1.16 and the results of the human health screening for the Sector 7 surface and subsurface soil are provided in Table C1.17.

Surface soil COPCs:

- chromium
- uranium metal
- Total PAHs
- cesium-137
- neptunium-237
- thorium-230
- uranium-235
- uranium-235/236
- uranium-238

Surface and subsurface soil COPCs:

- arsenic
- chromium
- cobalt
- manganese
- Total PAHs
- uranium metal

- cesium-137
- neptunium-237
- thorium-230
- uranium-238

These analytes were identified as COPCs and progressed into the next step of the SRE.

C.3.4.2 Protection of Groundwater Screen

Soil analytes that exceeded their site-specific DAF SSLs and their provisional soil background values, if available, are discussed in the following sections. Analytes that exceeded their respective SSL were not evaluated quantitatively in the risk characterization, but the parameters were further evaluated as part of Section 5 of the C-400 Complex RI Report. The results of this screening will be discussed in the summary and conclusions of the SRE.

C.3.4.2.1 Sector 1

No surface soil was collected from Sector 1; however, brick and concrete samples collected from Sector 1 were compared to SSLs. Consistent with the WAG 6 BRA, Sectors 1A-1D were evaluated as one sector. Table C1.18 provides the results of the protection of groundwater screening for the Sector 1 surface soil (0 to 1 ft bgs). Table C1.19 provides the results of the protection of groundwater screening for the Sector 1 subsurface soil (1 to 16 ft bgs). Table C1.20 provides the results of the protection of groundwater screening for the Sector 1 deep soil (> 16 ft bgs to the bottom of the RGA) are provided in; and Table C1.21 provides the results of the protection of groundwater screening for the Sector 1 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.2 Sector 2

Table C1.22 provides the results of the protection of groundwater screening for the Sector 2 surface soil (0 to 1 ft bgs). Table C1.23 provides the results of the protection of groundwater screening for the Sector 2 subsurface soil (1 to 16 ft bgs). Table C1.24 provides the results of the protection of groundwater screening for the Sector 2 deep soil (> 16 ft bgs to the bottom of the RGA), and Table C1.25 provides the results of the protection of groundwater screening for the Sector 2 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.3 Sector 3

Table C1.26 provides the results of the protection of groundwater screening for the Sector 3 surface soil (0 to 1 ft bgs). Table C1.27 provides the results of the protection of groundwater screening for the Sector 3 subsurface soil (1 to 16 ft bgs). Table C1.28 provides the results of the protection of groundwater screening for the Sector 3 deep soil (> 16 ft bgs to the bottom of the RGA), and Table C1.29 provides the results of the protection of groundwater screening for the Sector 3 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.4 Sector 4

Table C1.30 provides the results of the protection of groundwater screening for the Sector 4 surface soil (0 to 1 ft bgs). Table C1.31 provides the results of the protection of groundwater screening for the Sector 4 subsurface soil (1 to 16 ft bgs). Table C1.32 provides the results of the protection of groundwater screening for the Sector 4 deep soil (> 16 ft bgs to the bottom of the RGA), and Table C1.33 provides the results of the protection of groundwater screening for the Sector 4 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.5 Sector 5

Table C1.34 provides the results of the protection of groundwater screening for the Sector 5 surface soil (0 to 1 ft bgs). Table C1.35 provides the results of the protection of groundwater screening for the Sector 5 subsurface soil (1 to 16 ft bgs). Table C1.36 provides the results of the protection of groundwater screening for the Sector 5 deep soil > 16 ft bgs to the bottom of the RGA), and Table C1.37 provides the results of the protection of groundwater screening for the Sector 5 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.6 Sector 6

Table C1.38 provides the results of the protection of groundwater screening for the Sector 6 surface soil (0 to 1 ft bgs). Table C1.39 provides the results of the protection of groundwater screening for the Sector 6 subsurface soil (1 to 16 ft bgs). Table C1.40 provides the results of the protection of groundwater screening for the Sector 6 deep soil (> 16 ft bgs to the bottom of the RGA), and Table C1.41 provides the results of the protection of groundwater screening for the Sector 6 McNairy Formation soil are provided in.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.2.7 Sector 7

Table C1.42 provides the results of the protection of groundwater screening for the Sector 7 surface soil (0 to 1 ft bgs). Table C1.43 provides the results of the protection of groundwater screening for the Sector 7 subsurface soil (1 to 16 ft bgs). Table C1.44 provides the results of the protection of groundwater screening for the Sector 7 deep soil (> 16 ft bgs to the bottom of the RGA), and Table C1.45 provides the results of the protection of groundwater screening for the Sector 7 McNairy Formation soil.

Chemicals and radionuclides that exceed their respective protection of groundwater SSLs are further evaluated in Section 5 of this report.

C.3.4.3 Groundwater COPCs for Direct Exposure

Groundwater analytes that exceeded their site-specific NALs and their provisional groundwater background values, if available, are discussed in the following sections. Analytes that exceeded their respective NALs and provisional background values were identified as COPCs and progressed in the SRE. Note that UCRS groundwater COPCs that were identified based on this screening will not be evaluated quantitatively in the risk characterization; however, the results of UCRS screening will be discussed in the uncertainty section and conclusions section of the SRE.

C.3.4.3.1 Regional Gravel Aquifer

The results of the human health screening for the RGA groundwater exposure unit are provided in Table C1.46.

RGA groundwater COPCs:

- aluminum
- arsenic
- barium
- benzene
- bis(2-ethylhexyl)phthalate
- bromodichloromethane
- carbon tetrachloride
- chloroform
- chromium
- 1,1-dichloroethane
- 1,1-dichloroethene
- 1,2-dichloroethane
- *cis*-1,2-dichloroethene
- *trans*-1,2-dichloroethene
- 1,4-dioxane
- fluoride
- hexachlorocyclopentadiene
- iron
- manganese
- methylene chloride
- molybdenum
- nitrate as nitrogen
- p-nitroaniline
- pentachlorophenol
- tetrachloroethene
- Total PAHs
- Total PCBs
- 1,1,2-trichloroethane
- TCE
- uranium metal
- vinyl chloride
- neptunium-237
- technetium-99
- uranium-233/234
- uranium-235/236
- uranium-238

These chemicals and radionuclides were identified as COPCs and progressed into the next step of the SRE.

C.3.4.3.2 McNairy Formation

The results of the human health screening for the McNairy Formation groundwater exposure unit are provided in Table C1.47.

McNairy Formation groundwater COPCs:

- *cis*-1,2-dichloroethene
- p-nitroaniline
- 1,1,2-trichloroethane
- TCE
- uranium-238

These chemicals and radionuclides were identified as COPCs and progressed into the next step of the SRE.

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C.4. HUMAN HEALTH EXPOSURE ASSESSMENT

Exposure is the contact of an organism with a chemical or physical agent. The magnitude of exposure (i.e., dose) is determined by measuring or estimating the amount of an agent available at exchange boundaries (e.g., gut, skin) during a specified period. Exposure assessment is a process that uses information about the exposure setting and human activities to develop CMSs under current and potential future conditions. The steps involved in the exposure assessment are summarized as follows:

1. Characterization of the exposure setting—describe activities of the human population on or near the Site that may affect the extent of exposure and the physical characteristics of the Site.

2. Identification of exposure pathways—identify complete exposure pathways that include all links between the source and the exposed population. A complete pathway consists of the source of release, a mechanism of release, a transport medium, a point of potential human contact, and an exposure route.

3. Quantification of the exposure—estimate exposures or representative concentrations for COPCs and quantifying intakes.

Exposure estimates in this SRE represent normalized exposure rates which are evaluated for sources of uncertainty such as variability in data, modeling results, and/or parameter assumptions. Specifically, in this SRE, the exposure estimate is an estimation of the reasonable maximum exposure (RME) which can be expected to occur under current or future site conditions. As defined by RAGS, an RME estimate is a conservative estimate of exposure that falls within the upper bound of the range of all possible exposure estimates. In situations where populations are exposed through multiple pathways, RME estimates are calculated for both individual and multiple pathways.

The chronic exposure estimates are used in this SRE because they allow for the estimation of the health consequences that result from long-term or unrestricted exposure to contaminants present at sources in the C-400 Complex OU. Subchronic exposures receive less attention because these exposures require the use of assumptions concerning restrictions on rates of contact with contaminated media. Such assumptions are best left to managers who can use risk management to make remedial decisions that can reduce risks from chronic exposures to acceptable levels.

C.4.1 CHARACTERIZATION OF EXPOSURE SETTING

The Paducah Site consists of an inactive diffusion cascade system and associated support facilities. The enrichment process required extensive support facilities, and included a steam plant, four major electrical switchyards, four sets of cooling towers, a building for chemical cleaning and decontamination (C-400 Cleaning Building), a water treatment plant, and maintenance and laboratory facilities. The C-400 Complex OU is located inside a controlled access area, near the center of the industrial section of the Paducah Site. The C-400 Complex OU is bounded by 10th and 11th Streets to the west and east, respectively, and by Virginia and Tennessee Avenues to the north and south, respectively.

C.4.1.1 Location

The Paducah Site is located approximately 10 miles west of Paducah, Kentucky, 3.5 miles south of the Ohio River in the western part of McCracken County. The plant is located on a 3,556 acre DOE-owned site. Approximately 1,450 acres are utilized for site operations, 133 acres are in acquired easements, and the remaining 1,973 acres are licensed to the Commonwealth of Kentucky as part of the West Kentucky

Wildlife Management Area (WKWMA). Bordering the Paducah Site to the northeast is a TVA reservation on which the Shawnee Fossil Plant is located.

C.4.1.2 Surface Features

The topographic features at the site include nearly level to gently sloping dissected plains and the flood plain of the Ohio River. The elevations of the stream valleys in the dissected plains are up to 30 ft lower than the adjoining uplands. Local elevations range from 290 ft above mean sea level (amsl) along the Ohio River to 450 ft amsl southwest of the Paducah Site. Generally, the topography in the Paducah Site area slopes toward the Ohio River at an approximate gradient of 27 ft per mile (CH2M HILL 1992). Ground surface elevations vary from 360 to 390 ft amsl within the fenced security area and 340 to 420 ft amsl within the greater Paducah Site.

In the area of the C-400 Cleaning Building, the topography is relatively flat, with elevations ranging from approximately 370 to 376 ft amsl. Thick concrete aprons cover the heavy traffic areas immediately north and south of the building, while gravel or asphalt covers the areas on the east and west sides of the building. An active railroad track serves the south side of the building. An overhead gantry crane and loading dock were formerly located along the south side of the building, but have been removed. Aboveground steam lines run along the west side of the building.

Subsurface features around the building include storm sewers, underground piping running from storage tanks, and a variety of buried utility lines. Most of the storm water from the C-400 Cleaning Building area flows to storm drain inlets around the building and discharges via the storm sewer on the south side of the building to Outfall 008, then to Bayou Creek on the west side of the plant. Runoff from the north side of C-400 Cleaning Building area flows into the North-South Diversion Ditch (NSDD), then is pumped to the C-616 lagoons and released through Outfall 001 to Bayou Creek.

C.4.1.3 Meteorology and Climatology

The climate at the Paducah Site is humid-continental. The term “humid” refers to the surplus of precipitation versus evapotranspiration that normally is experienced throughout the year. According to the National Weather Service, for the period from 1991 to 2020, the average monthly precipitation was 4.19 inches, varying from an average of 3.11 inches in August (the monthly average low) to an average of 5.17 inches in April (the monthly average high). The “continental” nature of the local climate refers to the dominating influence of the North American landmass. Continental climates typically experience large temperature changes between seasons. The mean annual temperature for the Paducah area from 1991–2020 was 58.8°F, with the coldest month being January with an average temperature of 36.0°F and the warmest month being July with an average temperature of 79.7°F (https://www.weather.gov/pah/monthlynormals).

The prevailing wind speed is from the south-southwest at approximately 10 miles per hour. Historically, stronger winds are recorded when the winds are from the southwest.

C.4.1.4 Surface Water Hydrology

The Paducah Site is situated in the western portion of the Ohio River basin, approximately 15 miles downstream of the confluence of the Ohio River with the Tennessee River, and approximately 35 miles upstream of the confluence of the Ohio River with the Mississippi River. Locally, the Paducah Site is within the drainage areas of the Ohio River, Bayou Creek, and Little Bayou Creek.

The Ohio River is located approximately 3.5 miles north of the Paducah Site. It is the most significant surface-water feature in the region, carrying over 25 billion gal/day of water through its banks. Several dams regulate flow in the Ohio River. The Ohio River stage near the Paducah Site is measured upstream at Paducah, Kentucky, and downstream at Olmsted, Illinois, by U.S. Geological Survey gauging stations.

River stage typically varied between 293 ft and 335 ft amsl near the Paducah Site over the course of a year until August 2018 when the Olmsted Locks and Dam became operational downstream of the Paducah Site. Subsequent to 2018, low stage on the Ohio River has varied between 300 ft and 305 ft amsl. Water levels on the lower Ohio River generally are highest in late winter and early spring and lowest in late spring and early summer. The fenced security area of the Paducah Site is above the historical high water floodplain of the Ohio River (CH2M HILL 1991) and above the local 100-year flood elevation of the Ohio River (333 ft).

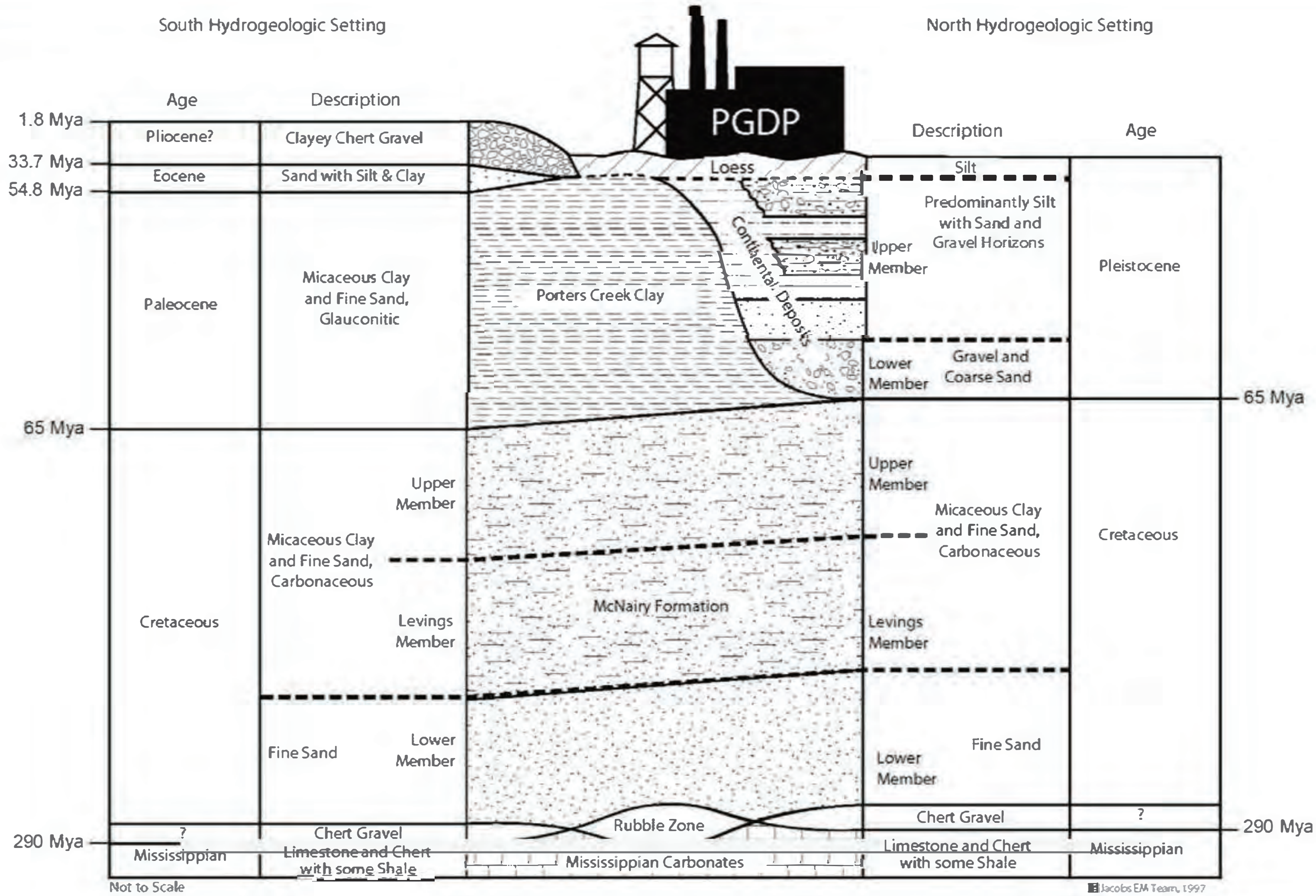
The fenced security area is situated on the divide between Little Bayou and Bayou Creeks. Surface flow is east-northeast toward Little Bayou Creek and west-northwest toward Bayou Creek. Bayou Creek is a perennial stream on the western boundary of the plant that flows generally northward, from approximately 2.5 miles south of the plant site to the Ohio River along a 9-mile course. Bayou Creek has an approximately 11,910-acre watershed. Little Bayou Creek becomes a perennial stream at the east outfalls of the Paducah Site. The Little Bayou Creek drainage originates within WKWMA and extends northward and joins Bayou Creek near the Ohio River along a 6.5-mile course within a 6,000-acre watershed. Drainage areas for both creeks are generally rural; however, they receive surface drainage from numerous swales that drain residential, agricultural, and commercial properties, including the Paducah Site and the TVA Shawnee Fossil Plant. The confluence of the two creeks is approximately 3 miles north of the plant site, just upstream of the location at which the combined flow of the creeks discharges into the Ohio River.

A network of ditches discharges effluent and surface water runoff from the Paducah Site to the creeks. Plant discharges are monitored at the Kentucky Pollutant Discharge Elimination System outfalls prior to discharge into the creeks. During the period of uranium enrichment operations at PGDP, most of the flow within Bayou and Little Bayou Creeks was from process effluents or surface water runoff from the Paducah Site. Subsequent to the uranium enrichment operations, the discharge of the Paducah Site groundwater pump-and-treat systems is a primary component of the flow in both creeks.

Other surface water bodies in the vicinity of the Paducah Site include the following: Metropolis Lake, located east of the Shawnee Fossil Plant; several small ponds, clay and gravel pits, and settling basins scattered throughout the area; and a marshy area just south of the confluence of Bayou Creek and Little Bayou Creek. The smaller surface water bodies are expected to have only localized effects on the regional groundwater flow pattern.

C.4.1.5 Hydrogeology

The significant geologic units relative to shallow groundwater flow at the Paducah Site include the Terrace Gravel and Porters Creek Clay (south portion of the Paducah Site) and the Pleistocene Continental Deposits and McNairy Formation (underlying the Paducah Site and adjacent areas to the north). Figure C.3 illustrates the geologic units at the Paducah Site. Groundwater flow in the Pleistocene Continental Deposits is a primary pathway for the transport of dissolved contamination from the Paducah Site. The following sections provide the framework of the shallow groundwater flow system at the Paducah Site (adapted from DOE 1999).



U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

Figure C.3. Stratigraphy in the Vicinity of the Paducah Site

C.4.1.6 Terrace Gravel Flow System

The Porters Creek Clay, with a vertical hydraulic conductivity of 1.5×10^{-4} to 1.4×10^{-1} ft/day, is a confining unit to downward groundwater flow south of the Paducah Site (DOE 2004). A shallow water table flow system is present in the Terrace Gravel, where it overlies the Porters Creek Clay south of the Paducah Site. Discharge from this water table flow system provides baseflow to Bayou Creek and underflow to the Continental Deposits of the ancestral Tennessee River to the southeast and east of the Paducah Site.

The elevation of the top of the Porters Creek Clay is an important control to the area's groundwater flow. A distinct groundwater divide (located south of the Terrace Slope) is centered in hills located approximately 9,000 ft southwest of the C-400 Complex OU, where the Terrace Gravel and Eocene sands, with a lateral hydraulic conductivity as high as 5 ft/day (Maxim 1997) overlie a "high" on the top of the Porters Creek Clay (Olive 1966). In adjacent areas where the top of the Porters Creek Clay approaches land surface, as it does immediately south of the Paducah Site and near the subcrop of the Porters Creek Clay to the west of the security-fenced area, the majority of groundwater flow is forced to discharge into surface streams (gaining reaches) and little underflow occurs into the Continental Deposits of the ancestral Tennessee River. To the east of the Paducah Site, the Terrace Gravel overlies a lower terrace and a thick sequence of Terrace Gravel occurs adjacent to the Continental Deposits of the ancestral Tennessee River, allowing significant underflow from the Terrace Gravel. Surface drainages in this area typically are losing reaches.

C.4.1.7 Upper Continental Recharge System

The UCRS is the upper strata where infiltration of surface water occurs and where the water table is found north of the Porters Creek Clay Terrace slope. The infiltration rate for the Paducah Site area is approximately 6.6 inches/year. Groundwater flow is primarily downward in the Upper Continental Deposits; however, lateral flow may occur over short distances. Vertical hydraulic gradients generally range from 0.5–1 ft/ft, as measured in wells completed at different depths in the UCRS. The UCRS is composed predominately of silt and fine sand members with a large range of hydraulic conductivity. Overall, the depth-averaged UCRS hydraulic conductivity is approximately 0.001 ft/day (DOE 2017d).

Beneath the Paducah Site and adjacent land to the north, the water table is found within the UCRS. Water table elevations are best known in the immediate vicinity of the fenced security area and in the area of the C-746-S&T and C-746-U Landfills to the north. Within the west area of the fenced security area, the elevation of the water table is controlled by the bottom of drainage ditches and the water level in the bordering Bayou Creek. The water table is as shallow as 5–10 ft in some localities and < 20-ft deep throughout the west plant area. Depth to the water table is much greater (as much as 40 ft) in the northeast plant area, where a storm sewer system is present to collect storm runoff. In the northeast plant area, the water table is believed to slope east toward bordering Little Bayou Creek.

At the currently operating C-746-U Landfill, trends and the elevation of the water table are controlled by water levels in the NSDD on the south side of the landfill and by water levels in Little Bayou Creek on the east and north sides. The water table slopes northward toward Little Bayou Creek at depths of 20–40 ft.

These depths represent the expected range of water table elevations and depths associated with the UCRS. In general, the water table slopes away from areas of tributaries and higher land surface toward Bayou and Little Bayou Creeks. The depth to the water table is very shallow in the vicinity of tributaries and wetlands found on the highlands and in the vicinity of the creeks.

C.4.1.8 Regional Gravel Aquifer

Vertically infiltrating water from the UCRS primarily moves downward into a basal sand member of the Upper Continental Deposits and the Plio-Pleistocene gravel member of the Lower Continental Deposits and then laterally north toward the Ohio River. This lateral flow system is called the RGA (typically present between 60 and 90 ft bgs beneath the C-400 Complex). As documented in the 2016 Sitewide Groundwater Flow Model and based on site specific lithological data, the RGA is the shallow aquifer beneath the Paducah Site and contiguous lands to the north (DOE 2017d).

Hydraulic potential in the RGA declines toward the Ohio River, which controls the base level of the region's surface water and groundwater systems. The RGA potentiometric surface gradient beneath the Paducah Site is commonly 10^{-4} ft/ft, but increases by an order of magnitude near the Ohio River. Vertical gradients are not well documented, but small, vertical gradients measured at nested wells at the C-404 Burial Ground, for example, range from 0.001 to 0.01 ft/ft, but are not consistently upward or downward (dependent on season and location relative to areas of recharge).

The hydraulic conductivity of the RGA varies spatially. Pumping tests have documented the hydraulic conductivity of the RGA ranges from 53 ft/day to 5,700 ft/day (DOE 2017d). The overall flow in the RGA is northward to the Ohio River, but there are localized northeast and northwest flow regimes in response to anthropogenic recharge and anisotropy of the hydraulic conductivity. Ambient groundwater flow rates in the more permeable pathways of the RGA commonly range from 1 to 3 ft/day.

C.4.1.9 McNairy Flow System

Groundwater flow in the fine sands and silts of the McNairy Formation is called the McNairy Flow System. The overall McNairy groundwater flow direction in the area of the Paducah Site is northward to the Ohio River, similar to that of the RGA. Hydraulic potential is greater in the RGA than in the McNairy Flow System beneath the Paducah Site. Area monitoring well clusters document an average downward vertical gradient of 0.013 ft/ft. Because the RGA has a steeper hydraulic potential slope toward the Ohio River than does the McNairy Flow System, the vertical gradient reverses nearer the Ohio River. The "hinge line," which is where the vertical hydraulic gradient between the RGA and McNairy Flow System changes from a downward vertical gradient to an upward vertical gradient, parallels the Ohio River near the northern DOE property boundary.

The contact between the Lower Continental Deposits and the McNairy Formation is a marked hydraulic properties boundary. Representative lateral and vertical hydraulic conductivities of the Upper McNairy Formation in the area of the Paducah Site are approximately 0.02 ft/day and 0.0005 ft/day, respectively. Vertical infiltration of groundwater into the McNairy Formation beneath the Paducah Site is on the order of 0.1 inch per year (lateral flow in the McNairy Formation beneath the Paducah Site is on the order of 0.03 inch per year). As a result, little interchange occurs between the RGA and McNairy Flow System.

C.4.1.10 Hydrogeologic Units

Five HUs are commonly used to discuss the shallow groundwater flow system beneath the Paducah Site and the contiguous lands to the north (Figure C.4). The following HUs are listed in descending order:

- HU1 (UCRS): Loess that covers most of the site.
- HU2 (UCRS): Discontinuous sand and gravel lenses in a clayey silt matrix.

SYSTEM	SERIES	FORMATION	THICKNESS IN FEET	DESCRIPTION	HYDROGEOLOGIC SYSTEMS
Quaternary	Pleistocene and Recent	Alluvium	0-40	Brown or gray sand and silty clay or clayey silt with streaks of sand	Upper Continental Recharge System (UCRS)
	Pleistocene	Loess		Brown or yellowish-brown to tan to gray unstratified silty clay	
	Pleistocene	Continental Deposits	3-121	Upper Continental Deposits (Clay Facies) Orange to yellowish brown to brown clayey silt, some very fine sand, trace of fine sand to gravel. Often micaceous.	
Tertiary	Pliocene(?)			Lower Continental Deposits (Gravel Facies) Reddish-Brown silty and sandy gravel, silt and clay.	Regional Gravel Aquifer
	Eocene	Eocene Sands (Undiff)	0-100	Red brown, or white fine to coarse grained sand. Beds of white to dark gray clay are distributed at random.	McNairy Flow System
				White to gray sandy clay, clay conglomerate and boulders, scattered clay lenses and lenses of coarse red sand. Black to dark gray lignitic clay, silt, or fine grained sand.	
	Paleocene	Porters Creek Clay	0-200	Dark gray, slightly to very micaceous clay. Fine grained clayey sand, commonly glauconitic in the upper part. Glauconitic sand and clay at the base. A Gravel layer ("Terrace Gravels") present atop the clay terrace, 2-8 feet thick	
		Clayton and McNairy Formations	200-300	Grayish white to dark micaceous clay, often silty, interbedded with light gray to yellowish brown very fine to medium grained sand. The upper part is mostly clay, the lower part is predominantly micaceous fine sand.	
Cretaceous					
		Tuscaloosa Formation	?	White, well rounded or broken chert gravel with clay.	
Mississippian		Mississippian Carbonates	500+	Dark gray limestone and interbedded chert, some shale.	

Adapted from:
Finch, W.I., 1967 Geological Map of part of the Joppa Quadrangle, McCracken County, Kentucky, U.S. Geological Survey GQ-652
Olive, W.W., 1966 Geological Map of part of the Heath Quadrangle, McCracken and Ballard Counties, Kentucky, U.S. Geological Survey GQ-561

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DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

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Figure C.4. Lithostratigraphic Column of the Jackson Purchase Region

- HU3 (UCRS): Relatively impermeable unit that acts as the upper semiconfining-to-confining layer for the RGA. The lithologic composition of HU3 is predominantly silt and fine sand.

- HU4 (RGA): Sand unit with a silt matrix that forms the top of the RGA, where present.

- HU5 (RGA): Sand and gravel, primary member of the RGA.

C.4.1.11 Demography and Land Use

The Paducah Site is surrounded by WKWMA and sparsely populated agricultural lands. The closest communities to the plant are Heath, Grahamville, and Kevil, all of which are located within 3 miles of the Paducah Site boundaries. Metropolis, Illinois, is located 5 miles to the northeast; Paducah, Kentucky, is located approximately 10 miles to the east; and Cape Girardeau, Missouri, is located approximately 40 miles to the northwest.

Historically, the economy of Western Kentucky has been based on agriculture, although there has been increased industrial development in recent years. The Paducah Site employs approximately 1,400 people, while the TVA Shawnee Fossil Plant employs an additional 275 people. The total estimated 2020 population within the counties that lie within a 50 mile radius of the Paducah Site is approximately 737,733; and approximately 87,050 people live within the three counties that contain the 10-mile radius of the plant (Massac County, Illinois, and Ballard and McCracken Counties, Kentucky) (DOC 2021). The estimated population of Paducah, Kentucky, is approximately 25,000. The population of McCracken County is estimated to be approximately 65,645 (DOC 2021).

In addition to the residential population surrounding the plant, WKWMA draws thousands of visitors each year for recreational purposes. WKWMA is used by visitors, primarily for hunting and fishing, but other activities include horseback riding, dog trials, hiking, and bird watching.

C.4.2 IDENTIFICATION OF EXPOSURE PATHWAYS

Exposure pathways describe the links between how a contaminant travels from a source to the eventual exposure of an individual. A complete pathway consists of the source of the contaminant, a mechanism of release, a transport medium, a point of potential human contact, and an exposure route. The following discussions focus on land use considerations for the C-400 Complex OU as well as the surrounding area of PGDP, points of potential human contact, types of receptors, and exposure routes.

C.4.2.1 Land Use Considerations

The Paducah Site is located approximately 10 miles west of Paducah, Kentucky, and 3.5 miles south of the Ohio River in the western part of McCracken County. The plant is located on a 3,556 acre DOE-owned Paducah Site. Approximately 1,450 acres are utilized for site operations. The C-400 Complex OU is an industrial area within the controlled access area; therefore, the current land use is industrial. This land use limits the current exposure medium for a receptor to the first foot of surface soil. As discussed in the text of the FS, remedial alternatives for the C-400 Complex OU require substantial earth movement to achieve remedial objectives; therefore, an excavation worker scenario is also relevant to the potential land use of the C-400 Complex OU. The excavation worker is assumed to be exposed by direct contact to the mixture of surface soil (0 to 1 ft bgs) and subsurface soil (1 to 16 ft bgs). Soil depths to 16 ft bgs were considered due to many of the utility lines in the C-400 Complex OU are at or near this depth. If excavation is to occur, these utility lines may be included and the FS would require consideration of soils to 16 ft bgs.

The current land use at C-400 Complex OU can be expected to continue in the foreseeable future. The most plausible future land use of the area is also industrial; however, uses of areas surrounding PGDP indicate that it would be prudent to examine a range of land uses to provide managers with estimates of the risk which may be posed to humans under these alternate uses. Alternate land uses considered as part of the WAG 6 BHHRA included recreational and rural residential scenarios. Additional details related to the alternative land use considerations are discussed in the WAG 6 BHHRA.

Groundwater within the C-400 Complex OU is found within three exposure units, the UCRS, the RGA, and the McNairy. There are no wells installed in the C-400 Complex OU for purposes of extracting potable water; however, there is potential that groundwater underlying the site could migrate off-site to a potable water source or to surface water bodies (e.g., Little Bayou Creek, Bayou Creek). In accordance with the Human Health RMD, risks from water drawn from the UCRS were not presented in the main body of the SRE, but are qualitatively discussed in the uncertainty analysis (DOE 2021). Groundwater for the RGA and McNairy was evaluated as a potable well source, but includes discussion that groundwater directly below the C-400 Complex OU is unlikely to be used as a potable source.

C.4.2.2 Potential Receptor Populations

Human health risks are assessed by determining POEs and exposure routes. POEs are locations where human receptors can contact contaminated media. Exposure routes are the processes by which human receptors contact contaminated media. Following are the summarizations of the exposure routes evaluated quantitatively in this SRE.

***Surface Soil, Brick, and Concrete*—**Current and future industrial workers are the only receptors that are assumed to be exposed to surface soil, brick, and concrete located between 0 to 1 ft bgs. For these receptors, exposure to chemical COPCs in surface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Exposure to radionuclide COPCs in surface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

***Surface and Subsurface Soil, Brick, and Concrete*—**Future excavation workers are the only receptors that are assumed to be exposed to surface and subsurface soil, brick, and concrete located between 0 to 16 ft bgs. For these receptors, exposure to chemical COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Exposure to radionuclide COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

***Groundwater*—**Future hypothetical residents are the only receptors that are assumed to be exposed to groundwater in the RGA and the McNairy. For these receptors, exposure to chemical COPCs in groundwater is assumed to occur via direct ingestion of groundwater, dermal absorption, and inhalation of vapors while using groundwater for household purposes (e.g., showering). Exposure to radionuclide COPCs in groundwater is assumed to occur via direct ingestion of groundwater.

C.4.3 QUANTIFICATION OF EXPOSURE

The following sections described the methods used to estimate the RME used for quantification of risk and hazard for receptors that could potentially be exposed to site media. A discussion of the methodology used to estimate EPCs for COPCs are detailed for each media. There is also a discussion of the methods used in the SRE to streamline the chemical and radionuclide intake estimates. Finally, information from the human health exposure assessment is summarized in a CSM of human health exposure pathways for the C-400 Complex OU.

C.4.3.1 Calculation of EPCs for COPCs

EPCs are concentration estimates of potential exposure that are selected to address uncertainty and variability in the dataset. EPCs are developed to represent an average exposure concentration for receptors over an exposure unit; therefore, EPCs were developed for each exposure unit-media combination. Medium-specific EPCs for each COPC were calculated/selected and used thereafter to provide a representative exposure concentration at the receptor-medium interaction point in the SRE. This section describes how data for each exposure unit were processed to calculate/select EPCs representative of exposure units, and also describes how EPCs were developed.

C.4.3.1.1 EPCs for soil

There are seven sectors for which an EPC was developed for each COPC. The seven sectors differed in size, number of samples, as well as the distribution of COPC concentrations (COPCs in surface soil may differ from surface and subsurface soil). Historical and recent samples within each sector were collected to characterize sources within a sector and thus result in a biased estimate of the concentration within the sector. To account for biases associated with selective sampling of soil, a systematic concentration assignment process was performed.

The grid concentration assignment process was applied to each COPC and each sector. The grid concentration assignment process first required the development of new grids that were, in addition to the 5-point composite grid samples, collected in accordance with the C-400 Complex RI/FS Work Plan (DOE 2020b). The process used to develop the new grid within a sector was as follows:

1. Total surface area of a sector was estimated from an aerial view through ArcGIS.

2. Total surface area associated with the 5-point grid composite samples (grid samples) was subtracted from the total surface area of a sector.

3. The remaining surface area outside the grid samples was divided by 2,500[3] to estimate the number of new grids to be assigned for each sector.

4. The resulting number from this division was rounded to the nearest whole number to provide the number of new grids.

5. New grids with a surface area of 2,500 ft^2 were added to areas within the sector without an existing grid until the surface area of the sector was covered.

The result of the new grids development is provided in Figure C.5. The new grids did not always use the 50 × 50 ft^2 dimensions due to the spatial constraints associated with the shapes of the sectors; however, the new grid shapes and orientations were designed to cover the greatest amount of surface area possible. There were instances where surface area within a grid was not incorporated within an existing grid or a new grid. This occurred in Sectors 2, 3, and 4. The amount of surface area not incorporated within a grid

[3] 2,500 ft^2 was selected due to the maximum allowable size for a grid was 50 ft × 50 ft in accordance with the Human Health RMD (DOE 2021).

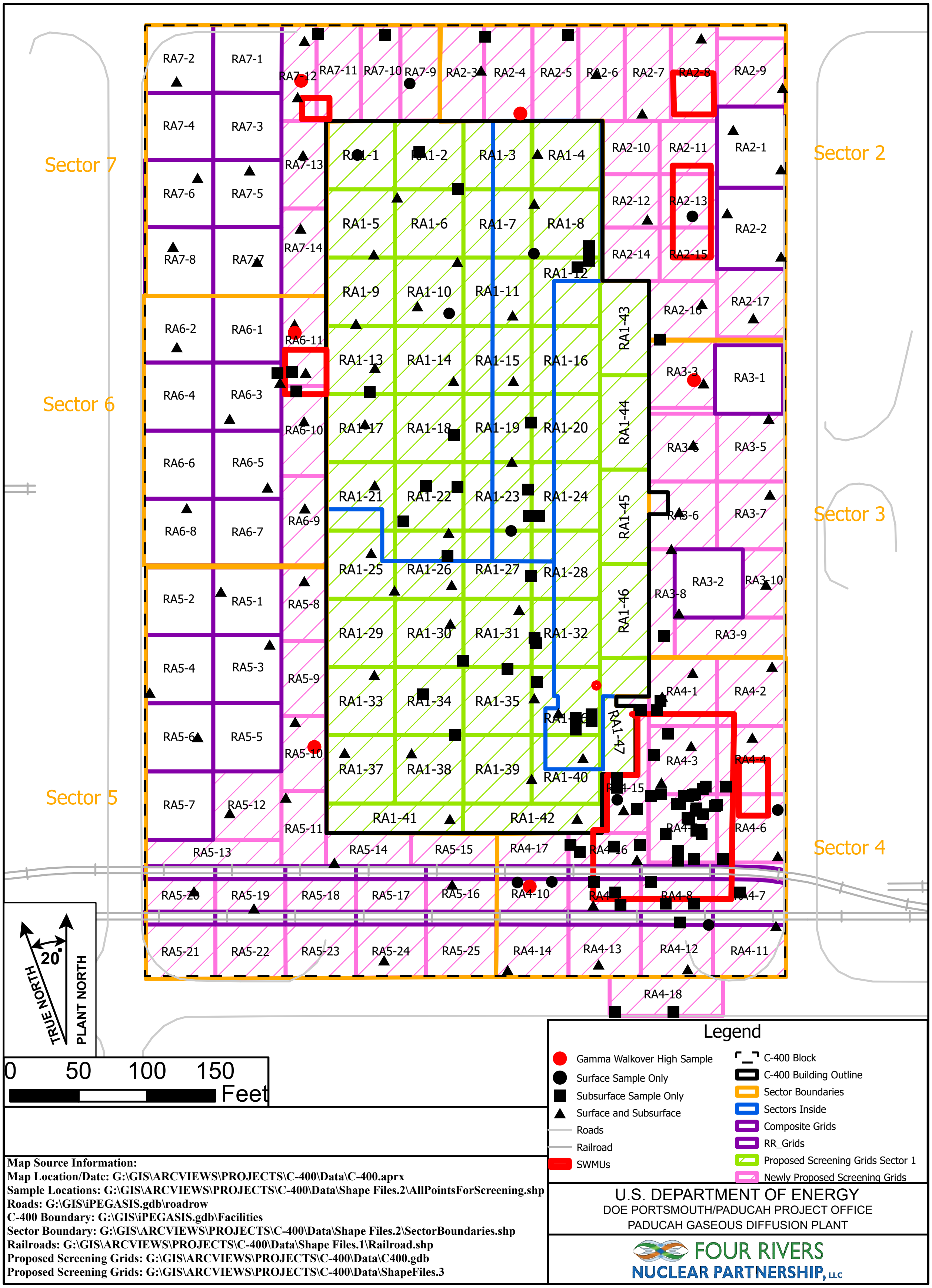


Figure C.5. Soil Grid Outlines for C-400 Complex OU

was < 1% of the total surface area for a sector and was located near perimeter of the C-400 Complex OU boundary (i.e., areas not located near detected concentrations of chemicals or radionuclides).

Once the new grids were added to each sector, the grid concentration assignment process was performed. The process assigned either a single detected concentration or a single DL to the volume of surface soil (0 to 1 ft bgs) and subsurface soil (1 to 16 ft bgs). In the grid concentration assignment process, there were three scenarios encountered. The three scenarios and how a value was assigned is discussed below:

1. Multiple results were available per cube for a COPC—the maximum detected value for the COPC was assigned as the concentration.

2. Multiple results were available per cube, but no detections of the COPC—the minimum DL for the COPC was assigned to the cube.

3. A single datapoint was available per cube for a COPC—the datapoint was assigned to the cube.

Once a result was assigned to each cube of soil (surface soil cube and subsurface soil cube), a final grid concentration process was performed for the surface and subsurface soil cubes. The same set of scenarios described above were encountered and the data were treated in the same manner for each scenario. The result of the grid concentration assignment process for surface soil is presented in Table C1.48 and the result of the grid concentration assignment process for surface and subsurface soil is presented in Table C1.49. A number of either surface or surface and subsurface cubes did not have data collected. In these instances, an average concentration of the detected assigned grid concentrations for each COPC was calculated for both surface cubes and surface and subsurface cubes. The calculated average concentration was then assigned to grids without data. The instances where the grid concentration was based on the average concentration were identified in the results of the grid concentration assignment process.

Soil EPCs were then calculated for each COPC for each sector. The EPC was based on the calculated 95% upper confidence limit (UCL95) on the mean for available data from each sector. In the following circumstances, the maximum detected concentration for the COPC in the media-sector combination was used instead of the UCL95:

- Less than 10 grids with data within a sector-media pair;
- Less than four grids with detections of the COPC in the sector-media pair;
- Less than two distinct values for a COPC in the sector-media pair.

There were instances where the calculated UCL95 was greater than the maximum detected concentration. In these instances, the UCL95 was used as the EPC instead of the maximum; however, the uncertainty associated with this selection is further discussed in the uncertainty section. The results of the EPC calculation and selection process are presented in Tables C1.50 through Table C1.67. The ProUCL software input values and the ProUCL outputs are provided in Attachment C. The tables also provide the calculated and selected EPCs for the associated sector without assigning the average concentration to grids without data. This information will be discussed in the uncertainty section. Risk characterizations within Sector 4 and Sector 5 were performed separately for two sets of grids. Risk characterization was performed for one group of grids that encompassed the railroad tracks within each sector (referred to as "RARR" in grid name). A second risk characterization was performed for the remaining grids within the sector. Risk was characterized separately for these two groups of grids due to differences between the grids such as how samples were collected and the list of target analytes analyzed. Further discussion of the differences between these grids is provided in the C-400 Complex RI/FS Work Plan (DOE 2020b).

C.4.3.1.2 EPCs for groundwater

RGA groundwater and McNairy Formation groundwater are the two groundwater exposure units for which an EPC was derived for each COPC. Data for groundwater will be summarized within each groundwater unit, but not over both exposure units. For the RGA groundwater unit, the EPC was based on the calculated on UCL95, when available. In the following circumstances, the maximum detected concentration for the COPC in the media-sector combination was used instead of the UCL95:

- Less than 10 grids with data within a sector-media pair;
- Less than four grids with detections of the COPC in the sector-media pair;
- Less than two distinct values for a COPC in the sector-media pair.

There were instances where the calculated UCL95 was greater than the maximum detected concentration. In these instances, the UCL95 was used as the EPC instead of the maximum; however, the uncertainty associated with this selection is further discussed in the uncertainty section. The results of the EPC calculation and selection process are presented in Table C1.68. The ProUCL input values and the ProUCL outputs are provided in Attachment C.

For the McNairy formation groundwater exposure unit, the maximum detected concentration was used as the EPC. This decision was made due to the limited number of samples collected within the exposure unit. Selection of the maximum detected value to represent the EPC for COPCs in groundwater is a protective assumption that will be further discussed in the uncertainty analysis along with the screening results of the UCRS groundwater samples.

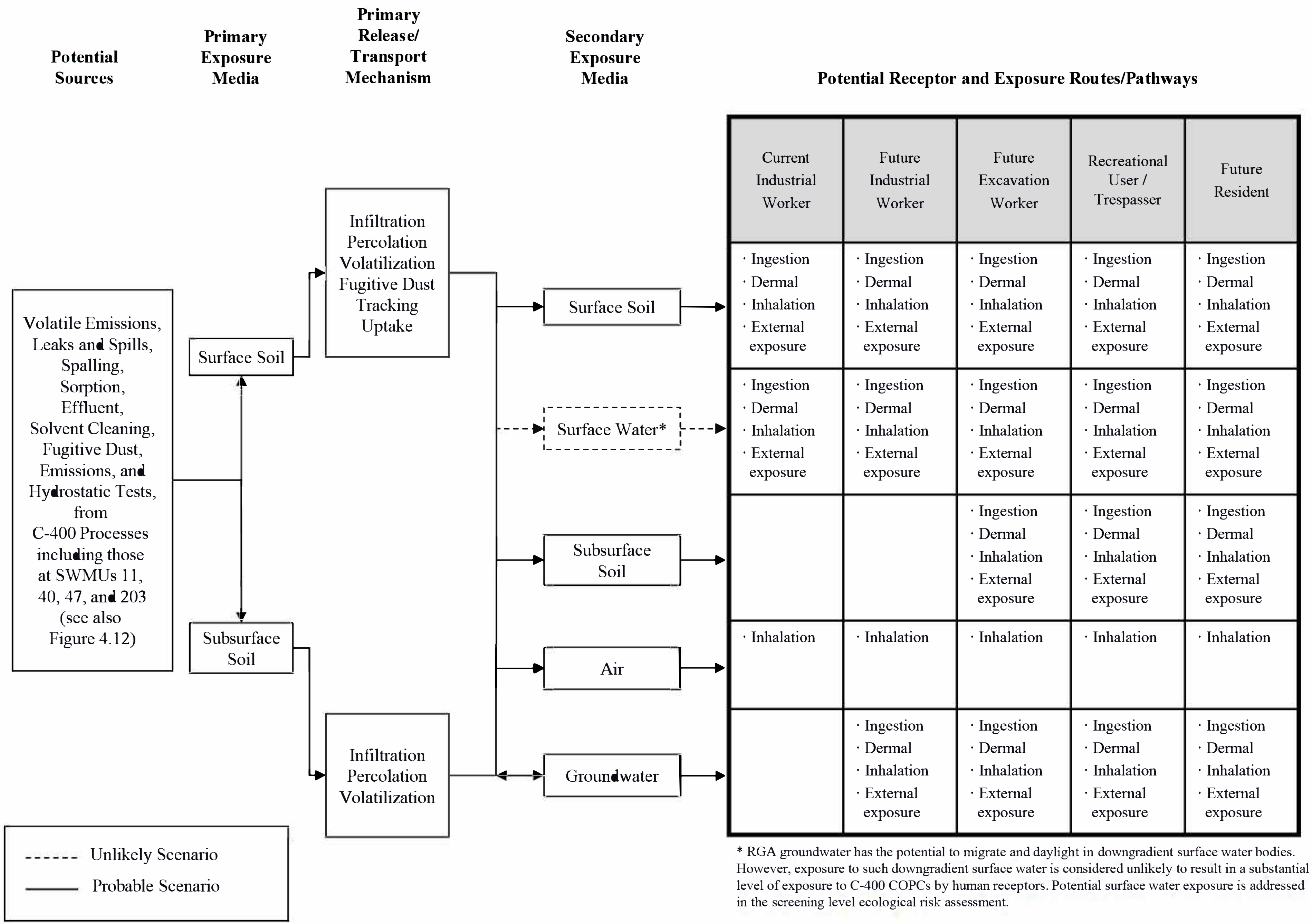
C.4.3.2 Streamlined Estimation of Chronic Daily Intakes

The final component of the exposure assessment is the development of a chronic daily intake (CDI) (EPA 1989b). The calculated CDI would be used with toxicity information to estimate risk and hazard a part of the risk characterization step of the assessment of risk; however, for the SRE, the development of the CDI has been streamlined by combining it with the toxicity information as part of the development of screening levels. The CDIs have been combined with toxicity in the development of the industrial worker, excavation worker, and resident NALs, assuming that the EFs have not changed and using the models for estimating exposure for the relevant exposure routes that were previously discussed. The carcinogenic and noncarcinogenic NALs have been developed for the identified COPCs and both were used to evaluate the following scenarios:

- Current and future industrial worker exposure to surface soil;
- Future excavation worker exposure to surface and subsurface soil; and
- Future hypothetical resident exposure to RGA and McNairy Formation groundwater.

C.4.3.3 Development of a Conceptual Site Model

Using the information presented in the previous sections, a CSM was developed for the C-400 Complex OU. The CSM for soil and groundwater (Figure C.6) illustrates the sources, pathways of migration, and routes of exposure relevant to this SRE. For this SRE, surface soil was defined as 0 to 1 ft bgs and surface and subsurface soil was defined as 0 to 16 ft bgs. Surface soil was used to evaluate direct exposure for the industrial worker receptor. Surface and subsurface soil was used to evaluate direct exposure for the excavation worker receptor. Groundwater from the RGA and McNairy units were used to evaluate direct exposure for the hypothetical resident.



* RGA groundwater has the potential to migrate and daylight in downgradient surface water bodies. However, exposure to such downgradient surface water is considered unlikely to result in a substantial level of exposure to C-400 COPCs by human receptors. Potential surface water exposure is addressed in the screening level ecological risk assessment.

Figure C.6. Conceptual Site Model (Human Health)

C.5. HUMAN HEALTH TOXICITY ASSESSMENT

This section summarizes the potential toxicological effects of the COPCs on exposed populations. Toxicological summaries were obtained from the RAIS prepared by the Toxicology and Risk Analysis Section of Oak Ridge National Laboratory for DOE (DOE 2004). This site also lists toxicity values taken from:

- EPA Integrated Risk Information System (IRIS) database;
- EPA Superfund Health Risk Technical Support Center Provisional Peer Reviewed Toxicity Values (PPRTVs);
- EPA's Office of Pesticide Programs Human Health Benchmarks for Pesticides;
- The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (MRLs);
- California EPA Office of Environmental Health Hazard Assessment toxicity values;
- Screening toxicity values in an appendix to certain PPRTV assessments;
- National Center for Environmental Assessment, and Health Effects Assessment Summary Tables database; and
- ATSDR's draft MRLs.

C.5.1 CARCINOGENS

Potential carcinogenic effects that result from human exposure to chemicals are estimated quantitatively using cancer slope factors (CSFs), which represent the theoretical increased risk per milligram of contaminant intake per kilogram of body weight per day; or inhalation unit risk (IUR) factors, which are the theoretical increased risk at a defined exposure concentration. CSFs or IUR factors are used to estimate a theoretical upper-bound lifetime probability of an individual developing cancer as a result of exposure to a potential carcinogen (EPA 1989b).

CSFs/IUR factors are derived by the EPA from the results of chronic animal bioassays, human epidemiological studies, or both. Animal bioassays are usually conducted at dose levels much higher than those likely to be achieved by human exposure to environmental media. Such high levels are used to detect possible adverse effects in the relatively small test populations used in the studies; therefore, a large degree of protective assumptions exists in the form of high-dose to low-dose extrapolation. Human epidemiological studies often are based on historical occupational exposures at levels much higher than those currently experienced in environmental settings, requiring quantitative extrapolation to account for the dose differences.

The EPA has developed CSFs specific to the oral route of exposure and IUR factors specific to the inhalation route of exposure. In accordance with EPA guidance, this SRE used an extrapolation calculation to estimate dermal CSFs from the oral CSFs that have potential to permeate the dermis (EPA 2004). The oral CSF is multiplied by the gastrointestinal absorption factor (ABSgi) to calculate a dermal CSF.

The following adjustment factors (e.g., EFs multiplied by the adjustment factor) were applied for early-life exposures for chemical carcinogens with mutagenic modes of action (EPA 2005b):

- Birth to 2 years of age, cancer EFs multiplied by 10;
- 2 to 6 years of age, cancer EFs multiplied by 3;
- 2 to 16 years of age, cancer EFs multiplied by 3; and
- 16 years through adulthood, cancer EFs not adjusted.

C.5.2 NON-CARCINOGENS

Potential non-carcinogenic effects that result from human exposure to chemicals are generally estimated quantitatively using RfDs and reference concentrations (RfCs). The RfD, expressed in units of daily dose (mg/kg-day), is an estimate of the daily maximum level of exposure to human populations (including sensitive sub-populations) that are likely to be without an appreciable risk of deleterious effects (EPA 1989b). For inhalation exposures, the EPA has derived RfCs for some chemicals. In concept, an inhalation RfC is similar to an RfD. If the concentration of a chemical in the air to which a human is exposed is lower than the RfC, then there is no appreciable risk for noncancer health effects from that exposure.

The threshold dose (i.e., RfD or RfC) for a compound is usually estimated from the no observed adverse effect level (NOAEL) or the LOAEL, as determined from animal studies or human data. The NOAEL is the highest dose at which no adverse effects are identified, while the LOAEL is the lowest dose at which adverse effects are detectable. Safety factors are applied to either the NOAEL or the LOAEL to estimate an RfD or RfC to account for uncertainties such as the extrapolation from animals to humans, the time period of exposure, and the potential for sensitive individuals within the human population.

Non-carcinogenic toxicity criteria are typically only available for oral (RfD) and inhalation (RfC) exposures. In this SRE, dermal RfDs were extrapolated from the oral RfDs for those contaminants that permeate the dermis using a contaminant-specific ABSgi. This factor represents the relationship between an administered dose and an absorbed dose for the oral route, essentially estimating the dose that enters a receptor's circulation and elicits a toxic effect.

C.6. HUMAN HEALTH RISK CHARACTERIZATION

Risk characterization is the final step in the risk assessment process. In this step, the information from the exposure and toxicity assessments is integrated to quantitatively estimate both carcinogenic health risks and noncarcinogenic hazard potential. For this assessment, risk is defined as both the lifetime probability of excess cancer incidence for carcinogens and the estimate of daily intake exceeding intake that may lead to toxic effects for noncarcinogens.

C.6.1 RISK CHARACTERIZATION METHODS

This section describes the methods used to quantify carcinogenic risk and non-carcinogenic hazard for each sector and groundwater exposure unit. The section provides the equations used to calculated ELCR and the HQ for each COPC and the cumulative ELCR and HI for each sector and groundwater exposure unit.

C.6.1.1 Cancer Risk for Chemicals

In this SRE, the numerical estimate of the potential for cancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as an ELCR. This value is calculated as shown in the following equation:

$$ELCR_{COPC} = \frac{EPC_{COPCi}}{Carcinogenic\ NAL_{COPCi}} \times 1 \times 10^{-6}$$

Where:

ELCR is the excess lifetime cancer risk for the COPC, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Carcinogenic NAL is the carcinogenic no action level for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Because the NAL was based on a target risk of 1×10^{-6}, the ratio of the EPC to the NAL was adjusted by multiplying the ratio by 1×10^{-6}. When performing this calculation, the proper NAL was used for each receptor-media pair. Risk characterization for the C-400 Complex OU consisted of the following comparisons:

- Surface soil EPCs to industrial worker carcinogenic NALs;
- Surface and subsurface soil EPCs to excavation worker carcinogenic NAL; and
- Groundwater EPCs to resident carcinogenic NALs.

The chemical and radionuclide specific ELCRs relevant to an individual receptor are summed to develop a total ELCR. The total ELCR is not an actuarial estimate of an individual developing cancer but can be used to estimate the total ELCR that may result if all contaminants reaching the receptor have additive effects. This can be represented in the following equation:

$$ELCR_{Total} = ELCR_{COPC1} + ELCR_{COPC2} + ELCR_{COPC3} \ldots ELCR_{COPCn}$$

The chemical-specific ELCR and total ELCR define dose-response relationships, meaning the ELCRs represent a statistical probability of the increased risk of developing cancer that exists in receptors exposed under the assumptions used in the calculation of the NAL.

The calculation for the carcinogenic endpoints was performed on two scales for each soil sector, a calculation for each individual grid within a sector and the calculation for the sector. The selected EPC for calculation of the grid-specific ELCR was the COPC concentration assigned to the grid during the grid concentration assignment process. The selected EPC for the calculation of the sector-specific HQ was the calculated COPC UCL95 if sufficient data was available, or the maximum concentration for the COPC for the sector if sufficient data was not available to develop a UCL95.

C.6.1.2 Noncancer Hazard for Chemicals

In this SRE, the numerical estimate of the potential for noncancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as an HQ. This value is calculated as shown in the following equation:

$$HQ = \frac{EPC_{COPCi}}{Noncarcinogenic\ NAL_{COPCi}} \times 0.1$$

Where:

HQ is the hazard quotient, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Noncarcinogenic NAL is the noncarcinogenic NAL for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Because the NAL was based on a target hazard quotient of 0.1, the ratio of the EPC to the NAL was adjusted by multiplying the ratio by 0.1. When performing this calculation, the proper NAL was used for each receptor-media pair. Risk characterization for the C-400 Complex OU consisted of the following comparisons:

- Surface soil EPCs to industrial worker noncarcinogenic NALs;
- Surface and subsurface soil EPCs to excavation worker noncarcinogenic NALs; and
- Groundwater EPCs to child resident noncarcinogenic NALs

For all adult exposures, the period of exposure was > 7 years; therefore, the chronic RfD was used in development of the NAL. For all exposures to children, regardless of duration, the chronic RfD was used (DOE 2021). The Human Health RMD also recommends summing the pathway HIs for all pathways relevant to an individual receptor to develop a total HI. The total HI is not an estimate of the systemic toxicity posed by all contaminants that may reach the receptor, but can be used to estimate if a toxic effect may result if all contaminants reaching the receptor have additive effects over all pathways. This is represented in the following equation:

$$HI = HQ_{COPC1} + HQ_{COPC2} + HQ_{COPC3} + \cdots HQ_{COPCn}$$

The calculation for the noncarcinogenic endpoints were performed on two scales for each soil sector, a calculation for each individual grid within a sector and the calculation for the sector. The selected EPC for calculation of the grid-specific HQ was the COPC concentration assigned to the grid during the grid concentration assignment process. The selected EPC for the calculation of the sector-specific HQ was the calculated COPC UCL95, if sufficient data was available; or the maximum concentration for the COPC for the sector, if sufficient data was not available to develop a UCL95.

C.6.2 CONTAMINANTS OF CONCERN AND PRIORITY CONTAMINANTS OF CONCERN

The risk characterization step of the SRE results in quantitative carcinogenic and noncarcinogenic estimates of risk for the media-receptor pairs that have been investigated. The results of the risk characterization (i.e., risk estimates, HQs) are compared to accepted regulatory thresholds for both carcinogenic and noncarcinogenic endpoints. If a COPC exceeds a regulatory threshold, it is identified as a COC and will have an RGO developed on the basis of human health. This section provides the details the process for how COCs are identified.

The process for identification of COCs in discussed in detail in the Human Health RMD (DOE 2021). The process described in the Human Health RMD includes the following steps when a BHHRA has been conducted:

1. Identification of use scenarios of concern;
2. Identification of POCs;
3. Identification of COCs; and
4. Identification of media of concern (MOC).

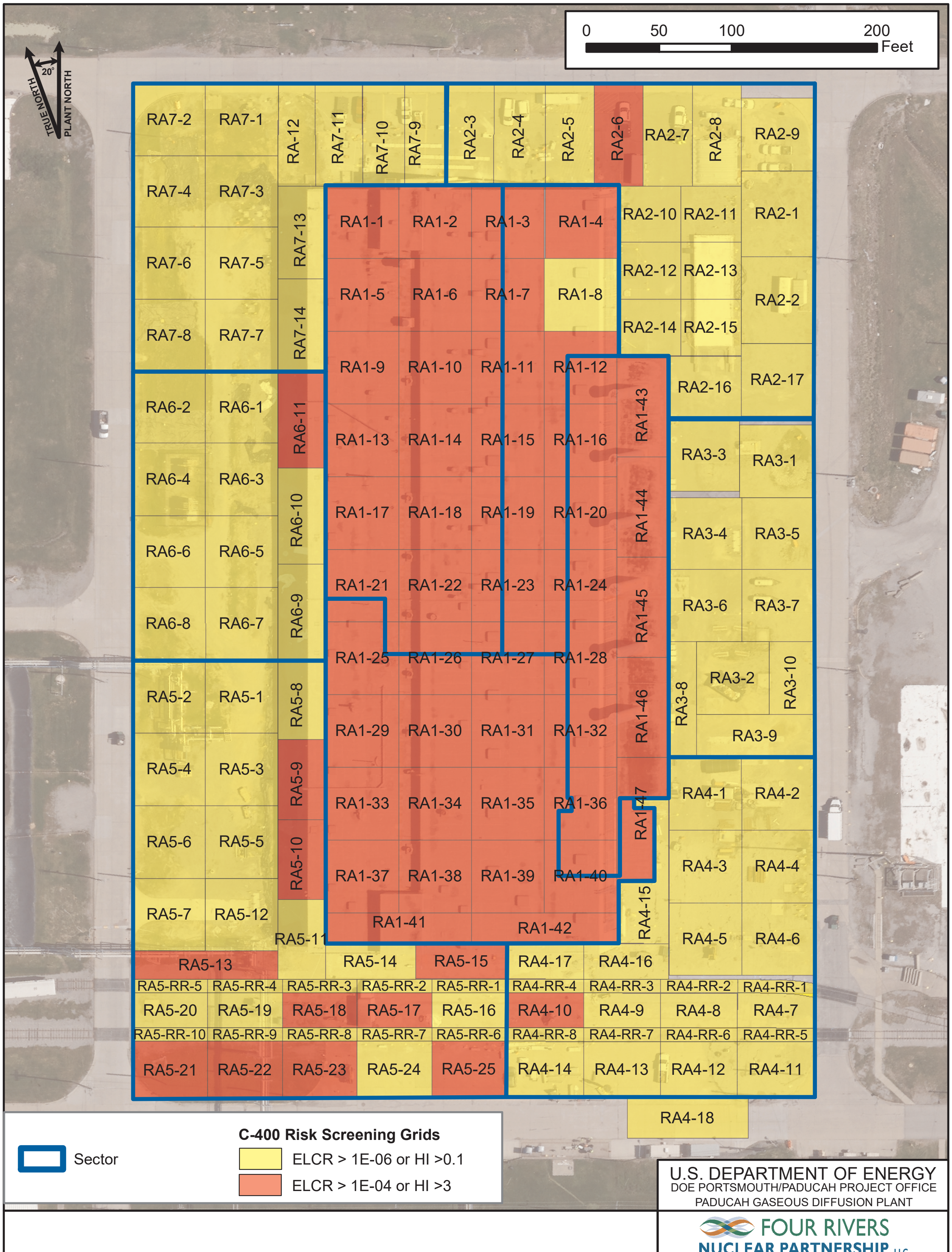
The Human Heath RMD also indicates that use scenarios of concern, POCs, and MOC should not be provided when the risk analysis is based on screening methodology that utilizes calculated ratios of chemical- and radionuclide-specific media concentrations and NALs.

The identification of COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, COCs were identified for each use scenario of concern. COPCs within a use scenario of concern exceeding either an ELCR of 1×10^{-6} or an HQ of 0.1 were identified as COCs. For risk characterization of soil, an ELCR and HQ were developed for individual grids, as well as a sector-wide ELCR and HQ. The sector-wide ELCR and HQ for COPCs were used to identify COCs for the sector; whereas, individual grid ELCR and HQ calculations were presented to provide information for risk managers. The individual grid quantification of risk and hazard were not used for the identification of COCs.

The identification of priority COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, priority COCs were identified for each use scenario of concern. COPCs within a use scenario of concern exceeding either an ELCR of 1×10^{-4} or an HQ of 1 were identified as priority COCs.

C.6.3 RESULTS OF THE RISK CHARACTERIZATION FOR SOIL, BRICK, AND CONCRETE

Cancer risks from chemicals, cancer risks that form from radionuclides, and noncancer hazards from chemicals are discussed for each soil sector in the following subsections. Based on the risk characterization results, COCs and priority COCs were identified based on criteria discussed in Section 6.1. For risk characterization of soil, the individual grid's cumulative ELCR or HI are color-coded to indicate if they are above an ELCR of 1×10^{-6} or an HI of 0.1, or above an ELCR of 1×10^{-4} or an HI of 1. The surface soil risk characterization results are presented in Figure C.7, and the surface and subsurface risk characterization results are presented in Figure C.8.



MAP SOURCE INFORMATION
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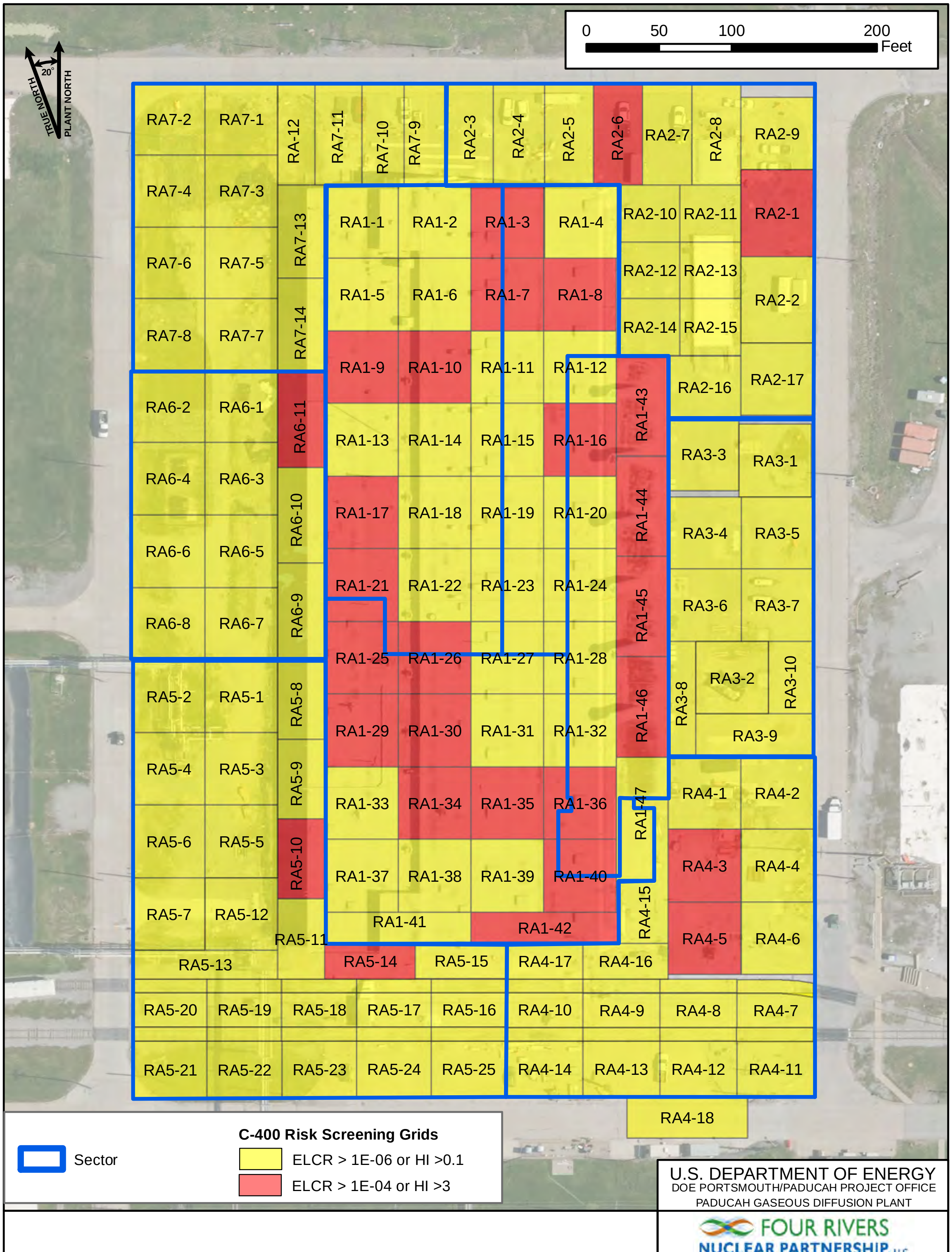
Screening Grids: G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGridsSector1.shp (3/24/2022);
G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGridSE.shp (3/24/2022);
G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGrids.shp (4/20/2022);
G:\GIS\ARCVIEWS\PROJECTS\C-400\Data\Shape Files.1\CompositeGrids.shp (3/24/2022); G:\GIS\ARCVIEWS\PROJECTS\C-400\Data\Shape Files.1\RRGridoutlines.shp (4/20/2022)

Figure C.7. Surface Soil Risk Characterization Summary



MAP SOURCE INFORMATION
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C-400 Sectors: G:\GIS\iPEGASIS.gdb\C400_Complex_Sectors; Basemap: G:\GIS\LiDAR\SID_Mosaics\FRNP_Paducah_Spring_2021.sid;
Screening Grids: G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGridsSector1.shp (3/24/2022);
G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGridSE.shp (3/24/2022);
G:\gis\ARCVIEWS\PROJECTS\C-400\Data\ShapeFiles.3\ProposedScreeningGrids.shp (4/20/2022);
G:\GIS\ARCVIEWS\PROJECTS\C-400\Data\Shape Files.1\CompositeGrids.shp (3/24/2022); G:\GIS\ARCVIEWS\PROJECTS\C-400\Data\Shape Files.1\RRGridoutlines.shp (2/15/2022)

Figure C.8. Surface and Subsurface Soil Risk Characterization Summary

C.6.3.1 Sector 1

The results of the risk characterization of industrial workers for the Sector 1 surface soil are provided in Table C1.69, and the results of the risk characterization for excavation workers for the Sector 1 surface and subsurface soil are provided in Table C1.70. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- chromium
- Total PAHs
- Total PCBs
- uranium metal
- cesium-137
- neptunium-237
- radium-226
- uranium-233/234
- uranium-235/236
- uranium-238

No priority COCs were identified for surface soil in Sector 1.

Surface and subsurface soil COCs:

- arsenic
- chromium
- cobalt
- Total PCBs
- uranium metal
- cesium-137
- neptunium-237
- radium-226
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium metal was identified as a priority COC for surface and subsurface soil in Sector 1.

C.6.3.2 Sector 2

The results of the risk characterization of industrial workers for the Sector 2 surface soil are provided in Table C1.71, and the results of the risk characterization for excavation workers for the Sector 2 surface and subsurface soil are provided in Table C1.72. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- arsenic
- chromium
- uranium metal

- neptunium-237
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium metal and uranium-238 were identified as priority COCs for surface soil in Sector 2.

Surface and subsurface soil COCs:

- arsenic
- chromium
- nickel
- uranium metal
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium metal was identified as a priority COC for surface and subsurface soil in Sector 2.

C.6.3.3 Sector 3

The results of the risk characterization of industrial workers for the Sector 3 surface soil are provided in Table C1.73, and the results of the risk characterization for excavation workers for the Sector 3 surface and subsurface soil are provided in Table C1.74. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- arsenic
- chromium
- Total PAHs
- TCE
- uranium-233/234
- uranium-238

No priority COCs were identified for surface soil in Sector 3.

Surface and subsurface soil COCs:

- arsenic
- chromium
- cobalt
- manganese
- TCE
- uranium metal
- uranium-238

Uranium metal was identified as a priority COC for surface and subsurface soil in Sector 3.

C.6.3.4 Sector 4

The results of the risk characterization of industrial workers for the Sector 4 surface soil for non-railroad grids are provided in Table C1.75, and the results of the risk characterization for excavation workers for the Sector 4 surface and subsurface soil non-railroad grids are provided in Table C1.76. The results of the risk characterization of industrial workers for the Sector 4 surface soil for railroad grids are provided in Table C1.77, and the results of the risk characterization for excavation workers for the Sector 4 surface and subsurface soil railroad grids are provided in Table C1.78. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- chromium
- Total PCBs
- uranium metalneptunium-237
- throium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium-238 was identified as a priority COC for surface soil in Sector 4 non-railroad grids.

Surface and subsurface soil COCs:

- arsenic
- chromium
- iron
- manganese
- TCE
- uranium metal
- cesium-137
- neptunium-237
- uranium-233/234
- uranium-235/236
- uranium-238

TCE and uranium metal was identified as a priority COCs for surface and subsurface soil in Sector 4 non-railroad grids.

Surface soil COCs:

- chromium
- uranium metal
- neptunium-237
- uranium-235/236
- uranium-238

No priority COCs were identified for surface soil in Sector 4 railroad grids.

Surface and subsurface soil COCs:

- arsenic
- chromium
- iron
- total dioxins/furans
- Total PAHs
- uranium metal
- neptunium-237
- uranium-238

Uranium metal was identified as a priority COC for surface and subsurface soil in Sector 4 railroad grids.

C.6.3.5 Sector 5

The results of the risk characterization of industrial workers for the Sector 5 surface soil for non-railroad grids are provided in Table C1.79, and the results of the risk characterization for excavation workers for the Sector 5 surface and subsurface soil non-railroad grids are provided in Table C1.80. The results of the risk characterization of industrial workers for the Sector 5 surface soil for railroad grids are provided in Table C1.81, and the results of the risk characterization for excavation workers for the Sector 5 surface and subsurface soil railroad grids are provided in Table C1.82.

Surface soil COCs:

- arsenic
- chromium
- Total PAHs
- TCE
- cesium-137
- neptunium-237
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium-235/236 and uranium-238 were identified as priority COCs for surface soil in Sector 5 non-railroad grids.

Surface and subsurface soil COCs:

- arsenic
- chromium
- cobalt
- manganese
- TCE
- uranium metal
- cesium-137
- neptunium-237
- uranium-233/234

- uranium-235/236
- uranium-238

TCE was identified as a priority COC for surface and subsurface soil in Sector 5 non-railroad grids.

Surface soil COCs:

- arsenic
- chromium
- uranium metal
- uranium-235/236
- uranium-238

No priority COCs were identified for surface soil in Sector 5 railroad grids.

Surface and subsurface soil COCs:

- arsenic
- chromium
- cobalt
- manganese
- uranium metal

No priority COCs were identified for surface and subsurface soil in Sector 5 railroad grids.

C.6.3.6 Sector 6

The results of the risk characterization of industrial workers for the Sector 6 surface soil are provided in Table C1.83, and the results of the risk characterization for excavation workers for the Sector 6 surface and subsurface soil are provided in Table C1.84. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- arsenic
- chromium
- Total PAHs
- Total PCBs
- uranium metal
- cesium-137
- neptunium-237
- plutonium-239/240
- technetium-99
- thorium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Throium-230 and uranium-238 were identified as priority COCs for surface soil in Sector 6.

Surface and subsurface soil COCs:

- antimony
- arsenic
- chromium
- cobalt
- manganese
- thallium
- Total PAHs
- uranium metal
- americium-241
- cesium-137
- neptunium-237
- plutonium-239/240
- throium-230
- uranium-233/234
- uranium-235/236
- uranium-238

Uranium metal and thorium-230 were identified as priority COCs for surface and subsurface soil in Sector 6.

C.6.3.7 Sector 7 Surface Soil Risk Characterization Results

The results of the risk characterization of industrial workers for the Sector 7 surface soil are provided in Table C1.85, and the results of the risk characterization for excavation workers for the Sector 7 surface and subsurface soil are provided in Table C1.86. The COPCs that have been identified as COCs and the identified priority COCs are provided at the bottom of each table.

Surface soil COCs:

- chromium
- Total PAHs
- cesium-137
- neptunium-237
- thorium-230
- uranium-235
- uranium-235/236
- uranium-238

No priority COCs were identified for surface soil in Sector 7.

Surface and subsurface soil COCs:

- arsenic
- chromium
- uranium metal
- cesium-137
- neptunium-237

- thorium-230
- uranium-238

No priority COCs were identified for surface and subsurface soil in Sector 7.

C.6.4 RESULTS OF THE RISK CHARACTERIZATION FOR GROUNDWATER

Cancer risks from chemicals, cancer risks from radionuclides, and noncancer hazards from chemicals, are discussed for each groundwater exposure unit in the following subsections. Based on the risk characterization results, COCs and priority COCs are identified based on criteria discussed in Section 6.1.

C.6.4.1 Regional Gravel Aquifer

The results of the risk characterization of hypothetical residents for the RGA exposure unit are provided in Table C1.87. The COPCs that have been identified as COCs and the identified priority COCs are provided in the table.

RGA groundwater COCs[4]:

- arsenic
- bromodichloromethane
- carbon tetrachloride
- chloroform
- chromium
- 1,2-dichloroethane
- *cis*-1,2-dichloroethene
- 1,4-dioxane
- fluoride
- hexachlorocyclopentadiene
- iron
- manganese
- methylene chloride
- nitrate as nitrogen
- pentachlorophenol
- p-nitroaniline
- Total PAHs
- Total PCBs
- 1,1,2-trichloroethane
- TCE
- uranium metal
- vinyl chloride
- technetium-99
- uranium-235/236

Priority COCs for RGA groundwater are arsenic, bromodichloromethane, chloroform, chromium, *cis*-1,2-dichloroethene, 1,4-dioxane, hexachlorocyclopentadiene, pentachlorophenol, Total PAHs, 1,1,2-trichloroethane, TCE, vinyl chloride, and technetium-99.

C.6.4.2 McNairy Formation

The results of the risk characterization of hypothetical residents for the McNairy exposure unit are provided in Table C1.88. The COPCs that have been identified as COCs and the identified priority COCs are provided in the table.

[4] Lead-210 was identified as a primary McNairy Formation groundwater COC and a minor RGA groundwater COC in the baseline WAG 6 risk assessment, the results of which were not included in the C-400 Complex RI. Lead-210 is related to natural uranium and not to uranium enrichment by the gaseous diffusion process at PGDP (see Section E.6 of DOE 2021). Therefore, lead-210 is not a COC for the RGA nor for the McNairy Formation.

Groundwater COCs:

- p-nitroaniline
- 1,1,2-trichloroethane
- *cis*-1,2-dichloroethene
- TCE
- uranium-238

The priority COCs for McNairy groundwater exposure unit were 1,1,2-trichloroethane, *cis*-1,2-dichloroethene, TCE, and uranium-238.

C.6.5 SUMMARY OF RISK CHARACTERIZATION

The risk characterization results were used to identify soil and groundwater COCs.[5] The list of surface soil COCs and priority COCs across the C-400 Complex OU based on risk characterization results for industrial worker NALs are provided in Table C1.89. The COCs identified as primary risk drivers for surface soil across the C-400 Complex OU were uranium metal and uranium-238. In the context of soil, a "primary risk driver" refers to those COCs that contribute greater than 50% of the cumulative risk or hazard for the majority of soil sectors. Thorium-230, uranium metal, and uranium-235/236 were also identified as priority COCs in certain sectors, which indicates elevated concentration above either an ELCR of 1×10^{-4} or an HI of 1 in individual sectors investigated and not across the C-400 Complex OU.

The list of surface and subsurface soil COCs based on risk characterization results for excavation worker NALs are provided in Table C1.90. The COC identified as primary risk drivers for surface and subsurface soil across the C-400 Complex OU were uranium metal and uranium-238. Thorium-230 was also identified as a priority COC in one sector, which indicates elevated concentration above either an ELCR of 1×10^{-4} in an individual sector investigated and not across the C-400 Complex OU. TCE was identified as a priority COC in two sectors, Sector 4 and Sector 5, located on the south site of the C-400 Complex OU. TCE is a risk driver, but the elevated concentrations are located in surface and subsurface soil located south of the C-400 Complex OU.

The list of groundwater COCs and priority COCs from the RGA and McNairy groundwater exposure units is presented in Table C1.91. There were a relatively large number of COCs identified as priority COCs in groundwater, specifically the RGA groundwater; however, review of the data indicated that there were five primary risk divers in groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. In the context of RGA groundwater, a "primary risk driver" refers to those COCs that have a frequency of exceedance (FOEs) of their respective ALs greater than 10%. For the McNairy groundwater, a "primary risk driver" refers to those COCs that contribute greater than 10% to the cumulative ELCR and noncancer hazard. The FOE of the AL in the McNairy was not used due to the limited sample size in the exposure unit. TCE was identified as the primary risk driver for RGA and McNairy groundwater. TCE contributed approximately 84% of the total ELCR and approximately 96% of the total noncancer hazard for RGA groundwater (Table C1.87). In McNairy groundwater, TCE contributed approximately 100% of the total ELCR and noncancer hazard (Table C1.88).

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[5] The Human Heath RMD indicates that use scenarios of concern, POCs, and MOC should not be provided when the risk analysis is based on screening methodology that utilizes calculated ratios of chemical- and radionuclide-specific media concentrations and NALs.

The current SRE results can be further compared to the results of the WAG 6 risk assessment. The main risk driver in the RGA was used for comparison to the WAG 6 risk assessment, TCE. The WAG 6 risk assessment utilized fewer datapoints than the current SRE due to being 20 years old (approximate 150 RGA groundwater samples versus over 800). The SRE has more data to support the conclusions of the evaluation of risks, but the comparison in time can help understand trends in risk from contaminants over time. The comparison is not equivalent in terms of the methods used to assess risk; however, the concentrations can be compared to qualitatively evaluate risks over time. The maximum TCE concentration and EPC in the WAG 6 risk assessment was 701 mg/L and 8.19 mg/L, respectively. The maximum TCE and EPC in the SRE was 1400 mg/L and 28.32 mg/L, respectively. Comparison of the concentrations indicate an increase in the maximum concentration and average concentration of TCE over time; therefore, the overall quantified risks in groundwater in the current SRE are greater than the overall quantified risks in groundwater in the WAG 6 risk assessment.

C.7. UNCERTAINTIES IN THE RISK ASSESSMENT

This section will present a quantitative and qualitative analysis of uncertainties and how each of the uncertainties affect the major portions of the SRE. Potential sources of uncertainty related to steps of the SRE are discussed in the following subsection and are grouped into data analysis uncertainties, exposure assessment uncertainties, toxicity uncertainties, and risk characterization uncertainties. Each individual uncertainty was classified as small, moderate, or large based on the definitions provided in the Human Health RMD. These classifications are summarized at the end of this section (DOE 2021).

C.7.1 DATA ANALYSIS UNCERTAINTIES

Common Laboratory Contaminants—A list of laboratory contaminants that are detected as part of the analysis process but are not related to site activities is provided in EPA guidance (EPA 1992). The list of chemicals provided in guidance relevant to this investigation include acetone, 2-butanone, freons (e.g., 1,1,2-trichloro-1,2,2,trifluoroethane), solvent preservatives (e.g., cyclohexanone), methylene chloride, phthalates, and toluene. None of the chemicals or classes of chemicals were identified as COPCs in soil; therefore, it is unlikely to affect the risk results for soil. The uncertainty associated with common laboratory contaminants in soil is likely miniscule due to none of the listed contaminants exceeding their respective direct contact screening levels; therefore, the impact to the SRE is unlikely to change, and the uncertainty is classified as small.

Bis(2-ethylhexyl)phthalate and methylene chloride were detected in groundwater samples collected from the RGA and were identified as COPCs. Bis(2-ethylhexl)phthalate was not identified as a COC and continued evaluation was not performed; however, methylene chloride was identified as a COC in RGA groundwater. Methylene chloride was detected in > 10% of groundwater samples collected in the RGA so the analyte was detected in a number of samples. Methylene chloride exceeded its residential NAL in < 10% of samples, which indicates that a small number of detections are driving the designation as a COC. This also supports the conclusion that methylene chloride is not a significant contributor to excess risk to a resident exposed to RGA groundwater. It is possible that alternative sources are the origin of methylene chloride detections in the RGA, but this scenario is difficult to confirm. In order to perform a protection human health SRE, methylene chloride was retained as a COC for RGA groundwater. The uncertainty associated with common laboratory contaminants in groundwater is relatively small due to the minor contribution that methylene chloride adds to the cumulative risk and HI for RGA groundwater (< 0.01%); therefore, the impact to the SRE is less than an order of magnitude and is classified as small.

Retention of Infrequently-Detected Analytes as COPCs—The identification of COPCs in soil and groundwater was based on the comparison of the maximum detected concentration for the analyte to its respective media-specific NAL. The comparison did not account for other factors such as the frequency of detection (FOD). Exclusion of this factor was based on the Human Health RMD to assure that chemicals with concentrations that pose a risk to human health were further evaluated (DOE 2021). Analytes that were detected infrequently (i.e., detected in < 10% of samples) and retained as COPCs in surface soil included neptunium-237 in Sector 2 and Sector 5. Analytes that were detected infrequently and retained as COPCs in surface and subsurface soil included neptunium-237 in Sector 5. Neptunium-237 was also identified as a COC for these media and sectors. The detection frequency was translated by using the maximum detected concentration as the EPC for risk characterization. Because neptunium-237 was identified as a COPC by a comparison of the maximum concentration, it translates to an ELCR > 1×10^{-6} and would be identified as a COC. Further review of neptunium-237's DL in soil indicated that a large proportion of data had DLs above the industrial worker NAL (Table C1.1), while there was only one DL that exceeded the excavation worker NAL (Table C1.2); therefore, the inclusion of neptunium-237 as a surface soil COPC is deemed appropriate due to the number of DLs greater than the industrial NAL, while inclusion as a surface and subsurface soil COPC is likely overestimating risk for the excavation receptor. The uncertainty associated with infrequently detected contaminants in soil is relatively small due to the minor contribution that neptunium-237 adds to the cumulative risk for the sector (i.e., approximately 1% of total risk for both surface soil and surface and subsurface soil); therefore, the impact to the SRE is less than an order of magnitude and is classified as small.

Analytes that were detected infrequently (i.e., detected in < 10% of samples) and retained as COPCs in RGA groundwater included hexachlorocyclopentadiene, pentachlorophenol, p-nitroaniline, Total PAHs, Total PCBs, 1,1-dichloroethane, 1,2-dichloroethane, 1,4-dioxane, benzene, bromodichloromethane, vinyl chloride, neptunium-237, thorium-230, uranium-233/234, uranium-235/236, and uranium-238. For a number of the COPCs identified in groundwater, there were insufficient data to develop a UCL95 for COPCs identified in both RGA and McNairy groundwater exposure units; the maximum detected concentration was used as the EPC to characterize risk. As a result, the COPCs based on the maximum detected concentration were selected as COCs due to the threshold used to identify COCs. Using the maximum detected concentration as the EPC for risk characterization is likely to bias the EPC greater than the average concentration in the groundwater exposure unit and overestimating risks to hypothetical residential receptors. For the evaluation of McNairy groundwater data, there was insufficient data to develop a UCL95; therefore, the maximum detected concentration was selected as the EPC. This is also likely to bias the EPC higher than an average concentration in the groundwater unit and overestimating risks to hypothetical residential receptors. The uncertainty associated with infrequently detected contaminants in groundwater is unlikely to significantly impact the calculated cumulative risk or HI. The relative contribution of these compounds (except 1,4-dioxane) is < 1% of the total risk or the HI. For 1,4-dioxane, the contribution is > 10% but does not change the cumulative risk or HI by more than an order of magnitude; therefore, the impact to the SRE is less than an order of magnitude and is classified as small.

Lack of Consideration of Temporal Patterns in Data—For the identification of COPCs, historical data collected from the site was combined with recently collected data to evaluate risks to receptors that could be exposed to concentrations of analytes detected at the C-400 Complex OU media. As discussed in Section 3.1, the sources of data included in the SRE were collected from 2000 (for soil data) or 2012 (for groundwater data). These data were combined for identification of COPCs and COCs; however, historical data for some COPCs (e.g., VOCs, SVOCs) is likely to bias site concentrations higher than reliance on recently collected data due to decreases in these concentrations over time through natural processes (i.e., migration, dilution, degradation). Inclusion of historical data is likely to bias the risk estimates higher than reliance on recently collected data alone. The uncertainty associated with excluding temporal patterns is unlikely to significantly impact the calculated cumulative risk or HI. The identified priority COCs are likely to persist in the environment for a long period of time (e.g., uranium metal) or are associated with a groundwater source zone (i.e., TCE); therefore, the impact to the SRE is less than an order of magnitude and is classified as small.

C.7.2 UNCERTAINTIES ASSOCIATED WITH COPC SELECTION

The identification of COPCs and COCs within the SRE has focused on the detected concentrations within the dataset; however, there may be instances in which the DLs for analytes exceed their respective NALs. Additional evaluation was performed to determine if the analytes with DLs elevated above their respective NALs impacted the risk estimates in the SRE. This evaluation is discussed in detail in the Human Health RMD and focused on comparison of half the maximum DL to the analyte NAL for each media evaluated (DOE 2021). If one-half the maximum DL is below its respective NAL, the analyte is unlikely to contribute significantly to risk from exposure to C-400 Complex OU media. If one-half the maximum DL is above its respective NAL, it is possible that the list of COPCs should be updated to include these analytes or the identified COPCs risk estimates that are biased due to the inclusion of censored data in the calculation of the EPC.

The evaluation of DLs began by evaluating one-half the maximum DL compared to the analytes' NAL for a specific media. If the DL is below the NAL, the analytes' DLs are excluded from additional consideration and if above the NAL, the background value was evaluated. One-half the maximum DL was compared to the analytes' provisional background for a specific media if one was available. If below background, the analytes' DLs are excluded from additional consideration and if above background, other lines of evidence were evaluated that included the frequency for which the DLs exceed the NAL, the magnitude of one-half the maximum DL exceeds the NAL, consideration if the analyte is likely to present at the C-400 Complex OU and the relevance of the analyte. The comparison of one-half the maximum DLs for surface soil to industrial worker NALs is presented in Table C1.1. The comparison of one-half the maximum DL for surface and subsurface soil to the excavation worker NALs is provided in Table C1.2.

The comparison of one-half the maximum DL for groundwater to the hypothetical resident NALs is provided in Table C1.3.

Surface Soil DLs—There were a total of 29 analytes for which one-half the maximum DL exceeded its respective industrial worker NAL. Of the 29 analytes, 3 did not exceed the provisional background value. The following were the 26 analytes for which one-half the maximum DL exceeded their NAL and provisional background value:

- acrolein
- atrazine
- bis(2-chloroethyl) ether
- 2-chloroethyl vinyl ether
- 4-chlorobenzenamine
- chromium
- 1,2-dibromo-3-chloropropane
- 1,2-dibromoethane
- 3,3'-dichlorobenzidine
- dieldrin
- 2,4-dinitrotoluene
- 2,6-dinitrotoluene
- hexachlorobenzene
- hexachlorobutadiene
- hexachlorocyclopentadiene
- 2-methyl-4,6-dinitrophenol
- n-nitroso-di-n-propylamine
- pentachlorophenol
- thallium
- Total PCBs
- 1,1,2-trichloroethane
- uranium metal
- lead-210
- neptunium-237
- uranium-235/236
- uranium-238

The analytes' frequency for which the DL exceeded the NAL and the magnitude for which one-half the maximum DL exceeded the industrial worker NAL was evaluated. There were ten analytes with an FOE of < 10%, indicating that the frequency at which the analyte could be detected above the NAL is low, the average concentration of the analyte is likely below the NAL, and the analytes are unlikely to significantly impact risk estimates. For a majority of these analytes, the low FOE of the NAL is associated with a higher FOD (e.g., chromium, uranium metal, Total PCBs) and evaluation in the SRE. The remaining 16 analytes with FOEs > 10%, the magnitudes of one-half the maximum DL exceedance of NALs were primarily below 10 (i.e., exceedance would translate to an ELCR below 1×10^{-5} or an HQ < 1). Exceptions to this were 2,6-dinitrotoluene, hexachlorocyclopentadiene, n-nitroso-di-n-propylamine, and uranium-235/236.

Four analytes were further qualitatively evaluated to determine if they should be identified as COPCs based on the results of previous risk assessments performed at the C-400 Complex OU. Uranium-235/236 was identified as a COPC for surface soil within the SRE, so additional evaluation was not performed. It is possible that the risk estimates developed for uranium-235/236 are biased; however, the calculated EPC is likely to bias high. ProUCL was used to develop the EPCs for quantification of risk. As part of this software, left-censored data is incorporated into the UCL95 estimate. If high DLs are included in the UCL95 calculation, the resulting value is biased high due to the uncertainty of the concentration of the analyte below the elevated DL. The resulting risk estimates of uranium-236/236 are biased high due to the incorporation of elevated DLs, and the current results of the SRE are appropriately protective of human health.

2,6-Dinitrotoluene is an isomer of dinitrotoluene and is primarily associated with the production of toluene diisocyanate, which is used in the manufacturing of polyurethane foam. 2,6-Dinitrotoluene is also used to make the explosive, TNT, and in the production of dyes and smokeless powders in the munitions industry. Previous risk assessment of the C-400 Complex OU did not identify 2,6-dinitrotoluene as a COPC or COC; therefore, it is unlikely that 2,6-dinitrotolunene is present in surface soil of the C-400 Complex OU at concentrations that would pose a risk to human health, and it is not identified as a COPC.

Hexachlorocyclopentadiene is a chemical used in the manufacturing of a group of related pesticides (i.e., aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, isodrin, mirex, pentac). Environmental releases of hexachlorocyclopentadiene are primarily attributed to releases that occur during production and disposal, as well as during the manufacture, use, and disposal of pesticides made from hexachlorocyclopentadiene. The previous risk assessment of C-400 Complex OU did not identify hexachlorocyclopentadiene as a COPC or COC; therefore, it is unlikely that hexachlorocyclopentadiene is present in the surface soil of the C-400 Complex OU or that it would pose a risk to human health; it is not identified as a COPC.

N-nitroso-di-n-propylamine is classified as a nitrosamine and is found within sodium nitrate-treated foods, certain alcoholic beverages, and in tobacco products. It can also be produced during digestion of nitrite- or secondary amine-containing foods or drugs. The previous risk assessment of the C-400 Complex OU identified n-nitroso-di-n-propylamine as a COC (DOE 1999); therefore, n-nitroso-di-n-propylamine was identified as a COPC due to its potential presence in the surface soil of the C-400 Complex OU that would pose a risk to human health. An RGO was also developed for this chemical and is presented in the RGO development section.

The exclusion of those constituents with one-half the maximum DL above their respective screening level is unlikely to significantly impact the calculated cancer risk and HI for soil. For the majority of constituents, one-half the maximum DL did not exceed its screening level by 10; therefore, the potential effect of excluding these would be small. For the subset of contaminants with one-half a DL greater than 10 times its respective screening level, the preceding paragraphs discuss the limited impact on the calculated risks and hazards; therefore, the impact to the SRE is classified as small.

Surface and Subsurface Soil DLs—There were a total of 32 analytes for which one-half the maximum DL exceeded the respective excavation worker NALs. Of the 32 analytes, one did not exceed the provisional background value. The following 31 analytes' one-half the maximum DLs exceeded the NALs and their provisional background values:

- acrolein
- acrylonitrile
- antimony
- arsenic
- atrazine
- bis(2-chloroethyl) ether
- 2-chloroethyl vinyl ether
- 4-chlorobenzenamine
- hexachlorocyclopentadiene
- mercury
- 2-methyl-4,6-dinitrophenol
- 3-nitrobenzenamine
- n-nitroso-di-n-propylamine
- pentachlorophenol
- thallium
- Total PCBs

- chromium
- 1,2-dibromo-3-chloropropane
- 1,2-dibromoethane
- 3,3'-dichlorobenzidine
- 1,4-dioxane
- 2,4-dinitrotoluene
- 2,6-dinitrotoluene
- hexachlorobenzene
- 1,1,2-trichloroethane
- TCE
- uranium metal
- lead-210
- neptunium-237
- uranium-235/236
- uranium-238

The analytes' frequencies for which the DLs exceeded the NALs and the magnitude for which one-half the maximum DLs exceeded the industrial worker NALs were evaluated. There were 21 analytes with an FOE of < 10%, indicating that the frequency at which the analytes could be detected above the NAL is low, the average concentration of the analytes are likely below the NALs, and the analytes are unlikely to significantly impact risk estimates. For a majority of these analytes, the low FOE of the NAL is associated with higher FODs (e.g., chromium, uranium metal, Total PCBs) and evaluation in the SRE. The remaining 10 analytes with FOEs > 10%, and the magnitudes of one-half the maximum DL exceedance of NALs were primarily below ten (i.e., exceedance would translate to an ELCR below 1×10^{-5} or an HQ < 1). Exceptions to this were n-nitro-di-n-propylamine, thallium, and uranium metal.

Three analytes were further qualitatively evaluated to determine if they should be identified as COPCs based on the results of previous risk assessments performed at the C-400 Complex OU. Thallium and uranium metal were identified as COPCs for surface and subsurface soil within the SRE, so additional evaluations were not performed. It is possible that the risk estimates developed for thallium and uranium metal are biased; however, the calculated EPC is likely to be bias high. ProUCL was used to develop the EPCs for quantification of risk. As part of this software, left-censored data is incorporated into the UCL95 estimate. If high DLs are included in the UCL95 calculation, the resulting value is biased high due to the uncertainty of the concentration of the analyte below the elevated DL. The resulting risk estimates of thallium and uranium metal are biased high due to the incorporation of elevated DLs, and the current results of the SRE are protective of human health.

N-Nitroso-di-n-propylamine is classified as a nitrosamine and found within sodium nitrate-treated foods, certain alcoholic beverages, and in tobacco products. It can also be produced during digestion of nitrite- or secondary amine-containing foods or drugs. Previous risk assessments of the C-400 Complex OU identified n-Nitroso-di-n-propylamine as a COC (DOE 1999); therefore, n-nitroso-di-n-propylamine was identified as a COPC due to its potential presence in surface and subsurface soil of the C-400 Complex OU that would pose a risk to human health. An RGO was also developed for this chemical and is presented in the RGO development section.

The exclusion of those constituents with one-half the maximum DL above their respective screening level is unlikely to significantly impact the calculated cancer risk and HI for soil. For the majority of constituents, one-half the maximum DL did not exceed its screening level by 10; therefore, the potential effect of excluding these would be small. For the subset of contaminants with one-half a DL greater than 10 times its respective screening level, the preceding paragraphs discuss the limited impact on the calculated risks and hazards; therefore, the impact to the SRE is classified as small.

Groundwater DLs—There were a total of 100 analytes for which one-half the maximum DL exceeded its respective hypothetical resident NAL. Of the 100 analytes, 8 did not exceed their provisional background values. There were 92 analytes where the one-half the maximum DL exceeded their NAL and provisional background values. A review of the FOE of analytes' NALs, indicated that a large majority of the analytes have DLs that exceed their respective NALs; however, this does not necessitate the inclusion of these analytes as COPCs for groundwater. The reasoning for this is that the high FOE of DLs is associated with the elevated concentration of TCE in groundwater. As evaluated in the risk characterization, TCE concentrations are orders of magnitude above its NAL (HQ of 10,000) with use of a UCL95 representing the EPC; therefore, on average, TCE concentrations are 10,000 greater than the NAL, which is the basis of the DL. The high concentrations of TCE require dilutions to be able to accurately analyte groundwater samples which, in turn, would elevate other analytes that are analyzed using similar analytical chemistry techniques (i.e., other semi-volatiles and volatiles). Additionally, TCE was identified as a COC, a priority COC, and is the risk driver for groundwater at the C-400 Complex OU that composes approximately 84% of the cancer risk and 96% of the noncancer hazard. If additional COPCs are evaluated due to elevated DLs, the overall conclusions of the SRE would not change and TCE would the main driver of risk; therefore, no additional COPCs were added to groundwater based on elevated DLs compared to NALs and the uncertainty is classified as small.

Comparison of the UCRS Data to RGA and McNairy Groundwater COPCs—The identification of groundwater COPCs was performed for two groundwater exposure units, the RGA and McNairy; however, groundwater data was collected from the UCRS. The UCRS has not been identified as a potable water source due to low yield (DOE 2021), but the groundwater data can be used to help confirm the identified COPCs in the RGA and McNairy groundwater exposure units. The UCRS groundwater data screening is presented in Table C1.92.

The results of screening UCRS groundwater data against the residential NALs indicate that a similar list of analytes have exceedances similar to what was seen in the RGA groundwater screen. Further evaluation of the groundwater data using the same lines of evidence as discussed in the risk characterization of RGA groundwater indicates that three analytes have elevated concentrations above the AL at a higher frequency: chromium, *cis*-1,2-dichloroethene, and TCE. Technetium-99 is the one analyte that does not exceed the AL in the UCRS data which differs from the risk-driving COCs in the RGA dataset. The difference between the UCRS and RGA groundwater data may stem from the elevated concentrations of technetium-99 being localized to the RGA and McNairy groundwater exposure units. Overall, the screening of UCRS data results in a similar list of analytes that are identified as risk drivers in the RGA and McNairy groundwater. Exclusion of the UCRS data in the identification of COPCs was unlikely to impact the conclusions of the SRE, and the uncertainty was not classified because the UCRS groundwater data was not included in the risk characterization.

Use of Chemical Surrogate Toxicity Values—For a subset of chemicals, toxicity information is not available to determine the toxicity associated with concentrations detected at the Paducah Site. For these chemicals, toxicity information from suitable surrogates was used to develop NALs that would identify if the chemicals were identified as COPCs. The selection surrogate toxicity information is based primarily on structural similarity between the chemicals which also assumes a similar mode of toxicity, dose-response relationship, and toxicity values used to develop the NAL; however, similarity in structure does not necessarily indicate similar toxicity (e.g., differences in chirality result in different effects in the body). The use of surrogates introduces uncertainty as to the potential COPCs identified at the Paducah Site. The direction of uncertainty associated with the use of surrogates is unknown since toxicity criteria are unavailable so the use of surrogates could over or underestimate the true toxicity of the chemicals. The magnitude of the uncertainty is also difficult to assess for the same reason; however, review of the results of the screening process and overall observations of the SRE indicate that those chemicals that utilized surrogate toxicity values were not identified as COPCs. Since risk is driven by those chemicals with toxicity criteria, the magnitude of the uncertainty is likely small.

C.7.3 UNCERTAINTIES ASSOCIATED WITH EXPOSURE ASSESSMENT

Grid Concentration Assignment Uncertainties—The development of the surface soil and the surface and surface soil EPCs for each sector was based on the grid concentration assignment process. The assignment process consisted of selecting concentrations for each COPC that would represent a cube of soil within the sector. There are two points in the assignment process that introduce uncertainty to the selected EPC, the selection of the maximum as the representative concentration in a grid and the use of the average detected concentration to represent grids without data.

The selection of the maximum detected concentration of a COPC to represent the cube was based on guidance provided by the Human Health RMD (DOE 2021). In those instances where multiple datapoints with detected concentrations were available, the selection of the maximum is likely to overestimate the concentration within that cube of soil. A more accurate representation of the concentration in a specified cube would be the average concentration of multiple datapoints (i.e., a simple average or an upper confidence limit of an average); however, utilizing the average of few datapoints is accompanied by its own uncertainties. Therefore, to perform a protective SRE, the maximum was selected as the representative value while being accompanied with the less uncertainty.

Selection of a representative concentration for a cube of soil within a sector utilized the maximum detected concentration or the minimum DL; however, for a subset of grids, there were no data available. In these instances the average of the detected concentrations within the sector was used to represent the grid without data. An EPC was then developed for a COPC using the grids with data and the average COPC concentration for a sector. The use of the average to represent grid COPC concentrations introduces uncertainty to the selected EPC due to using data across the grid to represent areas without data. To investigate this uncertainty, differences between selected EPCs were evaluated based on the information provided in Table C1.50 through Table C1.67. The selected EPC not considering the average COPC concentration for a section was compared to the EPCs used in the SRE risk characterization (i.e., including the average to represent grids without data). A ratio was developed comparing EPC without averages and EPC with averages for each COPC media pair (surface soil and surface and subsurface soil). An average of the ratios can then be used to provide a semiquantitative evaluation of the uncertainty. The following results of this comparison are provided:

Surface Soil Average Ratio:

- Sector 1—1.3
- Sector 2—0.74
- Sector 3—0.73
- Sector 4 non-railroad—0.80
- Sector 4 railroad—0.75
- Sector 5 non-railroad—0.82
- Sector 5 railroad—1
- Sector 6—1
- Sector 7—0.94

Surface and Subsurface Soil Average Ratio:

- Sector 1—1.2
- Sector 2—0.86
- Sector 3—0.71
- Sector 4 non-railroad—0.74

- Sector 4 railroad—1
- Sector 5 non-railroad—0.86
- Sector 5 railroad—1
- Sector 6—1
- Sector 7—0.94

Review of the ratios indicate that EPCs with the average included are either the same or greater in concentration than the EPCs without considering an average concentration of the COPC for those grids without data. For example, Sector 6 contained data for each of the grids used in the EPC selection; therefore, the ratio for this sector was 1. Another example is Sector 3 where the ratio was 0.73 and 0.71 for surface and surface and subsurface, respectively. This translates to the EPC considering an average is greater than the EPCs not considering the average by approximately 30%. The effect of including averages results in EPCs that are greater than EPCs without averages and inflates concentrations used to characterize risk. Likely this stems from the use of only detected concentrations to develop the average for a sector instead of considering samples that did not detect the COPC. The use of a ratio is a simple and rapid comparison but does not account for toxicity differences between compounds and effects on the final risk estimates (i.e., small differences in the EPC for a less toxic COPC is not likely to change the cumulative risk estimates for a sector as compared to larger differences in an EPC for a highly toxic analyte). However, the ratio method does measure the relative effects of the selected grid concentration assignment process, which generally results in an increase of COPC EPCs by approximately 0 to 30%. Due to the limited difference between the EPCs, the likely impact of the uncertainty is classified as small.

Inclusion of XRF Data—As discussed in Section C.3.2, XRF data were included in the screening process for selecting COPCs and was in the development of UCL95s. XRF data can provide useful information in the field for metals; however, the DLs for the analytes may be elevated as compared to other analytical techniques. For the SRE, XRF data were available for use in the screening and UCL95 calculation for metals in Sector 6. As part of the uncertainty assessment, a review of select COCs was performed to determine the effect of including XRF data. Two COCs (i.e., uranium metal, antimony) were reviewed in the uncertainty assessment based on their identification as COCs in Sector 6 and their contribution to total HI.

Uranium metal was identified as a COC in surface soil and surface and subsurface soil. Uranium metal contributed approximately 68% of the total HI for Sector 6 surface soil and approximately 64% of total HI in surface and subsurface soil. The maximum detected uranium metal concentration based on XRF data was 32.32 mg/kg in surface soil and 20 mg/kg in surface and subsurface soil. These concentrations are below the concentration used for screening (300 mg/kg for both surface soil and surface and subsurface soil); therefore, the inclusion of XRF data did not affect selection of uranium metal as a COPC. For evaluation of the effect on the UCL95 calculation, collocated XRF samples and samples analyzed with more sensitive analytical methods were compared. The following is a list of four samples with collocated data and the detected results for each method.

- SOU047001SA001: XRF = 25.47 mg/kg and SW846-6020 = 28.3 mg/kg
- SOU047001SA004: XRF = 17.39 mg/kg and SW846-6020 = 41.7 mg/kg
- SOU047002SA007: XRF = 20 U mg/kg and DOE A-01-R MOD = 2.21 mg/kg
- SOU047003SA007: XRF = 20 U mg/kg and DOE A-01-R MOD = 2.45 mg/kg

Comparison between the methods indicates that the detected results for XRF are less than SW846-6020; however, for two results, the DLs are higher than detected concentrations by other methods. As discussed in the grid concentration assignment process, for those instances where a contaminant is detected in one sample and not detected in another sample, the detected value was selected; therefore, it is unlikely that the

XRF data would impact the calculated UCL95. The relatively small difference between the XRF data result and the analytical method result for uranium metal indicated that the impact of the uncertainty was small (i.e., less than an order of magnitude impact on the calculated hazard).

Antimony was identified as a COC in surface and subsurface soil and contributed approximately 11% of the total HI for Sector 6. The maximum detected antimony concentration based on XRF data was 71.02 mg/kg in surface and subsurface soil. This concentration is above the maximum concentration based on another method, 0.42 mg/kg. Additionally, 0.42 mg/kg is below the provisional background value of 13.2 mg/kg for surface and subsurface soil; therefore, the inclusion of XRF data resulted in the identification of antimony as a COPC and the exclusion of XRF data would have excluded antimony as a COPC. For an evaluation of the effect on the UCL95 calculation, collocated XRF data samples and samples analyzed with more sensitive analytical methods were compared. The following is a list of four samples with collocated data and the detected results for each method.

- SOU047001SA001: XRF = 69.79 mg/kg and SW846-6020 = 0.36 mg/kg
- SOU047001SA004: XRF = 71.02 mg/kg and SW846-6020 = 0.15 mg/kg
- SOU047002SA007: XRF = 64.7 mg/kg and SW846-6020 = 0.3 mg/kg
- SOU047003SA007: XRF = 63.51 mg/kg and SW846-6020 = 0.25 mg/kg

Comparison of the methods indicates that the detected results for XRF data are 20–30 times greater than SW846-6020. Based on the grid concentration assignment process, the XRF data was selected to represent antimony in Sector 6 and would greatly inflate the detected concentration compared to other analytical methods; therefore, the calculated UCL95 is biased high due to the inclusion of XRF data. The relatively large difference between the XRF result and the analytical method result for antimony indicated the impact of the uncertainty is noteworthy; however, the contribution of hazard attributed to antimony is miniscule compared to other COCs in soil (e.g., uranium metal). Due to the limited impact on the HI, the uncertainty associated with including antimony XRF is classified as small.

Antimony would not have been identified as a COPC in the SRE if XRF data were excluded from the screening process. This would follow through to the risk characterization, and antimony would not have been identified as a COC in surface and subsurface soil; however, antimony was identified as a COC in historical risk assessments and will require the development of an RGO. Risk managers should note that antimony is identified as a COC in the current SRE, but the concentrations are biased high due to the inclusion of XRF data.

Groundwater UCL95 Data Selection Uncertainties—The selection of the groundwater EPCs was dependent on if sufficient data were available to develop a UCL95. For the McNairy groundwater exposure unit, there was insufficient data, and the maximum concentration was used as the EPC. The maximum represents a protective estimate of an EPC due to discounting detected concentrations less than the maximum or samples where the COPC was not detected. The result of using the maximum is that every COPC identified is automatically identified as a COC, with the potential of being a priority COC depending on the risk estimate. The use of the maximum is discussed as an appropriate option in the Human Health RMD and was used to identify COCs (DOE 2021).

For the RGA groundwater exposure unit, there was sufficient data to calculate a UCL95; however, determination of appropriate data to be included in the UCL95 calculation is subjective. In an attempt to avoid the possibility of selecting data that would be deemed inappropriate or motivated, available COPC data within the RGA was used to calculate the EPC. This is intended to present a "best-case" scenario for the selection of COCs. The results of the risk characterization of the RGA indicate there is unacceptable risk to the hypothetical receptor in this "best-case" scenario. The discussion of the impact of this uncertainty on the risk estimates is combined with the uncertainty associated with the use of the maximum detected concentration as the EPC.

UCL95s Compared to the Maximum as the EPC—In accordance with the Human Health RMD, the UCL95 was selected to represent the EPC even if the UCL95 exceeded the maximum concentration. The use of the maximum detected concentration to represent the EPC biases the quantification of risk due to not incorporating other relevant data for a COPC. The maximum detected concentration was used for situations with high uncertainty (i.e., when COPC data were limited or data were censored). This likely overestimated the COPCs' EPC and inflated risk estimates but was performed to account for uncertainty. The UCL95 is a better representation of the average COPC concentration; however, the underlying variability of the COPC data may inflate this average. In these instances, the use of the UCL95 was chosen to represent the EPC even though the maximum concentration represents an upper threshold on potential concentrations. The high variability in the underlying COPC data or limited samples introduces uncertainty into the selection of an EPC for which the elevated UCL95 was deemed as a protective representation of the EPC instead of defaulting to the maximum detected concentration.

A comparison of the identified RGA groundwater COCs using the UCL95 and using the maximum detected concentration as the EPC was performed. The definition of a COC in the SRE was a COPC with either a cancer risk > 1×10^{-6} or a noncancer HQ > 0.1; therefore, anything identified as COPC would automatically be identified as a COC if the maximum detected concentration was selected as the EPC. There would be a total 36 COCs in this scenario, which is more than when the UCL95 was selected as the EPC (24 COCs). The number of COCs identified differ but there would be no change in the conclusions of the SRE. The risk driver for RGA groundwater is TCE. The magnitude of the exceedance using the UCL95 is 10,000 and adjusting the EPC to use the maximum concentration would result in an exceedance of approximately 50,000,000. The use of the maximum concentration significantly increases the HQ, but does not suggest a change as to what should be considered a risk driver in RGA groundwater.

The impact associated with this uncertainty was determined by comparing the concentrations used to represent the TCE EPC in RGA groundwater to the maximum detected value or the UCL95. The ratio of the maximum detected concentration (1,400 mg/L) to the UCL95 (28.32 mg/L) for RGA TCE is approximately 50. The ratio of the two potential TCE EPCs was used to classify the uncertainties associated with the selection of EPCs as moderate.

C.7.4 UNCERTAINTIES ASSOCIATED WITH TOXICITY ASSESSMENT

Standard EPA RfDs and CSFs were used to estimate potential noncarcinogenic and carcinogenic health effects from exposure to detected chemical contaminants. Considerable uncertainty is associated with the methodology applied to derive CSFs and RfDs. EPA working groups review all relevant human and animal studies for each compound and select the studies pertinent to the derivation of the specific RfD and CSF. These studies often involve data from experimental studies in animals, high exposure levels, and exposures under acute or occupational conditions. Extrapolation of these data to humans under low-dose, chronic conditions introduces uncertainties. The magnitude of these uncertainties is addressed by applying uncertainty factors to the dose response data for each applicable uncertainty. These factors are incorporated to provide a margin of safety for use in human health assessments. The impact of this uncertainty on the risk estimates are difficult to ascertain due to the intentional inclusion of different uncertainty factors for a single chemical and/or radionuclide to provide a margin of safety; therefore, the effect on the risk estimates were classified as moderate.

As discussed in Section C.7.2, the use of surrogate toxicity information can introduce uncertainties into the SRE; however, COPCs identified in the SRE had sufficient toxicity criteria to develop risk estimates. It is possible that the chemicals lacking toxicity data may contribute greater risk than what has been evaluated with the use of surrogates; however, the direction and magnitude are unknown since toxicity criteria are unavailable and the use of surrogates could over or underestimate the true toxicity of the chemicals. Review of the results of the screening process and overall observations of the SRE indicate that those chemicals that utilized surrogate toxicity values were not identified as COPCs. Since risk is driven by chemicals with toxicity criteria, the magnitude of the uncertainty is likely small.

C.7.5 UNCERTAINTIES ASSOCIATED WITH RISK CHARACTERIZATION

Combining Chemical-Specific Risk and Hazard Estimates and Pathway-Specific Risk and Hazard Estimates—The method used to develop the cumulative ELCRs and cumulative HIs is discussed in the Human Health RMD (DOE 2021) and is consistent with EPA guidance (EPA 1989b). The method assumes that analytes have a mode of toxicity that is additive and that exposure to each COPC would increase the risks from carcinogenic and noncarcinogens in a linear fashion as discussed in EPA guidance; this assumption is made to apply a protective assumption in the evaluation of chemical mixtures due to the lack of more detailed evaluations (EPA 1989b). This assumption has limitations, which include the following limitations for non-carcinogenic analytes that are provided by the EPA.

- Little is known about the effects of chemical mixtures; although additivity is assumed, the interaction of multiple chemicals could possibly be synergistic or antagonistic.

- The RfDs and RfCs do not have equal accuracy or precision and are not based on the same severity of effects.

- Dose additivity is most properly applied to compounds that induce the same effect by the same mechanism of action. While the approach recommended by the EPA is a useful screening-level approach, the cumulative systemic toxicity could be overestimated for chemicals that act by different mechanisms and/or on different target organs.

The potential impacts of these uncertainties can be difficult to disentangle in general. For example, some chemicals may work additively, some antagonistically, and others synergistically, but the effect on the final risk estimate would require further review of the individual COC interactions with one another to be certain. Because uranium metal was the major non-carcinogenic risk-driver in soil and TCE was the major non-carcinogenic risk driver for groundwater, the HIs are unlikely to significantly change by accounting for this uncertainty; therefore, this uncertainty has been classified as small.

The EPA discussed the following limitations to the assumption for carcinogenic analytes:

- Cancer risks (e.g., ELCRs) are based on slope factors that represent an upper 95th percentile estimate of potency; the upper 95th percentiles of probability distributions are not strictly additive. Summing these risks can result in an overly conservative estimate of lifetime ELCR.

- Cancer risks may not be additive. By analogy to systemic toxicity effects, the endpoints may differ, and mechanisms of effect may vary.

- Not all slope factors contain the same weight-of-evidence for human carcinogenicity. The EPA recognizes this by placing weight-of-evidence classifications on all slope factors. Those contaminants with a weight-of-evidence classification of A should probably receive more attention in the selection of a remedial design than contaminants with a B or C classification. Similarly, a contaminant with a B classification should probably receive greater attention than one with a C classification. The simple combination of ELCRs does not take this hierarchy into account.

The potential impacts of these uncertainties can be difficult to disentangle due to multiple priority COCs for carcinogenic endpoints. For soil, there are multiple priority COCs that contribute somewhat equal amounts for some sectors; however, uranium-238 is the major priority COC that composes the majority of the cumulative risk for the majority of soil sectors. For groundwater, TCE is the major priority COC that composes the majority of risk; therefore, uncertainties related to summation of cancer risk estimates are classified as minor.

Combining Chemical and Radioisotope Risk Estimates Exposure—Uncertainty associated with adding risks from chemical exposure to those from exposure to radionuclides arises from two sources. First, the slope factors used to characterize the risk from chemicals are derived differently from the slope factors used to characterize risk from radionuclides. This difference results in estimates of chemical exposure risks that may be considered to be upper-bound risk estimates and estimates of radionuclide exposure risks that may be considered to be central tendency (e.g., "best") estimates; therefore, combining chemical exposure and radionuclide exposure risk estimates to estimate total risk for a land use scenario may place too much emphasis on chemical exposure risk. Second, the mechanism by which chemicals may cause cancer varies from the mechanism by which radionuclides may cause cancer. This difference in mechanism of action inflates the uncertainties that assume cancer risks are additive. The impact of this uncertainty on risk estimates differs based on the medium in the SRE. For soils, the cumulative cancer risk estimates for each sector are primarily composed of radionuclides (e.g., uranium-238) and not chemical contaminants; therefore, the upper-bound estimates from chemical cancer slope factors do not drive risk for soil. For groundwater, the cumulative cancer risk is composed primarily of the TCE cancer risk. The relative contribution of radionuclides in groundwater is miniscule in comparison ($< 0.01\%$); therefore, the impact associated with this uncertainty is classified as small.

Assumption of Linearity for High Cancer Risk Estimates—In the risk characterization, the incremental probability of an individual developing cancer over a lifetime based on exposure to site media was calculated. Inherent in this calculation is the default assumption that the dose-response relationship and cancer incidence probability increases in a linear fashion with increased absorbed dose; however, EPA guidance indicates that the default linear risk equation is valid for calculated cancer risks that are below 1×10^{-2} (EPA 1989). If calculated carcinogenic risk exceed the threshold of 1×10^{-2}, EPA suggests that the one-hit model be used in risk characterization. The one-hit model assumes that the relationship between cancer incidence probability and dose are asymptotically exponential. When the absorbed dose is low, the one-hit model and the assumed linear relationship result in similar estimates of cancer risk. As the dose increases, the risk estimates calculated by the default linear equation and the one-hit model begin to diverge because the default linear equation does not prevent the calculated risk from exceeding 1 (i.e., 100%). Risk estimates greater than 1×10^{-2} were calculated for RGA and McNairy groundwater due to the concentrations of TCE. The default linear equation was used in the development of the cancer risk estimates; however, the cancer incidence probability is likely less than the presented values. Application of the one-hit model to TCE concentrations would result in slightly lower cancer estimates than those presented in SRE. The difference in the resulting calculated cancer incidence probabilities using the one-hit model has not been quantified, but the magnitude of the uncertainty is small. Because the calculated cancer risk exceeds 1×10^{-4}, this uncertainty is unlikely to affect the conclusions of the risk assessment and the magnitude of the uncertainty is small.

C.7.6 SUMMARY OF UNCERTAINTIES

A large number of assumptions were utilized in the SRE. Each assumption introduces uncertainties within the SRE; however, the majority are likely to overestimate risk estimates for the receptor evaluated. Additionally, the potential effect on the risk estimates by these uncertainties is primarily classified as small (DOE 2021). A summary of these potential impacts and the identified uncertainties is presented in Table C1.93. The uncertainties related to data are likely to inflate the concentrations of the analytes at the C-400 Complex by including data from that past 20 years instead of restricting data to recent data that are more representative of current conditions. Additionally, an evaluation of the analytical methods was performed, and analytes that could potentially result in unacceptable risk were included as COPCs even with uncertainties related to the concentrations of those analytes in site media. An evaluation of the exposure uncertainties indicated that the methods used for soil were protective and likely did not exclude COPCs that should have been identified as COCs. The use of the UCL95 as groundwater EPCs may underestimate concentrations for select COPCs; however, multiple lines of evidence discussed in the risk characterization conclusion indicate that those COPCs excluded as COCs are not risk drivers for the site, and the overall effect was minimal to cumulative risk and hazard estimates. The uncertainties related to toxicity are standard in risk assessments and are intended to overestimate toxicity associated with analytes and are likely to have minimal impacts on the SRE conclusions. Finally, the uncertainties of the risk characterization stem from the streamlined methods used in the SRE to evaluate the additivity of COPCs. The uncertainties are unlikely to greatly impact the conclusions of the SRE. Despite inevitable uncertainties associated with the steps used to derive potential risks, the use of numerous health-protective assumptions most likely results in a protective estimate of potential health risks for receptors that could be exposed to site contaminants at the C-400 Complex OU.

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C.8. EVALUATION OF ECOLOGICAL RISKS

C.8.1 SERA SCOPE AND OBJECTIVES

A SERA consists of Steps 1 through 3b of the ERA process. The objective of the C-400 Complex OU SERA is to evaluate whether existing data justify a decision of whether or not site contaminants pose a risk to ecological receptors. Steps 1 and 2 of the SERA constitute a screening-level ecological risk assessment that is intentionally designed to use protective exposure assumptions for comparison to site data. If no potential for risk is identified in the SERA, then risk managers can confidently conclude that NFA is required at the site.

In Step 1 of the SERA, a preliminary CSM is developed from available information that can include observations made during site reconnaissance, in historical documents, in existing data, and by the professional judgment of other technical experts. The preliminary CSM identifies fate and transport mechanisms by which site contaminants could potentially move off-site and the ways that site contaminants act on likely receptors.

In Step 2 of the SERA, the maximum site concentrations for substances in each medium with complete exposure pathways are compared to screening-level benchmarks. Additionally, the SQLs for the data will be compared to the benchmarks. As part of the benchmark screening, HQs will be generated for each analyte.

As part of the SERA, Steps 3a and 3b will be performed; however, a subset of activities normally included in these steps will be performed as listed in the C-400 Complex RI/FS Work Plan (DOE 2020b). Steps 3a and 3b will include a more detailed evaluation of the site data in comparison to screening benchmarks (e.g., use of a statistical average instead of the maximum concentration for development of an HQ), as well as an evaluation of the assumptions used in Steps 1 and 2 of the SERA.

Step 3a will consist of the following:

- Compare site and background concentrations;

- Evaluate frequency and distribution of concentrations exceeding benchmarks and/or referenced site values;

- Calculate preliminary HQs for bioaccumulating constituents and for selected Paducah Site wildlife receptors;

- Evaluate site-specific exposure data and assumptions; and

- Consider alternative toxicity data and benchmarks for receptors exposed by direct contact.

Step 3b will consist of the following:

- Identifying assessment endpoints;
- Describing habitat;
- Presenting the CSM; and
- Specifying risk questions and hypotheses for the C-400 Complex OU.

C.8.2 SERA PROBLEM FORMULATION

The problem formulation within a SERA provides information to support a risk management decision concerning the need for additional evaluation of the ecological risk. Important inputs to the problem formulation are the identification of COPECs that warrant further evaluation, discussion of the effects of COPECs on ecological receptors, the identification of complete exposure pathways by which COPECs are brought into contact with ecological receptors, and the identification of assessment endpoints. The results of the problem formulation are to determine a final list of COPECs, the assessment endpoints, and questions and hypotheses that could potentially require further evaluation in an ERA. As part of the streamlined SERA, the problem formulation step begins with a discussion of the preliminary CSM for the C-400 Complex OU. This discussion includes the description of wildlife at the Paducah Site, relevant exposure media, and the receptor groups and relevant exposure routes.

C.8.2.1 Habitat Description

The following sections give a brief overview of the terrestrial and aquatic systems at the Paducah Site. A more detailed description, including identification and discussion of sensitive habitats and threatened/endangered species, is contained in the *Investigation of Sensitive Ecological Resources Inside the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (CDM 1994), and *Environmental Investigations at the Paducah Gaseous Diffusion Plant and Surrounding Area, McCracken County, Kentucky, Volume 5: Floodplain Investigation,* Part A: “Results of Field Survey” (COE 1994). The information contained in these previous studies were reviewed as part of the *Work Plan for the Soils Operable Unit Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, and it was determined that the results were consistent with current conditions (DOE 2010). The Ecological RMD contains an updated list of ecological species/receptors (DOE 2019). While threatened and endangered species likely are present at the Paducah Site, no species are known to be present at the C-400 Complex OU.

C.8.2.1.1 Terrestrial systems

The terrestrial component of the Paducah Site ecosystem includes the plants and animals that use the upland habitats for food, reproduction, and protection. The upland vegetative communities consist primarily of grassland, forest, and thicket habitats with agricultural areas. The main crops grown in the Paducah Site area include soybeans, corn, tobacco, and sorghum.

DOE periodically mows much of the grassland habitat adjacent to the site. The Kentucky Department of Fish and Wildlife Resources manages a large percentage of the adjacent WKWMA to promote native prairie vegetation by burning, mowing, and various other techniques.

Dominant overstory species of the forested areas include oaks, hickories, maples, elms, and sweetgum. Understory species include snowberry, poison ivy, trumpet creeper, Virginia creeper, and Solomon’s seal. Thicket areas consist predominantly of maples, black locust, sumac, persimmon, and forest species in the sapling stage with herbaceous groundcover similar to that of the forest understory.

Wildlife commonly found at the Paducah Site consists of species indigenous to open grassland, thicket, and forest habitats. Small mammal surveys conducted on WKWMA documented the presence of southern short-tailed shrews, prairie voles, house mice, rice rats, and deer mice (KSNPC 1991). Large mammals commonly present in the area include coyotes, eastern cottontails, opossums, groundhogs, whitetail deer, raccoons, and gray squirrels. Mist netting activities in the area have captured red bats, little brown bats, Indiana bats, northern long-eared bats, evening bats, and eastern pipistrelles (KSNPC 1991). Typical birds of the area include European starlings, cardinals, red-winged blackbirds, mourning doves, bobwhite quail, turkeys, killdeer, American robins, eastern meadowlarks, eastern bluebirds, blue jays, red-tailed hawks, and Great Horned owls.

Examples of a few amphibians and reptiles present include cricket frogs, Fowler's toads, common snapping turtles, green tree frogs, chorus frogs, southern leopard frogs, eastern fence lizards, and red-eared sliders (KSNPC 1991).

C.8.2.1.2 Aquatic systems

The aquatic communities in and around the Paducah Site that could be impacted by the site discharges include two perennial streams, Bayou Creek (named in older documents as Big Bayou Creek) and Little Bayou Creek; the NSDD; a marsh located at the confluence of Bayou Creek and Little Bayou Creek; and other smaller drainage areas. The dominant taxa in all surface waters include several species of sunfish, especially bluegill and green sunfish, as well as bass and catfish. Shallow streams, characteristic of the two main area creeks, are dominated by bluegill, green and longear sunfish, and stonerollers. Algal and benthic macroinvertebrate and insect populations vary seasonally. Periphyton, benthic macroinvertebrates, and fishes found in Bayou and Little Bayou Creeks are described in *Final Report on Environmental Studies at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, to Union Carbide Corporation* (Battelle 1978).

C.8.2.1.3 Wetlands and floodplains

A study by the U.S. Army Corps of Engineers (COE) of the Paducah Site groups the area wetlands into 16 vegetative cover types encompassing forested areas, scrub/shrub, and emergent wetlands (COE 1994). Wetland vegetation consists of species, such as sedges, rushes, spikerushes, and various other grasses and forbs in the emergent portions; red maple, sweet gum, oaks, and hickories in the forested portions; and black willow and various other saplings of forested species in the thicket portions. Wetlands inside the Paducah Site security fence are confined to portions of drainage ditches traversing the site (CDM 1994).

At the Paducah Site, the Ohio River, Bayou Creek, and Little Bayou Creek cause local area flooding during precipitation events. A floodplain analysis performed by the COE in 1994 found that much of the built-up portions of the site lie outside the 100- and 500-year floodplains of the Ohio River and these creeks (COE 1994). In addition, the COE 1994 analysis determined that ditches within the site area can contain the expected 100- and 500-year discharges. Wetlands and floodplains are not located in the vicinity of the C-400 Cleaning Building.

C.8.2.1.4 Threatened and endangered species

A number of state and federally-listed, threatened, and endangered species may be present on the buffer areas within the Paducah Site and the surrounding WKWMA land, though they are unlikely to be found on the maintained surface within the C-400 Complex OU (DOE 2008). These species are listed in Table C2.1. None of the species listed in the table have been reported as sighted on the DOE Reservation.

C.8.2.2 Exposure Media

Soil and groundwater migrating and entering surface water are the MOC for the C-400 Complex OU. Most soil at the C-400 Complex OU is located below the building footprint or is located under concrete/asphalt covering; however, the surface soil outside the building footprint has the potential for uptake by plants and soil invertebrates and thereby entering higher trophic levels through the food chain. Because of this potential, surface soil in Sector 2 through Sector 7 (the soil exposure units located outside the C-400 Cleaning Building footprint) was evaluated in the SERA.

The analytes detected in groundwater have the potential to migrate downgradient and be discharged to surface waters located further away from the C-400 Complex OU. The RGA groundwater has the potential to migrate and daylight in downgradient surface water bodies, while McNairy groundwater is unlikely to daylight in surface water bodies. Because of this potential, the RGA groundwater within 300 ft of the C-400 Complex OU boundary was evaluated in the SERA.

C.8.2.3 Receptor Groups

Receptor group selection of inclusion in the SERA was based on generic assessment endpoints. Assessment endpoints are any adverse effects on ecological receptors (e.g., plant and animal populations and communities, habitats, sensitive environments) that are likely to interact with contaminated media. The two contaminated media that ecological receptors could be exposed to from the C-400 Complex include surface soil and groundwater that have migrated and discharged to surface water. Because the C-400 complex is within an industrialized area with a variety of large structures and pavement that is unlikely to change significantly in the foreseeable future, there is no expectation of ecological function associated with the site. Site soil is unlikely to function as a habitat that could sustain a population of these receptors. The SERA evaluated several potential receptor groups that could be exposed to surface soil at the C-400 Complex OU, including terrestrial plants, soil invertebrates, and terrestrial birds and mammals. The list of receptors evaluated in the SERA that could be exposed to groundwater from the C-400 Complex OU assuming migration and discharge to downgradient surface water includes aquatic invertebrates, fish, aquatic plants, semi-aquatic birds and mammals, reptiles, and amphibians.

C.8.2.4 Exposure Routes

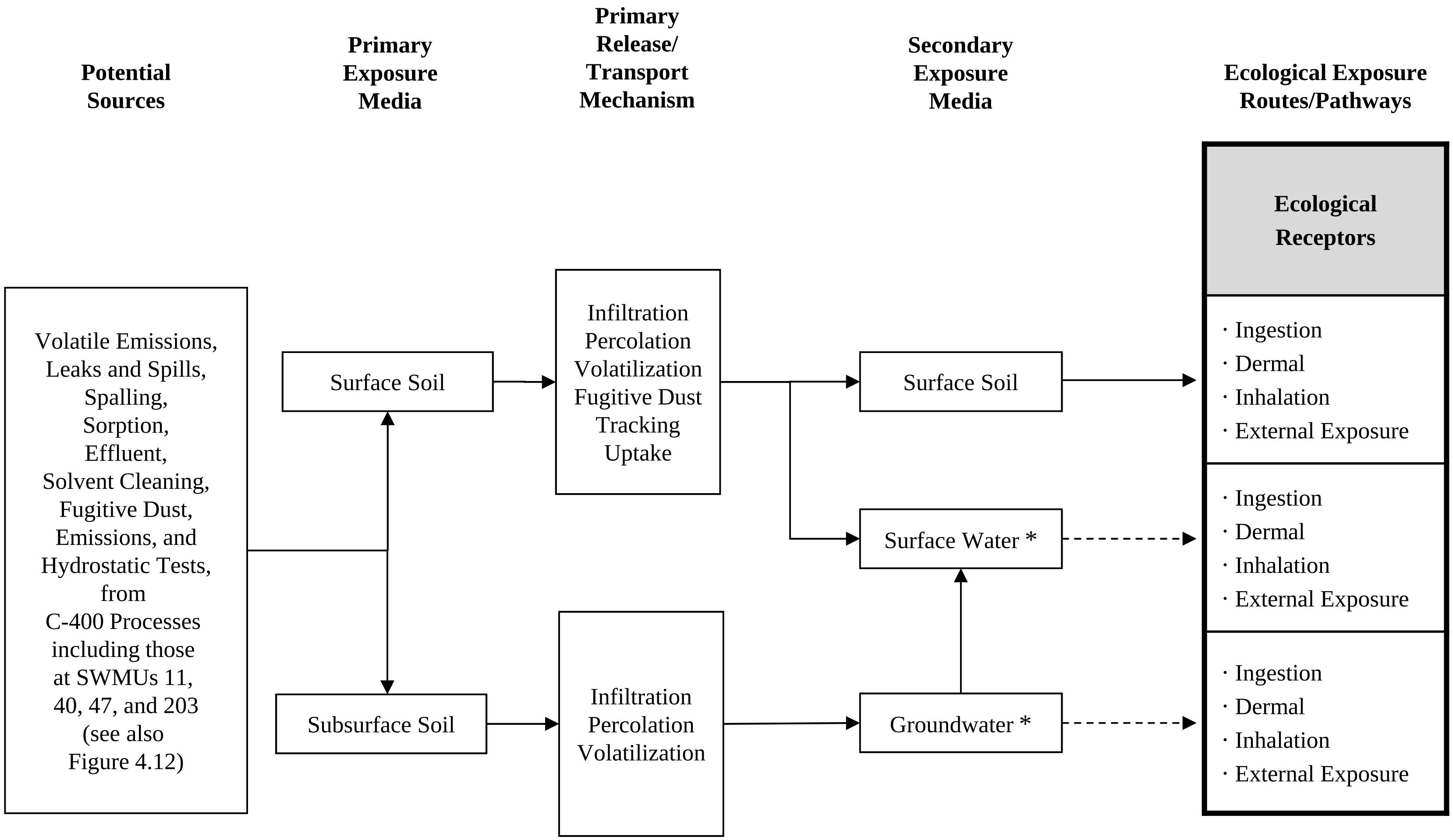
The potential exposure pathways to surface soil for ecological receptors are direct contact with and incidental ingestion of soil and ingestion of food sources exposed to contaminated soil media. The primary routes of concern for terrestrial receptors are the incidental ingestion of contaminated soils during feeding and the ingestion of contaminated food sources that are exposed to C-400 Complex OU media. Dermal exposure of terrestrial wildlife usually is considered minor due to protection provided by fur and feathers (Sample et al. 1997). As a result, the exposure route is considered insignificant and is not evaluated in the SERA. While the respiratory exposure for wildlife can be considered complete in most cases, this exposure pathway is insignificant (Sample et al. 1997).

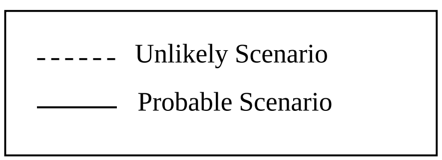
C.8.2.5 Ecological Conceptual Site Model

Using the information presented in the previous sections, an ecological CSM was developed for the C-400 Complex OU. The CSM for soil and groundwater (Figure C.9) illustrates the sources, pathways of migration, and routes of exposure relevant to this SERA. For this SERA, surface soil was defined as 0 to 1 ft bgs. Surface soil was used to evaluate direct exposure for the ecological receptors. Groundwater from the RGA unit was evaluated as surface water for direct exposure to surface water ecological receptors.

C.8.3 SERA EFFECTS AND EXPOSURE ESTIMATES

This section describes the sources of screening benchmarks, as well as the methods used to select COPECs as part of Step 2 of the SERA. The source of the ecological screening levels (referred to NFA values) are listed. The selection of the EPC and the methods used to develop HQs are also discussed.





* A compete exposure pathway for ecological receptors to groundwater is considered highly unlikely; however, RGA groundwater has the potential to migrate and daylight in downgradient surface water bodies. Therefore, RGA groundwater data were used to evaluate potential exposure of ecological receptors to surface water. The pathways for ecological receptor exposure to both groundwater and surface water are shown as unlikely because the analysis assumed that no dilution or attenuation occurred from the groundwater source to the point of exposure in downgradient surface water.

Figure C.9. Conceptual Site Model (Ecological)

C.8.3.1 Effects Estimates

There are three levels for which adverse effects may result from exposure to contaminated site media: ecological populations, ecological communities, and habitats. Adverse effects on ecological populations of ecological receptors are based on measures related to impaired reproduction, growth, and survival. Adverse effects on ecological communities are based on changes in community structure and function. Adverse effects on habitats are based on changes in composition and characteristics that reduce a habitat's ability to support plant and animal populations and communities. Evaluation of these adverse effects in the SERA was streamlined by comparing site concentrations to ecological benchmarks (referred to as NFA values). NFA values for chemical exposures were referenced from the Ecological RMD (DOE 2019) and included values from the following:

- EPA Ecological SSLs (Eco-SSLs)
- EPA Region 4 Ecological Screening Values
- KDEP screening values
- Oak Ridge National Laboratory benchmarks

For radionuclides, the ecological benchmarks used to quantify effect estimates in the SERA were developed using the RESRAD-BIOTA, Version 1.8 software (https://resrad.evs.anl.gov/codes/resrad-biota). The default input values were used to calculate the NFA values, with the exception of dose which was adjusted to 0.1 rad/day.

C.8.3.2 Exposure Estimate

The media for which exposure to ecological receptors is likely has been identified in the ecological CSM. The two media are surface soil (0 to 1 ft bgs) for Sector 2 through Sector 7 and groundwater that has migrated downgradient and discharged to surface water. The value selected to represent the exposure estimate, the EPC, for the Step 2 surface soil screening was the maximum of either the maximum detected concentration for each sector, or one-half the maximum DL for the analyte. For Step 2 of the SERA groundwater screen, the maximum of the maximum detected concentration, or one-half the maximum DL, was selected to represent the exposure estimate.

C.8.3.3 Identification of COPECs

The Step 2 screening process of the SERA was used to identify COPECs for surface soil and groundwater. The COPEC identification process consisted of the development of an HQ for each analyte, using the ratio of the exposure estimate to the NFA value as shown below:

$$HQ_i = \frac{EPC_i}{NFA_i}$$

Where:

HQi is the hazard quotient, dimensionless

EPCi is the exposure point concentration for an analyte, mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides

NFAi is the no further action value based on the ecological benchmark, mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides

Analytes with a calculated HQ > 1 were identified as COPECs that would be further evaluated in Step 3a and Step 3b of the SERA.

A subset of analytes did not have NFA values available for the development of the HQs. These analytes were identified as COPECs for further qualitative evaluation in Step 3a and Step 3b in the SERA.

C.8.4 SERA STEP 2 RISK CHARACTERIZATION

This section presents the COPECs identified as part of the Step 2 screening process to compare with the soil and surface water NFAs. The COPECs are listed for each surface soil sector as well as the RGA groundwater.

C.8.4.1 Sector 2 Surface Soil

The results of the Step 2 screening for the Sector 2 surface soil are provided in Table C2.2. The 19 analytes with calculated HQs > 1 are listed below. There were 38 chemicals that did not have NFA values for screening and that were identified as COPECs for additional evaluation in Step 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- cadmium
- carbazole
- chromium
- copper
- di-n-butyl phthalate
- HMW PAHs
- lead
- manganese
- mercury
- nickel
- selenium
- thallium
- toluene
- Total PCBs
- uranium metal
- vanadium
- zinc

C.8.4.2 Sector 3 Surface Soil

The results of the Step 2 screening for the Sector 3 surface soil are provided in Table C2.3. There were 20 analytes with calculated HQs > 1. These analytes are listed below. There were 38 chemicals that did not have NFA values for screening and that were identified as COPECs for additional evaluation in Step 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- carbazole
- *cis*-1,2-dichloroethene
- di-n-butyl phthalate
- fluoride
- HMW PAHs
- lead
- methylene chloride
- selenium
- thallium
- total dioxin/furans
- Total PCBs
- *trans*-1,2-dichloroethene
- TCE
- uranium metal

- manganese
- mercury
- vanadium
- zinc

C.8.4.3 Sector 4 Surface Soil

The results of the Step 2 screening for the Sector 4 surface soil are provided in Table C2.4. The 34 analytes with calculated HQs > 1 are listed below. There were 45 chemicals that did not have NFA values for screening and that were identified as COPECs for additional evaluation in Step 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- benzene
- bis(2-ethylhexyl)phthalate
- cadmium
- carbazole
- chloroform
- chromium
- *cis*-1,2-dichloroethene
- copper
- di-n-butyl phthalate
- ethylbenzene
- fluoride
- HMW PAHs
- lead
- manganese
- mercury
- methylene chloride
- molybdenum
- nickel
- selenium
- silver
- tetrachloroethene
- thallium
- toluene
- total dioxin/furans
- Total PCBs
- *tran*s-1,2-dichloroethene
- TCE
- uranium metal
- vanadium
- vinyl chloride
- m,p-xylene
- zinc

C.8.4.4 Sector 5 Surface Soil

The results of the Step 2 screening for the Sector 5 surface soil are provided in Table C2.5. The 38 analytes with calculated HQs > 1 are listed below. There were 39 chemicals that did not have an NFA value for screening and that were identified as COPECs for additional evaluation in Steps 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- arsenic
- barium
- benzene
- boron
- cadmium
- carbazole
- carbon disulfide
- chloroform
- manganese
- mercury
- methylene chloride
- molybdenum
- selenium
- tetrachloroethene
- thallium
- toluene
- total dioxin/furans
- Total PCBs

- chromium
- *cis*-1,2-dichloroethene
- cobalt
- copper
- cumene
- 1,1-dichloroethene
- di-n-butyl phthalate
- HMW PAHs
- lead
- *trans*-1,2-dichloroethene
- TCE
- uranium metal
- vanadium
- vinyl chloride
- m,p-xylene
- total xylene
- zinc
- uranium-238

C.8.4.5 Sector 6 Surface Soil

The results of the Step 2 screening for the Sector 6 surface soil are provided in Table C2.6. The 30 analytes with calculated HQs > 1 are listed below. There were 43 chemicals that did not have an NFA value for screening and that were identified as COPECs for additional evaluation in Steps 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- arsenic
- bis(2-ethylhexyl)phthalate
- cadmium
- carbazole
- chloroform
- chromium
- *cis*-1,2-dichloroethene
- cobalt
- copper
- di-n-butyl phthalate
- HMW PAHs
- lead
- manganese
- mercury
- methylene chloride
- molybdenum
- nickel
- selenium
- silver
- thallium
- Total PCBs
- TCE
- uranium metal
- vanadium
- m,p-xylene
- total xylene
- zinc
- thorium-230

C.8.4.6 Sector 7 Surface Soil

The results of the Step 2 screening for the Sector 6 surface soil are provided in Table C2.7. The 22 analytes with calculated HQs > 1 are listed below. There were 43 chemicals that did not have an NFA value for screening and that were identified as COPECs for additional evaluation in Steps 3a and 3b. These chemicals are discussed as a group at the end of the soil screening.

Surface soil COPECs:

- aluminum
- antimony
- bis(2-ethylhexyl)phthalate
- butyl benzyl phthalate
- cadmium
- lead
- manganese
- mercury
- nickel
- selenium

- carbazole
- chromium
- copper
- di-n-butyl phthalate
- fluoride
- HMW PAHs
- thallium
- total dioxin/furans
- Total PCBs
- uranium metal
- vanadium
- zinc

C.8.4.7 COPECs without NFAs

Analytes in soil that did not have NFA levels available for comparison to site data were identified as COPECs. Instead of reviewing the list of analytes without NFA values for each sector, a comprehensive list was developed due to frequent overlap in analytes without NFA values in each sector. The list of analytes without NFA values that were included as COPECs are identified in each soil screening table and include the following:

- acetophenone
- acrylonitrile
- benzaldehyde
- bis(2-chloroethoxy)methane
- bis(2-chloroethyl) ether
- bis(2-chloroisopropyl) ether
- bromochloromethane
- bromodichloromethane
- 4-bromophenyl phenyl ether
- calcium
- caprolactam
- chloroethane
- 2-chloroethyl vinyl ether
- chloromethane
- 4-chloro-3-methylphenol
- 2-chloronaphthalene
- 4-chlorophenyl phenyl ether
- m,p-cresol
- cyclohexane
- dibromochloromethane
- 1,2-dibromo-3-chloropropane
- 1,2-dibromoethane
- dichlorodifluoromethane
- *cis*-1,3-dichloropropene
- 1,2-dimethylbenzene
- 1,4-dioxane
- iron
- isophorone
- magnesium
- 2-methoxy-2-methylpropane
- methyl acetate
- methylcyclohexane
- 2-methyl-4,6-dinitrophenol
- 4-methyl-2-pentanone
- m+p methylphenol
- 3-nitrobenzenamine
- 2-nitrophenol
- p-nitroaniline
- n-nitroso-di-n-propylamine
- potassium
- pyridine
- sodium
- *trans*-1,3-dichloropropene
- 1,1,2-trichloro-1,2,2-trifluoroethane
- vinyl acetate
- actinium-227
- americium-243
- neptunium-239

C.8.4.8 RGA Groundwater

The results of the Step 2 screening for RGA groundwater are provided in Table C2.8. There were 44 analytes with calculated HQs > 1. These analytes are listed below.

Groundwater COPECs:

- acetone
- aluminum
- hexachlorocyclopentadiene
- indeno(1,2,3-cd)pyrene

- barium
- benzene
- benzo(a)pyrene
- benzo(g,h,i)perylene
- benzo(k)fluoranthene
- bis(2-ethylhexyl)phthalate
- bromodichloromethane
- cadmium
- carbon tetrachloride
- chloroform
- chromium
- cobalt
- copper
- dibenzo(a,h)anthracene
- 1,2-dichlorobenzene
- 1,1-dichloroethane
- 1,1-dichloroethene
- 1,4-dioxane
- *cis*-1,2-dichloroethene
- *trans*-1,2-dichloroethene
- iron
- lead
- manganese
- mercury
- methylene chloride
- nickel
- selenium
- silver
- tetrachloroethene
- toluene
- Total PCBs
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- TCE
- uranium metal
- vanadium
- vinyl chloride
- zinc
- uranium-233/234
- uranium-238

There were 28 analytes that did not have NFA values for screening and were identified as COPECs for additional evaluation in Steps 3a and 3b. These included the following:

- acetophenone
- bis(2-chloroethoxy)methane
- bis(2-chloroisopropyl) ether
- bromochloromethane
- caprolactam
- chloroethane
- 2-chloronaphthalene
- 4-chlorophenyl phenyl ether
- 1,2-dibromo-3-chloropropane
- 1,2-dibromoethane
- dichlorodifluoromethane
- *cis*-1,3-dichloropropene
- *trans*-1,3-dichloropropene
- 1,2-dimethylbenzene
- diphenylamine
- ethane
- ethylene
- methane
- methyl acetate
- 2-methyl-4,6-dinitrophenol
- m+p methylphenol
- nitrate as nitrogen
- p-nitroaniline
- 3-nitrobenzenamine
- n-nitroso-di-n-propylamine
- sulfate
- trichlorofluoromethane
- 1,1,2-trichloro-1,2,2-trifluoroethane

C.8.5 COPEC REFINEMENT

Step 2 of the SERA was to perform an initial screening utilizing protective assumptions to identify COPECs (e.g., maximum detected concentration as the EPC). Moving to Steps 3a and Step 3b of the SERA, the protective assumptions used in Step 2 were evaluated and the list of COPECs was refined and more realistic assumptions were made that were more representative of the C-400 Complex OU ecological CSM. This section discusses the refinement process utilized as part of Steps 3a and Step 3b and the list of refined COPECs after inclusion of the refined assumptions.

C.8.5.1 Steps for COPEC Refinement

The Step 2 screening step included protective assumptions that are intended to inflate exposure to site media, as well as to select the most susceptible receptor as the basis of the NFA value. Step 3 of the SERA includes a refinement of the selection of COPECs for the C-400 Complex OU. Refinement of the list of COPECs consists of further evaluation of the EPC, consideration of background, consideration of more appropriate NFA values, and consideration of additional lines of evidence.

The exposure estimate for the EPCs, used for comparison to the NFA values in Step 2, were the maximum of the maximum detected values for the analytes, or one-half the maximum DLs of the analytes. In Step 3, the EPC for each COPEC was adjusted to use an average concentration for comparison to a representative background value and/or the NFA value. For each soil sector, the average concentration from detected values within the sector was used to represent the EPC for the COPEC. For groundwater, the average concentration of detected values was used to represent the EPC.

Step 2 of the SERA utilized risk-based values to select the COPECs that would be further evaluated in Step 3. Step 3 includes not only a comparison of COPECs EPCs to risk-based values, but also includes a comparison of the EPCs to representative background values. If the average concentration of the COPEC in a soil sector or RGA groundwater was below its respective provisional background value, it was excluded from the refined list of COPECs.

The selected soil NFA values used in the Step 2 screening were the minimum of the values available for four classes of receptors: plants, soil invertebrates, mammals, and avian. In Step 3, the soil NFA values were separated into two groups for comparison of the sector EPCs, direct contact NFA values and bioaccumulative NFA values. The direct contact NFA value for a COPEC was selected as the minimum between the plant NFA value and the soil invertebrate NFA value presented in EPA guidance (EPA 2018). For those COPECs that are identified as bioaccumulative based on EPA guidance, a bioaccumulative NFA value was selected to develop a bioaccumulative HQ (EPA 2018). The bioaccumulative NFA value was determined as the minimum between the mammal NFA value and the avian NFA value. For groundwater, the same NFA values used in the Step 2 screening for COPECs were used in the Step 3 screening. If the COPEC calculated HQs are < 1, then the COPEC was removed from the refined list of COPECs. If a COPEC had a calculated HQ > 1, then the COPEC will be further evaluated in the refinement.

The calculation of HQs using the refined estimate of exposure and more applicable NFA values and representative background values consisted of the first line of evidence to refine the COPECs identified in Step 2 of the SERA. Additional lines of evidence used to refine the list included using information related to the distribution of concentrations within the media, as well as the magnitude of the calculated HQs. The distribution of COPEC contamination was evaluated by reviewing the FOE from the Step 2 NFA value. If the FOE for the COPEC was < 10% of samples, the COPEC was removed in the refinement. Additionally, COPECs with HQs < 3 were removed from the COPEC list in the refinement. A low FOE is indicative that the concentration distribution of the COPEC is within a relatively small area and the risks of the COPEC affecting the ecological community is low. The relatively small magnitude of exceedance is also indicative that risk to the ecological community is low due to the assumptions used to develop the NFA values.

Due to the use of groundwater data collected below the C-400 Complex to evaluate risks to surface water ecological receptors, a direct comparison of concentrations to surface water NFAs comes with a high degree of uncertainty. The concentrations detected in groundwater must migrate downgradient from the C-400 Complex OU a minimum of approximately 4,000 ft before being discharged into Bayou Creek or Little Bayou Creek. During this process, the concentrations detected in the groundwater underlying the C-400 Complex OU would decrease through attenuation, diffusion, or other processes. Additionally, once the concentrations enter the surface water body, they would again be decreased though dilution in surface water; therefore, the lines of evidence used to identify a refined list of COPECs are adjusted to focus on analytes for which higher confidence can be attributed to their selection of COPECs. This increased the magnitude for which COPECs were eliminated from the refined list from 3 to 10.

C.8.5.2 Sector 2 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 2 surface soil are presented in Table C2.9.

The COPECs with average sector concentrations above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are the following:

- carbazole
- HMW PAHs
- nickel
- selenium
- toluene
- uranium metal

Carbazole, nickel, and toluene exceeded their respective minimum NFA values in < 10% of samples, indicating the distribution of these COPECs is unlikely to affect the ecological population in this sector and were excluded as COPECs. HMW PAHs, selenium, and uranium metal HQs in the sector were relatively small (i.e., < 3), and considering the protective assumptions included in the NFA values (e.g., receptors spend their entire life feeding/living in the sector; surface soil in sector is not covered by asphalt/gravel), these COPECs were eliminated as COPECs in refinement of the COPEC list; therefore, there are no COPECs identified for Sector 2 surface soil.

C.8.5.3 Sector 3 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 3 surface soil are presented in Table C2.10.

The COPECs with an average sector concentration above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are the following:

- carbazole
- HMW PAHs
- selenium
- total dioxin/furans
- Total PCBs
- TCE

Carbazole and TCE exceeded their respective minimum NFA values in < 10% of samples indicating the distribution of these COPECs is unlikely to affect the ecological population in this sector and were excluded as COPECs. HMW weight PAHs, selenium, total dioxins and furans, and Total PCBs HQs in the sector were relatively small (i.e., < 3) and considering the protective assumptions included in the NFA values (e.g., receptors spend entire life feeding/living in the sector, surface soil in sector is not covered by asphalt/gravel), these COPECs were eliminated as COPECs in refinement of the COPEC list; therefore, there are no COPECs identified for Sector 3 surface soil.

C.8.5.4 Sector 4 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 4 surface soil are presented in Table C2.11.

The COPECs with average sector concentrations above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are the following:

- HMW PAHs
- total dioxin/furans
- Total PCBs
- TCE
- uranium metal

HMW PAHs, total dioxin/furans, Total PCBs, TCE, and uranium metal HQs in the sector were relatively small (i.e., < 3), and considering the protective assumptions included in the NFA values (e.g., receptors spend their entire life feeding/living in the sector; surface soil in sector is not covered by asphalt/gravel), these COPECs were eliminated as COPECs in refinement of the COPEC list; therefore, there are no COPECs identified for Sector 4 surface soil.

C.8.5.5 Sector 5 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 5 surface soil are presented in Table C2.12.

The COPECs with average sector concentrations above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are the following:

- carbazole
- *cis*-1,2-dichloroethene
- HMW PAHs
- selenium
- total dioxin/furans
- TCE
- vinyl chloride

Carbazole and vinyl chloride exceeded their respective minimum NFA value in < 10% of samples, indicating the distribution of these COPECs is unlikely to affect the ecological population in this sector and were excluded as COPECs. HMW PAHs, selenium, and total dioxins and furans HQs in the sector were relatively small (i.e., < 3), and considering the protective assumptions included in the NFA values (e.g., receptors spend their entire life feeding/living in the sector; surface soil in sector is not covered by asphalt/gravel), these COPECs were eliminated as COPECs in refinement of the COPEC list. Because *cis*-1,2-dichloroethene and TCE had HQs > 10, which indicates that risk to ecological receptors from Sector 5 concentrations is high, *cis*-1,2-dichloroethene and TCE were retained as COPECs in Sector 5 surface soil.

C.8.5.6 Sector 6 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 6 surface soil are presented in Table C2.13.

The COPECs with average sector concentrations above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are the following:

- antimony
- bis(2-ethylhexyl)phthalate (potential laboratory contaminant)
- carbazole

- HMW PAHs
- selenium
- thallium
- Total PCBs
- uranium metal
- zinc

Antimony, carbazole, selenium, uranium metal, and zinc HQs in the sector were relatively small (i.e., < 3), and considering the protective assumptions included in the NFA values (e.g., receptors spend their entire life feeding/living in the sector; surface soil in sector is not covered by asphalt/gravel), these COPECs were eliminated as COPECs in refinement of the COPEC list; however, bis(2-ethylhexyl)phthalate, high HMW PAHs, Total PCBs, and thallium all had HQs > 3, which indicates that risk to ecological receptors from Sector 6 concentrations is either sufficient to require additional consideration (HQ > 3) or high (HQ > 10). As a result, bis(2-ethylhexyl)phthalate, HMW PAHs, Total PCBs, and thallium were retained as COPECs in Sector 6 surface soil.

C.8.5.7 Sector 7 Surface Soil COPEC Refinement Results

The results of the COPEC refinement for Sector 7 surface soil are presented in Table C2.14.

The COPECs with average sector concentrations above the surface soil provisional background values and with direct contact or bioaccumulative HQs > 1 are:

- bis(2-ethylhexyl)phthalate (potential laboratory contaminant)
- butyl benzyl phthalate (potential laboratory contaminant)
- carbazole
- HMW PAHs
- mercury
- selenium
- total dioxin/furans

Butyl benzyl phthalate exceeded its respective minimum NFA value in < 10% of samples, indicating the distribution of this COPEC is unlikely to affect the ecological population in this sector and were excluded as COPEC. Bis(2-ethylhexyl)phthalate, selenium, and total dioxins and furans HQs in the sector were relatively small (i.e., < 3), and considering the protective assumptions included in the NFA values (e.g., receptors spend their entire life feeding/living in this sector; surface soil in this sector is not covered by asphalt/gravel), these COPECs were eliminated in refinement of the COPEC list; however, carbazole, HMW PAHs, and mercury all had HQs > 3, which indicates that risk to ecological receptors from Sector 7 concentrations is either sufficient to require additional consideration (HQ > 3) or high (HQ > 10). As a result, carbazole, HMW PAHs, and mercury were retained as COPECs in Sector 7 surface soil.

C.8.5.8 RGA Groundwater COPEC Refinement Results

The results of the COPEC refinement for RGA groundwater are presented in Table C2.15.

The COPECs with average concentrations above the groundwater provisional background values and HQs > 1 are the following:

- barium
- benzo(a)pyrene

- benzo(g,h,i)perylene
- benzo(k)fluoranthene
- chromium
- *cis*-1,2-dichloroethene
- dibenzo(a,h)anthracene
- hexachlorocyclopentadiene
- indeno(1,2,3-cd)pyrene
- manganese
- Total PCBs
- TCE

Benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, hexachlorocyclopentadiene, indeno(1,2,3-cd)pyrene, and Total PCBs exceeded their respective NFA values in < 10% of samples, indicating the distribution of these COPECs is unlikely to affect the ecological population in surface water after groundwater has migrated and discharged to surface water and were excluded as COPECs. Barium, chromium, *cis*-1,2-dichloroethene, and manganese HQs in RGA groundwater were relatively low (i.e., < 10), and considering the protective assumptions included in the NFA values, these COPECs were removed in refinement; however, TCE had an HQ > 10, which indicates that risk to ecological receptors. As a result, TCE was retained as a COPEC in RGA groundwater.

C.8.5.9 COPECs with No NFA Values

In the Step 2 COPEC screening, surface soil and groundwater were screened against NFA values provided in the Ecological RMD (DOE 2019). For a subset of analyte, no NFA value was available. In this instance, the analyte was identified as a COPEC and is further evaluated in Step 3. Multiple lines of evidence are included in the evaluation of those COPECs without NFA values, which includes a review of the FOD, review of COPECs that are identified as essential nutrients, and whether the compound is associated with previous activities at the C-400 Complex OU.

The FOD for each of the COPECs without NFA values was reviewed to determine if they were detected in either surface soil or groundwater. For the majority of the COPECs lacking NFA values, they were not detected in surface soil or groundwater data. These COPECs are unlikely to present in C-400 Complex OU media at concentrations that require further evaluation; therefore, they were removed from the refined list of COPECs. Furthermore, there were COPECs that were not detected in media, but that were detected at low frequencies. COPECs that were detected in < 10% of samples were also removed from the refined list of COPECs. The remaining COPECs without NFA values are as follows:

- 1,2-dimethylbenzene
- calcium
- cyclohexane
- iron
- magnesium
- methylcyclohexane
- sodium
- sulfate

The second line of evidence included the review of those COPECs that are identified as essential nutrients or naturally-occurring and the review of background concentrations for analytes (DOE 2019). The COPECs that are essential nutrients include calcium, magnesium, sodium, and potassium. These COPECs were compared to their provisional background values for surface soil and groundwater. The maximum detected calcium, magnesium, sodium, and potassium concentrations in soil were below the provisional background values. As a result, these analytes were removed from the refined COPEC list.

Iron is not classified as an essential nutrient for ecological receptors. It was evaluated by comparison of site data to provisional background values and a narrative. The concentrations of iron detected in surface soil did exceed the provisional background values; however, the exceedances were slightly elevated. For example, the maximum concentration of iron in Sector 4 surface soil (the highest across the C-400 Complex OU) was 10% > the background value (30,900 mg/kg compared to 28,000 mg/kg). Additionally, the toxicity of iron is based on the toxicity of plants where plant demand exceeds the amount available in soils (pH between 5 and 8) (EPA 2003). The pH of soil in the C-400 Complex OU is unlikely to fall outside the range specified; therefore, iron is not expected to be toxic to plants because soils are expected to fall within the normal range of pH 6 and 8. As a result, iron in was removed from the list of refined COPECs.

Two additional naturally occurring compounds that were found during groundwater sampling were nitrate and sulfate. The average concentration of nitrate in groundwater was approximately 10 mg/L, indicating that nitrate with a provisional background of 15.561 mg/L is consistent with background concentrations. Sulfate does not have a provisional background concentration and does not have an NFA value; therefore, other surface water quality criteria were reviewed to make comparisons. The KDEP water quality criteria for drinking water for sulfate is 250 mg/L, which is > the maximum detected concentration of sulfate in groundwater (81 mg/L). This comparison is not specific to ecological receptors, but allows for a qualitative determination to whether sulfate concentrations are a concern for surface water receptors. It is unlikely that sulfate in groundwater has the potential to migrate to surface water and pose a health risk to ecological receptors; therefore, sulfate was removed from the refined COPEC list.

The remaining three analytes, 1,2-dimethylbenzene, cyclohexane, and methylcyclohexane, are also not likely to affect the risk for receptors. 1,2-dimethybenzene, also known as o-xylene, concentrations can be compared to the total xylene NFA value. Both the maximum concentration and the average concentration for soil sectors were below the total xylene NFA value (0.1 mg/kg); therefore, it is unlikely that 1,2-dimethylbenzene concentrations in C-400 surface soil would be a risk to ecological receptors. The analyte was removed from the list of refined COPECs. Cyclohexane and methylcyclohexane are two analytes that do not have soil NFA values, but that do have surface water NFA values. Both of these analytes are toxic to aquatic receptors, but are less toxic to terrestrial receptors. As a result, the primary concern related to these analytes is migration from soil to groundwater and eventual migration downgradient to surface; however, cyclohexane and methylcyclohexane were not identified as COPECs in groundwater and the pathway from soil to groundwater to surface water is incomplete. It is unlikely that these analytes' concentrations in the C-400 Complex OU surface soil will result in unacceptable risks to ecological receptors; therefore, cyclohexane and methylcyclohexane were removed from the refined COPEC list.

C.8.6 SUMMARY OF COPEC REFINEMENT

Step 2 of the SERA utilized protective assumptions to identify a preliminary set of COPECs for soil sectors and RGA groundwater that was assumed to migrate downgradient and discharge to surface water. As part of Step 3, the identified COPECs were further evaluated considering representative background concentrations, more appropriate ecological benchmarks, and lines of evidence. The result of the refinement is a set of COPECs with site concentrations with potentially high risk for ecological receptors. The list of refined COPECs is provided in Table C2.16.

C.8.7 SERA UNCERTAINTIES

There are uncertainties related to each of the steps performed within this SERA. Each of these uncertainties should be reviewed by risk managers when considering the remedial alternative discussed in the C-400 Complex OU FS.

One uncertainty is related to the ecological CSM, which is discussed in Section 8.2. There are areas within the Paducah Site that could be suitable terrestrial habitats for ecological terrestrial receptors; however, the C-400 Complex OU is within an industrial use area, and the soils included in the SERA investigation are unlikely to be used as terrestrial habitat. The C-400 Cleaning Building footprint covers the Sector 1 soil, which prevents a complete exposure pathway, and the surrounding surface soil is mostly covered by a combination of concrete, asphalt, gravel, and/or industrial material. Because there is little surface soil outside the C-400 Cleaning Building footprint that is not obstructed in some way, it is highly unlikely that terrestrial ecological receptors would be exposed to contaminants in the C-400 Complex OU for a duration that would result in unacceptable risk, therefore, the uncertainty is likely to overestimate risk; however, the surface soils surrounding the C-400 Cleaning Building were evaluated as suitable habitat in order to provide information to risk managers.

Uncertainty is introduced to the SERA with the selection of NFA values that were used in the Step 2 and Step 3 screenings. The NFA values were developed to be protective of entire classes of receptors, some of which may not be present at C-400 Complex OU and the surrounding areas. The use of the NFA values based on receptors that may not be present at the C-400 Complex OU and the surrounding areas would identify COPECs that are not relevant; however, because this is a streamlined SERA, the evaluation of receptors that were observed was limited; therefore, the uncertainty is likely to overestimate risk.

A major uncertainty in the selection of COPECs in the SERA is the use of groundwater data underlying the C-400 Complex for comparison to surface water NFAs. The direct comparison of groundwater data to surface water NFA values assumes that the concentrations do not undergo any attenuation before entering a surface water feature. This is an unrealistic assumption due to the distance between the C-400 Complex to Bayou Creek and the C-400 Complex to Little Bayou Creek. The uncertainty likely greatly overestimates risk to potential surface water receptors; however, the comparison provides risk managers additional information related to risks to ecological receptors from impacted groundwater at the C-400 Complex.

The refinement step in the SERA introduces uncertainty to the final list of COPECs identified for the C-400 Complex. The refinement step is intended to further evaluate COPECs identified in Step 2 of the SERA by using assumptions more appropriate for the site. The refinement step includes multiple lines of evidence to focus on those COPECs that drive risk, which has been translated to remove COPECs with low FOE of the NAL value, as well as removing those COPECs with relatively low HQs. Sampling within the C-400 Complex OU has been determined to be representative of concentrations at the site; however, sampling has been biased to focus on areas with high concentrations of COPECs. This can bias the estimated average for the soil sectors and RGA groundwater high, and those COPECs with an HQ between 3 and 10 are likely not risk drivers in the SERA; however, basing the EPC on the average of detected values is a protective assumption that provides more information for risk managers to consider when determining the selected remedy for the C-400 Complex OU; therefore, the uncertainty is likely to overestimate risk.

C.9. SCREENING RISK EVALUATION SUMMARY AND CONCLUSIONS

C.9.1 HUMAN HEALTH SCREENING RISK EVALUATION

The purpose of this section is to summarize the results of the SRE and provide significant observations and interpretation of the results of the assessment for the risk managers to utilize as additional information when determining the selected remedy for the C-400 Complex OU.

C.9.1.1 Chemicals of Potential Concern

Data were examined to ensure that sampling methods were adequate to determine the nature and extent of contamination and were representative of current contaminant concentrations in surface and surface and subsurface soil and groundwater at the C-400 Complex OU. Historical data collected from 2000 onwards along with recently collected samples during 2021 and 2022 as part of the C-400 Complex OU RI were combined to develop the SRE dataset. Additional steps used to evaluate the SRE dataset include the following:

- Evaluation of the analytical methods used to generate data;
- Evaluation of data qualifiers associated with data;
- Evaluation of the SQLs and DLs;
- Removal of analytes not detected in SRE dataset;
- Examination of the toxicity using NALs;
- Examination of the protection of groundwater pathway using SSLs; and
- Removal of essential nutrients from the SRE dataset.

Soil data was segregated into seven exposure units named sectors for the identification of COPCs and quantification of risk. Sector 1 encompassed the building footprint, while Sector 2 through Sector 7 included soil surrounding the building. Groundwater data was also segregated into the RGA and McNairy groundwater exposure units. Data within each exposure unit were then screened for COPCs that progressed in the SRE.

Maximum detected concentrations were compared to direct contact NALs to identify COPCs for an exposure unit-media. The basis of the NALs used for comparison to sector-media pairs were as follows:

- Surface soil—Industrial worker NALs;
- Surface and subsurface soil—Excavation worker NALs;
- Groundwater—Resident NALs.

Background concentrations for analytes were also used for comparison to site data. If an analyte had a detected concentration greater than the provisional background concentration and their respective NAL, it was identified as a COPC for the exposure unit-media pair and progressed in the SRE. The list of COPCs included the following analyte classes:

- Total dioxin/furans
- metals
- Total PCBs
- radionuclides
- SVOCs
- VOCs

Maximum detected concentrations were compared to protection of groundwater SSLs based on the residential NALs using default DAFs of 1 and 20, as well as a site-specific DAF of 22 to identify which analytes would be further evaluated in Section 5.3 of this report. Additional evaluation of this pathway using a site-specific SSL based on site-specific geochemical parameters and a DAF of 22 was performed and the results are provided in Section 5 and Appendix B. Background concentrations were also included to determine which analytes were further evaluated. Data in soil were segregated and compared to protection of groundwater SSLs and provisional background values as follows:

- Surface soil (0 to 1 ft bgs)
- Subsurface soil (1 to 16 ft bgs)
- Deep soil (> 16 ft bgs to the bottom of RGA soil)
- McNairy Formation soil

The list of analytes that progressed to the fate and transport section included the following chemical classes:

- radionuclides
- SVOCs
- VOCs

C.9.1.2 Exposure Assessment

Three steps are involved in the exposure assessment. Step 1 is characterization of the exposure setting, which includes the description of the human population on or near the site that may affect the extent of exposure and the physical characteristics of the site. Step 2 is identification of exposure pathways, which includes identifying complete exposure pathways that include all links between the source and the exposed population. A complete pathway consists of the source of release, a mechanism of release, a transport medium, a point of potential human contact, and an exposure route. Step 3 is quantification of the exposure which estimates exposures or representative concentrations for COPCs and quantifying intakes.

Human health risks are assessed by determining POEs and exposure routes. POEs are locations where human receptors can contact contaminated media. Exposure routes are the processes by which human receptors contact contaminated media. The exposure routes evaluated quantitatively in this SRE are as follows:

- Current and future industrial workers were assumed to be exposed to surface soil, brick, and concrete located between 0 to 1 ft bgs. For these receptors, exposure to chemical COPCs in surface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Ingestion and inhalation of concrete is unlikely. Exposure to radionuclide COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

- Future excavation workers are the only receptors that are assumed to be exposed to surface and subsurface soil, brick, and concrete located between 0 to 16 ft bgs. For these receptors, exposure to chemical COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, and inhalation of soil particulates and vapors in ambient air. Exposure to radionuclide COPCs in surface and subsurface soil, brick, and concrete is assumed to occur via incidental ingestions, dermal contact, inhalation of soil particulates in ambient air, and external exposure to ionizing radiation.

- Future hypothetical residents are the only receptors that are assumed to be exposed to groundwater in the RGA and the McNairy. For these receptors, exposure to chemical COPCs in groundwater is assumed to occur via direct ingestion of groundwater, dermal absorption, and inhalation of vapors while using groundwater for household purposes (e.g., showering). Exposure to radionuclide COPCs in groundwater is assumed to occur via direct ingestion of groundwater.

EPCs are concentration estimates of potential exposure that are selected to address uncertainty and variability in the dataset. EPCs are developed to represent an average exposure concentration for receptors over an exposure unit. The EPCs were developed for each exposure unit-media combination and were developed/selected for surface soil and surface and subsurface soil by assigning a concentration to a grid located within a sector. The maximum detected concentration was assigned to the grid if multiple datapoints were available for a COPC, and the minimum DL was assigned when the COPC was not detected. The concentration from each grid was then used to develop a UCL95, which was selected as the EPC if there was sufficient data.

EPCs were also developed/selected for groundwater exposure units. Data deemed sufficient for use in the SRE were used to calculate the UCL95 that would be selected as the EPC. If there were insufficient data, the maximum detected concentration was selected as the EPC.

The criteria for insufficient data included the following:

- Less than ten samples for a COPC in the exposure unit;
- Less than four detections for a COPC in the exposure unit; and
- Less than two distinct values for a COPC in the exposure unit.

C.9.1.3 Toxicity Assessment

Toxicity values were obtained from the RAIS prepared by the Toxicology and Risk Analysis Section of Oak Ridge National Laboratory for DOE (DOE 2004). This site also lists toxicity values taken from the following sources:

- EPA's IRIS database;

- EPA's PPRTVs;

- EPA's Office of Pesticide Programs Human Health Benchmarks for Pesticides;

- ATSDR's MRLs;

- California EPA Office of Environmental Health Hazard Assessment toxicity values;

- Screening toxicity values in an appendix to certain PPRTV assessments;

- National Center for Environmental Assessment, and Health Effects Assessment Summary Tables database; and

- ATSDR's draft MRLs.

Potential carcinogenic effects resulting from human exposure to chemicals are estimated quantitatively using CSFs, which represent the theoretical increased risk per milligram of contaminant intake per kilogram of body weight per day or IUR factors, which are the theoretical increased risk at a defined exposure concentration. CSFs or IUR factors are used to estimate a theoretical upper-bound lifetime probability of an individual developing cancer as a result of exposure to a potential carcinogen (EPA 1989b).

Potential non-carcinogenic effects resulting from human exposure to chemicals are generally estimated quantitatively using RfDs and RfCs. The RfD, expressed in units of daily dose (mg/kg-day) is an estimate of the daily maximum level of exposure to human populations (including sensitive sub-populations) that is likely to be without an appreciable risk of deleterious effects (EPA 1989b). For inhalation exposures, the EPA has derived RfCs for some chemicals. In concept, an inhalation RfC is similar to an RfD. If the concentration of a chemical in air to which a human is exposed is lower than the RfC, then there is no appreciable risk for noncancer health effects from that exposure.

C.9.1.4 Risk Characterization

In this SRE, the numerical estimate of the potential for cancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as an ELCR. This value is calculated as shown in the following equation:

$$ELCR_{COPC} = \frac{EPC_{COPCi}}{Carcinogenic\ NAL_{COPCi}} \times 1 \times 10^{-6}$$

Where:

ELCR is the excess lifetime cancer risk for the COPC, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Carcinogenic NAL is the carcinogenic no action level for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

The numerical estimate of the potential for noncancer effects posed by a single chemical is derived as the ratio of the EPC for a COPC and the appropriate NAL. This ratio also is referred to as an HQ. This value is calculated as shown in the following equation:

$$HQ = \frac{EPC_{COPCi}}{Noncarcinogenic\ NAL_{COPCi}} \times 0.1$$

Where:

HQ is the hazard quotient, dimensionless

EPC is the exposure point concentration for a COPC, mg/kg -or- mg/L for chemical COPCs and pCi/g -or- pCi/L for radionuclide COPCs

Noncarcinogenic NAL is the noncarcinogenic no action level for the receptor being characterized, mg/kg -or- mg/L for chemical COPCs

The calculation for the carcinogenic and noncarcinogenic endpoints was performed on two scales for each soil sector, a calculation for each individual grid within a sector, and the calculation for the sector.

The identification of COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, COPCs exceeding either an ELCR of 1×10^{-6} or an HQ of 0.1 were identified as COCs.[6] For risk characterization of soil, an ELCR and HQ were developed for individual grids as, well as a sector-wide ELCR and HQ. The sector-wide ELCR and HQ for COPCs were used to identify COCs for the sector; whereas, individual grid ELCR and HQ calculations were presented to provide information for risk managers. The individual grid quantification of risk and hazard was not used for identification of COCs.

The identification of priority COCs was based on the risk characterization results for each media-receptor pair for each exposure unit. In accordance with the Human Health RMD, COPCs exceeding either an ELCR of $1{\times}10^{-4}$ or an HQ of 1 were identified as priority COCs.

C.9.1.5 Human Health SRE Observations

The performance of a risk assessment for a site is used to identify the COCs, POCs, and the MOC as described in the Human Health RMD. An SRE was performed for the C-400 Complex and risks for individual pathways but media could not be characterized; therefore, only COCs could be identified based on the results of the risk characterization. The observations of the SRE will focus on the identified priority COCs and the COCs that are risk drivers for the site (i.e., those COCs that comprise a majority or significant component of risk for a receptor) and do not include identification of POCs or MOCs.

The risk characterization results were used to identify soil and groundwater COCs. The list of surface soil COCs and priority COCs across the C-400 Complex OU was based on risk characterization results for industrial worker NALs. The list of surface and subsurface soil COCs was based on risk characterization results for excavation worker NALs. The list of groundwater COCs was based on risk characterization results for residential NALs and provisional background levels.

The COC identified as a priority COC most frequently in surface soil was uranium-238 indicating that uranium-238 is identified as the primary risk driver in surface soil across the C-400 Complex OU. Thorium-230, uranium metal, and uranium-235/236 were also identified as priority COCs in certain sectors, which indicates elevated concentration above either an ELCR of $1{\times}10^{-4}$ or an HI of 1 in individual sectors investigated and not across the C-400 Complex OU.

The COC identified as a priority COC most frequently in surface and subsurface soil was uranium metal, which indicates that uranium metal is identified as the primary risk driver in surface and subsurface soil across the C-400 Complex OU. Thorium-230 was also identified as a priority COC in one sector, which indicates an elevated concentration above an ELCR of $1{\times}10^{-4}$ in an individual sector investigated and not across the C-400 Complex OU. TCE was identified as a priority COC in two sectors, Sector 4 and Sector 5, located on the south side of the C-400 Complex OU.

There was a relatively large number of COCs identified as priority COCs in groundwater, specifically the RGA groundwater; however, there are five primary risk drivers in groundwater: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE. There were five analytes with an FOE of their respective ALs[7] > 10%: chromium, technetium-99, *cis*-1,2-dichloroethene, 1,1,2-trichloroethane, and TCE.

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[6] The Human Health RMD indicates that use scenarios of concern, pathways of concern, and media of concern should not be identified when the risk analysis is based on screening methodology that utilizes calculated ratios of chemical- and radionuclide-specific media concentrations and NALs.
[7] Risk-based ALs are the lesser of the cancer-based values for ELCR of $1{\times}10^{-4}$ and hazard-based values for HI of 3.

TCE was identified as the primary risk-driver for groundwater. TCE ELCR contributed approximately 84% of the total ELCR and approximately 96% of the total non-cancer hazard.

The evaluation of the potential for soil contaminants to leach into groundwater was evaluated in the SRE using SSLs based on default DAFs of 1 and 20, as well as a site-specific DAF of 22 to identify which analytes would be further evaluated in Section 5.3. Additional evaluation of this pathway using site-specific SSLs based on site-specific geochemical parameters and a site-specific DAF of 22 is presented in Section 5 and Appendix B.

C.9.2 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

C.9.2.1 SERA Problem Formulation

The problem formulation within a SERA provides information to support a risk management decision concerning the need for additional evaluation of ecological risk. The results of the problem formulation are to determine a final list of COPECs, assessment endpoints, and questions and hypotheses that could potentially require further evaluation in an ERA. As part of the streamlined SERA, the problem formulation step began with a discussion of the preliminary CSM for the C-400 Complex OU. This discussion includes the description of wildlife at the Paducah Site, relevant exposure media, and the receptor groups and relevant exposure routes.

Terrestrial wildlife commonly found in the Paducah Site area consists of species indigenous to open grassland, thicket, and forest habitats. Small mammal surveys conducted on WKWMA documented the presence of southern short-tailed shrews, prairie voles, house mice, rice rats, and deer mice (KSNPC 1991). Large mammals commonly present in the area include coyotes, eastern cottontails, opossums, groundhogs, whitetail deer, raccoons, and gray squirrels. Mist netting activities in the area have captured red bats, little brown bats, Indiana bats, northern long-eared bats, evening bats, and eastern pipistrelles (KSNPC 1991). Typical birds of the area include European starlings, cardinals, red-winged blackbirds, mourning doves, bobwhite quail, turkeys, killdeer, American robins, eastern meadowlarks, eastern bluebirds, blue jays, red-tailed hawks, and Great Horned owls.

Examples of a few amphibians and reptiles present include cricket frogs, Fowler's toads, common snapping turtles, green tree frogs, chorus frogs, southern leopard frogs, eastern fence lizards, and red-eared sliders (KSNPC 1991).

The aquatic communities in and around the Paducah Site that could be impacted by site discharges include two perennial streams, Bayou Creek and Little Bayou Creek; the NSDD; a marsh located at the confluence of Bayou Creek and Little Bayou Creek; and other smaller drainage areas. The dominant taxa in all surface waters include several species of sunfish, especially bluegill and green sunfish, as well as bass and catfish. Shallow streams, characteristic of the two main area creeks, are dominated by bluegill, green and longear sunfish, and stonerollers. Algal and benthic macroinvertebrate and insect populations vary seasonally. Periphyton, benthic macroinvertebrates, and fishes found in Bayou and Little Bayou Creeks are described in *Final Report on Environmental Studies at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, to Union Carbide Corporation* (Battelle 1978).

Soil and groundwater migrating and entering surface water are the media of interest for the C-400 Complex OU.[8] Most soil at the C-400 Complex OU is located below the building footprint or located under

[8] As documented in the C-400 Complex RI/FS Work Plan, subsurface soil is not likely to be a complete exposure pathway for current or future ecological receptors.

concrete/asphalt covering; however, the surface soil outside the building footprint has the potential for uptake by plants and soil invertebrates and could enter higher trophic levels through the food chain. As a result, surface soil in Sector 2 through Sector 7, the soil exposure units located outside the C-400 building footprint, were evaluated in the SERA.

The analytes detected in groundwater have the potential to migrate downgradient and be discharged to surface waters located further away from the C-400 Complex OU. The RGA groundwater has the potential to migrate and daylight in downgradient surface water bodies, while McNairy groundwater is unlikely to daylight in surface water bodies; therefore, RGA groundwater within 300 ft of the C-400 Complex OU boundary was evaluated in the SERA. The list of receptor groups that could be exposed to surface soil at the C-400 Complex OU includes terrestrial plants, soil invertebrates, and terrestrial birds and mammals. The list of receptors that could be exposed to groundwater below the C-400 Complex OU that could migrate downgradient and discharge to surface water includes aquatic invertebrates, fish, aquatic plants, semi-aquatic birds and mammals, reptiles, and amphibians. The potential exposure pathways to surface soil for ecological receptors are direct contact with and incidental ingestion of soil and ingestion of food sources exposed to contaminated soil media. The primary routes of concern for terrestrial receptors are the incidental ingestion of contaminated soils during feeding and the ingestion of contaminated food sources that are exposed to C-400 Complex OU media.

C.9.2.2 Effects Estimate

There are three levels for which adverse effects may result from exposure to contaminated site media by ecological populations, ecological communities, and habitats. Adverse effects on ecological populations of ecological receptors are based on measures related to impaired reproduction, growth, and survival. Adverse effects on ecological communities are based on changes in community structure and function. Adverse effects on habitats are based on changes in composition and characteristics that reduce a habitat's ability to support plant and animal populations and communities. Evaluation of these adverse effects in the SERA was streamlined by comparing site concentrations to ecological benchmarks (referred to as NFA values). NFA values for chemical exposures were referenced from the Ecological RMD (DOE 2019) and included values from:

- EPA Eco-SSLs
- EPA Region 4 Ecological Screening Values
- KDEP screening values
- Oak Ridge National Laboratory benchmarks

For radionuclides, the ecological benchmarks used in the SERA to quantify effect estimates were developed using the RESRAD-BIOTA, Version 1.8 software. The default input values were used to calculate the NFA values, with the exception of the dose adjusted to 0.1 rad/day.

C.9.2.3 Exposure Estimate

The media for which exposure to ecological receptors is likely has been identified in the ecological CSM. The two media are surface soil (0 to 1 ft bgs) for Sector 2 through Sector 7 and groundwater that has migrated downgradient and discharged to surface water. The value selected to represent the exposure estimate, the EPC, for the Step 2 surface soil screening was the maximum of either the maximum detected concentration for each sector or one-half the maximum DL for the analyte. For the Step 2 groundwater screening, the maximum of either the maximum detected concentration, or one-half the maximum DL, was selected to represent the exposure estimate.

C.9.2.4 Step 2 Risk Characterization

The Step 2 screening process of the SERA was used to identify COPECs for surface soil and groundwater. The COPEC identification process consisted of development of an HQ for each analyte, using the ratio of the exposure estimate to the NFA value as shown below:

$$HQ_i = \frac{EPC_i}{NFA_i}$$

Where:

HQi is the hazard quotient, dimensionless

EPCi is the exposure point concentration for an analyte, mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides

NFAi is the no further action value based on the ecological benchmark, mg/kg -or- mg/L for chemicals and pCi/g -or- pCi/L for radionuclides (DOE 2019)

C.9.2.5 Step 3 COPEC Refinement

The exposure estimate, the EPC, for comparison to a NFA value in Step 2 was the maximum site concentration which is either the greater of the maximum detected concentration, or one-half the maximum reported detection limit for substances reported as nondetect. In Step 3, the EPC for the COPEC was adjusted to use an average concentration for comparison to a representative background value and/or the NFA value. For each soil sector, the average concentration from detected values within the sector was used to represent the EPC for the COPEC. For groundwater, the average concentration of detected values was used to represent the EPC.

Step 2 of the SERA utilized risk-based values to select the COPECs that would be further evaluated in Step 3. Step 3 includes not only a comparison of COPECs EPCs to risk-based values, but also includes a comparison of the EPC to representative background values. If the average concentration of the COPEC in a soil sector or RGA groundwater was below its respective provisional background value, then it was excluded from the refined list of COPECs.

The selected soil NFA values used in the Step 2 screening were the minimum of the values available for four classes of receptors: plants, soil invertebrates, mammals, and avian. In Step 3, the soil NFA values were separated into two groups for comparison of the sector EPCs, direct contact NFA values, and bioaccumulative NFA values. The direct contact NFA value for a COPEC was selected as the minimum between the plant NFA value and the soil invertebrate NFA value presented in the Ecological RMD (DOE 2019). For those COPECs that are identified as bioaccumulative based on EPA guidance, a bioaccumulative NFA value was selected to develop a bioaccumulative HQ (EPA 2018). The bioaccumulative NFA value was the minimum between the mammal NFA value and the avian NFA value. For groundwater, the same NFA values used in the Step 2 screening for COPECs were used in the Step 3 screening. If the COPEC calculated HQs were < 1, the COPEC was removed from the refined list of COPECs. If a COPEC had a calculated HQ > 1, then the COPEC will be further evaluated in the refinement.

Additional lines of evidence used to refine the list included information related to the distribution of concentrations within the media, as well as the magnitude of the calculated HQs.

C.9.2.6 SERA Observations

Step 3 of the SERA included a refinement of assumptions used as part of Step 2 of the SERA. The result of the refinement process resulted in seven soil COPECs identified that may cause excess risk to ecological receptors. These include the following analytes:

- bis(2-ethylhexyl)phthalate
- HMW PAHs
- mercury
- thallium
- Total PCBs
- *cis*-1,2-dichloroethene
- TCE

Risk managers should be aware of the uncertainties related to identifying COPECs in surface soil at the C-400 Complex OU. The primary uncertainty with evaluating surface soil at the C-400 Complex OU is if the exposure pathway is complete for ecological receptors. There are areas within the Paducah Site that could be suitable terrestrial habitat for ecological terrestrial receptors; however, because the C-400 Complex OU is within an industrialized area with a variety of large structures and pavement that is unlikely to change significantly in the foreseeable future, there is no expectation of ecological function associated with the site. Because there is little surface soil outside the C-400 Cleaning Building footprint that is not obstructed in some way, it is highly unlikely that terrestrial ecological receptors would be exposed to contaminants in the C-400 Complex OU for a duration that would result in unacceptable risk.

TCE is the only COPEC identified for RGA groundwater that has potential to cause excess risk to surface water ecological receptors if groundwater under the C-400 Complex OU migrates and discharges to surface water. Identification of TCE as a COPEC assumes that concentrations of TCE will not be decreased as groundwater migrates or enters a surface water body, which is highly unlikely. There may be potential for elevated concentration of TCE to enter surface water bodies around the Paducah Site; however, the concentrations will be significantly less than what was used in the SERA.

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C.10. REMEDIAL GOAL OPTIONS

This section presents the methods used to derive the RGOs and list the RGO for each chemical of concern. It is important to note that RGOs are not cleanup levels, but are site-specific, risk- or radiological dose-based criteria that may be used to guide the development of revised PRGs in the FS and cleanup levels in the Record of Decision (ROD) by risk managers. Cleanup levels are developed as part of the risk analysis in the ROD (EPA 2018). RGOs were developed for those COPCs that were identified as COCs as part of the risk characterization process of the SRE and COCs identified as part of the historical risk assessment performed at the C-400 Complex OU. Additionally, those COPECs that were retained as part of Step 3 of the SERA are considered as the basis of an RGO.

C.10.1 DERIVATION OF REMEDIAL GOAL OPTIONS

The development of RGOs for the C-400 Complex OU consisted of the development of a range of risk-based RGOs, consideration of the provisional background values, and consideration of other relevant regulatory values. The risk-based RGOs are described in more detail in the following sections. The representative background value considered as RGOs were as follows:

- the provisional background values for surface soil for COCs identified in surface soil;
- the minimum of the surface soil and subsurface soil provisional background values for surface and subsurface soil COCs;
- the RGA provisional background values for RGA groundwater COCs;
- the McNairy provisional background values for McNairy groundwater COCs; and
- other appropriate regulatory values considered as RGOs included primary MCLs for groundwater.

C.10.1.1 Human Health Endpoint

Two methods can be used to develop RGOs. The first involves rearranging and combining all the exposure equations utilized to determine risk or hazard and using the rearranged equation to calculate the RGO. The second uses ratios of concentrations or activities and level of risk, hazard, or radiological dose to derive the RGO. Although the first method is of greater utility because the rearranged equation can be used to directly solve for RGOs, its use increases the chance for error; therefore, the second method was used to develop risk-based RGOs for the C-400 Complex OU. The following equation was used to develop the carcinogenic based RGOs.

$$\frac{EPC_{COC}}{ELCR_{COC}} = \frac{RGO}{Target\ ELCR}$$

Where:

EPCcoc is the representative EPC for the COC

ELCRcoc is the chemical-specific ELCR of a COC due to exposure to a single medium across all exposure routes

RGO is the remedial goal option

Target ELCR is either 1×10^{-6}, 1×10^{-5}, or 1×10^{-4}

The following equation was used to develop the noncarcinogenic based RGOs.

$$\frac{EPC_{COC}}{HI_{COC}} = \frac{RGO}{Target\ HI}$$

Where:

EPCcoc is the representative EPC for the COC

HIcoc is the chemical-specific HI of a COC due to exposure to a single medium across all exposure routes

RGO is the remedial goal option

Target HI is either 0.1, 1, or 3

In addition to developing risk-based RGOs for COCs identified in the SRE, previous risk assessments were reviewed for COCs. If a COC was identified in a previously performed risk assessment, an RGO for the COC was developed. The basis of RGOs for COCs identified in previous risk assessments is as follows:

- Surface soil COCs—Industrial Worker NAL
- Surface and subsurface COCs—Excavation Worker NAL
- Groundwater COCs—Residential NALs

NALs were developed based on either a target risk of 1×10^{-6} or a target hazard of 0.1. To present risk range RGOs, carcinogenic NALs were multiplied by 10 (equivalent to an ELCR of 1×10^{-5}) or by 100 (equivalent to an ELCR of 1×10^{-4}). To present the hazard range RGOs, noncarcinogenic NAL were multiplied by 10 (equivalent to an HI of 1) or by 30 (equivalent to an HI of 3).

The protection of groundwater RGOs were developed based on methodology discussed in Section 5 of this report. Briefly, protection of groundwater RGOs were based on the equations discussed in Section 3.2.4.2 in the SRE; however, site-specific parameters were used instead of default parameters. RGOs were calculated based on two target groundwater concentrations, the minimum NAL and the MCL.

C.10.1.2 Ecological Endpoints

RGOs based on ecological receptors were included for comparison to the human health-based RGOs; however, the consideration of ecologically based RGOs for cleanup decisions should also include consideration of the uncertainties of the SERA. For the purpose of comparing the human-health based RGOs to the ecologically based RGOs, the NFA values for those COPECs that were retained in Step 3 of the SERA are provided.

- bis(2-ethylhexyl)phthalate
- HMW PAHs
- mercury
- thallium
- Total PCBs

- *cis*-1,2-dichloroethene
- TCE

C.10.2 PRESENTATION OF REMEDIAL GOAL OPTIONS

The human health risk-based soil RGOs for COCs identified in the current SRE are presented in Table C1.94.

The human health risk-based groundwater RGOs for COCs identified in the current SRE are presented in Table C1.95.

The human health risk-based soil RGOs for COCs identified in historical risk assessments are presented in Table C1.96.

The human health risk-based soil RGOs for COCs identified in historical risk assessments are presented in Table C1.97.

The protection of groundwater RGOs for COCs identified in Section 5 of this report are presented in Table C1.98.

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ATTACHMENT C1

SCREENING HUMAN HEALTH RISK EVALUATION SUMMARY TABLES

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TABLES

Table C1.1. Surface Soil Detection Limit Evaluation

Type	Analysis	Unit	Detection Limits		1/2 Max DL	FOD	Provisional Background				Industrial Worker				
			Min	Max			FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
METAL	Aluminum	mg/kg	5.00E+00	1.22E+02	6.10E+01	238/238	0/238	0.00%	1.30E+04	No	0/238	0.00%	1.00E+05	No	6.1E-04
METAL	Antimony	mg/kg	9.04E-01	3.00E+01	1.50E+01	136/221	136/221	61.54%	2.10E-01	No	0/221	0.00%	9.34E+01	No	1.6E-01
METAL	Arsenic	mg/kg	9.12E-01	2.00E+01	1.00E+01	222/240	0/240	0.00%	1.20E+01	No	64/240	26.67%	1.60E+00	No	6.3E+00
METAL	Barium	mg/kg	3.65E-01	1.00E+02	5.00E+01	239/240	0/240	0.00%	2.00E+02	No	0/240	0.00%	4.04E+04	No	1.2E-03
METAL	Beryllium	mg/kg	9.12E-02	5.09E-01	2.55E-01	217/220	0/220	0.00%	6.70E-01	No	0/220	0.00%	4.50E+02	No	5.7E-04
METAL	Boron	mg/kg	2.74E+00	3.01E+01	1.51E+01	205/218	N/A	N/A	N/A	N/A	0/218	0.00%	4.65E+04	No	3.2E-04
METAL	Cadmium	mg/kg	5.00E-02	1.20E+01	6.00E+00	205/221	79/221	35.75%	2.10E-01	No	0/221	0.00%	6.05E+01	No	9.9E-02
METAL	Chromium	mg/kg	5.47E-01	8.50E+01	4.25E+01	239/240	0/240	0.00%	1.60E+01	No	1/240	0.42%	1.23E+01	No	3.5E+00
METAL	Cobalt	mg/kg	1.82E-01	9.86E-01	4.93E-01	219/219	0/219	0.00%	1.40E+01	No	0/219	0.00%	6.87E+01	No	7.2E-03
METAL	Copper	mg/kg	1.82E-01	3.50E+01	1.75E+01	220/221	1/221	0.45%	1.90E+01	No	0/221	0.00%	9.34E+03	No	1.9E-03
METAL	Iron	mg/kg	5.00E+00	2.48E+02	1.24E+02	240/240	0/240	0.00%	2.80E+04	No	0/240	0.00%	1.00E+05	No	1.2E-03
METAL	Lead	mg/kg	3.65E-01	2.00E+01	1.00E+01	221/240	0/240	0.00%	3.60E+01	No	0/240	0.00%	8.00E+02	No	1.3E-02
METAL	Manganese	mg/kg	9.28E-01	1.05E+02	5.25E+01	239/239	0/239	0.00%	1.50E+03	No	0/239	0.00%	4.72E+03	No	1.1E-02
METAL	Mercury	mg/kg	1.03E-02	1.00E+01	5.00E+00	140/240	2/240	0.83%	2.00E-01	No	0/240	0.00%	7.01E+01	No	7.1E-02
METAL	Molybdenum	mg/kg	1.82E-01	1.50E+01	7.50E+00	217/220	N/A	N/A	N/A	N/A	0/220	0.00%	1.16E+03	No	6.5E-03
METAL	Nickel	mg/kg	3.65E-01	6.50E+01	3.25E+01	235/240	1/240	0.42%	2.10E+01	No	0/240	0.00%	4.30E+03	No	7.6E-03
METAL	Selenium	mg/kg	5.00E-01	2.00E+01	1.00E+01	151/239	150/239	62.76%	8.00E-01	No	0/239	0.00%	1.17E+03	No	8.5E-03
METAL	Silver	mg/kg	2.00E-01	1.00E+01	5.00E+00	85/221	37/221	16.74%	2.30E+00	No	0/221	0.00%	1.17E+03	No	4.3E-03
METAL	Thallium	mg/kg	2.00E-01	2.00E+01	1.00E+01	41/220	40/220	18.18%	2.10E-01	No	1/220	0.45%	2.34E+00	No	4.3E+00
METAL	Uranium	mg/kg	3.65E-02	1.00E+02	5.00E+01	224/239	5/239	2.09%	4.90E+00	No	19/239	7.95%	4.66E+01	No	1.1E+00
METAL	Vanadium	mg/kg	9.12E-01	7.00E+01	3.50E+01	236/239	0/239	0.00%	3.80E+01	No	0/239	0.00%	1.15E+03	No	3.0E-02
METAL	Zinc	mg/kg	1.82E+00	4.59E+01	2.30E+01	221/221	0/221	0.00%	6.50E+01	No	0/221	0.00%	7.01E+04	No	3.3E-04
ANION	Fluoride	mg/kg	8.70E-01	4.98E+00	2.49E+00	206/218	N/A	N/A	N/A	N/A	0/218	0.00%	9.33E+03	No	2.7E-04
PPCB	Dieldrin	mg/kg	1.30E-03	1.33E-01	6.65E-02	0/26	N/A	N/A	N/A	N/A	4/26	15.38%	5.08E-02	No	1.3E+00
PPCB	Total PCB	mg/kg	3.31E-03	5.00E+00	2.50E+00	159/225	N/A	N/A	N/A	N/A	8/225	3.56%	2.93E-01	No	8.5E+00
SVOA	1,1-biphenyl	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	0/191	0.00%	2.00E+01	No	3.6E-01
SVOA	2,4,5-Trichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.90E+03	No	2.5E-03
SVOA	2,4,6-Trichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.90E+01	No	2.5E-01
SVOA	2,4-Dichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	8.70E+01	No	8.3E-02
SVOA	2,4-Dimethylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	5.80E+02	No	1.3E-02
SVOA	2,4-Dinitrophenol	mg/kg	6.57E-01	2.90E+01	1.45E+01	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	5.80E+01	No	2.5E-01
SVOA	2,4-Dinitrotoluene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	54/192	28.13%	2.57E+00	No	2.8E+00
SVOA	2,6-Dinitrotoluene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	91/192	47.40%	5.46E-01	No	1.3E+01
SVOA	2-Chloronaphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	1.84E+03	No	3.9E-04
SVOA	2-Chlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	1.17E+03	No	6.2E-03
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	54/192	28.13%	2.32E+00	No	3.1E+00
SVOA	2-Methylnaphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	21/192	N/A	N/A	N/A	N/A	0/192	0.00%	9.19E+01	No	7.9E-03
SVOA	2-Methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	1.45E+03	No	5.0E-03
SVOA	2-Nitrobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/216	N/A	N/A	N/A	N/A	0/216	0.00%	2.87E+02	No	2.5E-02
SVOA	2-Nitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	5.80E+01	No	1.3E-01
SVOA	3,3'-Dichlorobenzidine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	68/192	35.42%	1.80E+00	No	4.0E+00
SVOA	3-Nitrobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	3/192	1.56%	8.70E+00	No	8.3E-01
SVOA	4-Bromophenyl phenyl ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	1/192	0.52%	1.41E+01	No	5.1E-01
SVOA	4-Chloro-3-methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.90E+03	No	2.5E-03
SVOA	4-Chlorobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	25/192	13.02%	4.06E+00	No	1.8E+00
SVOA	4-Chlorophenyl phenyl ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	1/192	0.52%	1.41E+01	No	5.1E-01
SVOA	4-Nitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	5.80E+01	No	1.3E-01
SVOA	Acenaphthene	mg/kg	3.29E-02	1.45E+00	7.25E-01	29/216	N/A	N/A	N/A	N/A	0/216	0.00%	1.38E+03	No	5.3E-04
SVOA	Acenaphthylene	mg/kg	3.29E-02	1.45E+00	7.25E-01	0/216	N/A	N/A	N/A	N/A	0/216	0.00%	1.38E+03	No	5.3E-04
SVOA	Acetophenone	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	0/191	0.00%	2.34E+04	No	3.1E-04
SVOA	Anthracene	mg/kg	3.29E-02	1.45E+00	7.25E-01	42/216	N/A	N/A	N/A	N/A	0/216	0.00%	6.89E+03	No	1.1E-04
SVOA	Atrazine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	40/191	20.94%	3.53E+00	No	2.1E+00

Table C1.1. Surface Soil Detection Limit Evaluation (Continued)

			Detection Limits				Provisional Background				Industrial Worker				
Type	Analysis	Unit	Min	Max	1/2 Max DL	FOD	FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
SVOA	Benzaldehyde	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/187	N/A	N/A	N/A	N/A	0/187	0.00%	1.64E+03	No	4.4E-03
SVOA	Benzenemethanol	mg/kg	3.50E-01	3.50E-01	1.75E-01	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	2.90E+03	No	6.0E-05
SVOA	Benzo(ghi)perylene	mg/kg	3.29E-02	1.45E+00	7.25E-01	62/192	N/A	N/A	N/A	N/A	0/192	0.00%	6.89E+02	No	1.1E-03
SVOA	Benzoic acid	mg/kg	1.70E+00	1.70E+00	8.50E-01	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	1.16E+05	No	7.3E-06
SVOA	Bis(2-chloroethoxy)methane	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	8.70E+01	No	8.3E-02
SVOA	Bis(2-chloroethyl) ether	mg/kg	6.90E-03	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	91/192	47.40%	1.25E+00	No	5.8E+00
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	9.32E+01	No	7.8E-02
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	62/192	N/A	N/A	N/A	N/A	0/192	0.00%	5.80E+01	No	1.3E-02
SVOA	Butyl benzyl phthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	9/192	N/A	N/A	N/A	N/A	0/192	0.00%	4.27E+02	No	1.7E-03
SVOA	Caprolactam	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	0/191	0.00%	1.43E+04	No	5.1E-04
SVOA	Carbazole	mg/kg	3.29E-02	1.45E+00	7.25E-01	35/215	N/A	N/A	N/A	N/A	0/215	0.00%	4.06E+01	No	1.8E-02
SVOA	Dibenzofuran	mg/kg	3.29E-01	1.45E+01	7.25E+00	3/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.34E+02	No	3.1E-02
SVOA	Diethyl phthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.32E+04	No	3.1E-05
SVOA	Dimethyl phthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	4/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.32E+04	No	3.1E-05
SVOA	Di-n-butyl phthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	73/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.90E+03	No	2.5E-04
SVOA	Di-n-octylphthalate	mg/kg	3.29E-02	1.45E+00	7.25E-01	4/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.90E+02	No	2.5E-03
SVOA	Diphenylamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	0/191	0.00%	2.90E+03	No	2.5E-03
SVOA	Fluoranthene	mg/kg	3.29E-02	1.45E+00	7.25E-01	124/216	N/A	N/A	N/A	N/A	0/216	0.00%	9.19E+02	No	7.9E-04
SVOA	Fluorene	mg/kg	3.29E-02	1.45E+00	7.25E-01	24/216	N/A	N/A	N/A	N/A	0/216	0.00%	9.19E+02	No	7.9E-04
SVOA	Hexachlorobenzene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/216	N/A	N/A	N/A	N/A	101/216	46.76%	1.26E+00	No	5.8E+00
SVOA	Hexachlorobutadiene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	24/192	12.50%	5.61E+00	No	1.3E+00
SVOA	Hexachlorocyclopentadiene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	92/192	47.92%	7.45E-01	No	9.7E+00
SVOA	Hexachloroethane	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	4/192	2.08%	8.46E+00	No	8.6E-01
SVOA	Isophorone	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	8.55E+02	No	8.5E-03
SVOA	m,p-Cresol	mg/kg	6.90E-01	6.90E-01	3.45E-01	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	2.90E+03	No	1.2E-04
SVOA	m+p Methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/191	N/A	N/A	N/A	N/A	0/191	0.00%	5.80E+02	No	1.3E-02
SVOA	Naphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	21/216	N/A	N/A	N/A	N/A	0/216	0.00%	4.06E+00	No	1.8E-01
SVOA	Nitrobenzene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	2.24E+01	No	3.2E-01
SVOA	N-Nitroso-di-n-propylamine	mg/kg	6.90E-03	1.45E+01	7.25E+00	0/216	N/A	N/A	N/A	N/A	215/216	99.54%	1.16E-01	No	6.3E+01
SVOA	N-Nitrosodiphenylamine	mg/kg	3.50E-01	3.50E-01	1.75E-01	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	1.66E+02	No	1.1E-03
SVOA	Pentachlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	2/192	N/A	N/A	N/A	N/A	92/192	47.92%	8.77E-01	No	8.3E+00
SVOA	Phenanthrene	mg/kg	3.29E-02	1.45E+00	7.25E-01	122/216	N/A	N/A	N/A	N/A	0/216	0.00%	1.38E+03	No	5.3E-04
SVOA	Phenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	8.70E+03	No	8.3E-04
SVOA	p-Nitroaniline	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/192	N/A	N/A	N/A	N/A	0/192	0.00%	4.06E+01	No	1.8E-01
SVOA	Pyrene	mg/kg	3.29E-02	1.45E+00	7.25E-01	116/216	N/A	N/A	N/A	N/A	0/216	0.00%	6.89E+02	No	1.1E-03
SVOA	Pyridine	mg/kg	6.90E-01	6.90E-01	3.45E-01	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	2.34E+02	No	1.5E-03
RADS	Actinium-227	pCi/g	2.13E-01	7.12E-01	3.56E-01	0/9	N/A	N/A	N/A	N/A	0/9	0.00%	1.86E+01	No	1.9E-02
RADS	Americium-241	pCi/g	1.60E-02	1.50E+00	7.50E-01	19/250	N/A	N/A	N/A	N/A	0/250	0.00%	6.01E+00	No	1.2E-01
RADS	Americium-243	pCi/g	4.91E-02	4.91E-02	2.46E-02	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	3.38E-01	No	7.3E-02
RADS	Cesium-134	pCi/g	1.62E-02	1.62E-02	8.10E-03	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	2.42E-01	No	3.3E-02
RADS	Cesium-137	pCi/g	1.54E-02	2.87E-01	1.44E-01	90/249	0/249	0.00%	4.90E-01	No	5/249	2.01%	1.08E-01	No	1.3E+00
RADS	Cobalt-60	pCi/g	1.19E-02	7.08E-02	3.54E-02	0/28	N/A	N/A	N/A	N/A	2/28	7.14%	5.67E-02	No	6.2E-01
RADS	Lead-210	pCi/g	9.49E-01	1.90E+01	9.50E+00	0/9	N/A	N/A	N/A	N/A	5/9	55.56%	7.33E+00	No	1.3E+00
RADS	Neptunium-237	pCi/g	1.10E-02	1.26E+00	6.30E-01	34/250	31/250	12.40%	1.00E-01	No	229/250	91.60%	2.49E-01	No	2.5E+00
RADS	Neptunium-239	pCi/g	1.69E-01	1.69E-01	8.45E-02	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	1.08E+03	No	7.8E-05
RADS	Plutonium-238	pCi/g	1.50E-02	1.37E+00	6.85E-01	5/232	4/232	1.72%	7.30E-02	No	0/232	0.00%	2.65E+01	No	2.6E-02
RADS	Plutonium-239/240	pCi/g	1.00E-02	1.33E+00	6.65E-01	44/251	43/251	17.13%	2.50E-02	No	0/251	0.00%	2.27E+01	No	2.9E-02
RADS	Protactinium-231	pCi/g	3.87E-01	6.62E-01	3.31E-01	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	1.49E+00	No	2.2E-01
RADS	Radium-226	pCi/g	3.50E-01	1.47E+00	7.35E-01	5/9	0/9	0.00%	1.50E+00	No	9/9	100.00%	2.48E-02	No	3.0E+01
RADS	Strontium-90	pCi/g	1.28E-01	1.90E+00	9.50E-01	3/9	0/9	0.00%	4.70E+00	No	0/9	0.00%	1.03E+01	No	9.2E-02
RADS	Technetium-99	pCi/g	5.00E-01	5.77E+00	2.89E+00	151/251	140/251	55.78%	2.50E+00	No	0/251	0.00%	1.27E+03	No	2.3E-03
RADS	Thorium-228	pCi/g	4.00E-02	1.18E+00	5.90E-01	4/11	0/11	0.00%	1.60E+00	No	0/11	0.00%	1.54E+02	No	3.8E-03

Table C1.1. Surface Soil Detection Limit Evaluation (Continued)

Type	Analysis	Unit	Detection Limits		1/2 Max DL	FOD	Provisional Background				Industrial Worker				
			Min	Max			FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
RADS	Thorium-230	pCi/g	2.00E-02	3.94E+00	1.97E+00	197/251	1/251	0.40%	1.50E+00	No	0/251	0.00%	3.13E+01	No	6.3E-02
RADS	Thorium-232	pCi/g	2.00E-02	8.46E-01	4.23E-01	6/11	0/11	0.00%	1.50E+00	No	0/11	0.00%	3.08E+01	No	1.4E-02
RADS	Uranium-233/234	pCi/g	2.55E-01	1.66E+01	8.30E+00	206/222	14/222	6.31%	1.20E+00	No	0/222	0.00%	5.01E+01	No	1.7E-01
RADS	Uranium-234	pCi/g	2.00E-02	1.30E+00	6.50E-01	15/26	0/26	0.00%	1.20E+00	No	0/26	0.00%	5.01E+01	No	1.3E-02
RADS	Uranium-235	pCi/g	1.76E-02	6.08E-01	3.04E-01	20/27	2/27	7.41%	6.00E-02	No	4/27	14.81%	4.08E-01	No	7.5E-01
RADS	Uranium-235/236	pCi/g	1.00E-02	1.41E+01	7.05E+00	90/223	89/223	39.91%	6.00E-02	No	114/223	51.12%	4.08E-01	No	1.7E+01
RADS	Uranium-238	pCi/g	2.00E-02	1.60E+01	8.00E+00	241/249	9/249	3.61%	1.20E+00	No	5/249	2.01%	1.66E+00	No	4.8E+00
VOA	1,1,1-Trichloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/228	N/A	N/A	N/A	N/A	0/228	0.00%	3.58E+03	No	1.8E-04
VOA	1,1,2,2-Tetrachloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	2.91E+00	No	2.2E-01
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.04E-03	1.81E+00	9.05E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	2.81E+03	No	3.2E-04
VOA	1,1,2-Trichloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	2/228	N/A	N/A	N/A	N/A	1/228	0.44%	6.32E-01	No	1.0E+00
VOA	1,1-Dichloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	1.58E+01	No	4.1E-02
VOA	1,1-Dichloroethene	mg/kg	8.08E-04	1.30E+00	6.50E-01	3/228	N/A	N/A	N/A	N/A	0/228	0.00%	1.00E+02	No	6.5E-03
VOA	1,2,3-Trichlorobenzene	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	1.87E+02	No	9.7E-04
VOA	1,2,4-Trichlorobenzene	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	2.59E+01	No	7.0E-03
VOA	1,2-Dibromo-3-chloropropane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	5/193	2.59%	6.49E-02	No	2.8E+00
VOA	1,2-Dibromoethane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	1/193	0.52%	1.68E-01	No	1.1E+00
VOA	1,2-Dichlorobenzene	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	9.76E+02	No	1.9E-04
VOA	1,2-Dichloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.09E+00	No	3.1E-01
VOA	1,2-Dichloroethene	mg/kg	2.00E-03	2.01E-01	1.01E-01	1/25	N/A	N/A	N/A	N/A	0/25	0.00%	2.10E+03	No	4.8E-05
VOA	1,2-Dichloropropane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	6.63E+00	No	9.8E-02
VOA	1,2-Dimethylbenzene	mg/kg	8.08E-04	1.30E+00	6.50E-01	69/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.81E+02	No	2.3E-03
VOA	1,3-Dichlorobenzene	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	9.76E+02	No	1.9E-04
VOA	1,4-Dichlorobenzene	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	1.15E+01	No	1.6E-02
VOA	1,4-Dioxane	mg/kg	4.04E-02	1.81E+01	9.05E+00	1/169	N/A	N/A	N/A	N/A	0/169	0.00%	3.91E+01	No	2.3E-01
VOA	2-Butanone	mg/kg	4.04E-03	1.81E+00	9.05E-01	83/204	N/A	N/A	N/A	N/A	0/204	0.00%	2.24E+04	No	4.0E-05
VOA	2-Chloroethyl vinyl ether	mg/kg	4.04E-03	1.81E+00	9.05E-01	0/193	N/A	N/A	N/A	N/A	7/193	3.63%	9.15E-02	No	9.9E+00
VOA	2-Hexanone	mg/kg	4.04E-03	1.81E+00	9.05E-01	27/204	N/A	N/A	N/A	N/A	0/204	0.00%	1.52E+02	No	6.0E-03
VOA	2-Methoxy-2-methylpropane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	2.17E+02	No	8.3E-04
VOA	4-Methyl-2-pentanone	mg/kg	4.04E-03	1.81E+00	9.05E-01	19/204	N/A	N/A	N/A	N/A	0/204	0.00%	7.97E+03	No	1.1E-04
VOA	Acetone	mg/kg	4.04E-03	1.81E+00	9.05E-01	148/204	N/A	N/A	N/A	N/A	0/204	0.00%	2.10E+05	No	4.3E-06
VOA	Acrolein	mg/kg	4.04E-03	1.81E+00	9.05E-01	0/193	N/A	N/A	N/A	N/A	7/193	3.63%	6.05E-02	No	1.5E+01
VOA	Acrylonitrile	mg/kg	4.04E-03	1.81E+00	9.05E-01	0/217	N/A	N/A	N/A	N/A	1/217	0.46%	1.24E+00	No	7.3E-01
VOA	Benzene	mg/kg	8.08E-04	1.30E+00	6.50E-01	17/228	N/A	N/A	N/A	N/A	0/228	0.00%	5.31E+00	No	1.2E-01
VOA	Bromochloromethane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	6.28E+01	No	2.9E-03
VOA	Bromodichloromethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/228	N/A	N/A	N/A	N/A	0/228	0.00%	1.30E+00	No	5.0E-01
VOA	Bromoform	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	9.56E+01	No	6.8E-03
VOA	Bromomethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	3.03E+00	No	2.1E-01
VOA	Carbon disulfide	mg/kg	4.04E-03	1.81E+00	9.05E-01	4/204	N/A	N/A	N/A	N/A	0/204	0.00%	3.52E+02	No	2.6E-03
VOA	Carbon tetrachloride	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.96E+00	No	2.2E-01
VOA	Chlorobenzene	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	1.37E+02	No	4.7E-03
VOA	Chloroethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	2.27E+03	No	2.9E-04
VOA	Chloroform	mg/kg	8.08E-04	1.30E+00	6.50E-01	51/228	N/A	N/A	N/A	N/A	0/228	0.00%	1.39E+00	No	4.7E-01
VOA	Chloromethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	4.63E+01	No	1.4E-02
VOA	*cis* -1,2-Dichloroethene	mg/kg	8.08E-04	1.30E+00	6.50E-01	30/227	N/A	N/A	N/A	N/A	0/227	0.00%	4.67E+02	No	1.4E-03
VOA	*cis* -1,3-Dichloropropene	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	9.34E+00	No	7.0E-02
VOA	Cumene	mg/kg	8.08E-04	3.62E-01	1.81E-01	11/193	N/A	N/A	N/A	N/A	0/193	0.00%	1.04E+03	No	1.7E-04
VOA	Cyclohexane	mg/kg	8.08E-04	3.62E-01	1.81E-01	35/193	N/A	N/A	N/A	N/A	0/193	0.00%	2.74E+03	No	6.6E-05
VOA	Dibromochloromethane	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	7.79E+01	No	8.3E-03
VOA	Dichlorodifluoromethane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	3.68E+01	No	4.9E-03
VOA	Ethylbenzene	mg/kg	8.08E-04	1.30E+00	6.50E-01	55/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.66E+01	No	2.4E-02
VOA	m,p-Xylene	mg/kg	1.62E-03	2.50E+00	1.25E+00	77/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.50E+02	No	5.0E-03

Table C1.1. Surface Soil Detection Limit Evaluation (Continued)

Type	Analysis	Unit	Detection Limits		1/2 Max DL	FOD	Provisional Background				Industrial Worker				
			Min	Max			FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
VOA	Methyl acetate	mg/kg	4.04E-03	1.81E+00	9.05E-01	4/193	N/A	N/A	N/A	N/A	0/193	0.00%	2.34E+05	No	3.9E-06
VOA	Methylcyclohexane	mg/kg	8.08E-04	3.62E-01	1.81E-01	83/193	N/A	N/A	N/A	N/A	0/193	0.00%	1.30E+03	No	1.4E-04
VOA	Methylene chloride	mg/kg	4.04E-03	1.81E+00	9.05E-01	55/204	N/A	N/A	N/A	N/A	0/204	0.00%	4.08E+02	No	2.2E-03
VOA	Styrene	mg/kg	8.08E-04	1.30E+00	6.50E-01	4/204	N/A	N/A	N/A	N/A	0/204	0.00%	3.76E+03	No	1.7E-04
VOA	Tetrachloroethene	mg/kg	8.08E-04	1.30E+00	6.50E-01	8/228	N/A	N/A	N/A	N/A	0/228	0.00%	4.00E+01	No	1.6E-02
VOA	Toluene	mg/kg	8.08E-04	1.30E+00	6.50E-01	147/228	N/A	N/A	N/A	N/A	0/228	0.00%	6.25E+03	No	1.0E-04
VOA	Total Xylene	mg/kg	2.42E-03	1.09E+00	5.45E-01	69/217	N/A	N/A	N/A	N/A	0/217	0.00%	2.50E+02	No	2.2E-03
VOA	*trans* -1,2-Dichloroethene	mg/kg	8.08E-04	1.30E+00	6.50E-01	7/227	N/A	N/A	N/A	N/A	0/227	0.00%	4.54E+01	No	1.4E-02
VOA	*trans* -1,3-Dichloropropene	mg/kg	8.08E-04	1.30E+00	6.50E-01	0/204	N/A	N/A	N/A	N/A	0/204	0.00%	9.34E+00	No	7.0E-02
VOA	Trichloroethene	mg/kg	8.08E-04	3.62E-01	1.81E-01	113/228	N/A	N/A	N/A	N/A	0/228	0.00%	1.90E+00	No	9.5E-02
VOA	Trichlorofluoromethane	mg/kg	8.08E-04	3.62E-01	1.81E-01	0/193	N/A	N/A	N/A	N/A	0/193	0.00%	3.16E+02	No	5.7E-04
VOA	Vinyl acetate	mg/kg	1.00E-02	1.30E+00	6.50E-01	0/11	N/A	N/A	N/A	N/A	0/11	0.00%	3.85E+02	No	1.7E-03
VOA	Vinyl chloride	mg/kg	8.08E-04	1.30E+00	6.50E-01	4/228	N/A	N/A	N/A	N/A	0/228	0.00%	2.06E+00	No	3.2E-01

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory and calculated using TEF values in 2021 RMD for C-400 Basement Slab and Subsurface samples.

Total PAHs were calculated using TEF values in 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans were calculated using TEF Values in 2021 RMD.

Table C1.2. Surface and Subsurface Soil Detection Limit Evaluation

			Detection Limits				Provisional Background				Excavation Worker				
Type	Analysis	Unit	Min	Max	1/2 Max DL	FOD	FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > Bkgd?	Magnitude of Exceedance
METAL	Aluminum	mg/kg	5.00E+00	1.13E+03	5.65E+02	569/569	0/569	0.00%	1.20E+04	No	0/569	0.00%	3.26E+04	No	1.7E-02
METAL	Antimony	mg/kg	5.60E-01	3.00E+01	1.50E+01	202/416	416/416	100.00%	2.10E-01	Yes	9/416	2.16%	1.32E+01	Yes	1.1E+00
METAL	Arsenic	mg/kg	9.12E-01	2.00E+01	1.00E+01	437/571	74/571	12.96%	7.90E+00	Yes	203/571	35.55%	3.74E+00	Yes	2.7E+00
METAL	Barium	mg/kg	3.65E-01	1.00E+02	5.00E+01	570/571	0/571	0.00%	1.70E+02	No	0/571	0.00%	6.47E+03	No	7.7E-03
METAL	Beryllium	mg/kg	9.12E-02	5.83E-01	2.92E-01	412/415	0/415	0.00%	6.70E-01	No	0/415	0.00%	6.55E+01	No	4.5E-03
METAL	Boron	mg/kg	2.74E+00	3.01E+01	1.51E+01	361/408	N/A	N/A	N/A	N/A	0/408	0.00%	6.57E+03	No	2.3E-03
METAL	Cadmium	mg/kg	5.00E-02	1.20E+01	6.00E+00	347/416	266/416	63.94%	2.10E-01	Yes	0/416	0.00%	2.53E+01	No	2.4E-01
METAL	Chromium	mg/kg	5.47E-01	8.50E+01	4.25E+01	569/571	3/571	0.53%	1.60E+01	Yes	3/571	0.53%	9.14E+00	Yes	4.6E+00
METAL	Cobalt	mg/kg	1.82E-01	1.17E+00	5.85E-01	414/414	0/414	0.00%	1.30E+01	No	0/414	0.00%	9.84E+00	No	5.9E-02
METAL	Copper	mg/kg	1.82E-01	3.50E+01	1.75E+01	415/416	3/416	0.72%	1.90E+01	No	0/416	0.00%	1.32E+03	No	1.3E-02
METAL	Iron	mg/kg	5.00E+00	2.27E+03	1.14E+03	571/571	0/571	0.00%	2.80E+04	No	0/571	0.00%	2.30E+04	No	4.9E-02
METAL	Lead	mg/kg	3.00E-01	2.00E+01	1.00E+01	421/571	0/571	0.00%	2.30E+01	No	0/571	0.00%	8.00E+02	No	1.3E-02
METAL	Manganese	mg/kg	2.00E-01	2.85E+02	1.43E+02	570/570	0/570	0.00%	8.20E+02	No	0/570	0.00%	7.74E+02	No	1.8E-01
METAL	Mercury	mg/kg	1.03E-02	1.00E+01	5.00E+00	280/571	164/571	28.72%	1.30E-01	Yes	5/571	0.88%	9.86E+00	No	5.1E-01
METAL	Molybdenum	mg/kg	1.82E-01	1.50E+01	7.50E+00	409/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.64E+02	No	4.6E-02
METAL	Nickel	mg/kg	3.65E-01	6.50E+01	3.25E+01	532/571	2/571	0.35%	2.10E+01	Yes	0/571	0.00%	6.52E+02	No	5.0E-02
METAL	Selenium	mg/kg	5.00E-01	2.00E+01	1.00E+01	349/563	557/563	98.93%	7.00E-01	Yes	0/563	0.00%	1.64E+02	No	6.1E-02
METAL	Silver	mg/kg	2.00E-01	1.00E+01	5.00E+00	122/416	129/416	31.01%	2.30E+00	Yes	0/416	0.00%	1.64E+02	No	3.0E-02
METAL	Thallium	mg/kg	2.00E-01	2.00E+01	1.00E+01	120/415	411/415	99.04%	2.10E-01	Yes	409/415	98.55%	3.29E-01	Yes	3.0E+01
METAL	Uranium	mg/kg	3.00E-02	1.00E+03	5.00E+02	452/570	156/570	27.37%	4.60E+00	Yes	156/570	27.37%	6.58E+00	Yes	7.6E+01
METAL	Vanadium	mg/kg	9.12E-01	7.00E+01	3.50E+01	567/570	1/570	0.18%	3.70E+01	No	0/570	0.00%	1.65E+02	No	2.1E-01
METAL	Zinc	mg/kg	1.82E+00	4.59E+01	2.30E+01	416/416	0/416	0.00%	6.00E+01	No	0/416	0.00%	9.86E+03	No	2.3E-03
ANION	Fluoride	mg/kg	8.70E-01	4.98E+00	2.49E+00	396/408	N/A	N/A	N/A	N/A	0/408	0.00%	1.32E+03	No	1.9E-03
PPCB	Dieldrin	mg/kg	1.30E-03	1.33E-01	6.65E-02	0/26	N/A	N/A	N/A	N/A	0/26	0.00%	1.66E-01	No	4.0E-01
PPCB	Total PCB	mg/kg	3.31E-03	5.00E+00	2.50E+00	201/424	N/A	N/A	N/A	N/A	8/424	1.89%	1.12E+00	Yes	2.2E+00
SVOA	1,1-biphenyl	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	0/362	0.00%	2.69E+01	No	2.7E-01
SVOA	2,4,5-Trichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+03	No	3.8E-03
SVOA	2,4,6-Trichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+01	No	3.8E-01
SVOA	2,4-Dichlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	5.69E+01	No	1.3E-01
SVOA	2,4-Dimethylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	3.79E+02	No	1.9E-02
SVOA	2,4-Dinitrophenol	mg/kg	6.59E-01	2.90E+01	1.45E+01	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	3.79E+01	No	3.8E-01
SVOA	2,4-Dinitrotoluene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	4/391	1.02%	8.49E+00	No	8.5E-01
SVOA	2,6-Dinitrotoluene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	81/391	20.72%	1.78E+00	Yes	4.1E+00
SVOA	2-Chloronaphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.35E+03	No	5.4E-04
SVOA	2-Chlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.64E+02	No	4.4E-02
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	102/391	26.09%	1.52E+00	Yes	4.8E+00
SVOA	2-Methylnaphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	35/391	N/A	N/A	N/A	N/A	0/391	0.00%	6.73E+01	No	1.1E-02
SVOA	2-Methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	9.48E+02	No	7.6E-03
SVOA	2-Nitrobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.89E+02	No	3.8E-02
SVOA	2-Nitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	3.79E+01	No	1.9E-01
SVOA	3,3'-Dichlorobenzidine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	26/391	6.65%	5.90E+00	Yes	1.2E+00
SVOA	3-Nitrobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	26/391	6.65%	5.69E+00	Yes	1.3E+00
SVOA	4-Bromophenyl phenyl ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.91E+01	No	3.8E-01
SVOA	4-Chloro-3-methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+03	No	3.8E-03
SVOA	4-Chlorobenzenamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	3/391	0.77%	9.48E+00	No	7.6E-01
SVOA	4-Chlorophenyl phenyl ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.91E+01	No	3.8E-01
SVOA	4-Nitrophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	3.79E+01	No	1.9E-01
SVOA	Acenaphthene	mg/kg	3.29E-02	1.45E+00	7.25E-01	50/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.01E+03	No	7.2E-04
SVOA	Acenaphthylene	mg/kg	3.29E-02	1.45E+00	7.25E-01	2/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.01E+03	No	7.2E-04
SVOA	Acetophenone	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	0/362	0.00%	3.29E+03	No	2.2E-03
SVOA	Anthracene	mg/kg	3.29E-02	1.45E+00	7.25E-01	70/415	N/A	N/A	N/A	N/A	0/415	0.00%	5.05E+03	No	1.4E-04
SVOA	Atrazine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	2/362	0.55%	1.15E+01	No	6.3E-01
SVOA	Benzaldehyde	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/358	N/A	N/A	N/A	N/A	0/358	0.00%	1.15E+03	No	6.3E-03
SVOA	Benzenemethanol	mg/kg	3.45E-01	3.92E+00	1.96E+00	4/29	N/A	N/A	N/A	N/A	0/29	0.00%	1.90E+03	No	1.0E-03
SVOA	Benzo(ghi)perylene	mg/kg	3.29E-02	1.45E+00	7.25E-01	86/391	N/A	N/A	N/A	N/A	0/391	0.00%	5.05E+02	No	1.4E-03

Table C1.2. Surface and Subsurface Soil Detection Limit Evaluation (Continued)

			Detection Limits				Provisional Background				Excavation Worker				
Type	Analysis	Unit	Min	Max	1/2 Max DL	FOD	FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > Bkgd?	Magnitude of Exceedance
SVOA	Benzoic acid	mg/kg	6.89E-01	7.83E+00	3.92E+00	0/29	N/A	N/A	N/A	N/A	0/29	0.00%	7.58E+04	No	5.2E-05
SVOA	Bis(2-chloroethoxy)methane	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	5.69E+01	No	1.3E-01
SVOA	Bis(2-chloroethyl) ether	mg/kg	6.90E-03	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	59/391	15.09%	3.01E+00	Yes	2.4E+00
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	6.58E+01	No	1.1E-01
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	79/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+02	No	1.0E-02
SVOA	Butyl benzyl phthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	10/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.40E+03	No	1.4E-03
SVOA	Caprolactam	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	0/362	0.00%	9.43E+03	No	7.7E-04
SVOA	Carbazole	mg/kg	3.29E-02	1.45E+00	7.25E-01	53/386	N/A	N/A	N/A	N/A	0/386	0.00%	1.33E+02	No	5.5E-03
SVOA	Dibenzofuran	mg/kg	3.29E-01	1.45E+01	7.25E+00	6/391	N/A	N/A	N/A	N/A	0/391	0.00%	3.29E+01	No	2.2E-01
SVOA	Diethyl phthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	5/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.52E+04	No	1.3E-04
SVOA	Dimethyl phthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	4/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.52E+04	No	1.3E-04
SVOA	Di-n-butyl phthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	109/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+03	No	1.0E-03
SVOA	Di-n-octylphthalate	mg/kg	3.29E-02	3.92E+00	1.96E+00	7/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.90E+02	No	1.0E-02
SVOA	Diphenylamine	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	0/362	0.00%	1.90E+03	No	3.8E-03
SVOA	Fluoranthene	mg/kg	3.29E-02	1.45E+00	7.25E-01	186/415	N/A	N/A	N/A	N/A	0/415	0.00%	6.73E+02	No	1.1E-03
SVOA	Fluorene	mg/kg	3.29E-02	1.45E+00	7.25E-01	42/415	N/A	N/A	N/A	N/A	0/415	0.00%	6.73E+02	No	1.1E-03
SVOA	Hexachlorobenzene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/415	N/A	N/A	N/A	N/A	69/415	16.63%	2.33E+00	Yes	3.1E+00
SVOA	Hexachlorobutadiene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	2.41E+01	No	3.0E-01
SVOA	Hexachlorocyclopentadiene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	108/391	27.62%	1.00E+00	Yes	7.3E+00
SVOA	Hexachloroethane	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	1.98E+01	No	3.7E-01
SVOA	Isophorone	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	2.79E+03	No	2.6E-03
SVOA	m,p-Cresol	mg/kg	3.45E-01	3.92E+00	1.96E+00	0/29	N/A	N/A	N/A	N/A	0/29	0.00%	1.90E+03	No	1.0E-03
SVOA	m+p Methylphenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/362	N/A	N/A	N/A	N/A	0/362	0.00%	3.79E+02	No	1.9E-02
SVOA	Naphthalene	mg/kg	3.29E-02	1.45E+00	7.25E-01	35/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.67E+01	No	4.3E-02
SVOA	Nitrobenzene	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	5.63E+01	No	1.3E-01
SVOA	N-Nitroso-di-n-propylamine	mg/kg	6.90E-03	1.45E+01	7.25E+00	0/415	N/A	N/A	N/A	N/A	309/415	74.46%	3.79E-01	Yes	1.9E+01
SVOA	N-Nitrosodiphenylamine	mg/kg	3.50E-01	4.00E-01	2.00E-01	0/4	N/A	N/A	N/A	N/A	0/4	0.00%	3.79E+02	No	5.3E-04
SVOA	Pentachlorophenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	2/391	N/A	N/A	N/A	N/A	27/391	6.91%	4.06E+00	Yes	1.8E+00
SVOA	Phenanthrene	mg/kg	3.29E-02	1.45E+00	7.25E-01	174/415	N/A	N/A	N/A	N/A	0/415	0.00%	1.01E+03	No	7.2E-04
SVOA	Phenol	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	5.69E+03	No	1.3E-03
SVOA	p-Nitroaniline	mg/kg	3.29E-01	1.45E+01	7.25E+00	0/391	N/A	N/A	N/A	N/A	0/391	0.00%	7.58E+01	No	9.6E-02
SVOA	Pyrene	mg/kg	3.29E-02	1.45E+00	7.25E-01	173/415	N/A	N/A	N/A	N/A	0/415	0.00%	5.05E+02	No	1.4E-03
SVOA	Pyridine	mg/kg	6.90E-01	8.00E-01	4.00E-01	0/4	N/A	N/A	N/A	N/A	0/4	0.00%	3.29E+01	No	1.2E-02
RADS	Actinium-227	pCi/g	2.13E-01	7.12E-01	3.56E-01	0/11	N/A	N/A	N/A	N/A	0/11	0.00%	1.18E+01	No	3.0E-02
RADS	Americium-241	pCi/g	9.00E-03	1.50E+00	7.50E-01	23/580	N/A	N/A	N/A	N/A	0/580	0.00%	1.64E+01	No	4.6E-02
RADS	Americium-243	pCi/g	4.91E-02	4.91E-02	2.46E-02	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	2.11E+00	No	1.2E-02
RADS	Cesium-134	pCi/g	1.62E-02	1.62E-02	8.10E-03	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	4.01E-01	No	2.0E-02
RADS	Cesium-137	pCi/g	1.48E-02	2.87E-01	1.44E-01	104/578	1/578	0.17%	2.80E-01	No	0/578	0.00%	5.82E-01	No	2.5E-01
RADS	Cobalt-60	pCi/g	1.19E-02	7.13E-02	3.57E-02	0/167	N/A	N/A	N/A	N/A	0/167	0.00%	1.53E-01	No	2.3E-01
RADS	Lead-210	pCi/g	9.49E-01	1.90E+01	9.50E+00	0/11	N/A	N/A	N/A	N/A	5/11	45.45%	4.04E+00	Yes	2.4E+00
RADS	Neptunium-237	pCi/g	1.10E-02	1.97E+00	9.85E-01	40/580	423/580	72.93%	1.00E-01	Yes	1/580	0.17%	1.63E+00	No	6.0E-01
RADS	Neptunium-239	pCi/g	1.69E-01	1.69E-01	8.45E-02	0/1	N/A	N/A	N/A	N/A	0/1	0.00%	1.46E+03	No	5.8E-05
RADS	Plutonium-238	pCi/g	1.50E-02	1.37E+00	6.85E-01	6/425	421/425	99.06%	7.30E-02	Yes	0/425	0.00%	1.94E+01	No	3.5E-02
RADS	Plutonium-239/240	pCi/g	4.30E-03	1.33E+00	6.65E-01	54/581	577/581	99.31%	2.50E-02	Yes	0/581	0.00%	1.83E+01	No	3.6E-02
RADS	Protactinium-231	pCi/g	3.87E-01	6.62E-01	3.31E-01	0/8	N/A	N/A	N/A	N/A	0/8	0.00%	6.23E+00	No	5.3E-02
RADS	Radium-226	pCi/g	3.50E-01	1.47E+00	7.35E-01	7/11	0/11	0.00%	1.50E+00	No	11/11	100.00%	1.64E-01	Yes	4.5E+00
RADS	Strontium-90	pCi/g	1.28E-01	1.90E+00	9.50E-01	3/11	0/11	0.00%	4.70E+00	No	0/11	0.00%	2.49E+01	No	3.8E-02
RADS	Technetium-99	pCi/g	4.90E-01	5.77E+00	2.89E+00	201/592	502/592	84.80%	2.50E+00	Yes	0/592	0.00%	1.55E+03	No	1.9E-03
RADS	Thorium-228	pCi/g	2.00E-02	1.18E+00	5.90E-01	9/16	0/16	0.00%	1.60E+00	No	0/16	0.00%	6.34E+01	No	9.3E-03
RADS	Thorium-230	pCi/g	7.00E-03	3.94E+00	1.97E+00	497/581	3/581	0.52%	1.40E+00	Yes	0/581	0.00%	2.82E+01	No	7.0E-02
RADS	Thorium-232	pCi/g	7.00E-03	8.46E-01	4.23E-01	11/16	0/16	0.00%	1.50E+00	No	0/16	0.00%	2.60E+01	No	1.6E-02
RADS	Uranium-233/234	pCi/g	2.55E-01	1.66E+01	8.30E+00	352/403	17/403	4.22%	1.20E+00	Yes	0/403	0.00%	4.30E+01	No	1.9E-01
RADS	Uranium-234	pCi/g	2.00E-02	1.43E+00	7.15E-01	31/135	6/135	4.44%	1.20E+00	No	0/135	0.00%	4.30E+01	No	1.7E-02
RADS	Uranium-235	pCi/g	1.76E-02	7.31E-01	3.66E-01	120/173	19/173	10.98%	6.00E-02	Yes	0/173	0.00%	2.62E+00	No	1.4E-01
RADS	Uranium-235/236	pCi/g	1.00E-02	1.41E+01	7.05E+00	116/407	403/407	99.02%	6.00E-02	Yes	3/407	0.74%	2.62E+00	Yes	2.7E+00

Table C1.2. Surface and Subsurface Soil Detection Limit Evaluation (Continued)

			Detection Limits				Provisional Background				Excavation Worker				
Type	Analysis	Unit	Min	Max	1/2 Max DL	FOD	FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > Bkgd?	Magnitude of Exceedance
RADS	Uranium-238	pCi/g	9.00E-03	1.60E+01	8.00E+00	511/548	17/548	3.10%	1.20E+00	Yes	1/548	0.18%	8.98E+00	No	8.9E-01
VOA	1,1,1,2-Tetrachloroethane	mg/kg	5.40E-03	6.20E-03	3.10E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	4.68E+01	No	6.6E-05
VOA	1,1,1-Trichloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/492	N/A	N/A	N/A	N/A	0/492	0.00%	4.54E+03	No	2.5E-04
VOA	1,1,2,2-Tetrachloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	1.11E+01	No	1.0E-01
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.04E-03	1.12E+01	5.60E+00	2/386	N/A	N/A	N/A	N/A	0/386	0.00%	3.79E+03	No	1.5E-03
VOA	1,1,2-Trichloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	5/492	N/A	N/A	N/A	N/A	4/492	0.81%	8.49E-01	Yes	1.3E+00
VOA	1,1-Dichloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	1/468	N/A	N/A	N/A	N/A	0/468	0.00%	9.52E+01	No	1.2E-02
VOA	1,1-Dichloroethene	mg/kg	8.08E-04	2.24E+00	1.12E+00	19/517	N/A	N/A	N/A	N/A	0/517	0.00%	1.26E+02	No	8.9E-03
VOA	1,2,3-Trichlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	1/386	N/A	N/A	N/A	N/A	0/386	0.00%	2.63E+01	No	4.3E-02
VOA	1,2,3-Trichloropropane	mg/kg	5.40E-03	6.20E-03	3.10E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	1.53E-01	No	2.0E-02
VOA	1,2,4-Trichlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	2/386	N/A	N/A	N/A	N/A	0/386	0.00%	3.20E+01	No	3.5E-02
VOA	1,2-Dibromo-3-chloropropane	mg/kg	8.08E-04	2.24E+00	1.12E+00	1/386	N/A	N/A	N/A	N/A	1/386	0.26%	4.10E-01	Yes	2.7E+00
VOA	1,2-Dibromoethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/392	N/A	N/A	N/A	N/A	1/392	0.26%	7.86E-01	Yes	1.4E+00
VOA	1,2-Dichlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	1/386	N/A	N/A	N/A	N/A	0/386	0.00%	9.43E+02	No	1.2E-03
VOA	1,2-Dichloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	2/492	N/A	N/A	N/A	N/A	0/492	0.00%	1.13E+01	No	9.9E-02
VOA	1,2-Dichloroethene	mg/kg	2.00E-03	2.01E-01	1.01E-01	1/31	N/A	N/A	N/A	N/A	0/31	0.00%	2.96E+02	No	3.4E-04
VOA	1,2-Dichloropropane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	8.91E+00	No	1.3E-01
VOA	1,2-Dimethylbenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	78/492	N/A	N/A	N/A	N/A	0/492	0.00%	3.61E+02	No	3.1E-03
VOA	1,3-Dichlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	2/386	N/A	N/A	N/A	N/A	0/386	0.00%	9.43E+02	No	1.2E-03
VOA	1,4-Dichlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	1/386	N/A	N/A	N/A	N/A	0/386	0.00%	7.20E+01	No	1.6E-02
VOA	1,4-Dioxane	mg/kg	4.04E-02	1.12E+02	5.60E+01	2/353	N/A	N/A	N/A	N/A	1/353	0.28%	4.30E+01	Yes	1.3E+00
VOA	2-Butanone	mg/kg	4.04E-03	1.12E+01	5.60E+00	140/462	N/A	N/A	N/A	N/A	0/462	0.00%	1.28E+04	No	4.4E-04
VOA	2-Chloroethyl vinyl ether	mg/kg	4.04E-03	1.12E+01	5.60E+00	0/386	N/A	N/A	N/A	N/A	6/386	1.55%	4.80E-01	Yes	1.2E+01
VOA	2-Hexanone	mg/kg	4.04E-03	1.12E+01	5.60E+00	28/468	N/A	N/A	N/A	N/A	0/468	0.00%	9.69E+01	No	5.8E-02
VOA	2-Methoxy-2-methylpropane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/386	N/A	N/A	N/A	N/A	0/386	0.00%	9.70E+02	No	1.2E-03
VOA	4-Methyl-2-pentanone	mg/kg	4.04E-03	1.12E+01	5.60E+00	24/468	N/A	N/A	N/A	N/A	0/468	0.00%	2.31E+03	No	2.4E-03
VOA	Acetone	mg/kg	4.04E-03	1.12E+01	5.60E+00	325/466	N/A	N/A	N/A	N/A	0/466	0.00%	2.96E+04	No	1.9E-04
VOA	Acrolein	mg/kg	4.04E-03	1.12E+01	5.60E+00	4/386	N/A	N/A	N/A	N/A	9/386	2.33%	8.14E-02	Yes	6.9E+01
VOA	Acrylonitrile	mg/kg	4.04E-03	1.12E+01	5.60E+00	0/410	N/A	N/A	N/A	N/A	1/410	0.24%	4.46E+00	Yes	1.3E+00
VOA	Benzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	25/492	N/A	N/A	N/A	N/A	0/492	0.00%	2.59E+01	No	4.3E-02
VOA	Bromochloromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/386	N/A	N/A	N/A	N/A	0/386	0.00%	8.48E+01	No	1.3E-02
VOA	Bromodichloromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/492	N/A	N/A	N/A	N/A	0/492	0.00%	7.93E+00	No	1.4E-01
VOA	Bromoform	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	3.24E+02	No	3.5E-03
VOA	Bromomethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	3.80E+00	No	2.9E-01
VOA	Carbon disulfide	mg/kg	4.04E-03	1.12E+01	5.60E+00	5/468	N/A	N/A	N/A	N/A	0/468	0.00%	4.21E+02	No	1.3E-02
VOA	Carbon tetrachloride	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/492	N/A	N/A	N/A	N/A	0/492	0.00%	1.57E+01	No	7.1E-02
VOA	Chlorobenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	1.48E+02	No	7.6E-03
VOA	Chloroethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	3.07E+03	No	3.6E-04
VOA	Chloroform	mg/kg	8.08E-04	2.24E+00	1.12E+00	68/492	N/A	N/A	N/A	N/A	0/492	0.00%	8.90E+00	No	1.3E-01
VOA	Chloromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	6.26E+01	No	1.8E-02
VOA	*cis* -1,2-Dichloroethene	mg/kg	8.08E-04	2.24E+00	1.12E+00	116/510	N/A	N/A	N/A	N/A	0/510	0.00%	6.58E+01	No	1.7E-02
VOA	*cis* -1,3-Dichloropropene	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	2.83E+01	No	4.0E-02
VOA	Cumene	mg/kg	8.08E-04	2.24E+00	1.12E+00	13/386	N/A	N/A	N/A	N/A	0/386	0.00%	1.02E+03	No	1.1E-03
VOA	Cyclohexane	mg/kg	8.08E-04	2.24E+00	1.12E+00	42/386	N/A	N/A	N/A	N/A	0/386	0.00%	3.70E+03	No	3.0E-04
VOA	Dibromochloromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	5.48E+01	No	2.0E-02
VOA	Dibromomethane	mg/kg	5.40E-03	6.20E-03	3.10E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	1.28E+01	No	2.4E-04
VOA	Dichlorodifluoromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/392	N/A	N/A	N/A	N/A	0/392	0.00%	4.94E+01	No	2.3E-02
VOA	Ethyl methacrylate	mg/kg	5.40E-03	6.20E-03	3.10E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	7.61E+02	No	4.1E-06
VOA	Ethylbenzene	mg/kg	8.08E-04	2.24E+00	1.12E+00	60/492	N/A	N/A	N/A	N/A	0/492	0.00%	1.30E+02	No	8.6E-03
VOA	Iodomethane	mg/kg	5.40E-03	6.20E-03	3.10E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	6.26E+01	No	5.0E-05
VOA	m,p-Xylene	mg/kg	1.62E-03	4.49E+00	2.25E+00	86/492	N/A	N/A	N/A	N/A	0/492	0.00%	3.23E+02	No	7.0E-03
VOA	Methyl acetate	mg/kg	4.04E-03	1.12E+01	5.60E+00	5/386	N/A	N/A	N/A	N/A	0/386	0.00%	3.29E+04	No	1.7E-04
VOA	Methylcyclohexane	mg/kg	8.08E-04	2.24E+00	1.12E+00	100/386	N/A	N/A	N/A	N/A	0/386	0.00%	1.76E+03	No	6.4E-04
VOA	Methylene chloride	mg/kg	4.04E-03	1.12E+01	5.60E+00	137/468	N/A	N/A	N/A	N/A	0/468	0.00%	1.57E+02	No	3.6E-02
VOA	Styrene	mg/kg	8.08E-04	2.24E+00	1.12E+00	5/468	N/A	N/A	N/A	N/A	0/468	0.00%	3.00E+03	No	3.7E-04

Table C1.2. Surface and Subsurface Soil Detection Limit Evaluation (Continued)

Type	Analysis	Unit	Detection Limits		1/2 Max DL	FOD	Provisional Background				Excavation Worker				
			Min	Max			FOE	%	Bkgd	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > Bkgd?	Magnitude of Exceedance
VOA	Tetrachloroethene	mg/kg	8.08E-04	2.24E+00	1.12E+00	15/492	N/A	N/A	N/A	N/A	0/492	0.00%	4.34E+01	No	2.6E-02
VOA	Toluene	mg/kg	8.08E-04	2.24E+00	1.12E+00	198/492	N/A	N/A	N/A	N/A	0/492	0.00%	2.18E+03	No	5.1E-04
VOA	Total Xylene	mg/kg	2.42E-03	6.73E+00	3.37E+00	78/410	N/A	N/A	N/A	N/A	0/410	0.00%	3.23E+02	No	1.0E-02
VOA	*trans* -1,2-Dichloroethene	mg/kg	8.08E-04	2.24E+00	1.12E+00	33/510	N/A	N/A	N/A	N/A	0/510	0.00%	5.67E+01	No	2.0E-02
VOA	*trans* -1,3-Dichloropropene	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/468	N/A	N/A	N/A	N/A	0/468	0.00%	2.83E+01	No	4.0E-02
VOA	*Trans* -1,4-Dichloro-2-butene	mg/kg	1.10E-02	1.20E-02	6.00E-03	0/6	N/A	N/A	N/A	N/A	0/6	0.00%	2.19E-01	No	2.7E-02
VOA	Trichloroethene	mg/kg	8.08E-04	5.00E+00	2.50E+00	278/521	N/A	N/A	N/A	N/A	4/521	0.77%	2.26E+00	Yes	1.1E+00
VOA	Trichlorofluoromethane	mg/kg	8.08E-04	2.24E+00	1.12E+00	0/392	N/A	N/A	N/A	N/A	0/392	0.00%	4.11E+02	No	2.7E-03
VOA	Vinyl acetate	mg/kg	5.40E-03	1.30E+00	6.50E-01	0/82	N/A	N/A	N/A	N/A	0/82	0.00%	5.12E+02	No	1.3E-03
VOA	Vinyl chloride	mg/kg	8.08E-04	2.24E+00	1.12E+00	24/517	N/A	N/A	N/A	N/A	0/517	0.00%	4.72E+00	No	2.4E-01

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory and calculated using TEF values in 2021 RMD for C-400 Basement Slab and Subsurface samples.

Total PAHs were calculated using TEF values in 2021 RMD.

Background value is the lower of Surface or Subsurface Background levels.

Total Dioxin and Furans were calculated using TEF Values in 2021 RMD.

Table C1.3. Groundwater Detection Limit Evaluation

			Detection Limits				Provisional Background				Resident				
Type	Analysis	Unit	Min	Max	1/2 Max	FOD	FOE	%	Bkgd*	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
METAL	Aluminum	mg/L	5.00E-02	2.00E-01	1.00E-01	144/275	0/275	0.00%	6.87E-01	No	0/275	0.00%	2.00E+00	No	5.0E-02
METAL	Antimony	mg/L	3.00E-03	5.00E-03	2.50E-03	27/275	0/275	0.00%	6.00E-02	No	275/275	100.00%	7.79E-04	No	3.2E+00
METAL	Arsenic	mg/L	1.00E-03	5.00E-03	2.50E-03	96/275	0/275	0.00%	5.00E-03	No	275/275	100.00%	5.17E-05	No	4.8E+01
METAL	Barium	mg/L	2.00E-03	5.00E-03	2.50E-03	275/275	0/275	0.00%	2.35E-01	No	0/275	0.00%	3.77E-01	No	6.6E-03
METAL	Beryllium	mg/L	5.00E-04	1.00E-03	5.00E-04	21/275	0/275	0.00%	4.00E-03	No	0/275	0.00%	2.46E-03	No	2.0E-01
METAL	Boron	mg/L	1.50E-02	1.50E-02	7.50E-03	271/273	N/A	N/A	N/A	N/A	0/273	0.00%	3.99E-01	No	1.9E-02
METAL	Cadmium	mg/L	1.00E-03	1.00E-03	5.00E-04	12/275	0/275	0.00%	1.00E-02	No	275/275	100.00%	9.22E-04	No	5.4E-01
METAL	Chromium	mg/L	1.00E-02	1.00E-01	5.00E-02	169/275	2/275	0.73%	6.00E-02	No	275/275	100.00%	3.50E-05	No	1.4E+03
METAL	Cobalt	mg/L	1.00E-03	1.00E-03	5.00E-04	198/275	0/275	0.00%	4.50E-02	No	275/275	100.00%	6.01E-04	No	8.3E-01
METAL	Copper	mg/L	1.00E-03	2.00E-02	1.00E-02	262/275	0/275	0.00%	3.60E-02	No	0/275	0.00%	7.99E-02	No	1.3E-01
METAL	Iron	mg/L	1.00E-01	1.00E+00	5.00E-01	251/275	0/275	0.00%	5.03E+00	No	0/275	0.00%	1.40E+00	No	3.6E-01
METAL	Lead	mg/L	1.30E-03	2.00E-03	1.00E-03	74/275	0/275	0.00%	5.00E-02	No	0/275	0.00%	1.50E-02	No	6.7E-02
METAL	Manganese	mg/L	5.00E-03	1.00E-01	5.00E-02	268/275	0/275	0.00%	1.19E-01	No	17/275	6.18%	4.34E-02	No	1.2E+00
METAL	Mercury	mg/L	2.00E-04	2.00E-04	1.00E-04	24/273	0/273	0.00%	2.00E-04	No	0/273	0.00%	5.66E-04	No	1.8E-01
METAL	Molybdenum	mg/L	5.00E-04	1.00E-03	5.00E-04	179/275	0/275	0.00%	5.00E-02	No	0/275	0.00%	9.98E-03	No	5.0E-02
METAL	Nickel	mg/L	2.00E-03	5.00E-03	2.50E-03	275/275	0/275	0.00%	1.09E-01	No	0/275	0.00%	3.92E-02	No	6.4E-02
METAL	Selenium	mg/L	5.00E-03	5.00E-03	2.50E-03	25/275	0/275	0.00%	5.00E-03	No	0/275	0.00%	9.98E-03	No	2.5E-01
METAL	Silver	mg/L	1.00E-03	1.00E-03	5.00E-04	14/275	0/275	0.00%	1.10E-02	No	0/275	0.00%	9.41E-03	No	5.3E-02
METAL	Thallium	mg/L	2.00E-03	2.00E-03	1.00E-03	4/273	0/273	0.00%	5.60E-02	No	273/273	100.00%	2.00E-05	No	5.0E+01
METAL	Uranium	mg/L	2.00E-04	5.00E-03	2.50E-03	123/320	45/320	14.06%	1.00E-03	Yes	46/320	14.38%	3.99E-04	No	6.3E+00
METAL	Vanadium	mg/L	2.00E-02	2.00E-02	1.00E-02	59/273	0/273	0.00%	1.26E-01	No	273/273	100.00%	8.64E-03	No	1.2E+00
METAL	Zinc	mg/L	1.00E-02	2.00E-02	1.00E-02	228/275	0/275	0.00%	5.40E-02	No	0/275	0.00%	6.00E-01	No	1.7E-02
ANION	Fluoride	mg/L	1.00E-01	2.00E-01	1.00E-01	273/275	0/275	0.00%	2.70E-01	No	275/275	100.00%	7.99E-02	No	1.3E+00
ANION	Nitrate as Nitrogen	mg/L	1.00E-01	5.00E+00	2.50E+00	62/69	17/69	24.64%	1.47E+00	Yes	6/69	8.70%	3.19E+00	No	7.8E-01
ANION	Sulfate	mg/L	4.00E-01	2.00E+01	1.00E+01	69/69	1/69	1.45%	1.99E+01	No	0/69	0.00%	N/A	N/A	N/A
PPCB	Total PCB	mg/L	9.38E-05	4.97E-04	2.49E-04	5/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.36E-05	No	5.7E+00
RADS	Americium-241	pCi/L	2.11E-01	1.41E+00	7.05E-01	0/273	N/A	N/A	N/A	N/A	150/273	54.95%	5.04E-01	No	1.4E+00
RADS	Cesium-137	pCi/L	4.22E+00	1.43E+01	7.15E+00	0/272	N/A	N/A	N/A	N/A	272/272	100.00%	1.71E+00	No	4.2E+00
RADS	Neptunium-237	pCi/L	2.53E-01	1.42E+00	7.10E-01	8/273	245/273	89.74%	5.00E-01	Yes	122/273	44.69%	7.63E-01	No	9.3E-01
RADS	Plutonium-238	pCi/L	1.81E-01	1.42E+00	7.10E-01	0/273	N/A	N/A	N/A	N/A	209/273	76.56%	3.98E-01	No	1.8E+00
RADS	Plutonium-239/240	pCi/L	2.75E-01	1.38E+00	6.90E-01	0/273	273/273	100.00%	1.00E-01	Yes	246/273	90.11%	3.87E-01	No	1.8E+00
RADS	Technetium-99	pCi/L	1.82E+00	4.69E+01	2.35E+01	705/822	110/822	13.38%	2.06E+01	Yes	190/822	23.11%	1.90E+01	No	1.2E+00
RADS	Thorium-230	pCi/L	3.15E-01	1.44E+00	7.20E-01	1/273	7/273	2.56%	1.10E+00	No	200/273	73.26%	5.72E-01	No	1.3E+00
RADS	Uranium-233/234	pCi/L	2.22E-01	1.42E+00	7.10E-01	5/273	272/273	99.63%	3.00E-01	Yes	108/273	39.56%	7.39E-01	No	9.6E-01
RADS	Uranium-235/236	pCi/L	1.27E-01	1.26E+00	6.30E-01	2/273	266/273	97.44%	2.00E-01	Yes	39/273	14.29%	7.28E-01	No	8.7E-01
RADS	Uranium-238	pCi/L	1.02E-01	1.25E+00	6.25E-01	23/273	251/273	91.94%	3.00E-01	Yes	94/273	34.43%	6.01E-01	No	1.0E+00
SVOA	1,1-biphenyl	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	8.34E-05	No	7.7E+01
SVOA	2,4,5-Trichlorophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.18E-01	No	5.5E-02
SVOA	2,4,6-Trichlorophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.21E-03	No	5.3E+00
SVOA	2,4-Dichlorophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.57E-03	No	1.4E+00
SVOA	2,4-Dimethylphenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	3.55E-02	No	1.8E-01
SVOA	2,4-Dinitrophenol	mg/L	1.82E-02	2.57E-02	1.29E-02	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.88E-03	No	3.3E+00
SVOA	2,4-Dinitrotoluene	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	2.37E-04	No	2.7E+01
SVOA	2,6-Dinitrotoluene	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.85E-05	No	1.3E+02
SVOA	2-Chloronaphthalene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	7.47E-02	No	8.6E-03
SVOA	2-Chlorophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	272/273	99.63%	9.13E-03	No	7.1E-01
SVOA	2-Methyl-4,6-dinitrophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.51E-04	No	4.3E+01
SVOA	2-Methylnaphthalene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	3.59E-03	No	1.8E-01
SVOA	2-Methylphenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	9.26E-02	No	7.0E-02
SVOA	2-Nitrobenzenamine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.89E-02	No	3.4E-01
SVOA	2-Nitrophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.88E-03	No	1.7E+00
SVOA	3,3'-Dichlorobenzidine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.25E-04	No	5.2E+01
SVOA	3-Nitrobenzenamine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	5.85E-04	No	1.1E+01

Table C1.3. Groundwater Detection Limit Evaluation (Continued)

			Detection Limits				Provisional Background				Resident				
Type	Analysis	Unit	Min	Max	1/2 Max	FOD	FOE	%	Bkgd*	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
SVOA	4-Bromophenyl phenyl ether	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	8.34E-05	No	7.7E+01
SVOA	4-Chloro-3-methylphenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.45E-01	No	4.4E-02
SVOA	4-Chlorobenzenamine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.65E-04	No	1.8E+01
SVOA	4-Chlorophenyl phenyl ether	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	8.34E-05	No	7.7E+01
SVOA	4-Nitrophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.88E-03	No	1.7E+00
SVOA	Acenaphthene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	5.35E-02	No	1.2E-02
SVOA	Acenaphthylene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	5.35E-02	No	1.2E-02
SVOA	Acetophenone	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.92E-01	No	3.4E-02
SVOA	Anthracene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.77E-01	No	3.6E-03
SVOA	Atrazine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.02E-04	No	2.1E+01
SVOA	Benzaldehyde	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.86E-02	No	3.5E-01
SVOA	Benzo(ghi)perylene	mg/L	9.09E-04	1.29E-03	6.45E-04	3/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.21E-02	No	5.3E-02
SVOA	Bis(2-chloroethoxy)methane	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	5.90E-03	No	1.1E+00
SVOA	Bis(2-chloroethyl) ether	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.37E-05	No	4.7E+02
SVOA	Bis(2-chloroisopropyl) ether	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.57E-04	No	1.8E+01
SVOA	Bis(2-ethylhexyl)phthalate	mg/L	9.09E-04	1.29E-03	6.45E-04	44/273	N/A	N/A	N/A	N/A	0/273	0.00%	5.56E-03	No	1.2E-01
SVOA	Butyl benzyl phthalate	mg/L	9.09E-03	1.29E-02	6.45E-03	6/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.63E-02	No	4.0E-01
SVOA	Caprolactam	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	9.92E-01	No	6.5E-03
SVOA	Carbazole	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	2.03E-03	No	3.2E-01
SVOA	Dibenzofuran	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	7.86E-04	No	8.2E+00
SVOA	Diethyl phthalate	mg/L	9.09E-03	1.29E-02	6.45E-03	2/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.48E+00	No	4.4E-03
SVOA	Dimethyl phthalate	mg/L	9.09E-03	1.29E-02	6.45E-03	1/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.48E+00	No	4.4E-03
SVOA	Di-n-butyl phthalate	mg/L	9.09E-03	1.29E-02	6.45E-03	13/273	N/A	N/A	N/A	N/A	0/273	0.00%	9.02E-02	No	7.2E-02
SVOA	Di-n-octylphthalate	mg/L	9.09E-03	1.29E-02	6.45E-03	16/273	N/A	N/A	N/A	N/A	0/273	0.00%	2.01E-02	No	3.2E-01
SVOA	Diphenylamine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.26E-01	No	5.1E-02
SVOA	Fluoranthene	mg/L	9.09E-04	1.29E-03	6.45E-04	2/273	N/A	N/A	N/A	N/A	0/273	0.00%	8.02E-02	No	8.0E-03
SVOA	Fluorene	mg/L	9.09E-04	1.29E-03	6.45E-04	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	2.94E-02	No	2.2E-02
SVOA	Hexachlorobenzene	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	9.76E-06	No	6.6E+02
SVOA	Hexachlorobutadiene	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.39E-04	No	4.6E+01
SVOA	Hexachlorocyclopentadiene	mg/L	9.09E-03	1.29E-02	6.45E-03	2/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.12E-05	No	1.6E+02
SVOA	Hexachloroethane	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.28E-04	No	2.0E+01
SVOA	Isophorone	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	7.81E-02	No	8.3E-02
SVOA	m+p Methylphenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	3.71E-02	No	1.7E-01
SVOA	Naphthalene	mg/L	9.09E-04	1.29E-03	6.45E-04	1/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.17E-04	No	5.5E+00
SVOA	Nitrobenzene	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.40E-04	No	4.6E+01
SVOA	N-Nitroso-di-n-propylamine	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	1.08E-05	No	6.0E+02
SVOA	Pentachlorophenol	mg/L	9.09E-03	1.29E-02	6.45E-03	2/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.13E-05	No	1.6E+02
SVOA	Phenanthrene	mg/L	9.09E-04	1.29E-03	6.45E-04	1/273	N/A	N/A	N/A	N/A	0/273	0.00%	5.35E-02	No	1.2E-02
SVOA	Phenol	mg/L	9.09E-03	1.29E-02	6.45E-03	0/273	N/A	N/A	N/A	N/A	0/273	0.00%	5.77E-01	No	1.1E-02
SVOA	p-Nitroaniline	mg/L	9.09E-03	1.29E-02	6.45E-03	10/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.78E-03	No	1.7E+00
SVOA	Pyrene	mg/L	9.09E-04	1.29E-03	6.45E-04	2/273	N/A	N/A	N/A	N/A	0/273	0.00%	1.21E-02	No	5.3E-02
SVOA	Total PAH	mg/L	--	--	--	7/273	N/A	N/A	N/A	N/A	0/273	0.00%	2.51E-05	No	N/A
VOA	1,1,1-Trichloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	11/288	N/A	N/A	N/A	N/A	3/288	1.04%	8.01E-01	No	3.1E+01
VOA	1,1,2,2-Tetrachloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	7.57E-05	No	3.3E+05
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	5.00E-03	2.50E+02	1.25E+02	37/273	N/A	N/A	N/A	N/A	7/273	2.56%	1.02E+00	No	1.2E+02
VOA	1,1,2-Trichloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	80/288	N/A	N/A	N/A	N/A	288/288	100.00%	4.15E-05	No	6.0E+05
VOA	1,1-Dichloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	19/288	N/A	N/A	N/A	N/A	143/288	49.65%	2.75E-03	No	9.1E+03
VOA	1,1-Dichloroethene	mg/L	1.00E-03	5.00E+01	2.50E+01	144/844	N/A	N/A	N/A	N/A	441/844	52.25%	2.85E-02	No	8.8E+02
VOA	1,2,3-Trichlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	7.04E-04	No	3.6E+04
VOA	1,2,4-Trichlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.99E-04	No	6.3E+04
VOA	1,2-Dibromo-3-chloropropane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.34E-07	No	7.5E+07
VOA	1,2-Dibromoethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	7.47E-06	No	3.3E+06
VOA	1,2-Dichlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	3/273	N/A	N/A	N/A	N/A	91/273	33.33%	3.04E-02	No	8.2E+02

Table C1.3. Groundwater Detection Limit Evaluation (Continued)

Type	Analysis	Unit	Detection Limits		1/2 Max	FOD	Provisional Background				Resident				
			Min	Max			FOE	%	Bkgd*	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance
VOA	1,2-Dichloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	8/288	N/A	N/A	N/A	N/A	288/288	100.00%	1.71E-04	No	1.5E+05
VOA	1,2-Dichloropropane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	8.25E-04	No	3.0E+04
VOA	1,2-Dimethylbenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	109/273	39.93%	1.93E-02	No	1.3E+03
VOA	1,3-Dichlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	91/273	33.33%	3.04E-02	No	8.2E+02
VOA	1,4-Dichlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.82E-04	No	5.2E+04
VOA	1,4-Dioxane	mg/L	5.00E-02	2.50E+03	1.25E+03	2/204	N/A	N/A	N/A	N/A	204/204	100.00%	4.59E-04	No	2.7E+06
VOA	2-Butanone	mg/L	1.00E-03	2.50E+02	1.25E+02	31/408	N/A	N/A	N/A	N/A	29/408	7.11%	5.57E-01	No	2.2E+02
VOA	2-Chloroethyl vinyl ether	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	6.50E-06	No	1.9E+07
VOA	2-Hexanone	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	3.80E-03	No	3.3E+04
VOA	2-Methoxy-2-methylpropane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	109/273	39.93%	1.43E-02	No	1.7E+03
VOA	4-Methyl-2-pentanone	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	106/273	38.83%	1.24E-01	No	1.0E+03
VOA	Acetone	mg/L	5.00E-03	2.50E+02	1.25E+02	4/273	N/A	N/A	N/A	N/A	4/273	1.47%	1.80E+00	No	6.9E+01
VOA	Acrolein	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.15E-06	No	3.0E+07
VOA	Acrylonitrile	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	5.23E-05	No	2.4E+06
VOA	Benzene	mg/L	1.00E-03	5.00E+01	2.50E+01	6/423	N/A	N/A	N/A	N/A	423/423	100.00%	4.55E-04	No	5.5E+04
VOA	Bromochloromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	123/273	45.05%	8.34E-03	No	3.0E+03
VOA	Bromodichloromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	10/288	N/A	N/A	N/A	N/A	288/288	100.00%	1.34E-04	No	1.9E+05
VOA	Bromoform	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	131/273	47.99%	3.29E-03	No	7.6E+03
VOA	Bromomethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	7.55E-04	No	3.3E+04
VOA	Carbon disulfide	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	109/273	39.93%	8.11E-02	No	1.5E+03
VOA	Carbon tetrachloride	mg/L	1.00E-03	5.00E+01	2.50E+01	57/423	N/A	N/A	N/A	N/A	423/423	100.00%	4.55E-04	No	5.5E+04
VOA	Chlorobenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/408	N/A	N/A	N/A	N/A	219/408	53.68%	7.77E-03	No	3.2E+03
VOA	Chloroethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	3/273	1.10%	8.34E-01	No	3.0E+01
VOA	Chloroform	mg/L	1.00E-03	5.00E+01	2.50E+01	106/288	N/A	N/A	N/A	N/A	288/288	100.00%	2.21E-04	No	1.1E+05
VOA	Chloromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	131/273	47.99%	2.03E-03	No	1.2E+04
VOA	*cis*-1,2-Dichloroethene	mg/L	1.00E-03	5.00E+01	2.50E+01	675/833	N/A	N/A	N/A	N/A	678/833	81.39%	3.61E-03	No	6.9E+03
VOA	*cis*-1,3-Dichloropropene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.71E-04	No	5.3E+04
VOA	Cumene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	91/273	33.33%	4.51E-02	No	5.5E+02
VOA	Cyclohexane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	2/273	0.73%	1.25E+00	No	2.0E+01
VOA	Dibromochloromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	8.71E-04	No	2.9E+04
VOA	Dichlorodifluoromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	109/273	39.93%	1.97E-02	No	1.3E+03
VOA	Ethylbenzene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/288	N/A	N/A	N/A	N/A	146/288	50.69%	1.50E-03	No	1.7E+04
VOA	m,p-Xylene	mg/L	2.00E-03	1.00E+02	5.00E+01	0/273	N/A	N/A	N/A	N/A	123/273	45.05%	1.93E-02	No	2.6E+03
VOA	Methyl acetate	mg/L	5.00E-03	2.50E+02	1.25E+02	0/273	N/A	N/A	N/A	N/A	4/273	1.47%	1.99E+00	No	6.3E+01
VOA	Methylcyclohexane	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	3/273	1.10%	6.26E-01	No	4.0E+01
VOA	Methylene chloride	mg/L	5.00E-03	2.50E+02	1.25E+02	44/273	N/A	N/A	N/A	N/A	131/273	47.99%	1.07E-02	No	1.2E+04
VOA	Styrene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	15/273	5.49%	1.21E-01	No	2.1E+02
VOA	Tetrachloroethene	mg/L	1.00E-03	5.00E+01	2.50E+01	112/423	N/A	N/A	N/A	N/A	249/423	58.87%	4.06E-03	No	6.2E+03
VOA	Toluene	mg/L	1.00E-03	5.00E+01	2.50E+01	7/288	N/A	N/A	N/A	N/A	22/288	7.64%	1.10E-01	No	2.3E+02
VOA	Total Xylene	mg/L	3.00E-03	1.50E+02	7.50E+01	0/288	N/A	N/A	N/A	N/A	135/288	46.88%	1.93E-02	No	3.9E+03
VOA	*trans*-1,2-Dichloroethene	mg/L	1.00E-03	5.00E+01	2.50E+01	92/833	N/A	N/A	N/A	N/A	562/833	67.47%	9.29E-03	No	2.7E+03
VOA	*trans*-1,3-Dichloropropene	mg/L	1.00E-03	5.00E+01	2.50E+01	0/273	N/A	N/A	N/A	N/A	273/273	100.00%	4.71E-04	No	5.3E+04
VOA	Trichloroethene	mg/L	1.00E-03	5.00E+01	2.50E+01	842/844	N/A	N/A	N/A	N/A	844/844	100.00%	2.83E-04	No	8.8E+04
VOA	Trichlorofluoromethane	mg/L	1.00E-03	5.00E+01	2.50E+01	4/273	N/A	N/A	N/A	N/A	15/273	5.49%	1.14E-01	No	2.2E+02
VOA	Vinyl chloride	mg/L	1.00E-03	5.00E+01	2.50E+01	29/833	N/A	N/A	N/A	N/A	833/833	100.00%	1.88E-05	No	1.3E+06

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

*- Screened against the lower of background values

Table C1.3. Groundwater Detection Limit Evaluation (Continued)

			Detection Limits				Provisional Background				Resident				
Type	Analysis	Unit	Min	Max	1/2 Max	FOD	FOE	%	Bkgd*	1/2 Max > Bkgd?	FOE	%	NAL	1/2 Max > NAL?	Magnitude of Exceedance

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Plutonium-239/240 was screened against plutonium-239.

Uranium-233/234 was screened against uranium-234.

Uranium-235/236 was screened against uranium-235.

Uranium was screened against uranium (soluble salts).

Table C1.4. Sector 1 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		
					FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	1.05E+04	96/96	0/96	1.30E+04	0/96	1.00E+05	0/96	1.00E+05	9.16 - 94.7
METAL	Antimony	mg/kg	1.30E+01	66/96	66/96	2.10E-01	0/96	9.34E+01	0/96	2.80E+03	0.904 - 19.4
METAL	Arsenic	mg/kg	1.15E+01	95/96	0/96	1.20E+01	93/96	1.60E+00	0/96	1.60E+02	0.912 - 5.13
METAL	Barium	mg/kg	3.87E+02	96/96	1/96	2.00E+02	0/96	4.04E+04	0/96	1.00E+05	0.365 - 7.99
METAL	Beryllium	mg/kg	4.21E-01	95/96	0/96	6.70E-01	0/96	4.50E+02	0/96	1.35E+04	0.0912 - 0.509
METAL	Boron	mg/kg	1.40E+02	95/96	0/96	N/A	0/96	4.65E+04	0/96	1.00E+05	2.74 - 30.1
METAL	Cadmium	mg/kg	2.24E+00	96/96	57/96	2.10E-01	0/96	6.05E+01	0/96	1.82E+03	0.182 - 0.98
METAL	Chromium	mg/kg	1.94E+02	96/96	23/96	1.60E+01	36/96	1.23E+01	0/96	1.23E+03	0.547 - 3.05
METAL	Cobalt	mg/kg	1.37E+02	96/96	8/96	1.40E+01	1/96	6.87E+01	0/96	2.06E+03	0.182 - 0.207
METAL	Copper	mg/kg	4.09E+02	96/96	18/96	1.90E+01	0/96	9.34E+03	0/96	1.00E+05	0.182 - 2.07
METAL	Iron	mg/kg	3.43E+04	96/96	1/96	2.80E+04	0/96	1.00E+05	0/96	1.00E+05	18.3 - 204
METAL	Lead	mg/kg	5.09E+02	96/96	12/96	3.60E+01	0/96	8.00E+02	0/96	8.00E+02	0.365 - 0.414
METAL	Manganese	mg/kg	1.34E+03	96/96	0/96	1.50E+03	0/96	4.72E+03	0/96	1.00E+05	0.928 - 10.3
METAL	Mercury	mg/kg	8.71E-01	34/96	3/96	2.00E-01	0/96	7.01E+01	0/96	2.10E+03	0.0103 - 0.0249
METAL	Molybdenum	mg/kg	8.33E+00	96/96	0/96	N/A	0/96	1.16E+03	0/96	3.48E+04	0.182 - 0.98
METAL	Nickel	mg/kg	3.32E+02	96/96	22/96	2.10E+01	0/96	4.30E+03	0/96	1.00E+05	0.365 - 3.85
METAL	Selenium	mg/kg	5.44E+00	50/96	3/96	8.00E-01	0/96	1.17E+03	0/96	3.51E+04	0.912 - 5.13
METAL	Silver	mg/kg	2.22E+00	42/96	0/96	2.30E+00	0/96	1.17E+03	0/96	3.51E+04	0.452 - 5.27
METAL	Uranium	mg/kg	1.28E+03	96/96	76/96	4.90E+00	42/96	4.66E+01	0/96	1.40E+03	0.0365 - 0.37
METAL	Vanadium	mg/kg	2.56E+01	94/96	0/96	3.80E+01	0/96	1.15E+03	0/96	3.45E+04	0.912 - 4.14
METAL	Zinc	mg/kg	7.17E+02	96/96	32/96	6.50E+01	0/96	7.01E+04	0/96	1.00E+05	1.82 - 20.5
ANION	Fluoride	mg/kg	9.19E+01	84/96	0/96	N/A	0/96	9.33E+03	0/96	1.00E+05	0.87 - 4.98
PPCB	Total PCB	mg/kg	1.90E+01	96/101	0/101	N/A	35/101	2.93E-01	0/101	2.93E+01	0.00331 - 3.42
SVOA	2-Methylnaphthalene	mg/kg	4.99E+00	17/70	0/70	N/A	0/70	9.19E+01	0/70	2.76E+03	0.0329 - 1.37
SVOA	Acenaphthene	mg/kg	7.36E-01	4/94	0/94	N/A	0/94	1.38E+03	0/94	4.14E+04	0.0329 - 1.37
SVOA	Anthracene	mg/kg	1.97E+00	5/94	0/94	N/A	0/94	6.89E+03	0/94	1.00E+05	0.0329 - 1.37
SVOA	Benzo(ghi)perylene	mg/kg	5.08E+00	9/70	0/70	N/A	0/70	6.89E+02	0/70	2.07E+04	0.0329 - 1.37
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	3.64E+00	49/70	0/70	N/A	0/70	5.80E+01	0/70	5.80E+03	0.0329 - 1.37
SVOA	Butyl benzyl phthalate	mg/kg	2.53E+00	6/70	0/70	N/A	0/70	4.27E+02	0/70	4.27E+04	0.0329 - 1.37
SVOA	Carbazole	mg/kg	2.50E+00	11/94	0/94	N/A	0/94	4.06E+01	0/94	4.06E+03	0.0329 - 1.37
SVOA	Dibenzofuran	mg/kg	7.93E+00	3/70	0/70	N/A	0/70	2.34E+02	0/70	7.02E+03	0.329 - 13.7
SVOA	Dimethyl phthalate	mg/kg	5.57E-02	3/70	0/70	N/A	0/70	2.32E+04	0/70	6.96E+05	0.0329 - 1.37
SVOA	Di-n-butyl phthalate	mg/kg	1.16E+01	51/70	0/70	N/A	0/70	2.90E+03	0/70	8.70E+04	0.0329 - 1.37
SVOA	Di-n-octylphthalate	mg/kg	1.75E-01	2/70	0/70	N/A	0/70	2.90E+02	0/70	8.70E+03	0.0329 - 1.37
SVOA	Fluoranthene	mg/kg	2.52E+01	39/94	0/94	N/A	0/94	9.19E+02	0/94	2.76E+04	0.0329 - 1.37
SVOA	Fluorene	mg/kg	3.49E-01	2/94	0/94	N/A	0/94	9.19E+02	0/94	2.76E+04	0.0329 - 1.37
SVOA	Naphthalene	mg/kg	3.08E+00	16/94	0/94	N/A	0/94	4.06E+00	0/94	4.06E+02	0.0329 - 1.37
SVOA	Pentachlorophenol	mg/kg	3.56E-01	2/70	0/70	N/A	0/70	8.77E-01	0/70	8.77E+01	0.329 - 13.7
SVOA	Phenanthrene	mg/kg	4.06E+01	46/94	0/94	N/A	0/94	1.38E+03	0/94	4.14E+04	0.0329 - 1.37
SVOA	Pyrene	mg/kg	1.85E+01	33/94	0/94	N/A	0/94	6.89E+02	0/94	2.07E+04	0.0329 - 1.37
SVOA	Total PAH	mg/kg	9.35E+00	25/94	0/94	N/A	3/94	6.43E-01	0/94	6.43E+01	-
RADS	Americium-241	pCi/g	1.96E+01	10/101	0/101	N/A	1/101	6.01E+00	0/101	6.01E+02	0.148 - 1.5
RADS	Cesium-137	pCi/g	1.89E+01	31/101	13/101	4.90E-01	22/101	1.08E-01	1/101	1.08E+01	0.0228 - 0.116
RADS	Neptunium-237	pCi/g	1.13E+02	19/101	19/101	1.00E-01	19/101	2.49E-01	1/101	2.49E+01	0.32 - 1.11
RADS	Plutonium-238	pCi/g	1.22E+00	1/101	1/101	7.30E-02	0/101	2.65E+01	0/101	2.65E+03	0.196 - 1.27
RADS	Plutonium-239/240	pCi/g	9.86E+01	18/101	18/101	2.50E-02	1/101	2.27E+01	0/101	2.27E+03	0.232 - 1.25
RADS	Radium-226	pCi/g	3.11E+00	3/7	2/7	1.50E+00	3/7	2.48E-02	1/7	2.48E+00	0.35 - 1.47
RADS	Strontium-90	pCi/g	1.24E+01	3/7	1/7	4.70E+00	1/7	1.03E+01	0/7	1.03E+03	0.128 - 1.83
RADS	Technetium-99	pCi/g	5.77E+03	90/101	90/101	2.50E+00	2/101	1.27E+03	0/101	1.00E+05	1.74 - 5.77
RADS	Thorium-228	pCi/g	3.94E-01	2/7	0/7	1.60E+00	0/7	1.54E+02	0/7	1.54E+04	0.226 - 1.18
RADS	Thorium-230	pCi/g	1.21E+02	64/101	39/101	1.50E+00	5/101	3.13E+01	0/101	3.13E+03	0.232 - 3.94

Table C1.4. Sector 1 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Industrial Worker FOE	Industrial Worker NAL	Industrial Worker FOE	Industrial Worker AL	DL Range
RADS	Thorium-232	pCi/g	3.89E-01	2/7	0/7	1.50E+00	0/7	3.08E+01	0/7	3.08E+03	0.108 - 0.846
RADS	Uranium-233/234	pCi/g	3.31E+02	90/101	77/101	1.20E+00	13/101	5.01E+01	0/101	5.01E+03	0.444 - 5.14
RADS	Uranium-235/236	pCi/g	1.94E+01	55/101	55/101	6.00E-02	51/101	4.08E-01	0/101	4.08E+01	0.184 - 3.7
RADS	Uranium-238	pCi/g	3.71E+02	96/101	86/101	1.20E+00	81/101	1.66E+00	8/101	1.66E+02	0.179 - 3.85
VOA	1,2-Dichloroethene	mg/kg	6.30E-04	1/24	0/24	N/A	0/24	2.10E+03	0/24	6.30E+04	0.002 - 0.201
VOA	1,2-Dimethylbenzene	mg/kg	1.85E+00	56/94	0/94	N/A	0/94	2.81E+02	0/94	8.43E+03	0.000947 - 0.102
VOA	2-Butanone	mg/kg	4.25E-01	56/70	0/70	N/A	0/70	2.24E+04	0/70	6.72E+05	0.00473 - 0.509
VOA	2-Hexanone	mg/kg	3.26E-01	27/70	0/70	N/A	0/70	1.52E+02	0/70	4.56E+03	0.00473 - 0.509
VOA	4-Methyl-2-pentanone	mg/kg	2.32E-01	18/70	0/70	N/A	0/70	7.97E+03	0/70	2.39E+05	0.00473 - 0.509
VOA	Acetone	mg/kg	8.84E-01	69/70	0/70	N/A	0/70	2.10E+05	0/70	6.30E+06	0.00473 - 0.509
VOA	Benzene	mg/kg	2.06E-03	4/94	0/94	N/A	0/94	5.31E+00	0/94	5.31E+02	0.000947 - 0.102
VOA	Carbon disulfide	mg/kg	3.86E-03	3/70	0/70	N/A	0/70	3.52E+02	0/70	1.06E+04	0.00473 - 0.509
VOA	Chloroform	mg/kg	1.92E-03	31/94	0/94	N/A	0/94	1.39E+00	0/94	1.39E+02	0.000947 - 0.102
VOA	*cis* -1,2-Dichloroethene	mg/kg	7.84E-04	2/94	0/94	N/A	0/94	4.67E+02	0/94	1.40E+04	0.000947 - 0.102
VOA	Cumene	mg/kg	3.64E-03	8/70	0/70	N/A	0/70	1.04E+03	0/70	3.12E+04	0.000947 - 0.102
VOA	Cyclohexane	mg/kg	1.47E-03	17/70	0/70	N/A	0/70	2.74E+03	0/70	8.22E+04	0.000947 - 0.102
VOA	Ethylbenzene	mg/kg	9.79E-02	40/94	0/94	N/A	0/94	2.66E+01	0/94	2.66E+03	0.000947 - 0.102
VOA	m,p-Xylene	mg/kg	3.15E+00	59/94	0/94	N/A	0/94	2.50E+02	0/94	7.50E+03	0.00189 - 0.205
VOA	Methyl acetate	mg/kg	4.02E-01	2/70	0/70	N/A	0/70	2.34E+05	0/70	7.02E+06	0.00473 - 0.509
VOA	Methylcyclohexane	mg/kg	2.74E-02	51/70	0/70	N/A	0/70	1.30E+03	0/70	3.90E+04	0.000947 - 0.102
VOA	Methylene chloride	mg/kg	3.31E-03	16/70	0/70	N/A	0/70	4.08E+02	0/70	1.22E+04	0.00473 - 0.509
VOA	Styrene	mg/kg	4.22E-04	3/70	0/70	N/A	0/70	3.76E+03	0/70	1.13E+05	0.000947 - 0.102
VOA	Tetrachloroethene	mg/kg	5.50E-04	2/94	0/94	N/A	0/94	4.00E+01	0/94	1.20E+03	0.000947 - 0.102
VOA	Toluene	mg/kg	9.60E-01	92/94	0/94	N/A	0/94	6.25E+03	0/94	1.00E+05	0.000947 - 0.102
VOA	Total Xylene	mg/kg	5.00E+00	56/94	0/94	N/A	0/94	2.50E+02	0/94	7.50E+03	0.00284 - 0.307
VOA	Trichloroethene	mg/kg	5.73E-01	55/94	0/94	N/A	0/94	1.90E+00	0/94	5.70E+01	0.000947 - 0.102

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(orange)	One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Table C1.5. Sector 1 Surface and Subsurface Soil Data COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Excavation Worker FOE	Excavation Worker NAL	Excavation Worker FOE	Excavation Worker AL	DL Range
METAL	Aluminum	mg/kg	1.91E+04	147/147	34/147	1.20E+04	0/147	3.26E+04	0/147	1.00E+05	9.16 - 124
METAL	Antimony	mg/kg	1.30E+01	75/147	75/147	2.10E-01	0/147	1.32E+01	0/147	3.96E+02	0.904 - 22.7
METAL	Arsenic	mg/kg	1.81E+01	146/147	12/147	7.90E+00	74/147	3.74E+00	0/147	3.60E+02	0.912 - 5.13
METAL	Barium	mg/kg	3.87E+02	147/147	10/147	1.70E+02	0/147	6.47E+03	0/147	1.00E+05	0.365 - 9.64
METAL	Beryllium	mg/kg	1.26E+00	146/147	9/147	6.70E-01	0/147	6.55E+01	0/147	1.97E+03	0.0912 - 0.574
METAL	Boron	mg/kg	1.40E+02	135/147	N/A	N/A	0/147	6.57E+03	0/147	1.00E+05	2.74 - 30.1
METAL	Cadmium	mg/kg	2.24E+00	141/147	58/147	2.10E-01	0/147	2.53E+01	0/147	7.59E+02	0.182 - 0.98
METAL	Chromium	mg/kg	1.94E+02	147/147	62/147	1.60E+01	125/147	9.14E+00	0/147	9.14E+02	0.547 - 3.44
METAL	Cobalt	mg/kg	1.37E+02	147/147	13/147	1.30E+01	18/147	9.84E+00	0/147	2.95E+02	0.182 - 0.248
METAL	Copper	mg/kg	4.09E+02	147/147	19/147	1.90E+01	0/147	1.32E+03	0/147	3.96E+04	0.182 - 2.07
METAL	Iron	mg/kg	3.78E+04	147/147	5/147	2.80E+04	10/147	2.30E+04	0/147	1.00E+05	18.3 - 248
METAL	Lead	mg/kg	5.09E+02	147/147	14/147	2.30E+01	0/147	8.00E+02	0/147	8.00E+02	0.365 - 0.497
METAL	Manganese	mg/kg	3.01E+03	147/147	5/147	8.20E+02	6/147	7.74E+02	0/147	2.32E+04	0.928 - 114
METAL	Mercury	mg/kg	8.71E-01	68/147	7/147	1.30E-01	0/147	9.86E+00	0/147	2.96E+02	0.0103 - 0.0297
METAL	Molybdenum	mg/kg	8.33E+00	147/147	N/A	N/A	0/147	1.64E+02	0/147	4.92E+03	0.182 - 0.98
METAL	Nickel	mg/kg	3.32E+02	147/147	32/147	2.10E+01	0/147	6.52E+02	0/147	1.96E+04	0.365 - 3.85
METAL	Selenium	mg/kg	5.44E+00	96/147	42/147	7.00E-01	0/147	1.64E+02	0/147	4.92E+03	0.912 - 5.13
METAL	Silver	mg/kg	2.22E+00	53/147	0/147	2.30E+00	0/147	1.64E+02	0/147	4.92E+03	0.452 - 5.91
METAL	Thallium	mg/kg	5.20E-01	15/147	6/147	2.10E-01	1/147	3.29E-01	0/147	9.87E+00	0.365 - 0.497
METAL	Uranium	mg/kg	1.28E+03	147/147	85/147	4.60E+00	78/147	6.58E+00	19/147	1.97E+02	0.0365 - 0.468
METAL	Vanadium	mg/kg	6.76E+01	145/147	11/147	3.70E+01	0/147	1.65E+02	0/147	4.95E+03	0.912 - 22.6
METAL	Zinc	mg/kg	7.17E+02	147/147	37/147	6.00E+01	0/147	9.86E+03	0/147	1.00E+05	1.82 - 20.5
ANION	Fluoride	mg/kg	9.19E+01	135/147	N/A	N/A	0/147	1.32E+03	0/147	3.96E+04	0.87 - 4.98
PPCB	Total PCB	mg/kg	1.90E+01	102/145	N/A	N/A	12/145	1.12E+00	0/145	1.12E+02	0.00331 - 3.42
SVOA	2-Methylnaphthalene	mg/kg	4.99E+00	19/114	N/A	N/A	0/114	6.73E+01	0/114	2.02E+03	0.0329 - 1.37
SVOA	Acenaphthene	mg/kg	7.36E-01	5/138	N/A	N/A	0/138	1.01E+03	0/138	3.03E+04	0.0329 - 1.37
SVOA	Anthracene	mg/kg	1.97E+00	8/138	N/A	N/A	0/138	5.05E+03	0/138	1.00E+05	0.0329 - 1.37
SVOA	Benzo(ghi)perylene	mg/kg	5.08E+00	11/114	N/A	N/A	0/114	5.05E+02	0/114	1.52E+04	0.0329 - 1.37
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	3.64E+00	59/114	N/A	N/A	0/114	1.90E+02	0/114	1.14E+04	0.0329 - 1.37
SVOA	Butyl benzyl phthalate	mg/kg	2.53E+00	6/114	N/A	N/A	0/114	1.40E+03	0/114	1.14E+05	0.0329 - 1.37
SVOA	Carbazole	mg/kg	2.50E+00	13/138	N/A	N/A	0/138	1.33E+02	0/138	1.33E+04	0.0329 - 1.37
SVOA	Dibenzofuran	mg/kg	7.93E+00	4/114	N/A	N/A	0/114	3.29E+01	0/114	9.87E+02	0.329 - 13.7
SVOA	Dimethyl phthalate	mg/kg	5.57E-02	3/114	N/A	N/A	0/114	1.52E+04	0/114	4.56E+05	0.0329 - 1.37
SVOA	Di-n-butyl phthalate	mg/kg	1.16E+01	62/114	N/A	N/A	0/114	1.90E+03	0/114	5.70E+04	0.0329 - 1.37
SVOA	Di-n-octylphthalate	mg/kg	1.75E-01	4/114	N/A	N/A	0/114	1.90E+02	0/114	5.70E+03	0.0329 - 1.37
SVOA	Fluoranthene	mg/kg	2.52E+01	42/138	N/A	N/A	0/138	6.73E+02	0/138	2.02E+04	0.0329 - 1.37
SVOA	Fluorene	mg/kg	3.49E-01	3/138	N/A	N/A	0/138	6.73E+02	0/138	2.02E+04	0.0329 - 1.37
SVOA	Naphthalene	mg/kg	3.08E+00	19/138	N/A	N/A	0/138	1.67E+01	0/138	1.67E+03	0.0329 - 1.37
SVOA	Pentachlorophenol	mg/kg	3.56E-01	2/114	N/A	N/A	0/114	4.06E+00	0/114	4.06E+02	0.329 - 13.7
SVOA	Phenanthrene	mg/kg	4.06E+01	50/138	N/A	N/A	0/138	1.01E+03	0/138	3.03E+04	0.0329 - 1.37
SVOA	Pyrene	mg/kg	1.85E+01	35/138	N/A	N/A	0/138	5.05E+02	0/138	1.52E+04	0.0329 - 1.37
SVOA	Total PAH	mg/kg	9.35E+00	27/138	N/A	N/A	2/138	2.35E+00	0/138	1.51E+02	-
RADS	Americium-241	pCi/g	1.96E+01	10/152	N/A	N/A	1/152	1.64E+01	0/152	1.64E+03	0.148 - 1.5
RADS	Cesium-137	pCi/g	1.89E+01	31/151	18/151	2.80E-01	13/151	5.82E-01	0/151	5.82E+01	0.0228 - 0.116
RADS	Neptunium-237	pCi/g	1.13E+02	21/152	21/152	1.00E-01	14/152	1.63E+00	0/152	1.63E+02	0.292 - 1.11
RADS	Plutonium-238	pCi/g	1.22E+00	1/152	1/152	7.30E-02	0/152	1.94E+01	0/152	1.94E+03	0.196 - 1.27
RADS	Plutonium-239/240	pCi/g	9.86E+01	19/152	19/152	2.50E-02	1/152	1.83E+01	0/152	1.83E+03	0.193 - 1.25
RADS	Radium-226	pCi/g	3.11E+00	5/9	4/9	1.50E+00	5/9	1.64E-01	0/9	1.64E+01	0.35 - 1.47
RADS	Strontium-90	pCi/g	1.24E+01	3/9	1/9	4.70E+00	0/9	2.49E+01	0/9	2.49E+03	0.128 - 1.83
RADS	Technetium-99	pCi/g	5.77E+03	105/159	105/159	2.50E+00	1/159	1.55E+03	0/159	1.00E+05	1.73 - 5.77
RADS	Thorium-228	pCi/g	8.09E-01	4/9	0/9	1.60E+00	0/9	6.34E+01	0/9	6.34E+03	0.226 - 1.18

Table C1.5. Sector 1 Surface and Subsurface Soil Data COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Thorium-230	pCi/g	1.21E+02	107/152	59/152	1.40E+00	6/152	2.82E+01	0/152	2.82E+03	0.174 - 3.94
RADS	Thorium-232	pCi/g	1.43E+00	4/9	0/9	1.50E+00	0/9	2.60E+01	0/9	2.60E+03	0.108 - 0.846
RADS	Uranium-233/234	pCi/g	3.31E+02	131/152	88/152	1.20E+00	17/152	4.30E+01	0/152	4.30E+03	0.405 - 5.14
RADS	Uranium-235/236	pCi/g	1.94E+01	61/152	61/152	6.00E-02	19/152	2.62E+00	0/152	2.62E+02	0.184 - 3.7
RADS	Uranium-238	pCi/g	3.71E+02	141/152	97/152	1.20E+00	54/152	8.98E+00	0/152	8.98E+02	0.179 - 3.85
VOA	1,2-Dichloroethene	mg/kg	6.30E-04	1/24	N/A	N/A	0/24	2.96E+02	0/24	8.88E+03	0.002 - 0.201
VOA	1,2-Dimethylbenzene	mg/kg	1.85E+00	59/144	N/A	N/A	0/144	3.61E+02	0/144	1.08E+04	0.000842 - 0.102
VOA	2-Butanone	mg/kg	4.25E-01	64/120	N/A	N/A	0/120	1.28E+04	0/120	3.84E+05	0.00421 - 0.509
VOA	2-Hexanone	mg/kg	3.26E-01	27/120	N/A	N/A	0/120	9.69E+01	0/120	2.91E+03	0.00421 - 0.509
VOA	4-Methyl-2-pentanone	mg/kg	2.32E-01	21/120	N/A	N/A	0/120	2.31E+03	0/120	6.93E+04	0.00421 - 0.509
VOA	Acetone	mg/kg	8.84E-01	104/120	N/A	N/A	0/120	2.96E+04	0/120	8.88E+05	0.00421 - 0.509
VOA	Benzene	mg/kg	2.06E-03	4/144	N/A	N/A	0/144	2.59E+01	0/144	1.28E+03	0.000842 - 0.102
VOA	Carbon disulfide	mg/kg	3.86E-03	3/120	N/A	N/A	0/120	4.21E+02	0/120	1.26E+04	0.00421 - 0.509
VOA	Chloroform	mg/kg	3.53E-03	40/144	N/A	N/A	0/144	8.90E+00	0/144	8.90E+02	0.000842 - 0.102
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.77E-03	5/144	N/A	N/A	0/144	6.58E+01	0/144	1.97E+03	0.000842 - 0.102
VOA	Cumene	mg/kg	3.64E-03	9/120	N/A	N/A	0/120	1.02E+03	0/120	3.06E+04	0.000842 - 0.102
VOA	Cyclohexane	mg/kg	1.47E-03	19/120	N/A	N/A	0/120	3.70E+03	0/120	1.11E+05	0.000842 - 0.102
VOA	Ethylbenzene	mg/kg	9.79E-02	40/144	N/A	N/A	0/144	1.30E+02	0/144	1.30E+04	0.000842 - 0.102
VOA	m,p-Xylene	mg/kg	3.15E+00	62/144	N/A	N/A	0/144	3.23E+02	0/144	9.69E+03	0.00168 - 0.205
VOA	Methyl acetate	mg/kg	4.02E-01	2/120	N/A	N/A	0/120	3.29E+04	0/120	9.87E+05	0.00421 - 0.509
VOA	Methylcyclohexane	mg/kg	2.74E-02	53/120	N/A	N/A	0/120	1.76E+03	0/120	5.28E+04	0.000842 - 0.102
VOA	Methylene chloride	mg/kg	4.36E-03	19/120	N/A	N/A	0/120	1.57E+02	0/120	4.71E+03	0.00421 - 0.509
VOA	Styrene	mg/kg	1.43E-03	4/120	N/A	N/A	0/120	3.00E+03	0/120	9.00E+04	0.000842 - 0.102
VOA	Tetrachloroethene	mg/kg	5.50E-04	2/144	N/A	N/A	0/144	4.34E+01	0/144	1.30E+03	0.000842 - 0.102
VOA	Toluene	mg/kg	9.60E-01	107/144	N/A	N/A	0/144	2.18E+03	0/144	6.54E+04	0.000842 - 0.102
VOA	Total Xylene	mg/kg	5.00E+00	59/144	N/A	N/A	0/144	3.23E+02	0/144	9.69E+03	0.00253 - 0.307
VOA	Trichloroethene	mg/kg	5.73E-01	82/144	N/A	N/A	0/144	2.26E+00	0/144	6.78E+01	0.000842 - 0.102

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory and calculated using TEF values in 2021 RMD for C-400 Basement Slab and Subsurface samples.

Total PAHs were calculated using TEF values in the 2021 RMD.

Table C1.6. Sector 2 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.80E+04	16/16	3/16	1.30E+04	0/16	1.00E+05	0/16	1.00E+05	10.7 - 122
METAL	Antimony	mg/kg	1.54E+00	6/16	6/16	2.10E-01	0/16	9.34E+01	0/16	2.80E+03	1.94 - 2.36
METAL	Arsenic	mg/kg	1.25E+01	16/16	1/16	1.20E+01	16/16	1.60E+00	0/16	1.60E+02	1.06 - 5.51
METAL	Barium	mg/kg	1.64E+02	16/16	0/16	2.00E+02	0/16	4.04E+04	0/16	1.00E+05	0.851 - 0.978
METAL	Beryllium	mg/kg	6.65E-01	16/16	0/16	6.70E-01	0/16	4.50E+02	0/16	1.35E+04	0.106 - 0.122
METAL	Boron	mg/kg	4.99E+00	14/16	N/A	N/A	0/16	4.65E+04	0/16	1.00E+05	3.19 - 3.67
METAL	Cadmium	mg/kg	1.12E+00	12/16	4/16	2.10E-01	0/16	6.05E+01	0/16	1.82E+03	0.213 - 1.1
METAL	Chromium	mg/kg	5.35E+01	16/16	8/16	1.60E+01	14/16	1.23E+01	0/16	1.23E+03	0.638 - 0.733
METAL	Cobalt	mg/kg	1.09E+01	16/16	0/16	1.40E+01	0/16	6.87E+01	0/16	2.06E+03	0.213 - 0.244
METAL	Copper	mg/kg	8.93E+02	16/16	2/16	1.90E+01	0/16	9.34E+03	0/16	1.00E+05	0.425 - 4.5
METAL	Iron	mg/kg	2.68E+04	16/16	0/16	2.80E+04	0/16	1.00E+05	0/16	1.00E+05	21.4 - 244
METAL	Lead	mg/kg	2.40E+01	16/16	0/16	3.60E+01	0/16	8.00E+02	0/16	8.00E+02	0.425 - 0.489
METAL	Manganese	mg/kg	1.35E+03	16/16	0/16	1.50E+03	0/16	4.72E+03	0/16	1.00E+05	1.07 - 12.2
METAL	Mercury	mg/kg	7.92E-02	13/16	0/16	2.00E-01	0/16	7.01E+01	0/16	2.10E+03	0.0241 - 0.0298
METAL	Molybdenum	mg/kg	1.28E+00	16/16	N/A	N/A	0/16	1.16E+03	0/16	3.48E+04	0.213 - 1.1
METAL	Nickel	mg/kg	1.43E+03	16/16	1/16	2.10E+01	0/16	4.30E+03	0/16	1.00E+05	0.425 - 4.41
METAL	Selenium	mg/kg	1.85E+00	12/16	8/16	8.00E-01	0/16	1.17E+03	0/16	3.51E+04	1.06 - 5.51
METAL	Silver	mg/kg	1.70E+00	5/16	0/16	2.30E+00	0/16	1.17E+03	0/16	3.51E+04	0.485 - 5.68
METAL	Thallium	mg/kg	2.47E-01	8/16	3/16	2.10E-01	0/16	2.34E+00	0/16	7.02E+01	0.425 - 0.489
METAL	Uranium	mg/kg	9.10E+02	16/16	7/16	4.90E+00	2/16	4.66E+01	0/16	1.40E+03	0.0425 - 0.221
METAL	Vanadium	mg/kg	3.80E+01	16/16	0/16	3.80E+01	0/16	1.15E+03	0/16	3.45E+04	4.25 - 4.89
METAL	Zinc	mg/kg	1.44E+02	16/16	2/16	6.50E+01	0/16	7.01E+04	0/16	1.00E+05	4.25 - 22.1
ANION	Fluoride	mg/kg	2.65E+01	16/16	N/A	N/A	0/16	9.33E+03	0/16	1.00E+05	1.09 - 1.24
PPCB	Total PCB	mg/kg	8.62E-02	6/16	N/A	N/A	0/16	2.93E-01	0/16	2.93E+01	0.00361 - 0.0225
SVOA	Acenaphthene	mg/kg	2.82E-01	3/16	N/A	N/A	0/16	1.38E+03	0/16	4.14E+04	0.0367 - 0.358
SVOA	Anthracene	mg/kg	5.42E-01	3/16	N/A	N/A	0/16	6.89E+03	0/16	1.00E+05	0.0367 - 0.358
SVOA	Benzo(ghi)perylene	mg/kg	2.01E-01	5/16	N/A	N/A	0/16	6.89E+02	0/16	2.07E+04	0.0367 - 0.358
SVOA	Carbazole	mg/kg	1.38E-01	3/16	N/A	N/A	0/16	4.06E+01	0/16	4.06E+03	0.0367 - 0.358
SVOA	Di-n-butyl phthalate	mg/kg	1.78E-02	4/16	N/A	N/A	0/16	2.90E+03	0/16	8.70E+04	0.0367 - 0.358
SVOA	Fluoranthene	mg/kg	1.46E+00	7/16	N/A	N/A	0/16	9.19E+02	0/16	2.76E+04	0.0367 - 0.358
SVOA	Fluorene	mg/kg	5.18E-01	3/16	N/A	N/A	0/16	9.19E+02	0/16	2.76E+04	0.0367 - 0.358
SVOA	Phenanthrene	mg/kg	1.80E+00	5/16	N/A	N/A	0/16	1.38E+03	0/16	4.14E+04	0.0367 - 0.358
SVOA	Pyrene	mg/kg	8.02E-01	8/16	N/A	N/A	0/16	6.89E+02	0/16	2.07E+04	0.0367 - 0.358
SVOA	Total PAH	mg/kg	4.95E-01	6/16	N/A	N/A	0/16	6.43E-01	0/16	6.43E+01	-
RADS	Americium-241	pCi/g	6.59E-01	1/17	N/A	N/A	0/17	6.01E+00	0/17	6.01E+02	0.238 - 0.874
RADS	Cesium-137	pCi/g	6.65E-02	2/17	0/17	4.90E-01	0/17	1.08E-01	0/17	1.08E+01	0.0255 - 0.0966
RADS	Neptunium-237	pCi/g	1.15E+00	1/17	1/17	1.00E-01	1/17	2.49E-01	0/17	2.49E+01	0.364 - 0.919
RADS	Plutonium-239/240	pCi/g	3.33E+00	1/17	1/17	2.50E-02	0/17	2.27E+01	0/17	2.27E+03	0.323 - 0.864
RADS	Technetium-99	pCi/g	2.53E+01	6/17	6/17	2.50E+00	0/17	1.27E+03	0/17	1.00E+05	2.36 - 3.92
RADS	Thorium-230	pCi/g	1.12E+01	16/17	5/17	1.50E+00	0/17	3.13E+01	0/17	3.13E+03	0.365 - 1.15
RADS	Uranium-233/234	pCi/g	5.12E+02	16/17	11/17	1.20E+00	1/17	5.01E+01	0/17	5.01E+03	0.385 - 2.27
RADS	Uranium-235/236	pCi/g	2.84E+01	6/17	6/17	6.00E-02	5/17	4.08E-01	0/17	4.08E+01	0.134 - 0.746
RADS	Uranium-238	pCi/g	5.54E+02	16/17	12/17	1.20E+00	11/17	1.66E+00	1/17	1.66E+02	0.16 - 1.41
VOA	1,2-Dimethylbenzene	mg/kg	2.08E-02	2/16	N/A	N/A	0/16	2.81E+02	0/16	8.43E+03	0.000986 - 0.053
VOA	1,4-Dioxane	mg/kg	5.52E-02	1/16	N/A	N/A	0/16	3.91E+01	0/16	3.91E+03	0.0493 - 2.65
VOA	2-Butanone	mg/kg	1.27E-01	2/16	N/A	N/A	0/16	2.24E+04	0/16	6.72E+05	0.00493 - 0.265
VOA	4-Methyl-2-pentanone	mg/kg	2.60E-03	1/16	N/A	N/A	0/16	7.97E+03	0/16	2.39E+05	0.00493 - 0.265
VOA	Acetone	mg/kg	2.03E-02	6/16	N/A	N/A	0/16	2.10E+05	0/16	6.30E+06	0.00493 - 0.265
VOA	Benzene	mg/kg	7.59E-04	2/16	N/A	N/A	0/16	5.31E+00	0/16	5.31E+02	0.000986 - 0.053
VOA	Chloroform	mg/kg	2.43E-03	3/16	N/A	N/A	0/16	1.39E+00	0/16	1.39E+02	0.000986 - 0.053
VOA	Cumene	mg/kg	4.34E-04	1/16	N/A	N/A	0/16	1.04E+03	0/16	3.12E+04	0.000986 - 0.053

Table C1.6. Sector 2 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Industrial Worker FOE	Industrial Worker NAL	Industrial Worker FOE	Industrial Worker AL	DL Range
VOA	Cyclohexane	mg/kg	3.58E-03	3/16	N/A	N/A	0/16	2.74E+03	0/16	8.22E+04	0.000986 - 0.053
VOA	Ethylbenzene	mg/kg	1.24E-02	3/16	N/A	N/A	0/16	2.66E+01	0/16	2.66E+03	0.000986 - 0.053
VOA	m,p-Xylene	mg/kg	5.56E-02	4/16	N/A	N/A	0/16	2.50E+02	0/16	7.50E+03	0.00197 - 0.106
VOA	Methylcyclohexane	mg/kg	2.45E+00	7/16	N/A	N/A	0/16	1.30E+03	0/16	3.90E+04	0.000989 - 0.108
VOA	Toluene	mg/kg	3.92E+00	6/16	N/A	N/A	0/16	6.25E+03	0/16	1.00E+05	0.000989 - 0.108
VOA	Total Xylene	mg/kg	7.64E-02	2/16	N/A	N/A	0/16	2.50E+02	0/16	7.50E+03	0.00296 - 0.159
VOA	Trichloroethene	mg/kg	2.57E-03	1/16	N/A	N/A	0/16	1.90E+00	0/16	5.70E+01	0.000986 - 0.053

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Table C1.7. Sector 2 Surface and Subsurface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.91E+04	30/30	14/30	1.20E+04	0/30	3.26E+04	0/30	1.00E+05	10.7 - 122
METAL	Antimony	mg/kg	1.54E+00	8/30	8/30	2.10E-01	0/30	1.32E+01	0/30	3.96E+02	1.94 - 2.48
METAL	Arsenic	mg/kg	1.25E+01	30/30	5/30	7.90E+00	23/30	3.74E+00	0/30	3.60E+02	1.01 - 5.51
METAL	Barium	mg/kg	2.25E+02	30/30	3/30	1.70E+02	0/30	6.47E+03	0/30	1.00E+05	0.805 - 0.978
METAL	Beryllium	mg/kg	7.57E-01	30/30	3/30	6.70E-01	0/30	6.55E+01	0/30	1.97E+03	0.101 - 0.122
METAL	Boron	mg/kg	5.57E+00	27/30	N/A	N/A	0/30	6.57E+03	0/30	1.00E+05	3.02 - 3.67
METAL	Cadmium	mg/kg	1.12E+00	22/30	6/30	2.10E-01	0/30	2.53E+01	0/30	7.59E+02	0.201 - 1.1
METAL	Chromium	mg/kg	5.69E+01	30/30	18/30	1.60E+01	29/30	9.14E+00	0/30	9.14E+02	0.604 - 0.733
METAL	Cobalt	mg/kg	1.22E+01	30/30	0/30	1.30E+01	3/30	9.84E+00	0/30	2.95E+02	0.201 - 0.244
METAL	Copper	mg/kg	8.93E+02	30/30	5/30	1.90E+01	0/30	1.32E+03	0/30	3.96E+04	0.402 - 4.5
METAL	Iron	mg/kg	3.03E+04	30/30	1/30	2.80E+04	6/30	2.30E+04	0/30	1.00E+05	21.4 - 244
METAL	Lead	mg/kg	6.27E+01	30/30	2/30	2.30E+01	0/30	8.00E+02	0/30	8.00E+02	0.402 - 0.489
METAL	Manganese	mg/kg	1.35E+03	30/30	4/30	8.20E+02	4/30	7.74E+02	0/30	2.32E+04	1.07 - 12.2
METAL	Mercury	mg/kg	9.50E-02	24/30	0/30	1.30E-01	0/30	9.86E+00	0/30	2.96E+02	0.0235 - 0.0298
METAL	Molybdenum	mg/kg	1.28E+00	30/30	N/A	N/A	0/30	1.64E+02	0/30	4.92E+03	0.201 - 1.1
METAL	Nickel	mg/kg	1.43E+03	30/30	6/30	2.10E+01	1/30	6.52E+02	0/30	1.96E+04	0.402 - 4.41
METAL	Selenium	mg/kg	1.85E+00	25/30	17/30	7.00E-01	0/30	1.64E+02	0/30	4.92E+03	1.01 - 5.51
METAL	Silver	mg/kg	1.70E+00	8/30	0/30	2.30E+00	0/30	1.64E+02	0/30	4.92E+03	0.485 - 5.68
METAL	Thallium	mg/kg	2.47E-01	14/30	4/30	2.10E-01	0/30	3.29E-01	0/30	9.87E+00	0.402 - 0.489
METAL	Uranium	mg/kg	9.10E+02	30/30	14/30	4.60E+00	11/30	6.58E+00	2/30	1.97E+02	0.0402 - 0.221
METAL	Vanadium	mg/kg	3.98E+01	30/30	3/30	3.70E+01	0/30	1.65E+02	0/30	4.95E+03	4.02 - 4.89
METAL	Zinc	mg/kg	1.44E+02	30/30	5/30	6.00E+01	0/30	9.86E+03	0/30	1.00E+05	4.02 - 22.1
ANION	Fluoride	mg/kg	4.04E+01	30/30	N/A	N/A	0/30	1.32E+03	0/30	3.96E+04	1.05 - 1.27
PPCB	Total PCB	mg/kg	8.62E-02	9/26	N/A	N/A	0/26	1.12E+00	0/26	1.12E+02	0.00361 - 0.0225
SVOA	Acenaphthene	mg/kg	2.82E-01	4/26	N/A	N/A	0/26	1.01E+03	0/26	3.03E+04	0.0365 - 0.753
SVOA	Anthracene	mg/kg	5.42E-01	4/26	N/A	N/A	0/26	5.05E+03	0/26	1.00E+05	0.0365 - 0.753
SVOA	Benzo(ghi)perylene	mg/kg	2.01E-01	7/26	N/A	N/A	0/26	5.05E+02	0/26	1.52E+04	0.0365 - 0.753
SVOA	Carbazole	mg/kg	1.38E-01	4/26	N/A	N/A	0/26	1.33E+02	0/26	1.33E+04	0.0365 - 0.753
SVOA	Di-n-butyl phthalate	mg/kg	2.41E-02	8/26	N/A	N/A	0/26	1.90E+03	0/26	5.70E+04	0.0365 - 0.753
SVOA	Fluoranthene	mg/kg	1.46E+00	10/26	N/A	N/A	0/26	6.73E+02	0/26	2.02E+04	0.0365 - 0.753
SVOA	Fluorene	mg/kg	5.18E-01	3/26	N/A	N/A	0/26	6.73E+02	0/26	2.02E+04	0.0365 - 0.753
SVOA	Phenanthrene	mg/kg	1.80E+00	7/26	N/A	N/A	0/26	1.01E+03	0/26	3.03E+04	0.0365 - 0.753
SVOA	Pyrene	mg/kg	8.02E-01	11/26	N/A	N/A	0/26	5.05E+02	0/26	1.52E+04	0.0365 - 0.753
SVOA	Total PAH	mg/kg	4.95E-01	9/26	N/A	N/A	0/26	2.35E+00	0/26	1.51E+02	-
RADS	Americium-241	pCi/g	6.59E-01	1/31	N/A	N/A	0/31	1.64E+01	0/31	1.64E+03	0.238 - 0.874
RADS	Cesium-137	pCi/g	1.03E-01	3/31	0/31	2.80E-01	0/31	5.82E-01	0/31	5.82E+01	0.0255 - 0.0966
RADS	Neptunium-237	pCi/g	1.15E+00	1/31	1/31	1.00E-01	0/31	1.63E+00	0/31	1.63E+02	0.364 - 0.919
RADS	Plutonium-239/240	pCi/g	3.33E+00	2/31	2/31	2.50E-02	0/31	1.83E+01	0/31	1.83E+03	0.323 - 0.864
RADS	Technetium-99	pCi/g	3.05E+01	10/33	10/33	2.50E+00	0/33	1.55E+03	0/33	1.00E+05	2.36 - 4
RADS	Thorium-230	pCi/g	1.12E+01	29/31	9/31	1.40E+00	0/31	2.82E+01	0/31	2.82E+03	0.289 - 1.15
RADS	Uranium-233/234	pCi/g	5.12E+02	28/31	18/31	1.20E+00	1/31	4.30E+01	0/31	4.30E+03	0.334 - 2.27
RADS	Uranium-235/236	pCi/g	2.84E+01	11/31	11/31	6.00E-02	1/31	2.62E+00	0/31	2.62E+02	0.129 - 0.746
RADS	Uranium-238	pCi/g	5.54E+02	28/31	19/31	1.20E+00	9/31	8.98E+00	0/31	8.98E+02	0.16 - 1.41
VOA	1,2-Dimethylbenzene	mg/kg	2.08E-02	3/27	N/A	N/A	0/27	3.61E+02	0/27	1.08E+04	0.000882 - 0.053
VOA	1,4-Dioxane	mg/kg	5.52E-02	2/27	N/A	N/A	0/27	4.30E+01	0/27	4.30E+03	0.0441 - 2.65
VOA	2-Butanone	mg/kg	1.27E-01	4/27	N/A	N/A	0/27	1.28E+04	0/27	3.84E+05	0.00441 - 0.265
VOA	4-Methyl-2-pentanone	mg/kg	2.60E-03	1/27	N/A	N/A	0/27	2.31E+03	0/27	6.93E+04	0.00441 - 0.265
VOA	Acetone	mg/kg	2.03E-02	11/27	N/A	N/A	0/27	2.96E+04	0/27	8.88E+05	0.00441 - 0.265
VOA	Benzene	mg/kg	8.10E-04	3/27	N/A	N/A	0/27	2.59E+01	0/27	1.28E+03	0.000882 - 0.053
VOA	Chloroform	mg/kg	2.43E-03	3/27	N/A	N/A	0/27	8.90E+00	0/27	8.90E+02	0.000882 - 0.053
VOA	*cis*-1,2-Dichloroethene	mg/kg	8.59E-04	1/27	N/A	N/A	0/27	6.58E+01	0/27	1.97E+03	0.000882 - 0.053

Table C1.7. Sector 2 Surface and Subsurface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Excavation Worker FOE	Excavation Worker NAL	Excavation Worker FOE	Excavation Worker AL	DL Range
VOA	Cumene	mg/kg	4.34E-04	1/27	N/A	N/A	0/27	1.02E+03	0/27	3.06E+04	0.000882 - 0.053
VOA	Cyclohexane	mg/kg	4.31E-03	5/27	N/A	N/A	0/27	3.70E+03	0/27	1.11E+05	0.000882 - 0.053
VOA	Ethylbenzene	mg/kg	1.24E-02	3/27	N/A	N/A	0/27	1.30E+02	0/27	1.30E+04	0.000882 - 0.053
VOA	m,p-Xylene	mg/kg	5.56E-02	5/27	N/A	N/A	0/27	3.23E+02	0/27	9.69E+03	0.00176 - 0.106
VOA	Methylcyclohexane	mg/kg	2.45E+00	10/27	N/A	N/A	0/27	1.76E+03	0/27	5.28E+04	0.000882 - 0.108
VOA	Methylene chloride	mg/kg	1.80E-03	1/27	N/A	N/A	0/27	1.57E+02	0/27	4.71E+03	0.00441 - 0.265
VOA	Toluene	mg/kg	3.92E+00	9/27	N/A	N/A	0/27	2.18E+03	0/27	6.54E+04	0.000882 - 0.108
VOA	Total Xylene	mg/kg	7.64E-02	3/27	N/A	N/A	0/27	3.23E+02	0/27	9.69E+03	0.00265 - 0.159
VOA	Trichloroethene	mg/kg	5.13E-03	2/27	N/A	N/A	0/27	2.26E+00	0/27	6.78E+01	0.000882 - 0.053

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(orange)	One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Table C1.8. Sector 3 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.73E+04	12/12	5/12	1.30E+04	0/12	1.00E+05	0/12	1.00E+05	10.2 - 114
METAL	Antimony	mg/kg	2.10E+00	6/12	6/12	2.10E-01	0/12	9.34E+01	0/12	2.80E+03	1.96 - 2.4
METAL	Arsenic	mg/kg	1.31E+01	12/12	1/12	1.20E+01	12/12	1.60E+00	0/12	1.60E+02	1.01 - 1.2
METAL	Barium	mg/kg	1.29E+02	12/12	0/12	2.00E+02	0/12	4.04E+04	0/12	1.00E+05	0.806 - 0.958
METAL	Beryllium	mg/kg	6.10E-01	12/12	0/12	6.70E-01	0/12	4.50E+02	0/12	1.35E+04	0.101 - 0.12
METAL	Boron	mg/kg	5.93E+00	12/12	N/A	N/A	0/12	4.65E+04	0/12	1.00E+05	3.02 - 3.59
METAL	Cadmium	mg/kg	3.49E-01	10/12	2/12	2.10E-01	0/12	6.05E+01	0/12	1.82E+03	0.202 - 0.24
METAL	Chromium	mg/kg	2.08E+01	12/12	7/12	1.60E+01	10/12	1.23E+01	0/12	1.23E+03	0.605 - 0.719
METAL	Cobalt	mg/kg	8.99E+00	12/12	0/12	1.40E+01	0/12	6.87E+01	0/12	2.06E+03	0.202 - 0.24
METAL	Copper	mg/kg	1.70E+01	12/12	0/12	1.90E+01	0/12	9.34E+03	0/12	1.00E+05	0.403 - 0.479
METAL	Iron	mg/kg	2.42E+04	12/12	0/12	2.80E+04	0/12	1.00E+05	0/12	1.00E+05	20.3 - 228
METAL	Lead	mg/kg	1.61E+01	12/12	0/12	3.60E+01	0/12	8.00E+02	0/12	8.00E+02	0.403 - 0.479
METAL	Manganese	mg/kg	5.97E+02	12/12	0/12	1.50E+03	0/12	4.72E+03	0/12	1.00E+05	1.02 - 11.4
METAL	Mercury	mg/kg	5.02E-02	11/12	0/12	2.00E-01	0/12	7.01E+01	0/12	2.10E+03	0.0225 - 0.0281
METAL	Molybdenum	mg/kg	8.65E-01	12/12	N/A	N/A	0/12	1.16E+03	0/12	3.48E+04	0.202 - 0.24
METAL	Nickel	mg/kg	1.83E+01	12/12	0/12	2.10E+01	0/12	4.30E+03	0/12	1.00E+05	0.403 - 0.479
METAL	Selenium	mg/kg	1.65E+00	12/12	8/12	8.00E-01	0/12	1.17E+03	0/12	3.51E+04	1.01 - 1.2
METAL	Silver	mg/kg	4.43E-01	2/12	0/12	2.30E+00	0/12	1.17E+03	0/12	3.51E+04	0.531 - 5.45
METAL	Thallium	mg/kg	2.42E-01	7/12	3/12	2.10E-01	0/12	2.34E+00	0/12	7.02E+01	0.403 - 0.479
METAL	Uranium	mg/kg	2.97E+01	12/12	9/12	4.90E+00	0/12	4.66E+01	0/12	1.40E+03	0.0403 - 0.0479
METAL	Vanadium	mg/kg	3.69E+01	12/12	0/12	3.80E+01	0/12	1.15E+03	0/12	3.45E+04	4.03 - 4.79
METAL	Zinc	mg/kg	2.39E+02	12/12	3/12	6.50E+01	0/12	7.01E+04	0/12	1.00E+05	4.03 - 4.79
ANION	Fluoride	mg/kg	5.24E+01	12/12	N/A	N/A	0/12	9.33E+03	0/12	1.00E+05	1.06 - 1.21
DI/FURA	Total Dioxin/Furans	mg/kg	3.33E-06	1/1	N/A	N/A	0/1	1.57E-05	0/1	1.57E-03	-
PPCB	Total PCB	mg/kg	1.98E-01	10/11	N/A	N/A	0/11	2.93E-01	0/11	2.93E+01	0.00364 - 0.0364
SVOA	Anthracene	mg/kg	9.39E-02	2/11	N/A	N/A	0/11	6.89E+03	0/11	1.00E+05	0.036 - 0.736
SVOA	Benzo(ghi)perylene	mg/kg	2.75E-01	6/11	N/A	N/A	0/11	6.89E+02	0/11	2.07E+04	0.036 - 0.736
SVOA	Carbazole	mg/kg	7.77E-02	1/11	N/A	N/A	0/11	4.06E+01	0/11	4.06E+03	0.036 - 0.736
SVOA	Di-n-butyl phthalate	mg/kg	1.80E-02	2/11	N/A	N/A	0/11	2.90E+03	0/11	8.70E+04	0.036 - 0.736
SVOA	Di-n-octylphthalate	mg/kg	5.96E-02	2/11	N/A	N/A	0/11	2.90E+02	0/11	8.70E+03	0.036 - 0.736
SVOA	Fluoranthene	mg/kg	3.99E+00	11/11	N/A	N/A	0/11	9.19E+02	0/11	2.76E+04	0.036 - 0.736
SVOA	Phenanthrene	mg/kg	1.69E+00	10/11	N/A	N/A	0/11	1.38E+03	0/11	4.14E+04	0.036 - 0.736
SVOA	Pyrene	mg/kg	3.62E+00	10/11	N/A	N/A	0/11	6.89E+02	0/11	2.07E+04	0.036 - 0.736
SVOA	Total PAH	mg/kg	1.09E+00	10/11	N/A	N/A	2/11	6.43E-01	0/11	6.43E+01	-
RADS	Cesium-137	pCi/g	1.57E-01	6/13	0/13	4.90E-01	3/13	1.08E-01	0/13	1.08E+01	0.0369 - 0.0859
RADS	Plutonium-239/240	pCi/g	1.05E+00	1/13	1/13	2.50E-02	0/13	2.27E+01	0/13	2.27E+03	0.367 - 0.815
RADS	Technetium-99	pCi/g	1.96E+01	3/13	3/13	2.50E+00	0/13	1.27E+03	0/13	1.00E+05	2.28 - 3.97
RADS	Thorium-230	pCi/g	2.24E+00	12/13	3/13	1.50E+00	0/13	3.13E+01	0/13	3.13E+03	0.51 - 1.33
RADS	Uranium-233/234	pCi/g	3.58E+01	13/13	13/13	1.20E+00	0/13	5.01E+01	0/13	5.01E+03	0.502 - 1.02
RADS	Uranium-235/236	pCi/g	1.57E+00	2/13	2/13	6.00E-02	2/13	4.08E-01	0/13	4.08E+01	0.33 - 0.578
RADS	Uranium-238	pCi/g	3.86E+01	13/13	13/13	1.20E+00	12/13	1.66E+00	0/13	1.66E+02	0.274 - 0.733
VOA	2-Butanone	mg/kg	1.53E-02	2/11	N/A	N/A	0/11	2.24E+04	0/11	6.72E+05	0.00466 - 0.535
VOA	Acetone	mg/kg	7.41E-02	7/11	N/A	N/A	0/11	2.10E+05	0/11	6.30E+06	0.00466 - 0.535
VOA	*cis* -1,2-Dichloroethene	mg/kg	7.66E-02	2/11	N/A	N/A	0/11	4.67E+02	0/11	1.40E+04	0.000933 - 0.107
VOA	Methylcyclohexane	mg/kg	4.17E-04	1/11	N/A	N/A	0/11	1.30E+03	0/11	3.90E+04	0.000933 - 0.107
VOA	Methylene chloride	mg/kg	2.60E-03	3/11	N/A	N/A	0/11	4.08E+02	0/11	1.22E+04	0.00466 - 0.535
VOA	Toluene	mg/kg	8.23E-04	5/11	N/A	N/A	0/11	6.25E+03	0/11	1.00E+05	0.000933 - 0.107
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.50E-04	1/11	N/A	N/A	0/11	4.54E+01	0/11	1.36E+03	0.000933 - 0.107
VOA	Trichloroethene	mg/kg	3.01E+00	7/11	N/A	N/A	1/11	1.90E+00	0/11	5.70E+01	0.000933 - 0.112

Table C1.8. Sector 3 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(orange)	One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.9. Sector 3 Surface and Subsurface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Excavation Worker FOE	Excavation Worker NAL	Excavation Worker FOE	Excavation Worker AL	DL Range
METAL	Aluminum	mg/kg	1.97E+04	24/24	15/24	1.20E+04	0/24	3.26E+04	0/24	1.00E+05	10.2 - 1130
METAL	Antimony	mg/kg	2.10E+00	8/24	8/24	2.10E-01	0/24	1.32E+01	0/24	3.96E+02	1.96 - 2.41
METAL	Arsenic	mg/kg	1.31E+01	24/24	7/24	7.90E+00	19/24	3.74E+00	0/24	3.60E+02	1.01 - 1.28
METAL	Barium	mg/kg	2.64E+02	24/24	5/24	1.70E+02	0/24	6.47E+03	0/24	1.00E+05	0.806 - 90.8
METAL	Beryllium	mg/kg	9.95E-01	24/24	4/24	6.70E-01	0/24	6.55E+01	0/24	1.97E+03	0.101 - 0.128
METAL	Boron	mg/kg	5.93E+00	24/24	N/A	N/A	0/24	6.57E+03	0/24	1.00E+05	3.02 - 3.84
METAL	Cadmium	mg/kg	3.49E-01	19/24	2/24	2.10E-01	0/24	2.53E+01	0/24	7.59E+02	0.202 - 0.256
METAL	Chromium	mg/kg	2.46E+01	24/24	17/24	1.60E+01	24/24	9.14E+00	0/24	9.14E+02	0.605 - 0.768
METAL	Cobalt	mg/kg	2.71E+01	24/24	3/24	1.30E+01	4/24	9.84E+00	0/24	2.95E+02	0.202 - 0.256
METAL	Copper	mg/kg	1.78E+01	24/24	0/24	1.90E+01	0/24	1.32E+03	0/24	3.96E+04	0.403 - 0.512
METAL	Iron	mg/kg	2.51E+04	24/24	0/24	2.80E+04	3/24	2.30E+04	0/24	1.00E+05	20.3 - 2270
METAL	Lead	mg/kg	1.61E+01	24/24	0/24	2.30E+01	0/24	8.00E+02	0/24	8.00E+02	0.403 - 0.512
METAL	Manganese	mg/kg	3.11E+03	24/24	4/24	8.20E+02	4/24	7.74E+02	0/24	2.32E+04	1.02 - 113
METAL	Mercury	mg/kg	1.06E-01	19/24	0/24	1.30E-01	0/24	9.86E+00	0/24	2.96E+02	0.0225 - 0.0304
METAL	Molybdenum	mg/kg	8.65E-01	24/24	N/A	N/A	0/24	1.64E+02	0/24	4.92E+03	0.202 - 0.256
METAL	Nickel	mg/kg	2.60E+01	24/24	4/24	2.10E+01	0/24	6.52E+02	0/24	1.96E+04	0.403 - 0.512
METAL	Selenium	mg/kg	3.02E+00	24/24	21/24	7.00E-01	0/24	1.64E+02	0/24	4.92E+03	1.01 - 1.28
METAL	Silver	mg/kg	4.43E-01	3/24	0/24	2.30E+00	0/24	1.64E+02	0/24	4.92E+03	0.531 - 5.54
METAL	Thallium	mg/kg	4.00E-01	15/24	6/24	2.10E-01	1/24	3.29E-01	0/24	9.87E+00	0.403 - 0.512
METAL	Uranium	mg/kg	2.97E+01	24/24	9/24	4.60E+00	8/24	6.58E+00	0/24	1.97E+02	0.0403 - 0.0512
METAL	Vanadium	mg/kg	3.69E+01	24/24	0/24	3.70E+01	0/24	1.65E+02	0/24	4.95E+03	4.03 - 5.12
METAL	Zinc	mg/kg	2.39E+02	24/24	6/24	6.00E+01	0/24	9.86E+03	0/24	1.00E+05	4.03 - 5.12
ANION	Fluoride	mg/kg	5.24E+01	24/24	N/A	N/A	0/24	1.32E+03	0/24	3.96E+04	1.06 - 1.27
DI/FURA	Total Dioxin/Furans	mg/kg	3.33E-06	2/2	N/A	N/A	0/2	1.89E-05	0/2	5.67E-04	-
PPCB	Total PCB	mg/kg	1.98E-01	12/20	N/A	N/A	0/20	1.12E+00	0/20	1.12E+02	0.00364 - 0.0364
SVOA	2-Methylnaphthalene	mg/kg	7.13E-02	2/20	N/A	N/A	0/20	6.73E+01	0/20	2.02E+03	0.036 - 0.736
SVOA	Acenaphthene	mg/kg	3.40E-01	2/20	N/A	N/A	0/20	1.01E+03	0/20	3.03E+04	0.036 - 0.736
SVOA	Anthracene	mg/kg	5.05E-01	4/20	N/A	N/A	0/20	5.05E+03	0/20	1.00E+05	0.036 - 0.736
SVOA	Benzo(ghi)perylene	mg/kg	3.79E-01	8/20	N/A	N/A	0/20	5.05E+02	0/20	1.52E+04	0.036 - 0.736
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.23E-02	1/20	N/A	N/A	0/20	1.90E+02	0/20	1.14E+04	0.036 - 0.736
SVOA	Carbazole	mg/kg	2.49E-01	3/20	N/A	N/A	0/20	1.33E+02	0/20	1.33E+04	0.036 - 0.736
SVOA	Di-n-butyl phthalate	mg/kg	1.89E-02	3/20	N/A	N/A	0/20	1.90E+03	0/20	5.70E+04	0.036 - 0.736
SVOA	Di-n-octylphthalate	mg/kg	5.96E-02	2/20	N/A	N/A	0/20	1.90E+02	0/20	5.70E+03	0.036 - 0.736
SVOA	Fluoranthene	mg/kg	3.99E+00	15/20	N/A	N/A	0/20	6.73E+02	0/20	2.02E+04	0.036 - 0.736
SVOA	Fluorene	mg/kg	2.80E-01	2/20	N/A	N/A	0/20	6.73E+02	0/20	2.02E+04	0.036 - 0.736
SVOA	Naphthalene	mg/kg	2.78E-01	2/20	N/A	N/A	0/20	1.67E+01	0/20	1.67E+03	0.036 - 0.736
SVOA	Phenanthrene	mg/kg	2.13E+00	14/20	N/A	N/A	0/20	1.01E+03	0/20	3.03E+04	0.036 - 0.736
SVOA	Pyrene	mg/kg	3.62E+00	14/20	N/A	N/A	0/20	5.05E+02	0/20	1.52E+04	0.036 - 0.736
SVOA	Total PAH	mg/kg	1.21E+00	14/20	N/A	N/A	0/20	2.35E+00	0/20	1.51E+02	-
RADS	Cesium-137	pCi/g	1.57E-01	6/25	0/25	2.80E-01	0/25	5.82E-01	0/25	5.82E+01	0.0349 - 0.0946
RADS	Plutonium-239/240	pCi/g	1.05E+00	1/25	1/25	2.50E-02	0/25	1.83E+01	0/25	1.83E+03	0.317 - 0.894
RADS	Technetium-99	pCi/g	1.96E+01	3/25	3/25	2.50E+00	0/25	1.55E+03	0/25	1.00E+05	2.28 - 3.97
RADS	Thorium-230	pCi/g	2.24E+00	23/25	6/25	1.40E+00	0/25	2.82E+01	0/25	2.82E+03	0.51 - 1.33
RADS	Uranium-233/234	pCi/g	3.58E+01	21/25	15/25	1.20E+00	0/25	4.30E+01	0/25	4.30E+03	0.425 - 1.02
RADS	Uranium-235/236	pCi/g	1.57E+00	2/25	2/25	6.00E-02	0/25	2.62E+00	0/25	2.62E+02	0.292 - 0.699
RADS	Uranium-238	pCi/g	3.86E+01	23/25	17/25	1.20E+00	3/25	8.98E+00	0/25	8.98E+02	0.264 - 0.777
VOA	1,1-Dichloroethene	mg/kg	1.45E-03	1/20	N/A	N/A	0/20	1.26E+02	0/20	3.78E+03	0.000933 - 0.107
VOA	1,2,3-Trichlorobenzene	mg/kg	1.63E-03	1/20	N/A	N/A	0/20	2.63E+01	0/20	7.89E+02	0.000933 - 0.107
VOA	1,2,4-Trichlorobenzene	mg/kg	1.17E-03	1/20	N/A	N/A	0/20	3.20E+01	0/20	9.60E+02	0.000933 - 0.107
VOA	1,2-Dibromo-3-chloropropane	mg/kg	6.61E-04	1/20	N/A	N/A	0/20	4.10E-01	0/20	4.10E+01	0.000933 - 0.107
VOA	1,2-Dichlorobenzene	mg/kg	6.07E-04	1/20	N/A	N/A	0/20	9.43E+02	0/20	2.83E+04	0.000933 - 0.107

Table C1.9. Sector 3 Surface and Subsurface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
VOA	1,3-Dichlorobenzene	mg/kg	4.66E-04	1/20	N/A	N/A	0/20	9.43E+02	0/20	2.83E+04	0.000933 - 0.107
VOA	1,4-Dichlorobenzene	mg/kg	5.96E-04	1/20	N/A	N/A	0/20	7.20E+01	0/20	7.20E+03	0.000933 - 0.107
VOA	2-Butanone	mg/kg	1.99E-01	5/20	N/A	N/A	0/20	1.28E+04	0/20	3.84E+05	0.00466 - 0.535
VOA	Acetone	mg/kg	7.41E-02	13/20	N/A	N/A	0/20	2.96E+04	0/20	8.88E+05	0.00466 - 0.535
VOA	Chloroform	mg/kg	5.14E-04	1/20	N/A	N/A	0/20	8.90E+00	0/20	8.90E+02	0.000933 - 0.107
VOA	*cis* -1,2-Dichloroethene	mg/kg	7.66E-02	7/20	N/A	N/A	0/20	6.58E+01	0/20	1.97E+03	0.000933 - 0.107
VOA	Methylcyclohexane	mg/kg	4.17E-04	1/20	N/A	N/A	0/20	1.76E+03	0/20	5.28E+04	0.000933 - 0.107
VOA	Methylene chloride	mg/kg	3.73E-03	6/20	N/A	N/A	0/20	1.57E+02	0/20	4.71E+03	0.00466 - 0.535
VOA	Toluene	mg/kg	8.23E-04	5/20	N/A	N/A	0/20	2.18E+03	0/20	6.54E+04	0.000933 - 0.107
VOA	*trans* -1,2-Dichloroethene	mg/kg	2.56E-03	3/20	N/A	N/A	0/20	5.67E+01	0/20	1.70E+03	0.000933 - 0.107
VOA	Trichloroethene	mg/kg	3.01E+00	12/20	N/A	N/A	1/20	2.26E+00	0/20	6.78E+01	0.000933 - 0.112

(red)	One or more samples exceed AL value
(green)	One or more samples exceed NAL value
(orange)	One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.10. Sector 4 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.63E+04	45/45	3/45	1.30E+04	0/45	1.00E+05	0/45	1.00E+05	9.76 - 112
METAL	Antimony	mg/kg	3.85E+00	17/27	17/27	2.10E-01	0/27	9.34E+01	0/27	2.80E+03	1.97 - 20
METAL	Arsenic	mg/kg	1.10E+01	30/46	0/46	1.20E+01	30/46	1.60E+00	0/46	1.60E+02	1.02 - 20
METAL	Barium	mg/kg	3.29E+02	46/46	1/46	2.00E+02	0/46	4.04E+04	0/46	1.00E+05	0.781 - 8.18
METAL	Beryllium	mg/kg	5.83E-01	26/27	0/27	6.70E-01	0/27	4.50E+02	0/27	1.35E+04	0.0976 - 0.5
METAL	Boron	mg/kg	6.12E+00	24/26	N/A	N/A	0/26	4.65E+04	0/26	1.00E+05	2.93 - 3.53
METAL	Cadmium	mg/kg	2.40E+00	25/27	11/27	2.10E-01	0/27	6.05E+01	0/27	1.82E+03	0.195 - 2
METAL	Chromium	mg/kg	4.50E+01	46/46	21/46	1.60E+01	35/46	1.23E+01	0/46	1.23E+03	0.586 - 2.5
METAL	Cobalt	mg/kg	9.35E+00	26/26	0/26	1.40E+01	0/26	6.87E+01	0/26	2.06E+03	0.195 - 0.235
METAL	Copper	mg/kg	3.14E+01	27/27	2/27	1.90E+01	0/27	9.34E+03	0/27	1.00E+05	0.39 - 2.5
METAL	Iron	mg/kg	3.09E+04	46/46	1/46	2.80E+04	0/46	1.00E+05	0/46	1.00E+05	19.5 - 235
METAL	Lead	mg/kg	3.66E+01	27/46	1/46	3.60E+01	0/46	8.00E+02	0/46	8.00E+02	0.39 - 20
METAL	Manganese	mg/kg	1.10E+03	45/45	0/45	1.50E+03	0/45	4.72E+03	0/45	1.00E+05	0.976 - 11.6
METAL	Mercury	mg/kg	2.90E-01	22/46	1/46	2.00E-01	0/46	7.01E+01	0/46	2.10E+03	0.0215 - 0.2
METAL	Molybdenum	mg/kg	5.92E+00	26/26	N/A	N/A	0/26	1.16E+03	0/26	3.48E+04	0.195 - 0.235
METAL	Nickel	mg/kg	5.71E+01	42/46	2/46	2.10E+01	0/46	4.30E+03	0/46	1.00E+05	0.39 - 5
METAL	Selenium	mg/kg	1.26E+00	21/45	6/45	8.00E-01	0/45	1.17E+03	0/45	3.51E+04	1 - 20
METAL	Silver	mg/kg	9.97E+00	11/27	4/27	2.30E+00	0/27	1.17E+03	0/27	3.51E+04	0.504 - 5.82
METAL	Thallium	mg/kg	2.15E-01	3/27	1/27	2.10E-01	0/27	2.34E+00	0/27	7.02E+01	0.39 - 20
METAL	Uranium	mg/kg	2.38E+02	30/45	18/45	4.90E+00	5/45	4.66E+01	0/45	1.40E+03	0.039 - 100
METAL	Vanadium	mg/kg	4.41E+01	45/45	2/45	3.80E+01	0/45	1.15E+03	0/45	3.45E+04	2.5 - 4.71
METAL	Zinc	mg/kg	9.27E+02	27/27	5/27	6.50E+01	0/27	7.01E+04	0/27	1.00E+05	4.09 - 45.9
ANION	Fluoride	mg/kg	3.69E+01	26/26	N/A	N/A	0/26	9.33E+03	0/26	1.00E+05	1.03 - 1.2
DI/FURA	Total Dioxin/Furans	mg/kg	5.32E-06	8/8	N/A	N/A	0/8	1.57E-05	0/8	1.57E-03	-
PPCB	Total PCB	mg/kg	9.99E-01	20/27	N/A	N/A	2/27	2.93E-01	0/27	2.93E+01	0.00336 - 0.182
SVOA	Acenaphthene	mg/kg	1.35E-01	3/26	N/A	N/A	0/26	1.38E+03	0/26	4.14E+04	0.0332 - 0.383
SVOA	Anthracene	mg/kg	2.59E-01	6/26	N/A	N/A	0/26	6.89E+03	0/26	1.00E+05	0.0332 - 0.383
SVOA	Benzo(ghi)perylene	mg/kg	2.03E-01	11/26	N/A	N/A	0/26	6.89E+02	0/26	2.07E+04	0.0332 - 0.383
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	3.32E-02	5/26	N/A	N/A	0/26	5.80E+01	0/26	5.80E+03	0.0332 - 0.383
SVOA	Butyl benzyl phthalate	mg/kg	3.08E-02	1/26	N/A	N/A	0/26	4.27E+02	0/26	4.27E+04	0.0332 - 0.383
SVOA	Carbazole	mg/kg	4.28E-02	3/26	N/A	N/A	0/26	4.06E+01	0/26	4.06E+03	0.0332 - 0.383
SVOA	Di-n-butyl phthalate	mg/kg	3.12E-02	6/26	N/A	N/A	0/26	2.90E+03	0/26	8.70E+04	0.0332 - 0.383
SVOA	Fluoranthene	mg/kg	1.10E+00	16/26	N/A	N/A	0/26	9.19E+02	0/26	2.76E+04	0.0332 - 0.383
SVOA	Fluorene	mg/kg	4.28E-02	2/26	N/A	N/A	0/26	9.19E+02	0/26	2.76E+04	0.0332 - 0.383
SVOA	Phenanthrene	mg/kg	7.74E-01	13/26	N/A	N/A	0/26	1.38E+03	0/26	4.14E+04	0.0332 - 0.383
SVOA	Pyrene	mg/kg	1.03E+00	15/26	N/A	N/A	0/26	6.89E+02	0/26	2.07E+04	0.0332 - 0.383
SVOA	Total PAH	mg/kg	5.69E-01	16/26	N/A	N/A	0/26	6.43E-01	0/26	6.43E+01	-
RADS	Americium-241	pCi/g	2.02E+00	2/47	N/A	N/A	0/47	6.01E+00	0/47	6.01E+02	0.0723 - 1.03
RADS	Cesium-137	pCi/g	2.82E+00	17/47	2/47	4.90E-01	5/47	1.08E-01	0/47	1.08E+01	0.0154 - 0.0778
RADS	Neptunium-237	pCi/g	8.10E+00	5/47	5/47	1.00E-01	3/47	2.49E-01	0/47	2.49E+01	0.0323 - 1.26
RADS	Plutonium-239/240	pCi/g	1.97E+01	9/48	9/48	2.50E-02	0/48	2.27E+01	0/48	2.27E+03	0.0435 - 1.19
RADS	Technetium-99	pCi/g	3.23E+02	14/48	14/48	2.50E+00	0/48	1.27E+03	0/48	1.00E+05	1.58 - 4.76
RADS	Thorium-228	pCi/g	3.98E-01	1/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	0.0642 - 0.0642
RADS	Thorium-230	pCi/g	7.78E+01	39/48	12/48	1.50E+00	2/48	3.13E+01	0/48	3.13E+03	0.0882 - 1.15
RADS	Thorium-232	pCi/g	4.17E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	0.0438 - 0.0438
RADS	Uranium-233/234	pCi/g	2.27E+02	26/28	21/28	1.20E+00	2/28	5.01E+01	0/28	5.01E+03	0.255 - 0.976
RADS	Uranium-234	pCi/g	3.32E+00	6/17	6/17	1.20E+00	0/17	5.01E+01	0/17	5.01E+03	0.217 - 1.3
RADS	Uranium-235	pCi/g	2.64E-01	18/19	15/19	6.00E-02	0/19	4.08E-01	0/19	4.08E+01	0.0176 - 0.0489
RADS	Uranium-235/236	pCi/g	1.61E+01	6/28	6/28	6.00E-02	4/28	4.08E-01	0/28	4.08E+01	0.135 - 0.913
RADS	Uranium-238	pCi/g	3.30E+02	45/46	37/46	1.20E+00	33/46	1.66E+00	2/46	1.66E+02	0.188 - 1.31
VOA	1,2-Dimethylbenzene	mg/kg	2.21E-02	2/39	N/A	N/A	0/39	2.81E+02	0/39	8.43E+03	0.000808 - 1.3

Table C1.10. Sector 4 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
VOA	2-Butanone	mg/kg	1.80E-02	8/39	N/A	N/A	0/39	2.24E+04	0/39	6.72E+05	0.00404 - 1.3
VOA	Acetone	mg/kg	1.40E-01	29/39	N/A	N/A	0/39	2.10E+05	0/39	6.30E+06	0.00404 - 1.3
VOA	Benzene	mg/kg	4.02E-03	4/39	N/A	N/A	0/39	5.31E+00	0/39	5.31E+02	0.000808 - 1.3
VOA	Chloroform	mg/kg	1.55E-03	7/39	N/A	N/A	0/39	1.39E+00	0/39	1.39E+02	0.000808 - 1.3
VOA	*cis* -1,2-Dichloroethene	mg/kg	7.46E-02	16/38	N/A	N/A	0/38	4.67E+02	0/38	1.40E+04	0.000808 - 1.3
VOA	Cumene	mg/kg	1.69E-03	1/28	N/A	N/A	0/28	1.04E+03	0/28	3.12E+04	0.000808 - 0.00147
VOA	Cyclohexane	mg/kg	4.81E-02	7/28	N/A	N/A	0/28	2.74E+03	0/28	8.22E+04	0.000808 - 0.00147
VOA	Ethylbenzene	mg/kg	2.32E-02	3/39	N/A	N/A	0/39	2.66E+01	0/39	2.66E+03	0.000808 - 1.3
VOA	m,p-Xylene	mg/kg	6.29E-02	3/39	N/A	N/A	0/39	2.50E+02	0/39	7.50E+03	0.00162 - 2.5
VOA	Methyl acetate	mg/kg	1.88E-02	1/28	N/A	N/A	0/28	2.34E+05	0/28	7.02E+06	0.00404 - 0.00735
VOA	Methylcyclohexane	mg/kg	6.34E-02	12/28	N/A	N/A	0/28	1.30E+03	0/28	3.90E+04	0.000808 - 0.00147
VOA	Methylene chloride	mg/kg	7.12E-03	10/39	N/A	N/A	0/39	4.08E+02	0/39	1.22E+04	0.00404 - 1.3
VOA	Tetrachloroethene	mg/kg	3.81E-04	1/39	N/A	N/A	0/39	4.00E+01	0/39	1.20E+03	0.000808 - 1.3
VOA	Toluene	mg/kg	6.06E-02	17/39	N/A	N/A	0/39	6.25E+03	0/39	1.00E+05	0.000808 - 1.3
VOA	Total Xylene	mg/kg	8.50E-02	2/28	N/A	N/A	0/28	2.50E+02	0/28	7.50E+03	0.00242 - 0.00441
VOA	*trans* -1,2-Dichloroethene	mg/kg	1.18E-03	2/38	N/A	N/A	0/38	4.54E+01	0/38	1.36E+03	0.000808 - 1.3
VOA	Trichloroethene	mg/kg	6.02E-01	33/39	N/A	N/A	0/39	1.90E+00	0/39	5.70E+01	0.000808 - 0.3
VOA	Vinyl chloride	mg/kg	1.53E-03	1/39	N/A	N/A	0/39	2.06E+00	0/39	2.06E+02	0.000808 - 1.3

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.11. Sector 4 Surface and Subsurface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	2.39E+04	217/217	43/217	1.20E+04	0/217	3.26E+04	0/217	1.00E+05	9.76 - 125
METAL	Antimony	mg/kg	3.85E+00	41/63	41/63	2.10E-01	0/63	1.32E+01	0/63	3.96E+02	1.97 - 20
METAL	Arsenic	mg/kg	2.29E+01	87/218	11/218	7.90E+00	63/218	3.74E+00	0/218	3.60E+02	1.02 - 20
METAL	Barium	mg/kg	1.62E+03	218/218	13/218	1.70E+02	0/218	6.47E+03	0/218	1.00E+05	0.781 - 9.58
METAL	Beryllium	mg/kg	9.57E-01	62/63	7/63	6.70E-01	0/63	6.55E+01	0/63	1.97E+03	0.0976 - 0.583
METAL	Boron	mg/kg	6.12E+00	53/62	N/A	N/A	0/62	6.57E+03	0/62	1.00E+05	2.93 - 17.5
METAL	Cadmium	mg/kg	2.40E+00	46/63	12/63	2.10E-01	0/63	2.53E+01	0/63	7.59E+02	0.195 - 2
METAL	Chromium	mg/kg	1.17E+02	218/218	72/218	1.60E+01	199/218	9.14E+00	0/218	9.14E+02	0.586 - 3.5
METAL	Cobalt	mg/kg	1.20E+01	62/62	0/62	1.30E+01	2/62	9.84E+00	0/62	2.95E+02	0.195 - 1.17
METAL	Copper	mg/kg	3.14E+01	63/63	3/63	1.90E+01	0/63	1.32E+03	0/63	3.96E+04	0.39 - 2.5
METAL	Iron	mg/kg	5.51E+04	218/218	5/218	2.80E+04	20/218	2.30E+04	0/218	1.00E+05	19.5 - 446
METAL	Lead	mg/kg	1.07E+02	68/218	8/218	2.30E+01	0/218	8.00E+02	0/218	8.00E+02	0.39 - 20
METAL	Manganese	mg/kg	3.05E+03	217/217	10/217	8.20E+02	11/217	7.74E+02	0/217	2.32E+04	0.976 - 119
METAL	Mercury	mg/kg	5.70E-01	48/218	2/218	1.30E-01	0/218	9.86E+00	0/218	2.96E+02	0.0215 - 0.2
METAL	Molybdenum	mg/kg	5.92E+00	62/62	N/A	N/A	0/62	1.64E+02	0/62	4.92E+03	0.195 - 0.254
METAL	Nickel	mg/kg	7.36E+01	180/218	4/218	2.10E+01	0/218	6.52E+02	0/218	1.96E+04	0.39 - 5
METAL	Selenium	mg/kg	3.46E+00	69/210	53/210	7.00E-01	0/210	1.64E+02	0/210	4.92E+03	1 - 20
METAL	Silver	mg/kg	9.97E+00	14/63	4/63	2.30E+00	0/63	1.64E+02	0/63	4.92E+03	0.504 - 6.21
METAL	Thallium	mg/kg	2.54E-01	17/63	6/63	2.10E-01	0/63	3.29E-01	0/63	9.87E+00	0.39 - 20
METAL	Uranium	mg/kg	3.40E+02	99/217	55/217	4.60E+00	52/217	6.58E+00	15/217	1.97E+02	0.039 - 1000
METAL	Vanadium	mg/kg	5.22E+01	217/217	16/217	3.70E+01	0/217	1.65E+02	0/217	4.95E+03	2.5 - 23.3
METAL	Zinc	mg/kg	9.27E+02	63/63	9/63	6.00E+01	0/63	9.86E+03	0/63	1.00E+05	4.09 - 45.9
ANION	Fluoride	mg/kg	3.69E+01	62/62	N/A	N/A	0/62	1.32E+03	0/62	3.96E+04	1.03 - 1.27
PPCB	Total PCB	mg/kg	9.99E-01	36/87	N/A	N/A	0/87	1.12E+00	0/87	1.12E+02	0.00336 - 0.182
DI/FURA	Total Dioxin/Furans	mg/kg	5.39E-05	26/26	N/A	N/A	3/26	1.89E-05	0/26	5.67E-04	-
SVOA	2-Methylnaphthalene	mg/kg	1.78E-01	7/86	N/A	N/A	0/86	6.73E+01	0/86	2.02E+03	0.0332 - 0.4
SVOA	Acenaphthene	mg/kg	7.73E-01	10/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOA	Acenaphthylene	mg/kg	1.17E-02	1/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOA	Anthracene	mg/kg	1.84E+00	14/86	N/A	N/A	0/86	5.05E+03	0/86	1.00E+05	0.0332 - 0.4
SVOA	Benzenemethanol	mg/kg	2.80E-01	4/25	N/A	N/A	0/25	1.90E+03	0/25	5.70E+04	0.345 - 3.92
SVOA	Benzo(ghi)perylene	mg/kg	1.10E+00	16/86	N/A	N/A	0/86	5.05E+02	0/86	1.52E+04	0.0332 - 0.4
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	2.50E-01	9/86	N/A	N/A	0/86	1.90E+02	0/86	1.14E+04	0.0332 - 3.92
SVOA	Butyl benzyl phthalate	mg/kg	3.08E-02	1/86	N/A	N/A	0/86	1.40E+03	0/86	1.14E+05	0.0332 - 3.92
SVOA	Carbazole	mg/kg	7.66E-01	7/61	N/A	N/A	0/61	1.33E+02	0/61	1.33E+04	0.0332 - 0.4
SVOA	Dibenzofuran	mg/kg	4.87E-01	2/86	N/A	N/A	0/86	3.29E+01	0/86	9.87E+02	0.332 - 4
SVOA	Di-n-butyl phthalate	mg/kg	3.12E-02	13/86	N/A	N/A	0/86	1.90E+03	0/86	5.70E+04	0.0332 - 3.92
SVOA	Fluoranthene	mg/kg	7.38E+00	32/86	N/A	N/A	0/86	6.73E+02	0/86	2.02E+04	0.0332 - 0.4
SVOA	Fluorene	mg/kg	1.01E+00	8/86	N/A	N/A	0/86	6.73E+02	0/86	2.02E+04	0.0332 - 0.4
SVOA	Naphthalene	mg/kg	3.67E-01	4/86	N/A	N/A	0/86	1.67E+01	0/86	1.67E+03	0.0332 - 0.4
SVOA	Phenanthrene	mg/kg	7.80E+00	32/86	N/A	N/A	0/86	1.01E+03	0/86	3.03E+04	0.0332 - 0.4
SVOA	Pyrene	mg/kg	5.60E+00	30/86	N/A	N/A	0/86	5.05E+02	0/86	1.52E+04	0.0332 - 0.4
SVOA	Total PAH	mg/kg	3.55E+00	27/86	N/A	N/A	1/86	2.35E+00	0/86	1.51E+02	-
RADS	Americium-241	pCi/g	2.02E+00	3/220	N/A	N/A	0/220	1.64E+01	0/220	1.64E+03	0.0597 - 1.11
RADS	Cesium-137	pCi/g	2.82E+00	23/220	3/220	2.80E-01	2/220	5.82E-01	0/220	5.82E+01	0.0148 - 0.105
RADS	Neptunium-237	pCi/g	8.10E+00	6/220	6/220	1.00E-01	3/220	1.63E+00	0/220	1.63E+02	0.0293 - 1.41
RADS	Plutonium-239/240	pCi/g	1.97E+01	11/221	11/221	2.50E-02	1/221	1.83E+01	0/221	1.83E+03	0.0435 - 1.19
RADS	Technetium-99	pCi/g	3.23E+02	24/221	23/221	2.50E+00	0/221	1.55E+03	0/221	1.00E+05	1.58 - 4.76
RADS	Thorium-228	pCi/g	3.98E-01	1/1	0/1	1.60E+00	0/1	6.34E+01	0/1	6.34E+03	0.0642 - 0.0642
RADS	Thorium-230	pCi/g	7.78E+01	203/221	16/221	1.40E+00	2/221	2.82E+01	0/221	2.82E+03	0.0852 - 1.15
RADS	Thorium-232	pCi/g	4.17E-01	1/1	0/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.0438 - 0.0438
RADS	Uranium-233/234	pCi/g	2.27E+02	53/64	33/64	1.20E+00	2/64	4.30E+01	0/64	4.30E+03	0.255 - 1.15

Table C1.11. Sector 4 Surface and Subsurface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Uranium-234	pCi/g	3.32E+00	10/114	10/114	1.20E+00	0/114	4.30E+01	0/114	4.30E+03	0.061 - 1.43
RADS	Uranium-235	pCi/g	2.64E-01	118/156	37/156	6.00E-02	0/156	2.62E+00	0/156	2.62E+02	0.0176 - 0.0971
RADS	Uranium-235/236	pCi/g	1.61E+01	7/64	7/64	6.00E-02	2/64	2.62E+00	0/64	2.62E+02	0.125 - 1.03
RADS	Uranium-238	pCi/g	3.30E+02	174/188	87/188	1.20E+00	5/188	8.98E+00	0/188	8.98E+02	0.125 - 1.47
VOA	1,1-Dichloroethene	mg/kg	4.65E-02	10/177	N/A	N/A	0/177	1.26E+02	0/177	3.78E+03	0.000808 - 1.3
VOA	1,2,4-Trichlorobenzene	mg/kg	1.95E-03	1/76	N/A	N/A	0/76	3.20E+01	0/76	9.60E+02	0.000808 - 0.00188
VOA	1,2-Dimethylbenzene	mg/kg	2.21E-02	3/152	N/A	N/A	0/152	3.61E+02	0/152	1.08E+04	0.000808 - 1.3
VOA	1,3-Dichlorobenzene	mg/kg	4.58E-04	1/76	N/A	N/A	0/76	9.43E+02	0/76	2.83E+04	0.000808 - 0.00188
VOA	2-Butanone	mg/kg	5.27E-02	25/152	N/A	N/A	0/152	1.28E+04	0/152	3.84E+05	0.00404 - 1.3
VOA	4-Methyl-2-pentanone	mg/kg	2.75E-03	1/152	N/A	N/A	0/152	2.31E+03	0/152	6.93E+04	0.00404 - 1.3
VOA	Acetone	mg/kg	4.60E-01	99/152	N/A	N/A	0/152	2.96E+04	0/152	8.88E+05	0.00404 - 1.3
VOA	Acrolein	mg/kg	2.76E-03	2/76	N/A	N/A	0/76	8.14E-02	0/76	2.44E+00	0.00404 - 0.00938
VOA	Benzene	mg/kg	4.02E-03	6/152	N/A	N/A	0/152	2.59E+01	0/152	1.28E+03	0.000808 - 1.3
VOA	Chloroform	mg/kg	1.74E-03	10/152	N/A	N/A	0/152	8.90E+00	0/152	8.90E+02	0.000808 - 1.3
VOA	*cis* -1,2-Dichloroethene	mg/kg	2.50E+00	70/170	N/A	N/A	0/170	6.58E+01	0/170	1.97E+03	0.000808 - 1.3
VOA	Cumene	mg/kg	1.69E-03	2/76	N/A	N/A	0/76	1.02E+03	0/76	3.06E+04	0.000808 - 0.00188
VOA	Cyclohexane	mg/kg	4.81E-02	8/76	N/A	N/A	0/76	3.70E+03	0/76	1.11E+05	0.000808 - 0.00188
VOA	Ethylbenzene	mg/kg	2.32E-02	4/152	N/A	N/A	0/152	1.30E+02	0/152	1.30E+04	0.000808 - 1.3
VOA	m,p-Xylene	mg/kg	6.29E-02	4/152	N/A	N/A	0/152	3.23E+02	0/152	9.69E+03	0.00162 - 2.5
VOA	Methyl acetate	mg/kg	1.88E-02	1/76	N/A	N/A	0/76	3.29E+04	0/76	9.87E+05	0.00404 - 0.00938
VOA	Methylcyclohexane	mg/kg	6.34E-02	17/76	N/A	N/A	0/76	1.76E+03	0/76	5.28E+04	0.000808 - 0.00188
VOA	Methylene chloride	mg/kg	8.58E-03	41/152	N/A	N/A	0/152	1.57E+02	0/152	4.71E+03	0.00404 - 1.3
VOA	Tetrachloroethene	mg/kg	1.36E-03	5/152	N/A	N/A	0/152	4.34E+01	0/152	1.30E+03	0.000808 - 1.3
VOA	Toluene	mg/kg	6.06E-02	26/152	N/A	N/A	0/152	2.18E+03	0/152	6.54E+04	0.000808 - 1.3
VOA	Total Xylene	mg/kg	8.50E-02	3/76	N/A	N/A	0/76	3.23E+02	0/76	9.69E+03	0.00242 - 0.00563
VOA	*trans* -1,2-Dichloroethene	mg/kg	2.80E-02	18/170	N/A	N/A	0/170	5.67E+01	0/170	1.70E+03	0.000808 - 1.3
VOA	Trichloroethene	mg/kg	1.13E+02	147/181	N/A	N/A	18/181	2.26E+00	1/181	6.78E+01	0.000808 - 5
VOA	Vinyl chloride	mg/kg	7.55E-02	13/177	N/A	N/A	0/177	4.72E+00	0/177	4.72E+02	0.000808 - 1.3

(red) One or more samples exceed AL value

(green) One or more samples exceed NAL value

(orange) One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.12. Sector 5 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	1.39E+04	32/32	4/32	1.30E+04	0/32	1.00E+05	0/32	1.00E+05	9.77 - 114
METAL	Antimony	mg/kg	3.94E+00	16/32	16/32	2.10E-01	0/32	9.34E+01	0/32	2.80E+03	1.85 - 21.9
METAL	Arsenic	mg/kg	2.00E+01	31/32	2/32	1.20E+01	31/32	1.60E+00	0/32	1.60E+02	1.01 - 5.66
METAL	Barium	mg/kg	3.66E+02	32/32	2/32	2.00E+02	0/32	4.04E+04	0/32	1.00E+05	0.782 - 4.82
METAL	Beryllium	mg/kg	1.30E+00	31/32	3/32	6.70E-01	0/32	4.50E+02	0/32	1.35E+04	0.0977 - 0.493
METAL	Boron	mg/kg	9.68E+00	26/32	N/A	N/A	0/32	4.65E+04	0/32	1.00E+05	2.93 - 14.8
METAL	Cadmium	mg/kg	6.06E-01	28/32	16/32	2.10E-01	0/32	6.05E+01	0/32	1.82E+03	0.195 - 1.06
METAL	Chromium	mg/kg	4.24E+01	32/32	12/32	1.60E+01	24/32	1.23E+01	0/32	1.23E+03	0.586 - 2.96
METAL	Cobalt	mg/kg	1.80E+01	32/32	2/32	1.40E+01	0/32	6.87E+01	0/32	2.06E+03	0.195 - 0.986
METAL	Copper	mg/kg	3.50E+01	32/32	2/32	1.90E+01	0/32	9.34E+03	0/32	1.00E+05	0.391 - 1.97
METAL	Iron	mg/kg	3.45E+04	32/32	2/32	2.80E+04	0/32	1.00E+05	0/32	1.00E+05	19.5 - 238
METAL	Lead	mg/kg	4.92E+01	32/32	1/32	3.60E+01	0/32	8.00E+02	0/32	8.00E+02	0.391 - 1.97
METAL	Manganese	mg/kg	2.65E+03	32/32	3/32	1.50E+03	0/32	4.72E+03	0/32	1.00E+05	1.02 - 24.1
METAL	Mercury	mg/kg	5.81E-02	26/32	0/32	2.00E-01	0/32	7.01E+01	0/32	2.10E+03	0.0218 - 0.0294
METAL	Molybdenum	mg/kg	2.53E+00	30/32	N/A	N/A	0/32	1.16E+03	0/32	3.48E+04	0.195 - 1.06
METAL	Nickel	mg/kg	1.63E+01	32/32	0/32	2.10E+01	0/32	4.30E+03	0/32	1.00E+05	0.391 - 1.97
METAL	Selenium	mg/kg	2.08E+00	24/32	12/32	8.00E-01	0/32	1.17E+03	0/32	3.51E+04	1.01 - 5.66
METAL	Silver	mg/kg	2.81E+00	7/32	1/32	2.30E+00	0/32	1.17E+03	0/32	3.51E+04	0.502 - 5.47
METAL	Thallium	mg/kg	2.66E-01	10/32	1/32	2.10E-01	0/32	2.34E+00	0/32	7.02E+01	0.391 - 1.97
METAL	Uranium	mg/kg	8.98E+01	32/32	15/32	4.90E+00	3/32	4.66E+01	0/32	1.40E+03	0.0391 - 0.409
METAL	Vanadium	mg/kg	5.37E+01	32/32	2/32	3.80E+01	0/32	1.15E+03	0/32	3.45E+04	3.91 - 19.7
METAL	Zinc	mg/kg	2.75E+02	32/32	4/32	6.50E+01	0/32	7.01E+04	0/32	1.00E+05	4.03 - 22.7
ANION	Fluoride	mg/kg	2.05E+01	32/32	N/A	N/A	0/32	9.33E+03	0/32	1.00E+05	1 - 1.23
DI/FURA	Total Dioxin/Furans	mg/kg	1.06E-05	10/10	N/A	N/A	0/10	1.57E-05	0/10	1.57E-03	-
PPCB	Total PCB	mg/kg	7.40E-02	15/32	N/A	N/A	0/32	2.93E-01	0/32	2.93E+01	0.00336 - 0.0386
SVOA	2-Methylnaphthalene	mg/kg	6.36E-02	4/32	N/A	N/A	0/32	9.19E+01	0/32	2.76E+03	0.0341 - 0.396
SVOA	Acenaphthene	mg/kg	7.65E-01	8/32	N/A	N/A	0/32	1.38E+03	0/32	4.14E+04	0.0341 - 0.396
SVOA	Anthracene	mg/kg	1.28E+00	14/32	N/A	N/A	0/32	6.89E+03	0/32	1.00E+05	0.0341 - 0.396
SVOA	Benzo(ghi)perylene	mg/kg	3.22E+00	15/32	N/A	N/A	0/32	6.89E+02	0/32	2.07E+04	0.0341 - 0.396
SVOA	Carbazole	mg/kg	7.23E-01	8/32	N/A	N/A	0/32	4.06E+01	0/32	4.06E+03	0.0341 - 0.396
SVOA	Dimethyl phthalate	mg/kg	2.11E-01	1/32	N/A	N/A	0/32	2.32E+04	0/32	6.96E+05	0.0341 - 0.396
SVOA	Di-n-butyl phthalate	mg/kg	1.81E-02	3/32	N/A	N/A	0/32	2.90E+03	0/32	8.70E+04	0.0341 - 0.396
SVOA	Fluoranthene	mg/kg	9.10E+00	24/32	N/A	N/A	0/32	9.19E+02	0/32	2.76E+04	0.0341 - 0.396
SVOA	Fluorene	mg/kg	6.59E-01	8/32	N/A	N/A	0/32	9.19E+02	0/32	2.76E+04	0.0341 - 0.396
SVOA	Naphthalene	mg/kg	1.53E-01	4/32	N/A	N/A	0/32	4.06E+00	0/32	4.06E+02	0.0341 - 0.396
SVOA	Phenanthrene	mg/kg	6.76E+00	24/32	N/A	N/A	0/32	1.38E+03	0/32	4.14E+04	0.0341 - 0.396
SVOA	Pyrene	mg/kg	8.22E+00	23/32	N/A	N/A	0/32	6.89E+02	0/32	2.07E+04	0.0341 - 0.396
SVOA	Total PAH	mg/kg	6.90E+00	14/32	N/A	N/A	2/32	6.43E-01	0/32	6.43E+01	-
RADS	Cesium-137	pCi/g	8.09E+00	5/32	2/32	4.90E-01	4/32	1.08E-01	0/32	1.08E+01	0.0286 - 0.144
RADS	Neptunium-237	pCi/g	3.54E+00	1/33	1/33	1.00E-01	1/33	2.49E-01	0/33	2.49E+01	0.238 - 1.05
RADS	Plutonium-239/240	pCi/g	1.25E+01	1/33	1/33	2.50E-02	0/33	2.27E+01	0/33	2.27E+03	0.262 - 1.07
RADS	Radium-226	pCi/g	1.21E+00	1/1	0/1	1.50E+00	1/1	2.48E-02	0/1	2.48E+00	0.455 - 0.455
RADS	Technetium-99	pCi/g	4.16E+02	9/33	9/33	2.50E+00	0/33	1.27E+03	0/33	1.00E+05	2.74 - 4.3
RADS	Thorium-230	pCi/g	5.40E+01	29/33	9/33	1.50E+00	1/33	3.13E+01	0/33	3.13E+03	0.331 - 1.08
RADS	Thorium-232	pCi/g	1.59E+00	1/1	1/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	0.468 - 0.468
RADS	Uranium-233/234	pCi/g	2.90E+03	33/33	25/33	1.20E+00	1/33	5.01E+01	0/33	5.01E+03	0.328 - 16.6
RADS	Uranium-235/236	pCi/g	1.77E+02	9/33	9/33	6.00E-02	6/33	4.08E-01	1/33	4.08E+01	0.141 - 14.1
RADS	Uranium-238	pCi/g	3.00E+03	33/33	26/33	1.20E+00	20/33	1.66E+00	1/33	1.66E+02	0.17 - 16
VOA	1,1,2-Trichloroethane	mg/kg	2.41E-03	2/32	N/A	N/A	0/32	6.32E-01	0/32	1.90E+01	0.000884 - 0.362
VOA	1,1-Dichloroethene	mg/kg	5.97E-03	3/32	N/A	N/A	0/32	1.00E+02	0/32	3.00E+03	0.000884 - 0.362
VOA	1,2-Dimethylbenzene	mg/kg	1.71E-02	7/32	N/A	N/A	0/32	2.81E+02	0/32	8.43E+03	0.000884 - 0.362

Table C1.12. Sector 5 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
VOA	2-Butanone	mg/kg	2.25E-01	10/32	N/A	N/A	0/32	2.24E+04	0/32	6.72E+05	0.00442 - 1.81
VOA	Acetone	mg/kg	2.49E-01	20/32	N/A	N/A	0/32	2.10E+05	0/32	6.30E+06	0.00442 - 1.81
VOA	Benzene	mg/kg	8.47E-04	5/32	N/A	N/A	0/32	5.31E+00	0/32	5.31E+02	0.000884 - 0.362
VOA	Carbon disulfide	mg/kg	1.62E-02	1/32	N/A	N/A	0/32	3.52E+02	0/32	1.06E+04	0.00442 - 1.81
VOA	Chloroform	mg/kg	6.58E-04	5/32	N/A	N/A	0/32	1.39E+00	0/32	1.39E+02	0.000884 - 0.362
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.85E+00	9/32	N/A	N/A	0/32	4.67E+02	0/32	1.40E+04	0.000884 - 0.362
VOA	Cumene	mg/kg	1.30E-03	1/32	N/A	N/A	0/32	1.04E+03	0/32	3.12E+04	0.000884 - 0.362
VOA	Cyclohexane	mg/kg	1.15E-03	6/32	N/A	N/A	0/32	2.74E+03	0/32	8.22E+04	0.000884 - 0.362
VOA	Ethylbenzene	mg/kg	1.03E-02	7/32	N/A	N/A	0/32	2.66E+01	0/32	2.66E+03	0.000884 - 0.362
VOA	m,p-Xylene	mg/kg	4.81E-02	8/32	N/A	N/A	0/32	2.50E+02	0/32	7.50E+03	0.00177 - 0.724
VOA	Methyl acetate	mg/kg	2.33E-03	1/32	N/A	N/A	0/32	2.34E+05	0/32	7.02E+06	0.00442 - 1.81
VOA	Methylcyclohexane	mg/kg	2.34E-03	8/32	N/A	N/A	0/32	1.30E+03	0/32	3.90E+04	0.000884 - 0.362
VOA	Methylene chloride	mg/kg	5.26E-03	14/32	N/A	N/A	0/32	4.08E+02	0/32	1.22E+04	0.00442 - 1.81
VOA	Styrene	mg/kg	1.18E-03	1/32	N/A	N/A	0/32	3.76E+03	0/32	1.13E+05	0.000884 - 0.362
VOA	Tetrachloroethene	mg/kg	8.35E-02	5/32	N/A	N/A	0/32	4.00E+01	0/32	1.20E+03	0.000884 - 0.362
VOA	Toluene	mg/kg	1.40E-02	17/32	N/A	N/A	0/32	6.25E+03	0/32	1.00E+05	0.000884 - 0.362
VOA	Total Xylene	mg/kg	6.53E-02	7/32	N/A	N/A	0/32	2.50E+02	0/32	7.50E+03	0.00265 - 1.09
VOA	*trans* -1,2-Dichloroethene	mg/kg	2.71E-02	4/32	N/A	N/A	0/32	4.54E+01	0/32	1.36E+03	0.000884 - 0.362
VOA	Trichloroethene	mg/kg	2.36E+01	12/32	N/A	N/A	2/32	1.90E+00	0/32	5.70E+01	0.000884 - 0.362
VOA	Vinyl chloride	mg/kg	2.21E-01	3/32	N/A	N/A	0/32	2.06E+00	0/32	2.06E+02	0.000884 - 0.362

One or more samples exceed AL
One or more samples exceed NAL value
One or more samples exceed background value
FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
-- = No calculation completed, analyte not detected
Notes:
Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).
Uranium was screened against Uranium (Soluble Salts).
Total PCBs were calculated by laboratory.
Total PAHs were calculated using TEF values in the 2021 RMD.
Background value is the lower of surface or subsurface background levels.
Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.13. Sector 5 Surface and Subsurface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
METAL	Aluminum	mg/kg	2.12E+04	73/73	31/73	1.20E+04	0/73	3.26E+04	0/73	1.00E+05	9.77 - 123
METAL	Antimony	mg/kg	3.94E+00	28/73	28/73	2.10E-01	0/73	1.32E+01	0/73	3.96E+02	1.85 - 21.9
METAL	Arsenic	mg/kg	2.00E+01	71/73	7/73	7.90E+00	56/73	3.74E+00	0/73	3.60E+02	1.01 - 5.66
METAL	Barium	mg/kg	3.66E+02	73/73	6/73	1.70E+02	0/73	6.47E+03	0/73	1.00E+05	0.782 - 9.55
METAL	Beryllium	mg/kg	1.30E+00	72/73	10/73	6.70E-01	0/73	6.55E+01	0/73	1.97E+03	0.0977 - 0.493
METAL	Boron	mg/kg	9.68E+00	58/73	N/A	N/A	0/73	6.57E+03	0/73	1.00E+05	2.93 - 14.8
METAL	Cadmium	mg/kg	6.06E-01	51/73	16/73	2.10E-01	0/73	2.53E+01	0/73	7.59E+02	0.195 - 1.06
METAL	Chromium	mg/kg	5.14E+01	73/73	33/73	1.60E+01	71/73	9.14E+00	0/73	9.14E+02	0.586 - 2.96
METAL	Cobalt	mg/kg	2.53E+01	73/73	5/73	1.30E+01	13/73	9.84E+00	0/73	2.95E+02	0.195 - 0.986
METAL	Copper	mg/kg	3.50E+01	73/73	3/73	1.90E+01	0/73	1.32E+03	0/73	3.96E+04	0.391 - 1.97
METAL	Iron	mg/kg	3.45E+04	73/73	3/73	2.80E+04	6/73	2.30E+04	0/73	1.00E+05	19.5 - 246
METAL	Lead	mg/kg	4.92E+01	73/73	2/73	2.30E+01	0/73	8.00E+02	0/73	8.00E+02	0.391 - 1.97
METAL	Manganese	mg/kg	2.86E+03	73/73	11/73	8.20E+02	13/73	7.74E+02	0/73	2.32E+04	1.02 - 285
METAL	Mercury	mg/kg	5.96E-02	56/73	0/73	1.30E-01	0/73	9.86E+00	0/73	2.96E+02	0.0218 - 0.0299
METAL	Molybdenum	mg/kg	2.53E+00	71/73	N/A	N/A	0/73	1.64E+02	0/73	4.92E+03	0.195 - 1.06
METAL	Nickel	mg/kg	2.06E+01	73/73	0/73	2.10E+01	0/73	6.52E+02	0/73	1.96E+04	0.391 - 1.97
METAL	Selenium	mg/kg	3.25E+00	64/73	49/73	7.00E-01	0/73	1.64E+02	0/73	4.92E+03	1.01 - 5.66
METAL	Silver	mg/kg	2.81E+00	15/73	1/73	2.30E+00	0/73	1.64E+02	0/73	4.92E+03	0.502 - 5.73
METAL	Thallium	mg/kg	2.82E-01	29/73	7/73	2.10E-01	0/73	3.29E-01	0/73	9.87E+00	0.391 - 1.97
METAL	Uranium	mg/kg	8.98E+01	73/73	18/73	4.60E+00	14/73	6.58E+00	0/73	1.97E+02	0.0391 - 0.409
METAL	Vanadium	mg/kg	6.20E+01	73/73	7/73	3.70E+01	0/73	1.65E+02	0/73	4.95E+03	3.91 - 19.7
METAL	Zinc	mg/kg	2.75E+02	73/73	6/73	6.00E+01	0/73	9.86E+03	0/73	1.00E+05	4.03 - 22.7
ANION	Fluoride	mg/kg	2.05E+01	73/73	N/A	N/A	0/73	1.32E+03	0/73	3.96E+04	1 - 2.36
DI/FURA	Total Dioxin/Furans	mg/kg	1.58E-05	32/32	N/A	N/A	0/32	1.89E-05	0/32	5.67E-04	-
PPCB	Total PCB	mg/kg	7.40E-02	23/72	N/A	N/A	0/72	1.12E+00	0/72	1.12E+02	0.00336 - 0.0386
SVOA	2-Methylnaphthalene	mg/kg	6.36E-02	6/72	N/A	N/A	0/72	6.73E+01	0/72	2.02E+03	0.0341 - 0.396
SVOA	Acenaphthene	mg/kg	7.65E-01	12/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOA	Acenaphthylene	mg/kg	1.62E-02	1/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOA	Anthracene	mg/kg	1.28E+00	22/72	N/A	N/A	0/72	5.05E+03	0/72	1.00E+05	0.0341 - 0.396
SVOA	Benzo(ghi)perylene	mg/kg	3.22E+00	23/72	N/A	N/A	0/72	5.05E+02	0/72	1.52E+04	0.0341 - 0.396
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.63E-02	2/72	N/A	N/A	0/72	1.90E+02	0/72	1.14E+04	0.0341 - 0.396
SVOA	Butyl benzyl phthalate	mg/kg	1.66E-02	1/72	N/A	N/A	0/72	1.40E+03	0/72	1.14E+05	0.0341 - 0.396
SVOA	Carbazole	mg/kg	7.23E-01	11/72	N/A	N/A	0/72	1.33E+02	0/72	1.33E+04	0.0341 - 0.396
SVOA	Diethyl phthalate	mg/kg	1.82E-02	1/72	N/A	N/A	0/72	1.52E+04	0/72	4.56E+05	0.0341 - 0.396
SVOA	Dimethyl phthalate	mg/kg	2.11E-01	1/72	N/A	N/A	0/72	1.52E+04	0/72	4.56E+05	0.0341 - 0.396
SVOA	Di-n-butyl phthalate	mg/kg	3.38E-02	9/72	N/A	N/A	0/72	1.90E+03	0/72	5.70E+04	0.0341 - 0.396
SVOA	Di-n-octylphthalate	mg/kg	1.70E-02	1/72	N/A	N/A	0/72	1.90E+02	0/72	5.70E+03	0.0341 - 0.396
SVOA	Fluoranthene	mg/kg	9.10E+00	45/72	N/A	N/A	0/72	6.73E+02	0/72	2.02E+04	0.0341 - 0.396
SVOA	Fluorene	mg/kg	6.59E-01	13/72	N/A	N/A	0/72	6.73E+02	0/72	2.02E+04	0.0341 - 0.396
SVOA	Naphthalene	mg/kg	1.53E-01	6/72	N/A	N/A	0/72	1.67E+01	0/72	1.67E+03	0.0341 - 0.396
SVOA	Phenanthrene	mg/kg	6.76E+00	37/72	N/A	N/A	0/72	1.01E+03	0/72	3.03E+04	0.0341 - 0.396
SVOA	Pyrene	mg/kg	8.22E+00	41/72	N/A	N/A	0/72	5.05E+02	0/72	1.52E+04	0.0341 - 0.396
SVOA	Total PAH	mg/kg	6.90E+00	29/72	N/A	N/A	1/72	2.35E+00	0/72	1.51E+02	-
RADS	Cesium-137	pCi/g	8.09E+00	5/73	2/73	2.80E-01	2/73	5.82E-01	0/73	5.82E+01	0.0286 - 0.144
RADS	Neptunium-237	pCi/g	3.54E+00	1/74	1/74	1.00E-01	1/74	1.63E+00	0/74	1.63E+02	0.238 - 1.05
RADS	Plutonium-239/240	pCi/g	1.25E+01	1/74	1/74	2.50E-02	0/74	1.83E+01	0/74	1.83E+03	0.234 - 1.09
RADS	Radium-226	pCi/g	1.21E+00	1/1	0/1	1.50E+00	1/1	1.64E-01	0/1	1.64E+01	0.455 - 0.455
RADS	Technetium-99	pCi/g	4.16E+02	14/74	14/74	2.50E+00	0/74	1.55E+03	0/74	1.00E+05	2.74 - 4.97
RADS	Thorium-230	pCi/g	5.40E+01	65/74	21/74	1.40E+00	1/74	2.82E+01	0/74	2.82E+03	0.331 - 1.08
RADS	Thorium-232	pCi/g	1.59E+00	1/1	1/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.468 - 0.468
RADS	Uranium-233/234	pCi/g	2.90E+03	68/74	36/74	1.20E+00	1/74	4.30E+01	0/74	4.30E+03	0.255 - 16.6

Table C1.13. Sector 5 Surface and Subsurface Soil COPC Screen (Continued)

					Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Max	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
RADS	Uranium-235/236	pCi/g	1.77E+02	14/74	14/74	6.00E-02	1/74	2.62E+00	0/74	2.62E+02	0.116 - 14.1
RADS	Uranium-238	pCi/g	3.00E+03	74/74	41/74	1.20E+00	7/74	8.98E+00	1/74	8.98E+02	0.136 - 16
VOA	1,1,2-Trichloroethane	mg/kg	1.94E-02	5/72	N/A	N/A	0/72	8.49E-01	0/72	2.55E+01	0.000884 - 2.24
VOA	1,1-Dichloroethene	mg/kg	9.14E-03	7/72	N/A	N/A	0/72	1.26E+02	0/72	3.78E+03	0.000884 - 2.24
VOA	1,2-Dichloroethane	mg/kg	1.55E-03	2/72	N/A	N/A	0/72	1.13E+01	0/72	5.19E+02	0.000884 - 2.24
VOA	1,2-Dimethylbenzene	mg/kg	1.71E-02	10/72	N/A	N/A	0/72	3.61E+02	0/72	1.08E+04	0.000884 - 2.24
VOA	2-Butanone	mg/kg	2.25E-01	28/72	N/A	N/A	0/72	1.28E+04	0/72	3.84E+05	0.00442 - 11.2
VOA	2-Hexanone	mg/kg	2.34E-03	1/72	N/A	N/A	0/72	9.69E+01	0/72	2.91E+03	0.00442 - 11.2
VOA	4-Methyl-2-pentanone	mg/kg	2.15E-03	1/72	N/A	N/A	0/72	2.31E+03	0/72	6.93E+04	0.00442 - 11.2
VOA	Acetone	mg/kg	2.51E-01	53/72	N/A	N/A	0/72	2.96E+04	0/72	8.88E+05	0.00442 - 11.2
VOA	Acrolein	mg/kg	2.98E-03	1/72	N/A	N/A	0/72	8.14E-02	0/72	2.44E+00	0.00442 - 11.2
VOA	Benzene	mg/kg	1.01E-03	9/72	N/A	N/A	0/72	2.59E+01	0/72	1.28E+03	0.000884 - 2.24
VOA	Carbon disulfide	mg/kg	1.62E-02	1/72	N/A	N/A	0/72	4.21E+02	0/72	1.26E+04	0.00442 - 11.2
VOA	Chloroform	mg/kg	6.93E-03	8/72	N/A	N/A	0/72	8.90E+00	0/72	8.90E+02	0.000884 - 2.24
VOA	*cis* -1,2-Dichloroethene	mg/kg	9.11E+00	27/72	N/A	N/A	0/72	6.58E+01	0/72	1.97E+03	0.000884 - 2.24
VOA	Cumene	mg/kg	1.30E-03	1/72	N/A	N/A	0/72	1.02E+03	0/72	3.06E+04	0.000884 - 2.24
VOA	Cyclohexane	mg/kg	1.15E-03	7/72	N/A	N/A	0/72	3.70E+03	0/72	1.11E+05	0.000884 - 2.24
VOA	Ethylbenzene	mg/kg	1.03E-02	10/72	N/A	N/A	0/72	1.30E+02	0/72	1.30E+04	0.000884 - 2.24
VOA	m,p-Xylene	mg/kg	4.81E-02	11/72	N/A	N/A	0/72	3.23E+02	0/72	9.69E+03	0.00177 - 4.49
VOA	Methyl acetate	mg/kg	2.33E-03	2/72	N/A	N/A	0/72	3.29E+04	0/72	9.87E+05	0.00442 - 11.2
VOA	Methylcyclohexane	mg/kg	2.34E-03	14/72	N/A	N/A	0/72	1.76E+03	0/72	5.28E+04	0.000884 - 2.24
VOA	Methylene chloride	mg/kg	6.99E-03	37/72	N/A	N/A	0/72	1.57E+02	0/72	4.71E+03	0.00442 - 11.2
VOA	Styrene	mg/kg	1.18E-03	1/72	N/A	N/A	0/72	3.00E+03	0/72	9.00E+04	0.000884 - 2.24
VOA	Tetrachloroethene	mg/kg	8.35E-02	8/72	N/A	N/A	0/72	4.34E+01	0/72	1.30E+03	0.000884 - 2.24
VOA	Toluene	mg/kg	1.40E-02	30/72	N/A	N/A	0/72	2.18E+03	0/72	6.54E+04	0.000884 - 2.24
VOA	Total Xylene	mg/kg	6.53E-02	10/72	N/A	N/A	0/72	3.23E+02	0/72	9.69E+03	0.00265 - 6.73
VOA	*trans* -1,2-Dichloroethene	mg/kg	4.62E-02	11/72	N/A	N/A	0/72	5.67E+01	0/72	1.70E+03	0.000884 - 2.24
VOA	Trichloroethene	mg/kg	1.44E+02	22/72	N/A	N/A	3/72	2.26E+00	1/72	6.78E+01	0.000884 - 2.24
VOA	Vinyl chloride	mg/kg	4.79E-01	10/72	N/A	N/A	0/72	4.72E+00	0/72	4.72E+02	0.000884 - 2.24

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

Table C1.14. Sector 6 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Industrial Worker FOE	Industrial Worker NAL	Industrial Worker FOE	Industrial Worker AL	DL Range
METAL	Aluminum	mg/kg	1.48E+04	18/18	3/18	1.30E+04	0/18	1.00E+05	0/18	1.00E+05	5 - 114
METAL	Antimony	mg/kg	6.98E+01	11/19	11/19	2.10E-01	0/19	9.34E+01	0/19	2.80E+03	2.01 - 30
METAL	Arsenic	mg/kg	2.24E+01	19/19	2/19	1.20E+01	19/19	1.60E+00	0/19	1.60E+02	0.971 - 11
METAL	Barium	mg/kg	3.25E+02	18/19	2/19	2.00E+02	0/19	4.04E+04	0/19	1.00E+05	0.777 - 100
METAL	Beryllium	mg/kg	7.00E-01	18/18	1/18	6.70E-01	0/18	4.50E+02	0/18	1.35E+04	0.0971 - 0.114
METAL	Boron	mg/kg	4.05E+00	17/17	N/A	N/A	0/17	4.65E+04	0/17	1.00E+05	2.91 - 3.42
METAL	Cadmium	mg/kg	1.60E+01	18/19	13/19	2.10E-01	0/19	6.05E+01	0/19	1.82E+03	0.05 - 12
METAL	Calcium	mg/kg	8.20E+04	1/1	0/1	2.00E+05	0/1	N/A	0/1	N/A	250 - 250
METAL	Chromium	mg/kg	7.61E+01	18/19	10/19	1.60E+01	17/19	1.23E+01	0/19	1.23E+03	0.583 - 85
METAL	Cobalt	mg/kg	1.04E+02	18/18	1/18	1.40E+01	1/18	6.87E+01	0/18	2.06E+03	0.194 - 0.228
METAL	Copper	mg/kg	3.05E+02	18/19	6/19	1.90E+01	0/19	9.34E+03	0/19	1.00E+05	0.389 - 35
METAL	Iron	mg/kg	2.95E+04	19/19	1/19	2.80E+04	0/19	1.00E+05	0/19	1.00E+05	5 - 228
METAL	Lead	mg/kg	5.99E+01	19/19	2/19	3.60E+01	0/19	8.00E+02	0/19	8.00E+02	0.389 - 13
METAL	Magnesium	mg/kg	3.58E+03	1/1	0/1	7.70E+03	0/1	N/A	0/1	N/A	50 - 50
METAL	Manganese	mg/kg	3.84E+03	19/19	1/19	1.50E+03	0/19	4.72E+03	0/19	1.00E+05	1.05 - 105
METAL	Mercury	mg/kg	1.57E-01	16/19	0/19	2.00E-01	0/19	7.01E+01	0/19	2.10E+03	0.0225 - 10
METAL	Molybdenum	mg/kg	1.88E+00	18/19	N/A	N/A	0/19	1.16E+03	0/19	3.48E+04	0.194 - 15
METAL	Nickel	mg/kg	1.35E+02	18/19	6/19	2.10E+01	0/19	4.30E+03	0/19	1.00E+05	0.389 - 65
METAL	Selenium	mg/kg	1.57E+00	15/19	13/19	8.00E-01	0/19	1.17E+03	0/19	3.51E+04	0.5 - 20
METAL	Silver	mg/kg	6.91E+00	8/19	2/19	2.30E+00	0/19	1.17E+03	0/19	3.51E+04	0.2 - 10
METAL	Sodium	mg/kg	7.00E+01	1/1	0/1	3.20E+02	0/1	N/A	0/1	N/A	20 - 20
METAL	Thallium	mg/kg	1.01E+00	8/18	3/18	2.10E-01	0/18	2.34E+00	0/18	7.02E+01	0.2 - 0.456
METAL	Uranium	mg/kg	3.00E+02	19/19	15/19	4.90E+00	4/19	4.66E+01	0/19	1.40E+03	0.0401 - 20
METAL	Vanadium	mg/kg	3.28E+01	18/19	0/19	3.80E+01	0/19	1.15E+03	0/19	3.45E+04	1 - 70
METAL	Zinc	mg/kg	6.96E+02	19/19	10/19	6.50E+01	0/19	7.01E+04	0/19	1.00E+05	2 - 44.4
ANION	Fluoride	mg/kg	3.12E+01	17/17	N/A	N/A	0/17	9.33E+03	0/17	1.00E+05	1.06 - 1.21
PPCB	Total PCB	mg/kg	7.33E-01	9/19	N/A	N/A	2/19	2.93E-01	0/19	2.93E+01	0.00367 - 5
SVOA	Acenaphthene	mg/kg	3.81E-01	6/18	N/A	N/A	0/18	1.38E+03	0/18	4.14E+04	0.0361 - 1.45
SVOA	Anthracene	mg/kg	1.06E+00	6/18	N/A	N/A	0/18	6.89E+03	0/18	1.00E+05	0.0361 - 1.45
SVOA	Benzo(ghi)perylene	mg/kg	1.81E+00	10/18	N/A	N/A	0/18	6.89E+02	0/18	2.07E+04	0.0361 - 1.45
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	7.00E+00	4/18	N/A	N/A	0/18	5.80E+01	0/18	5.80E+03	0.0361 - 1.45
SVOA	Carbazole	mg/kg	7.73E-01	6/17	N/A	N/A	0/17	4.06E+01	0/17	4.06E+03	0.0361 - 1.45
SVOA	Di-n-butyl phthalate	mg/kg	4.21E-02	4/18	N/A	N/A	0/18	2.90E+03	0/18	8.70E+04	0.0361 - 1.45
SVOA	Fluoranthene	mg/kg	9.06E+00	17/18	N/A	N/A	0/18	9.19E+02	0/18	2.76E+04	0.0361 - 1.45
SVOA	Fluorene	mg/kg	4.64E-01	5/18	N/A	N/A	0/18	9.19E+02	0/18	2.76E+04	0.0361 - 1.45
SVOA	Phenanthrene	mg/kg	5.27E+00	15/18	N/A	N/A	0/18	1.38E+03	0/18	4.14E+04	0.0361 - 1.45
SVOA	Pyrene	mg/kg	5.85E+00	17/18	N/A	N/A	0/18	6.89E+02	0/18	2.07E+04	0.0361 - 1.45
SVOA	Total PAH	mg/kg	4.92E+00	17/18	N/A	N/A	4/18	6.43E-01	0/18	6.43E+01	-
RADS	Americium-241	pCi/g	3.93E+01	5/19	N/A	N/A	2/19	6.01E+00	0/19	6.01E+02	0.016 - 0.797
RADS	Cesium-137	pCi/g	3.42E+00	15/19	5/19	4.90E-01	14/19	1.08E-01	0/19	1.08E+01	0.0295 - 0.287
RADS	Neptunium-237	pCi/g	1.86E+01	5/19	5/19	1.00E-01	4/19	2.49E-01	0/19	2.49E+01	0.011 - 1
RADS	Plutonium-238	pCi/g	3.51E+00	3/19	2/19	7.30E-02	0/19	2.65E+01	0/19	2.65E+03	0.015 - 1.37
RADS	Plutonium-239/240	pCi/g	2.39E+02	7/19	7/19	2.50E-02	2/19	2.27E+01	0/19	2.27E+03	0.01 - 1.33
RADS	Technetium-99	pCi/g	1.61E+03	15/19	15/19	2.50E+00	1/19	1.27E+03	0/19	1.00E+05	0.5 - 4.05
RADS	Thorium-228	pCi/g	7.70E-01	1/1	0/1	1.60E+00	0/1	1.54E+02	0/1	1.54E+04	0.04 - 0.04
RADS	Thorium-230	pCi/g	1.06E+04	17/19	14/19	1.50E+00	5/19	3.13E+01	1/19	3.13E+03	0.02 - 3.9
RADS	Thorium-232	pCi/g	8.60E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	0.02 - 0.02
RADS	Uranium-233/234	pCi/g	4.13E+02	18/18	18/18	1.20E+00	4/18	5.01E+01	0/18	5.01E+03	0.45 - 1.8
RADS	Uranium-234	pCi/g	6.85E+00	1/1	1/1	1.20E+00	0/1	5.01E+01	0/1	5.01E+03	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	2.80E+01	8/19	8/19	6.00E-02	8/19	4.08E-01	0/19	4.08E+01	0.01 - 1.49
RADS	Uranium-238	pCi/g	4.40E+02	19/19	19/19	1.20E+00	17/19	1.66E+00	2/19	1.66E+02	0.02 - 1.46

Table C1.14. Sector 6 Surface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Industrial Worker		Industrial Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
VOA	1,2-Dimethylbenzene	mg/kg	3.74E-04	1/17	N/A	N/A	0/17	2.81E+02	0/17	8.43E+03	0.000929 - 0.113
VOA	2-Butanone	mg/kg	2.56E-01	3/17	N/A	N/A	0/17	2.24E+04	0/17	6.72E+05	0.00465 - 0.564
VOA	Acetone	mg/kg	3.20E-02	5/17	N/A	N/A	0/17	2.10E+05	0/17	6.30E+06	0.00465 - 0.564
VOA	Benzene	mg/kg	6.55E-04	2/17	N/A	N/A	0/17	5.31E+00	0/17	5.31E+02	0.000929 - 0.113
VOA	Chloroform	mg/kg	8.88E-04	1/17	N/A	N/A	0/17	1.39E+00	0/17	1.39E+02	0.000929 - 0.113
VOA	*cis* -1,2-Dichloroethene	mg/kg	9.29E-04	1/17	N/A	N/A	0/17	4.67E+02	0/17	1.40E+04	0.000929 - 0.113
VOA	Cyclohexane	mg/kg	1.65E-03	2/17	N/A	N/A	0/17	2.74E+03	0/17	8.22E+04	0.000929 - 0.113
VOA	Ethylbenzene	mg/kg	3.83E-04	1/17	N/A	N/A	0/17	2.66E+01	0/17	2.66E+03	0.000929 - 0.113
VOA	m,p-Xylene	mg/kg	9.17E-04	2/17	N/A	N/A	0/17	2.50E+02	0/17	7.50E+03	0.00186 - 0.226
VOA	Methylcyclohexane	mg/kg	2.40E-03	4/17	N/A	N/A	0/17	1.30E+03	0/17	3.90E+04	0.000929 - 0.113
VOA	Methylene chloride	mg/kg	2.30E-01	5/17	N/A	N/A	0/17	4.08E+02	0/17	1.22E+04	0.00465 - 0.564
VOA	Toluene	mg/kg	1.55E-03	7/17	N/A	N/A	0/17	6.25E+03	0/17	1.00E+05	0.000929 - 0.113
VOA	Total Xylene	mg/kg	1.29E-03	1/17	N/A	N/A	0/17	2.50E+02	0/17	7.50E+03	0.00279 - 0.338
VOA	Trichloroethene	mg/kg	1.02E-02	4/17	N/A	N/A	0/17	1.90E+00	0/17	5.70E+01	0.000929 - 0.121

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Table C1.15. Sector 6 Surface and Subsurface Soil COPC Screen

					Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Max	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	1.99E+04	39/39	11/39	1.20E+04	0/39	3.26E+04	0/39	1.00E+05	5 - 120
METAL	Antimony	mg/kg	7.10E+01	21/40	21/40	2.10E-01	4/40	1.32E+01	0/40	3.96E+02	0.56 - 30
METAL	Arsenic	mg/kg	2.24E+01	40/40	4/40	7.90E+00	35/40	3.74E+00	0/40	3.60E+02	0.971 - 11
METAL	Barium	mg/kg	4.21E+02	39/40	5/40	1.70E+02	0/40	6.47E+03	0/40	1.00E+05	0.777 - 100
METAL	Beryllium	mg/kg	8.90E-01	39/39	3/39	6.70E-01	0/39	6.55E+01	0/39	1.97E+03	0.0971 - 0.12
METAL	Boron	mg/kg	4.05E+00	32/33	N/A	N/A	0/33	6.57E+03	0/33	1.00E+05	2.91 - 3.6
METAL	Cadmium	mg/kg	1.60E+01	35/40	15/40	2.10E-01	0/40	2.53E+01	0/40	7.59E+02	0.05 - 12
METAL	Calcium	mg/kg	8.20E+04	6/6	1/6	6.10E+03	0/6	N/A	0/6	N/A	50 - 250
METAL	Chromium	mg/kg	7.61E+01	38/40	19/40	1.60E+01	38/40	9.14E+00	0/40	9.14E+02	0.583 - 85
METAL	Cobalt	mg/kg	1.04E+02	39/39	4/39	1.30E+01	6/39	9.84E+00	0/39	2.95E+02	0.194 - 0.24
METAL	Copper	mg/kg	3.05E+02	39/40	7/40	1.90E+01	0/40	1.32E+03	0/40	3.96E+04	0.389 - 35
METAL	Iron	mg/kg	2.95E+04	40/40	1/40	2.80E+04	5/40	2.30E+04	0/40	1.00E+05	5 - 240
METAL	Lead	mg/kg	5.99E+01	40/40	6/40	2.30E+01	0/40	8.00E+02	0/40	8.00E+02	0.3 - 13
METAL	Magnesium	mg/kg	3.58E+03	6/6	1/6	2.10E+03	0/6	N/A	0/6	N/A	50 - 57.9
METAL	Manganese	mg/kg	3.84E+03	40/40	4/40	8.20E+02	4/40	7.74E+02	0/40	2.32E+04	0.2 - 105
METAL	Mercury	mg/kg	1.57E-01	28/40	1/40	1.30E-01	0/40	9.86E+00	0/40	2.96E+02	0.0225 - 10
METAL	Molybdenum	mg/kg	1.88E+00	36/40	N/A	N/A	0/40	1.64E+02	0/40	4.92E+03	0.194 - 15
METAL	Nickel	mg/kg	1.35E+02	39/40	8/40	2.10E+01	0/40	6.52E+02	0/40	1.96E+04	0.389 - 65
METAL	Selenium	mg/kg	2.04E+00	34/40	30/40	7.00E-01	0/40	1.64E+02	0/40	4.92E+03	0.5 - 20
METAL	Silver	mg/kg	6.91E+00	15/40	2/40	2.30E+00	0/40	1.64E+02	0/40	4.92E+03	0.2 - 10
METAL	Sodium	mg/kg	3.76E+02	6/6	1/6	3.20E+02	0/6	N/A	0/6	N/A	20 - 23.2
METAL	Thallium	mg/kg	1.01E+00	18/39	7/39	2.10E-01	3/39	3.29E-01	0/39	9.87E+00	0.2 - 0.48
METAL	Uranium	mg/kg	3.00E+02	40/40	23/40	4.60E+00	22/40	6.58E+00	2/40	1.97E+02	0.03 - 20
METAL	Vanadium	mg/kg	3.61E+01	39/40	0/40	3.70E+01	0/40	1.65E+02	0/40	4.95E+03	1 - 70
METAL	Zinc	mg/kg	6.96E+02	40/40	11/40	6.00E+01	0/40	9.86E+03	0/40	1.00E+05	2 - 44.4
ANION	Fluoride	mg/kg	3.12E+01	33/33	N/A	N/A	0/33	1.32E+03	0/33	3.96E+04	1.06 - 1.24
PPCB	Total PCB	mg/kg	7.33E-01	9/37	N/A	N/A	0/37	1.12E+00	0/37	1.12E+02	0.00367 - 5
SVOA	Acenaphthene	mg/kg	3.81E-01	9/36	N/A	N/A	0/36	1.01E+03	0/36	3.03E+04	0.0361 - 1.45
SVOA	Anthracene	mg/kg	1.06E+00	8/36	N/A	N/A	0/36	5.05E+03	0/36	1.00E+05	0.0361 - 1.45
SVOA	Benzo(ghi)perylene	mg/kg	1.81E+00	12/36	N/A	N/A	0/36	5.05E+02	0/36	1.52E+04	0.0361 - 1.45
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	7.00E+00	4/36	N/A	N/A	0/36	1.90E+02	0/36	1.14E+04	0.0361 - 1.45
SVOA	Carbazole	mg/kg	7.73E-01	8/32	N/A	N/A	0/32	1.33E+02	0/32	1.33E+04	0.0361 - 1.45
SVOA	Diethyl phthalate	mg/kg	3.43E-02	2/36	N/A	N/A	0/36	1.52E+04	0/36	4.56E+05	0.0361 - 1.45
SVOA	Di-n-butyl phthalate	mg/kg	4.21E-02	7/36	N/A	N/A	0/36	1.90E+03	0/36	5.70E+04	0.0361 - 1.45
SVOA	Fluoranthene	mg/kg	9.06E+00	26/36	N/A	N/A	0/36	6.73E+02	0/36	2.02E+04	0.0361 - 1.45
SVOA	Fluorene	mg/kg	4.64E-01	6/36	N/A	N/A	0/36	6.73E+02	0/36	2.02E+04	0.0361 - 1.45
SVOA	Naphthalene	mg/kg	1.48E-02	1/36	N/A	N/A	0/36	1.67E+01	0/36	1.67E+03	0.0361 - 1.45
SVOA	Phenanthrene	mg/kg	5.27E+00	21/36	N/A	N/A	0/36	1.01E+03	0/36	3.03E+04	0.0361 - 1.45
SVOA	Pyrene	mg/kg	5.85E+00	26/36	N/A	N/A	0/36	5.05E+02	0/36	1.52E+04	0.0361 - 1.45
SVOA	Total PAH	mg/kg	4.92E+00	24/36	N/A	N/A	2/36	2.35E+00	0/36	1.51E+02	-
RADS	Americium-241	pCi/g	3.93E+01	8/38	N/A	N/A	2/38	1.64E+01	0/38	1.64E+03	0.009 - 0.973
RADS	Cesium-137	pCi/g	3.42E+00	16/38	11/38	2.80E-01	5/38	5.82E-01	0/38	5.82E+01	0.0295 - 0.287
RADS	Neptunium-237	pCi/g	1.86E+01	7/38	7/38	1.00E-01	2/38	1.63E+00	0/38	1.63E+02	0.011 - 1.97
RADS	Plutonium-238	pCi/g	3.51E+00	4/38	3/38	7.30E-02	0/38	1.94E+01	0/38	1.94E+03	0.015 - 1.37
RADS	Plutonium-239/240	pCi/g	2.39E+02	10/38	9/38	2.50E-02	3/38	1.83E+01	0/38	1.83E+03	0.0043 - 1.33
RADS	Technetium-99	pCi/g	1.61E+03	23/38	23/38	2.50E+00	1/38	1.55E+03	0/38	1.00E+05	0.49 - 4.57
RADS	Thorium-228	pCi/g	1.11E+00	4/4	0/4	1.60E+00	0/4	6.34E+01	0/4	6.34E+03	0.02 - 0.04
RADS	Thorium-230	pCi/g	1.06E+04	32/38	20/38	1.40E+00	7/38	2.82E+01	1/38	2.82E+03	0.007 - 3.9
RADS	Thorium-232	pCi/g	1.16E+00	4/4	0/4	1.50E+00	0/4	2.60E+01	0/4	2.60E+03	0.007 - 0.02
RADS	Uranium-233/234	pCi/g	4.13E+02	33/34	27/34	1.20E+00	5/34	4.30E+01	0/34	4.30E+03	0.422 - 1.8
RADS	Uranium-234	pCi/g	8.10E+00	4/4	2/4	1.20E+00	0/4	4.30E+01	0/4	4.30E+03	0.02 - 0.02

Table C1.15. Sector 6 Surface and Subsurface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Uranium-235/236	pCi/g	2.80E+01	15/38	13/38	6.00E-02	4/38	2.62E+00	0/38	2.62E+02	0.01 - 1.49
RADS	Uranium-238	pCi/g	4.40E+02	37/38	32/38	1.20E+00	11/38	8.98E+00	0/38	8.98E+02	0.009 - 1.46
VOA	1,1-Dichloroethene	mg/kg	5.28E-03	1/38	N/A	N/A	0/38	1.26E+02	0/38	3.78E+03	0.000888 - 0.113
VOA	1,2-Dimethylbenzene	mg/kg	3.74E-04	1/38	N/A	N/A	0/38	3.61E+02	0/38	1.08E+04	0.000888 - 0.113
VOA	2-Butanone	mg/kg	2.56E-01	8/32	N/A	N/A	0/32	1.28E+04	0/32	3.84E+05	0.00444 - 0.564
VOA	Acetone	mg/kg	1.95E-01	21/36	N/A	N/A	0/36	2.96E+04	0/36	8.88E+05	0.00444 - 0.564
VOA	Acrolein	mg/kg	2.44E-03	1/32	N/A	N/A	0/32	8.14E-02	0/32	2.44E+00	0.00444 - 0.564
VOA	Benzene	mg/kg	6.55E-04	2/38	N/A	N/A	0/38	2.59E+01	0/38	1.28E+03	0.000888 - 0.113
VOA	Chloroform	mg/kg	8.88E-04	1/38	N/A	N/A	0/38	8.90E+00	0/38	8.90E+02	0.000888 - 0.113
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.77E-01	5/38	N/A	N/A	0/38	6.58E+01	0/38	1.97E+03	0.000888 - 0.113
VOA	Cyclohexane	mg/kg	1.65E-03	2/32	N/A	N/A	0/32	3.70E+03	0/32	1.11E+05	0.000888 - 0.113
VOA	Ethylbenzene	mg/kg	3.83E-04	1/38	N/A	N/A	0/38	1.30E+02	0/38	1.30E+04	0.000888 - 0.113
VOA	m,p-Xylene	mg/kg	9.17E-04	2/38	N/A	N/A	0/38	3.23E+02	0/38	9.69E+03	0.00178 - 0.226
VOA	Methylcyclohexane	mg/kg	2.40E-03	4/32	N/A	N/A	0/32	1.76E+03	0/32	5.28E+04	0.000888 - 0.113
VOA	Methylene chloride	mg/kg	2.30E-01	15/38	N/A	N/A	0/38	1.57E+02	0/38	4.71E+03	0.00444 - 0.564
VOA	Toluene	mg/kg	6.54E-03	13/38	N/A	N/A	0/38	2.18E+03	0/38	6.54E+04	0.000888 - 0.113
VOA	Total Xylene	mg/kg	1.29E-03	1/32	N/A	N/A	0/32	3.23E+02	0/32	9.69E+03	0.00266 - 0.338
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.28E-03	1/38	N/A	N/A	0/38	5.67E+01	0/38	1.70E+03	0.000888 - 0.113
VOA	Trichloroethene	mg/kg	6.28E-02	7/38	N/A	N/A	0/38	2.26E+00	0/38	6.78E+01	0.000888 - 0.125
VOA	Vinyl chloride	mg/kg	5.88E-03	1/38	N/A	N/A	0/38	4.72E+00	0/38	4.72E+02	0.000888 - 0.113

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Table C1.16. Sector 7 Surface Soil COPC Screen

Type	Analysis	Unit	Max	FOD	Provisional Background FOE	Provisional Background Bkgd	Industrial Worker FOE	Industrial Worker NAL	Industrial Worker FOE	Industrial Worker AL	DL Range
METAL	Aluminum	mg/kg	1.45E+04	19/19	3/19	1.30E+04	0/19	1.00E+05	0/19	1.00E+05	9.87 - 114
METAL	Antimony	mg/kg	1.27E+00	14/19	14/19	2.10E-01	0/19	9.34E+01	0/19	2.80E+03	1.92 - 2.46
METAL	Arsenic	mg/kg	9.00E+00	19/19	0/19	1.20E+01	19/19	1.60E+00	0/19	1.60E+02	1.01 - 4.94
METAL	Barium	mg/kg	1.06E+02	19/19	0/19	2.00E+02	0/19	4.04E+04	0/19	1.00E+05	0.79 - 0.993
METAL	Beryllium	mg/kg	7.44E-01	19/19	2/19	6.70E-01	0/19	4.50E+02	0/19	1.35E+04	0.0987 - 0.124
METAL	Boron	mg/kg	4.26E+00	17/19	N/A	N/A	0/19	4.65E+04	0/19	1.00E+05	2.96 - 3.72
METAL	Cadmium	mg/kg	1.70E+00	16/19	6/19	2.10E-01	0/19	6.05E+01	0/19	1.82E+03	0.202 - 0.987
METAL	Chromium	mg/kg	4.01E+01	19/19	11/19	1.60E+01	15/19	1.23E+01	0/19	1.23E+03	0.592 - 0.745
METAL	Cobalt	mg/kg	9.63E+00	19/19	0/19	1.40E+01	0/19	6.87E+01	0/19	2.06E+03	0.197 - 0.248
METAL	Copper	mg/kg	2.61E+02	19/19	3/19	1.90E+01	0/19	9.34E+03	0/19	1.00E+05	0.395 - 4.23
METAL	Iron	mg/kg	2.51E+04	19/19	0/19	2.80E+04	0/19	1.00E+05	0/19	1.00E+05	19.7 - 248
METAL	Lead	mg/kg	5.65E+01	19/19	1/19	3.60E+01	0/19	8.00E+02	0/19	8.00E+02	0.395 - 0.496
METAL	Manganese	mg/kg	5.81E+02	19/19	0/19	1.50E+03	0/19	4.72E+03	0/19	1.00E+05	0.987 - 12.4
METAL	Mercury	mg/kg	7.55E+00	18/19	4/19	2.00E-01	0/19	7.01E+01	0/19	2.10E+03	0.0223 - 0.446
METAL	Molybdenum	mg/kg	1.62E+00	19/19	N/A	N/A	0/19	1.16E+03	0/19	3.48E+04	0.202 - 0.987
METAL	Nickel	mg/kg	1.32E+02	19/19	4/19	2.10E+01	0/19	4.30E+03	0/19	1.00E+05	0.395 - 0.496
METAL	Selenium	mg/kg	1.67E+00	17/19	13/19	8.00E-01	0/19	1.17E+03	0/19	3.51E+04	1.01 - 4.94
METAL	Silver	mg/kg	1.25E+00	10/19	0/19	2.30E+00	0/19	1.17E+03	0/19	3.51E+04	0.48 - 5.63
METAL	Thallium	mg/kg	1.92E-01	5/19	0/19	2.10E-01	0/19	2.34E+00	0/19	7.02E+01	0.395 - 0.496
METAL	Uranium	mg/kg	8.39E+01	19/19	13/19	4.90E+00	2/19	4.66E+01	0/19	1.40E+03	0.0395 - 0.0496
METAL	Vanadium	mg/kg	3.76E+01	19/19	0/19	3.80E+01	0/19	1.15E+03	0/19	3.45E+04	3.95 - 4.96
METAL	Zinc	mg/kg	1.38E+02	19/19	3/19	6.50E+01	0/19	7.01E+04	0/19	1.00E+05	4.05 - 21.4
ANION	Fluoride	mg/kg	3.68E+01	19/19	N/A	N/A	0/19	9.33E+03	0/19	1.00E+05	1.06 - 1.26
DI/FURA	Total Dioxin/Furans	mg/kg	5.80E-06	1/1	N/A	N/A	0/1	1.57E-05	0/1	1.57E-03	-
PPCB	Total PCB	mg/kg	8.60E-03	4/20	N/A	N/A	0/20	2.93E-01	0/20	2.93E+01	0.00351 - 0.733
SVOA	Acenaphthene	mg/kg	6.32E-01	5/20	N/A	N/A	0/20	1.38E+03	0/20	4.14E+04	0.0346 - 0.415
SVOA	Anthracene	mg/kg	9.96E-01	6/20	N/A	N/A	0/20	6.89E+03	0/20	1.00E+05	0.0346 - 0.415
SVOA	Benzo(ghi)perylene	mg/kg	1.52E+00	6/20	N/A	N/A	0/20	6.89E+02	0/20	2.07E+04	0.0346 - 0.415
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.11E-01	4/20	N/A	N/A	0/20	5.80E+01	0/20	5.80E+03	0.0346 - 0.415
SVOA	Butyl benzyl phthalate	mg/kg	6.17E+00	2/20	N/A	N/A	0/20	4.27E+02	0/20	4.27E+04	0.0346 - 0.415
SVOA	Carbazole	mg/kg	5.72E-01	3/20	N/A	N/A	0/20	4.06E+01	0/20	4.06E+03	0.0346 - 0.415
SVOA	Di-n-butyl phthalate	mg/kg	2.84E-02	3/20	N/A	N/A	0/20	2.90E+03	0/20	8.70E+04	0.0346 - 0.415
SVOA	Fluoranthene	mg/kg	6.37E+00	10/20	N/A	N/A	0/20	9.19E+02	0/20	2.76E+04	0.0346 - 0.415
SVOA	Fluorene	mg/kg	4.88E-01	4/20	N/A	N/A	0/20	9.19E+02	0/20	2.76E+04	0.0346 - 0.415
SVOA	Naphthalene	mg/kg	1.40E-01	1/20	N/A	N/A	0/20	4.06E+00	0/20	4.06E+02	0.0346 - 0.415
SVOA	Phenanthrene	mg/kg	5.33E+00	9/20	N/A	N/A	0/20	1.38E+03	0/20	4.14E+04	0.0346 - 0.415
SVOA	Pyrene	mg/kg	5.66E+00	10/20	N/A	N/A	0/20	6.89E+02	0/20	2.07E+04	0.0346 - 0.415
SVOA	Total PAH	mg/kg	3.39E+00	10/20	N/A	N/A	5/20	6.43E-01	0/20	6.43E+01	-
RADS	Americium-241	pCi/g	3.99E+00	1/20	N/A	N/A	0/20	6.01E+00	0/20	6.01E+02	0.373 - 1.07
RADS	Cesium-137	pCi/g	2.93E+00	14/20	7/20	4.90E-01	11/20	1.08E-01	0/20	1.08E+01	0.0292 - 0.117
RADS	Neptunium-237	pCi/g	6.50E+00	3/20	3/20	1.00E-01	3/20	2.49E-01	0/20	2.49E+01	0.337 - 1.03
RADS	Plutonium-238	pCi/g	4.56E-01	1/20	1/20	7.30E-02	0/20	2.65E+01	0/20	2.65E+03	0.178 - 1.34
RADS	Plutonium-239/240	pCi/g	1.50E+01	7/20	7/20	2.50E-02	0/20	2.27E+01	0/20	2.27E+03	0.302 - 0.849
RADS	Radium-226	pCi/g	1.33E+00	1/1	0/1	1.50E+00	1/1	2.48E-02	0/1	2.48E+00	0.76 - 0.76
RADS	Technetium-99	pCi/g	1.63E+02	14/20	14/20	2.50E+00	0/20	1.27E+03	0/20	1.00E+05	2.35 - 4.21
RADS	Thorium-230	pCi/g	1.52E+02	20/20	14/20	1.50E+00	1/20	3.13E+01	0/20	3.13E+03	0.394 - 1.13
RADS	Thorium-232	pCi/g	9.16E-01	1/1	0/1	1.50E+00	0/1	3.08E+01	0/1	3.08E+03	0.472 - 0.472
RADS	Uranium-233/234	pCi/g	2.79E+01	10/12	9/12	1.20E+00	0/12	5.01E+01	0/12	5.01E+03	0.453 - 0.896
RADS	Uranium-234	pCi/g	8.67E+00	8/8	8/8	1.20E+00	0/8	5.01E+01	0/8	5.01E+03	0.659 - 0.863
RADS	Uranium-235	pCi/g	8.25E-01	2/8	2/8	6.00E-02	2/8	4.08E-01	0/8	4.08E+01	0.24 - 0.608
RADS	Uranium-235/236	pCi/g	1.12E+00	4/12	4/12	6.00E-02	4/12	4.08E-01	0/12	4.08E+01	0.296 - 0.663
RADS	Uranium-238	pCi/g	3.36E+01	19/20	18/20	1.20E+00	16/20	1.66E+00	0/20	1.66E+02	0.247 - 0.802

Table C1.16. Sector 7 Surface Soil COPC Screen (Continued)

					Provisional Background		Industrial Worker		Industrial Worker		
Type	Analysis	Unit	Max	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
VOA	1,2-Dimethylbenzene	mg/kg	4.74E-03	1/19	N/A	N/A	0/19	2.81E+02	0/19	8.43E+03	0.000887 - 0.00129
VOA	2-Butanone	mg/kg	2.96E-03	2/19	N/A	N/A	0/19	2.24E+04	0/19	6.72E+05	0.00444 - 0.00647
VOA	Acetone	mg/kg	2.02E-02	12/19	N/A	N/A	0/19	2.10E+05	0/19	6.30E+06	0.00444 - 0.00647
VOA	Chloroform	mg/kg	8.72E-04	4/19	N/A	N/A	0/19	1.39E+00	0/19	1.39E+02	0.000887 - 0.00129
VOA	Ethylbenzene	mg/kg	2.32E-03	1/19	N/A	N/A	0/19	2.66E+01	0/19	2.66E+03	0.000887 - 0.00129
VOA	m,p-Xylene	mg/kg	1.09E-02	1/19	N/A	N/A	0/19	2.50E+02	0/19	7.50E+03	0.00177 - 0.00259
VOA	Methylene chloride	mg/kg	4.22E-03	7/19	N/A	N/A	0/19	4.08E+02	0/19	1.22E+04	0.00444 - 0.00647
VOA	Toluene	mg/kg	8.26E-03	3/19	N/A	N/A	0/19	6.25E+03	0/19	1.00E+05	0.000887 - 0.00129
VOA	Total Xylene	mg/kg	1.56E-02	1/19	N/A	N/A	0/19	2.50E+02	0/19	7.50E+03	0.00266 - 0.00388
VOA	Trichloroethene	mg/kg	3.40E-03	1/19	N/A	N/A	0/19	1.90E+00	0/19	5.70E+01	0.000887 - 0.00129

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.17. Sector 7 Surface and Subsurface Soil COPC Screen

					Provisional Background		Excavation Worker		Excavation Worker		
Type	Analysis	Unit	Max	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	DL Range
METAL	Aluminum	mg/kg	1.57E+04	39/39	11/39	1.20E+04	0/39	3.26E+04	0/39	1.00E+05	9.87 - 120
METAL	Antimony	mg/kg	2.34E+00	21/39	21/39	2.10E-01	0/39	1.32E+01	0/39	3.96E+02	1.92 - 2.46
METAL	Arsenic	mg/kg	9.52E+00	39/39	5/39	7.90E+00	32/39	3.74E+00	0/39	3.60E+02	0.998 - 4.94
METAL	Barium	mg/kg	2.81E+02	39/39	3/39	1.70E+02	0/39	6.47E+03	0/39	1.00E+05	0.79 - 9.51
METAL	Beryllium	mg/kg	9.13E-01	39/39	5/39	6.70E-01	0/39	6.55E+01	0/39	1.97E+03	0.0987 - 0.124
METAL	Boron	mg/kg	4.26E+00	32/39	N/A	N/A	0/39	6.57E+03	0/39	1.00E+05	2.96 - 3.72
METAL	Cadmium	mg/kg	1.70E+00	33/39	7/39	2.10E-01	0/39	2.53E+01	0/39	7.59E+02	0.2 - 0.987
METAL	Chromium	mg/kg	4.01E+01	39/39	23/39	1.60E+01	38/39	9.14E+00	0/39	9.14E+02	0.592 - 0.745
METAL	Cobalt	mg/kg	1.42E+01	39/39	2/39	1.30E+01	2/39	9.84E+00	0/39	2.95E+02	0.197 - 0.248
METAL	Copper	mg/kg	2.61E+02	39/39	4/39	1.90E+01	0/39	1.32E+03	0/39	3.96E+04	0.395 - 4.23
METAL	Iron	mg/kg	2.69E+04	39/39	0/39	2.80E+04	4/39	2.30E+04	0/39	1.00E+05	19.7 - 248
METAL	Lead	mg/kg	5.65E+01	39/39	2/39	2.30E+01	0/39	8.00E+02	0/39	8.00E+02	0.395 - 0.496
METAL	Manganese	mg/kg	1.58E+03	39/39	1/39	8.20E+02	3/39	7.74E+02	0/39	2.32E+04	0.987 - 12.4
METAL	Mercury	mg/kg	7.55E+00	37/39	10/39	1.30E-01	0/39	9.86E+00	0/39	2.96E+02	0.0223 - 0.521
METAL	Molybdenum	mg/kg	1.62E+00	39/39	N/A	N/A	0/39	1.64E+02	0/39	4.92E+03	0.2 - 0.987
METAL	Nickel	mg/kg	2.31E+02	39/39	7/39	2.10E+01	0/39	6.52E+02	0/39	1.96E+04	0.395 - 3.99
METAL	Selenium	mg/kg	2.34E+00	37/39	34/39	7.00E-01	0/39	1.64E+02	0/39	4.92E+03	0.998 - 4.94
METAL	Silver	mg/kg	1.93E+00	14/39	0/39	2.30E+00	0/39	1.64E+02	0/39	4.92E+03	0.48 - 6.11
METAL	Thallium	mg/kg	2.05E-01	12/39	0/39	2.10E-01	0/39	3.29E-01	0/39	9.87E+00	0.395 - 0.496
METAL	Uranium	mg/kg	8.39E+01	39/39	21/39	4.60E+00	18/39	6.58E+00	0/39	1.97E+02	0.0395 - 0.0496
METAL	Vanadium	mg/kg	4.92E+01	39/39	3/39	3.70E+01	0/39	1.65E+02	0/39	4.95E+03	3.95 - 4.96
METAL	Zinc	mg/kg	1.38E+02	39/39	5/39	6.00E+01	0/39	9.86E+03	0/39	1.00E+05	3.99 - 21.4
ANION	Fluoride	mg/kg	3.68E+01	39/39	N/A	N/A	0/39	1.32E+03	0/39	3.96E+04	1.06 - 1.26
DI/FURA	Total Dioxin/Furans	mg/kg	6.40E-06	2/2	N/A	N/A	0/2	1.89E-05	0/2	5.67E-04	-
PPCB	Total PCB	mg/kg	1.27E-02	10/37	N/A	N/A	0/37	1.12E+00	0/37	1.12E+02	0.00351 - 0.733
SVOA	2-Methylnaphthalene	mg/kg	2.26E-02	1/37	N/A	N/A	0/37	6.73E+01	0/37	2.02E+03	0.0346 - 0.415
SVOA	Acenaphthene	mg/kg	6.32E-01	8/37	N/A	N/A	0/37	1.01E+03	0/37	3.03E+04	0.0346 - 0.415
SVOA	Anthracene	mg/kg	9.96E-01	10/37	N/A	N/A	0/37	5.05E+03	0/37	1.00E+05	0.0346 - 0.415
SVOA	Benzo(ghi)perylene	mg/kg	1.52E+00	9/37	N/A	N/A	0/37	5.05E+02	0/37	1.52E+04	0.0346 - 0.415
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.11E-01	4/37	N/A	N/A	0/37	1.90E+02	0/37	1.14E+04	0.0346 - 0.415
SVOA	Butyl benzyl phthalate	mg/kg	6.17E+00	2/37	N/A	N/A	0/37	1.40E+03	0/37	1.14E+05	0.0346 - 0.415
SVOA	Carbazole	mg/kg	5.72E-01	7/37	N/A	N/A	0/37	1.33E+02	0/37	1.33E+04	0.0346 - 0.415
SVOA	Diethyl phthalate	mg/kg	1.92E-02	2/37	N/A	N/A	0/37	1.52E+04	0/37	4.56E+05	0.0346 - 0.415
SVOA	Di-n-butyl phthalate	mg/kg	2.84E-02	7/37	N/A	N/A	0/37	1.90E+03	0/37	5.70E+04	0.0346 - 0.415
SVOA	Fluoranthene	mg/kg	6.37E+00	16/37	N/A	N/A	0/37	6.73E+02	0/37	2.02E+04	0.0346 - 0.415
SVOA	Fluorene	mg/kg	4.88E-01	7/37	N/A	N/A	0/37	6.73E+02	0/37	2.02E+04	0.0346 - 0.415
SVOA	Naphthalene	mg/kg	1.40E-01	3/37	N/A	N/A	0/37	1.67E+01	0/37	1.67E+03	0.0346 - 0.415
SVOA	Phenanthrene	mg/kg	5.33E+00	13/37	N/A	N/A	0/37	1.01E+03	0/37	3.03E+04	0.0346 - 0.415
SVOA	Pyrene	mg/kg	5.66E+00	16/37	N/A	N/A	0/37	5.05E+02	0/37	1.52E+04	0.0346 - 0.415
SVOA	Total PAH	mg/kg	3.39E+00	16/37	N/A	N/A	2/37	2.35E+00	0/37	1.51E+02	-
RADS	Americium-241	pCi/g	3.99E+00	1/40	N/A	N/A	0/40	1.64E+01	0/40	1.64E+03	0.294 - 1.21
RADS	Cesium-137	pCi/g	3.03E+00	20/40	12/40	2.80E-01	9/40	5.82E-01	0/40	5.82E+01	0.0292 - 0.117
RADS	Neptunium-237	pCi/g	6.50E+00	4/40	4/40	1.00E-01	2/40	1.63E+00	0/40	1.63E+02	0.337 - 1.03
RADS	Plutonium-238	pCi/g	4.56E-01	1/40	1/40	7.30E-02	0/40	1.94E+01	0/40	1.94E+03	0.178 - 1.34
RADS	Plutonium-239/240	pCi/g	1.50E+01	10/40	10/40	2.50E-02	0/40	1.83E+01	0/40	1.83E+03	0.302 - 1.14
RADS	Radium-226	pCi/g	1.33E+00	1/1	0/1	1.50E+00	1/1	1.64E-01	0/1	1.64E+01	0.76 - 0.76
RADS	Technetium-99	pCi/g	1.63E+02	22/42	22/42	2.50E+00	0/42	1.55E+03	0/42	1.00E+05	2.35 - 4.41
RADS	Thorium-230	pCi/g	1.52E+02	38/40	20/40	1.40E+00	1/40	2.82E+01	0/40	2.82E+03	0.373 - 1.13
RADS	Thorium-232	pCi/g	9.16E-01	1/1	0/1	1.50E+00	0/1	2.60E+01	0/1	2.60E+03	0.472 - 0.472
RADS	Uranium-233/234	pCi/g	2.79E+01	18/23	12/23	1.20E+00	0/23	4.30E+01	0/23	4.30E+03	0.453 - 1.2
RADS	Uranium-234	pCi/g	8.67E+00	17/17	16/17	1.20E+00	0/17	4.30E+01	0/17	4.30E+03	0.482 - 1.09
RADS	Uranium-235	pCi/g	8.25E-01	2/17	2/17	6.00E-02	0/17	2.62E+00	0/17	2.62E+02	0.232 - 0.731

Table C1.17. Sector 7 Surface and Subsurface Soil COPC Screen (Continued)

Type	Analysis	Unit	Max	FOD	Provisional Background		Excavation Worker		Excavation Worker		DL Range
					FOE	Bkgd	FOE	NAL	FOE	AL	
RADS	Uranium-235/236	pCi/g	1.12E+00	6/23	6/23	6.00E-02	0/23	2.62E+00	0/23	2.62E+02	0.28 - 0.863
RADS	Uranium-238	pCi/g	3.36E+01	34/40	29/40	1.20E+00	9/40	8.98E+00	0/40	8.98E+02	0.247 - 1.15
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	1.15E-02	2/39	N/A	N/A	0/39	3.79E+03	0/39	1.00E+05	0.00444 - 0.00817
VOA	1,1-Dichloroethane	mg/kg	6.81E-04	1/39	N/A	N/A	0/39	9.52E+01	0/39	9.52E+03	0.000887 - 0.00163
VOA	1,2-Dimethylbenzene	mg/kg	4.74E-03	2/39	N/A	N/A	0/39	3.61E+02	0/39	1.08E+04	0.000887 - 0.00163
VOA	2-Butanone	mg/kg	1.41E-02	6/39	N/A	N/A	0/39	1.28E+04	0/39	3.84E+05	0.00444 - 0.00817
VOA	Acetone	mg/kg	6.54E-02	24/39	N/A	N/A	0/39	2.96E+04	0/39	8.88E+05	0.00444 - 0.00817
VOA	Benzene	mg/kg	5.41E-04	1/39	N/A	N/A	0/39	2.59E+01	0/39	1.28E+03	0.000887 - 0.00163
VOA	Carbon disulfide	mg/kg	5.44E-03	1/39	N/A	N/A	0/39	4.21E+02	0/39	1.26E+04	0.00444 - 0.00817
VOA	Chloroform	mg/kg	1.08E-03	5/39	N/A	N/A	0/39	8.90E+00	0/39	8.90E+02	0.000887 - 0.00163
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.09E-03	1/39	N/A	N/A	0/39	6.58E+01	0/39	1.97E+03	0.000887 - 0.00163
VOA	Cyclohexane	mg/kg	7.93E-04	1/39	N/A	N/A	0/39	3.70E+03	0/39	1.11E+05	0.000887 - 0.00163
VOA	Ethylbenzene	mg/kg	2.32E-03	2/39	N/A	N/A	0/39	1.30E+02	0/39	1.30E+04	0.000887 - 0.00163
VOA	m,p-Xylene	mg/kg	1.09E-02	2/39	N/A	N/A	0/39	3.23E+02	0/39	9.69E+03	0.00177 - 0.00327
VOA	Methylcyclohexane	mg/kg	1.33E-03	1/39	N/A	N/A	0/39	1.76E+03	0/39	5.28E+04	0.000887 - 0.00163
VOA	Methylene chloride	mg/kg	8.15E-03	18/39	N/A	N/A	0/39	1.57E+02	0/39	4.71E+03	0.00444 - 0.00817
VOA	Toluene	mg/kg	8.26E-03	8/39	N/A	N/A	0/39	2.18E+03	0/39	6.54E+04	0.000887 - 0.00163
VOA	Total Xylene	mg/kg	1.56E-02	2/39	N/A	N/A	0/39	3.23E+02	0/39	9.69E+03	0.00266 - 0.0049
VOA	Trichloroethene	mg/kg	3.40E-03	6/39	N/A	N/A	0/39	2.26E+00	0/39	6.78E+01	0.000887 - 0.00163

One or more samples exceed NAL value

One or more samples exceed background value

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

Background value is the lower of surface or subsurface background levels.

Total Dioxin and Furans were calculated using TEF Values in the 2021 RMD.

Table C1.18. Sector 1 Surface Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.96E+02	1.05E+04	5.58E+03	96/96	0/96	1.30E+04	0/96	6.60E+04	0/96	5.99E+04	91/96	3.00E+03	9.16 - 94.7
METAL	Antimony	mg/kg	3.22E-01	1.30E+01	1.56E+00	66/96	66/96	2.10E-01	45/96	7.74E-01	48/96	7.04E-01	66/96	3.52E-02	0.904 - 19.4
METAL	Arsenic	mg/kg	4.06E-01	1.15E+01	3.82E+00	95/96	0/96	1.20E+01	95/96	3.32E-02	95/96	3.02E-02	95/96	1.51E-03	0.912 - 5.13
METAL	Barium	mg/kg	9.10E+00	3.87E+02	6.37E+01	96/96	1/96	2.00E+02	1/96	3.41E+02	1/96	3.11E+02	94/96	1.55E+01	0.365 - 7.99
METAL	Beryllium	mg/kg	2.85E-02	4.21E-01	2.69E-01	95/96	0/96	6.70E-01	0/96	4.29E+01	0/96	3.89E+01	0/96	1.95E+00	0.0912 - 0.509
METAL	Boron	mg/kg	3.07E+00	1.40E+02	1.40E+01	95/96	0/96	N/A	6/96	2.82E+01	6/96	2.56E+01	95/96	1.28E+00	2.74 - 30.1
METAL	Cadmium	mg/kg	5.33E-02	2.24E+00	3.70E-01	96/96	57/96	2.10E-01	2/96	1.52E+00	3/96	1.39E+00	95/96	6.93E-02	0.182 - 0.98
METAL	Chromium	mg/kg	3.32E+00	1.94E+02	1.77E+01	96/96	23/96	1.60E+01	0/96	3.96E+06	0/96	3.60E+06	0/96	1.80E+05	0.547 - 3.05
METAL	Cobalt	mg/kg	1.82E+00	1.37E+02	7.88E+00	96/96	8/96	1.40E+01	96/96	5.96E-01	96/96	5.43E-01	96/96	2.71E-02	0.182 - 0.207
METAL	Copper	mg/kg	2.00E+00	4.09E+02	2.28E+01	96/96	18/96	1.90E+01	6/96	6.18E+01	7/96	5.62E+01	88/96	2.81E+00	0.182 - 2.07
METAL	Iron	mg/kg	1.37E+03	3.43E+04	8.52E+03	96/96	1/96	2.80E+04	96/96	7.74E+02	96/96	7.04E+02	96/96	3.52E+01	18.3 - 204
METAL	Lead	mg/kg	1.77E+00	5.09E+02	2.12E+01	96/96	12/96	3.60E+01	1/96	2.97E+02	1/96	2.70E+02	22/96	1.35E+01	0.365 - 0.414
METAL	Manganese	mg/kg	2.51E+01	1.34E+03	3.40E+02	96/96	0/96	1.50E+03	93/96	6.23E+01	93/96	5.65E+01	96/96	2.83E+00	0.928 - 10.3
METAL	Mercury	mg/kg	3.88E-03	8.71E-01	1.03E-01	34/96	3/96	2.00E-01	1/96	6.49E-01	2/96	5.91E-01	18/96	2.95E-02	0.0103 - 0.0249
METAL	Molybdenum	mg/kg	1.61E-01	8.33E+00	1.12E+00	96/96	0/96	N/A	3/96	4.44E+00	5/96	4.03E+00	95/96	2.02E-01	0.182 - 0.98
METAL	Nickel	mg/kg	6.37E+00	3.32E+02	2.10E+01	96/96	22/96	2.10E+01	5/96	5.63E+01	5/96	5.12E+01	96/96	2.56E+00	0.365 - 3.85
METAL	Selenium	mg/kg	3.44E-01	5.44E+00	6.00E-01	50/96	3/96	8.00E-01	2/96	1.14E+00	2/96	1.04E+00	50/96	5.19E-02	0.912 - 5.13
METAL	Silver	mg/kg	1.12E-01	2.22E+00	1.13E+00	42/96	0/96	2.30E+00	4/96	1.76E+00	7/96	1.60E+00	42/96	7.99E-02	0.452 - 5.27
METAL	Thallium	mg/kg	--	--	--	0/96	0/96	2.10E-01	0/96	3.12E-02	0/96	2.84E-02	0/96	1.42E-03	0.365 - 0.414
METAL	Uranium	mg/kg	9.46E-01	1.28E+03	1.21E+02	96/96	76/96	4.90E+00	80/96	3.96E+00	84/96	3.60E+00	96/96	1.80E-01	0.0365 - 0.37
METAL	Vanadium	mg/kg	1.19E+00	2.56E+01	1.27E+01	94/96	0/96	3.80E+01	0/96	1.90E+02	0/96	1.73E+02	81/96	8.64E+00	0.912 - 4.14
METAL	Zinc	mg/kg	5.07E+00	7.17E+02	7.97E+01	96/96	32/96	6.50E+01	0/96	8.21E+02	0/96	7.46E+02	60/96	3.73E+01	1.82 - 20.5
ANION	Fluoride	mg/kg	3.59E-01	9.19E+01	4.30E+00	84/96	0/96	N/A	0/96	2.64E+02	0/96	2.40E+02	5/96	1.20E+01	0.87 - 4.98
PPCB	Dieldrin	mg/kg	--	--	--	0/26	0/26	N/A	0/26	1.56E-03	0/26	1.42E-03	0/26	7.08E-05	0.0013 - 0.133
PPCB	Total PCB	mg/kg	7.16E-03	1.90E+01	8.50E-01	96/101	0/101	N/A	50/101	1.50E-01	51/101	1.36E-01	96/101	6.82E-03	0.00331 - 3.42
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.92E-02	0/70	1.74E-02	0/70	8.72E-04	0.329 - 13.7
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	8.84E+00	0/70	8.04E+00	0/70	4.02E-01	0.329 - 13.7
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.55E-02	0/70	2.32E-02	0/70	1.16E-03	0.329 - 13.7
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.97E-02	0/70	4.52E-02	0/70	2.26E-03	0.329 - 13.7
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	9.26E-01	0/70	8.42E-01	0/70	4.21E-02	0.329 - 13.7
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	9.59E-02	0/70	8.72E-02	0/70	4.36E-03	0.659 - 27.5
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.06E-03	0/70	6.42E-03	0/70	3.21E-04	0.329 - 13.7
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.47E-03	0/70	1.33E-03	0/70	6.67E-05	0.329 - 13.7
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	8.47E+00	0/70	7.70E+00	0/70	3.85E-01	0.0329 - 1.37
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.96E-01	0/70	1.78E-01	0/70	8.91E-03	0.329 - 13.7
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.68E-03	0/70	5.16E-03	0/70	2.58E-04	0.329 - 13.7
SVOA	2-Methylnaphthalene	mg/kg	1.13E-02	4.99E+00	3.31E-01	17/70	0/70	N/A	1/70	4.07E-01	1/70	3.70E-01	9/70	1.85E-02	0.0329 - 1.37
SVOA	2-Methylphenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.66E+00	0/70	1.51E+00	0/70	7.53E-02	0.329 - 13.7
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/94	0/94	N/A	0/94	1.76E-01	0/94	1.60E-01	0/94	8.01E-03	0.329 - 13.7
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	9.59E-02	0/70	8.72E-02	0/70	4.36E-03	0.329 - 13.7
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.81E-02	0/70	1.65E-02	0/70	8.24E-04	0.329 - 13.7
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.39E-03	0/70	4.90E-03	0/70	2.45E-04	0.329 - 13.7
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.52E-03	0/70	6.84E-03	0/70	3.42E-04	0.329 - 13.7
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.76E+00	0/70	3.42E+00	0/70	1.71E-01	0.329 - 13.7
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.41E-03	0/70	3.10E-03	0/70	1.55E-04	0.329 - 13.7
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.52E-03	0/70	6.84E-03	0/70	3.42E-04	0.329 - 13.7
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	9.59E-02	0/70	8.72E-02	0/70	4.36E-03	0.329 - 13.7
SVOA	Acenaphthene	mg/kg	1.23E-02	7.36E-01	3.19E-01	4/94	0/94	N/A	0/94	1.21E+01	0/94	1.10E+01	1/94	5.49E-01	0.0329 - 1.37
SVOA	Acenaphthylene	mg/kg	--	--	--	0/94	0/94	N/A	0/94	1.21E+01	0/94	1.10E+01	0/94	5.49E-01	0.0329 - 1.37
SVOA	Acetophenone	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.28E+00	0/70	1.17E+00	0/70	5.84E-02	0.329 - 13.7
SVOA	Anthracene	mg/kg	1.12E-02	1.97E+00	5.94E-01	5/94	0/94	N/A	0/94	1.28E+02	0/94	1.16E+02	0/94	5.81E+00	0.0329 - 1.37
SVOA	Atrazine	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.29E-02	0/70	4.31E-03	0/70	1.96E-04	0.329 - 13.7

Table C1.18. Sector 1 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzaldehyde	mg/kg	--	--	--	0/67	0/67	N/A	0/67	9.13E-02	0/67	8.30E-02	0/67	4.15E-03	0.329 - 13.7
SVOA	Benzo(ghi)perylene	mg/kg	1.02E-01	5.08E+00	9.45E-01	9/70	0/70	N/A	0/70	2.90E+01	0/70	2.63E+01	2/70	1.32E+00	0.0329 - 1.37
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.97E-02	0/70	2.70E-02	0/70	1.35E-03	0.329 - 13.7
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.94E-05	0/70	7.22E-05	0/70	3.61E-06	0.329 - 13.7
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.88E-03	0/70	2.62E-03	0/70	1.31E-04	0.329 - 13.7
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.52E-02	3.64E+00	6.17E-01	49/70	0/70	N/A	0/70	2.93E+01	0/70	2.66E+01	7/70	1.33E+00	0.0329 - 1.37
SVOA	Butyl benzyl phthalate	mg/kg	1.41E-01	2.53E+00	6.39E-01	6/70	0/70	N/A	0/70	5.19E+00	0/70	4.72E+00	3/70	2.36E-01	0.0329 - 1.37
SVOA	Caprolactam	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.43E+00	0/70	4.94E+00	0/70	2.47E-01	0.329 - 13.7
SVOA	Carbazole	mg/kg	1.02E-02	2.50E+00	5.27E-01	11/94	0/94	N/A	2/94	8.27E-01	2/94	7.51E-01	8/94	3.76E-02	0.0329 - 1.37
SVOA	Dibenzofuran	mg/kg	1.28E-01	7.93E+00	3.09E+00	3/70	0/70	N/A	2/70	3.21E-01	2/70	2.92E-01	3/70	1.46E-02	0.329 - 13.7
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.34E+01	0/70	1.22E+01	0/70	6.08E-01	0.0329 - 1.37
SVOA	Dimethyl phthalate	mg/kg	2.28E-02	5.57E-02	4.00E-02	3/70	0/70	N/A	0/70	1.34E+01	0/70	1.22E+01	0/70	6.08E-01	0.0329 - 1.37
SVOA	Di-n-butyl phthalate	mg/kg	1.24E-02	1.16E+01	1.02E+00	51/70	0/70	N/A	2/70	4.99E+00	4/70	4.54E+00	29/70	2.27E-01	0.0329 - 1.37
SVOA	Di-n-octylphthalate	mg/kg	9.64E-02	1.75E-01	1.36E-01	2/70	0/70	N/A	0/70	1.24E+02	0/70	1.13E+02	0/70	5.65E+00	0.0329 - 1.37
SVOA	Diphenylamine	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.13E+00	0/70	4.66E+00	0/70	2.33E-01	0.329 - 13.7
SVOA	Fluoranthene	mg/kg	1.37E-02	2.52E+01	1.53E+00	39/94	0/94	N/A	0/94	1.96E+02	0/94	1.78E+02	2/94	8.91E+00	0.0329 - 1.37
SVOA	Fluorene	mg/kg	1.42E-02	3.49E-01	1.82E-01	2/94	0/94	N/A	0/94	1.20E+01	0/94	1.09E+01	0/94	5.45E-01	0.0329 - 1.37
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/94	0/94	N/A	0/94	2.71E-03	0/94	2.46E-03	0/94	1.23E-04	0.329 - 13.7
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.87E-03	0/70	5.34E-03	0/70	2.67E-04	0.329 - 13.7
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.82E-03	0/70	2.56E-03	0/70	1.28E-04	0.329 - 13.7
SVOA	Hexachloroethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.40E-03	0/70	4.00E-03	0/70	2.00E-04	0.329 - 13.7
SVOA	Isophorone	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.68E-01	0/70	5.16E-01	0/70	2.58E-02	0.329 - 13.7
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.53E-01	0/70	5.94E-01	0/70	2.97E-02	0.329 - 13.7
SVOA	Naphthalene	mg/kg	1.14E-02	3.08E+00	2.55E-01	16/94	0/94	N/A	16/94	8.47E-03	16/94	7.70E-03	16/94	3.85E-04	0.0329 - 1.37
SVOA	Nitrobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.02E-03	0/70	1.83E-03	0/70	9.17E-05	0.329 - 13.7
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/94	0/94	N/A	0/94	1.78E-04	0/94	1.62E-04	0/94	8.10E-06	0.329 - 13.7
SVOA	Pentachlorophenol	mg/kg	3.32E-01	3.56E-01	3.44E-01	2/70	0/70	N/A	2/70	1.26E-03	2/70	1.14E-03	2/70	5.71E-05	0.329 - 13.7
SVOA	Phenanthrene	mg/kg	1.09E-02	4.06E+01	1.59E+00	46/94	0/94	N/A	2/94	1.21E+01	2/94	1.10E+01	8/94	5.49E-01	0.0329 - 1.37
SVOA	Phenol	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.28E+00	0/70	6.62E+00	0/70	3.31E-01	0.329 - 13.7
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.48E-02	0/70	3.16E-02	0/70	1.58E-03	0.329 - 13.7
SVOA	Pyrene	mg/kg	1.19E-02	1.85E+01	1.37E+00	33/94	0/94	N/A	0/94	2.90E+01	0/94	2.63E+01	4/94	1.32E+00	0.0329 - 1.37
SVOA	Total PAH	mg/kg	1.04E-05	9.35E+00	7.19E-01	25/94	0/94	N/A	3/94	6.47E-01	4/94	5.89E-01	11/94	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/7	0/7	N/A	0/7	9.72E+00	0/7	8.84E+00	0/7	4.42E-01	0.213 - 0.712
RADS	Americium-241	pCi/g	6.43E-01	1.96E+01	3.06E+00	10/101	0/101	N/A	0/101	2.11E+01	1/101	1.92E+01	7/101	9.58E-01	0.148 - 1.5
RADS	Cesium-137	pCi/g	3.60E-02	1.89E+01	2.53E+00	31/101	13/101	4.90E-01	1/101	1.05E+01	1/101	9.58E+00	13/101	4.79E-01	0.0228 - 0.116
RADS	Cobalt-60	pCi/g	--	--	--	0/7	0/7	N/A	0/7	3.50E-02	0/7	3.19E-02	0/7	1.59E-03	0.0264 - 0.0708
RADS	Lead-210	pCi/g	--	--	--	0/7	0/7	N/A	0/7	1.95E-01	0/7	1.78E-01	0/7	8.88E-03	0.949 - 19
RADS	Neptunium-237	pCi/g	5.10E-01	1.13E+02	8.90E+00	19/101	19/101	1.00E-01	14/101	1.18E+00	14/101	1.07E+00	19/101	5.36E-02	0.32 - 1.11
RADS	Plutonium-238	pCi/g	1.22E+00	1.22E+00	1.22E+00	1/101	1/101	7.30E-02	0/101	4.82E+00	0/101	4.38E+00	1/101	2.19E-01	0.196 - 1.27
RADS	Plutonium-239/240	pCi/g	3.05E-01	9.86E+01	9.56E+00	18/101	18/101	2.50E-02	5/101	4.69E+00	8/101	4.26E+00	18/101	2.13E-01	0.232 - 1.25
RADS	Protactinium-231	pCi/g	--	--	--	0/5	0/5	N/A	0/5	1.33E+01	0/5	1.21E+01	0/5	6.06E-01	0.387 - 0.662
RADS	Radium-226	pCi/g	5.69E-01	3.11E+00	1.81E+00	3/7	2/7	1.50E+00	3/7	3.59E-03	3/7	3.26E-03	3/7	1.63E-04	0.35 - 1.47
RADS	Strontium-90	pCi/g	3.97E-01	1.24E+01	4.93E+00	3/7	1/7	4.70E+00	3/7	2.46E-02	3/7	2.24E-02	3/7	1.12E-03	0.128 - 1.83
RADS	Technetium-99	pCi/g	3.41E+00	5.77E+03	2.17E+02	90/101	90/101	2.50E+00	90/101	1.67E-01	90/101	1.52E-01	90/101	7.60E-03	1.74 - 5.77
RADS	Thorium-228	pCi/g	2.64E-01	3.94E-01	3.29E-01	2/7	0/7	1.60E+00	2/7	2.16E-04	2/7	1.96E-04	2/7	9.80E-06	0.226 - 1.18
RADS	Thorium-230	pCi/g	5.03E-01	1.21E+02	9.11E+00	64/101	39/101	1.50E+00	4/101	4.03E+01	4/101	3.66E+01	28/101	1.83E+00	0.232 - 3.94
RADS	Thorium-232	pCi/g	2.75E-01	3.89E-01	3.32E-01	2/7	0/7	1.50E+00	2/7	2.16E-01	2/7	1.96E-01	2/7	9.80E-03	0.108 - 0.846
RADS	Uranium-233/234	pCi/g	6.14E-01	3.31E+02	3.62E+01	90/101	77/101	1.20E+00	80/101	1.09E+00	81/101	9.90E-01	90/101	4.95E-02	0.444 - 5.14
RADS	Uranium-235/236	pCi/g	2.18E-01	1.94E+01	3.63E+00	55/101	55/101	6.00E-02	29/101	1.07E+00	30/101	9.76E-01	55/101	4.88E-02	0.184 - 3.7
RADS	Uranium-238	pCi/g	5.29E-01	3.71E+02	4.27E+01	96/101	86/101	1.20E+00	92/101	8.87E-01	94/101	8.05E-01	96/101	4.03E-02	0.179 - 3.85
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/94	0/94	N/A	0/94	6.18E+00	0/94	5.62E+00	0/94	2.81E-01	0.000947 - 0.102
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.51E-04	0/70	5.92E-04	0/70	2.96E-05	0.000947 - 0.102

Table C1.18. Sector 1 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.63E+01	0/70	5.13E+01	0/70	2.56E+00	0.00473 - 0.509
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/94	0/94	N/A	0/94	2.97E-04	0/94	2.69E-04	0/94	1.35E-05	0.000947 - 0.102
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.72E-02	0/70	1.56E-02	0/70	7.82E-04	0.000947 - 0.102
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/94	0/94	N/A	0/94	2.24E-01	0/94	2.04E-01	0/94	1.02E-02	0.000947 - 0.102
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.60E-02	0/70	4.18E-02	0/70	2.09E-03	0.000947 - 0.102
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	2.55E-02	0/70	2.32E-02	0/70	1.16E-03	0.000947 - 0.102
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.17E-06	0/70	2.88E-06	0/70	1.44E-07	0.000947 - 0.102
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.62E-05	0/70	4.20E-05	0/70	2.10E-06	0.000947 - 0.102
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.49E-01	0/70	5.90E-01	0/70	2.95E-02	0.000947 - 0.102
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/94	0/94	N/A	0/94	1.06E-03	0/94	9.69E-04	0/94	4.84E-05	0.000947 - 0.102
VOA	1,2-Dichloroethene	mg/kg	6.30E-04	6.30E-04	6.30E-04	1/24	0/24	N/A	0/24	1.05E-01	0/24	9.56E-02	0/24	4.78E-03	0.002 - 0.201
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.03E-03	0/70	5.48E-03	0/70	2.74E-04	0.000947 - 0.102
VOA	1,2-Dimethylbenzene	mg/kg	3.72E-04	1.85E+00	3.93E-02	56/94	0/94	N/A	1/94	4.18E-01	1/94	3.81E-01	7/94	1.90E-02	0.000947 - 0.102
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.49E-01	0/70	5.90E-01	0/70	2.95E-02	0.000947 - 0.102
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.02E-02	0/70	9.24E-03	0/70	4.62E-04	0.000947 - 0.102
VOA	1,4-Dioxane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	2.07E-03	0/50	1.88E-03	0/50	9.42E-05	0.0473 - 5.09
VOA	2-Butanone	mg/kg	1.73E-03	4.25E-01	2.79E-02	56/70	0/70	N/A	0/70	2.55E+00	0/70	2.32E+00	3/70	1.16E-01	0.00473 - 0.509
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.04E-05	0/70	2.76E-05	0/70	1.38E-06	0.00473 - 0.509
VOA	2-Hexanone	mg/kg	1.77E-03	3.26E-01	2.25E-02	27/70	0/70	N/A	5/70	1.93E-02	5/70	1.75E-02	27/70	8.75E-04	0.00473 - 0.509
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	7.08E-02	0/70	6.44E-02	0/70	3.22E-03	0.000947 - 0.102
VOA	4-Methyl-2-pentanone	mg/kg	1.73E-03	2.32E-01	3.86E-02	18/70	0/70	N/A	0/70	6.18E-01	0/70	5.62E-01	4/70	2.81E-02	0.00473 - 0.509
VOA	Acetone	mg/kg	4.19E-03	8.84E-01	6.76E-02	69/70	0/70	N/A	0/70	8.10E+00	0/70	7.36E+00	1/70	3.68E-01	0.00473 - 0.509
VOA	Acrolein	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.85E-05	0/70	1.68E-05	0/70	8.41E-07	0.00473 - 0.509
VOA	Acrylonitrile	mg/kg	--	--	--	0/94	0/94	N/A	0/94	2.51E-04	0/94	2.28E-04	0/94	1.14E-05	0.00473 - 0.509
VOA	Benzene	mg/kg	3.63E-04	2.06E-03	8.29E-04	4/94	0/94	N/A	0/94	5.13E-03	0/94	4.66E-03	4/94	2.33E-04	0.000947 - 0.102
VOA	Bromochloromethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.58E-02	0/70	4.16E-02	0/70	2.08E-03	0.000947 - 0.102
VOA	Bromodichloromethane	mg/kg	--	--	--	0/94	0/94	N/A	0/94	8.03E-04	0/94	7.30E-04	0/94	3.65E-05	0.000947 - 0.102
VOA	Bromoform	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.92E-02	0/70	1.75E-02	0/70	8.73E-04	0.000947 - 0.102
VOA	Bromomethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	4.20E-03	0/70	3.82E-03	0/70	1.91E-04	0.000947 - 0.102
VOA	Carbon disulfide	mg/kg	2.19E-03	3.86E-03	3.02E-03	3/70	0/70	N/A	0/70	5.28E-01	0/70	4.80E-01	0/70	2.40E-02	0.00473 - 0.509
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/94	0/94	N/A	0/94	3.89E-03	0/94	3.54E-03	0/94	1.77E-04	0.000947 - 0.102
VOA	Chlorobenzene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.16E-01	0/70	1.06E-01	0/70	5.28E-03	0.000947 - 0.102
VOA	Chloroethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.21E+00	0/70	4.74E+00	0/70	2.37E-01	0.000947 - 0.102
VOA	Chloroform	mg/kg	3.52E-04	1.92E-03	8.89E-04	31/94	0/94	N/A	4/94	1.35E-03	7/94	1.22E-03	31/94	6.12E-05	0.000947 - 0.102
VOA	Chloromethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.16E-02	0/70	1.05E-02	0/70	5.26E-04	0.000947 - 0.102
VOA	*cis* -1,2-Dichloroethene	mg/kg	6.30E-04	7.84E-04	7.07E-04	2/94	0/94	N/A	0/94	2.33E-02	0/94	2.12E-02	0/94	1.06E-03	0.000947 - 0.102
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.70E-03	0/70	3.36E-03	0/70	1.68E-04	0.000947 - 0.102
VOA	Cumene	mg/kg	3.57E-04	3.64E-03	1.65E-03	8/70	0/70	N/A	0/70	1.62E+00	0/70	1.48E+00	0/70	7.38E-02	0.000947 - 0.102
VOA	Cyclohexane	mg/kg	3.62E-04	1.47E-03	8.00E-04	17/70	0/70	N/A	0/70	2.86E+01	0/70	2.60E+01	0/70	1.30E+00	0.000947 - 0.102
VOA	Dibromochloromethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	5.10E-03	0/70	4.64E-03	0/70	2.32E-04	0.000947 - 0.102
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	6.69E-01	0/70	6.08E-01	0/70	3.04E-02	0.000947 - 0.102
VOA	Ethylbenzene	mg/kg	3.22E-04	9.79E-02	8.61E-03	40/94	0/94	N/A	3/94	3.70E-02	4/94	3.36E-02	9/94	1.68E-03	0.000947 - 0.102
VOA	m,p-Xylene	mg/kg	6.90E-04	3.15E+00	6.67E-02	59/94	0/94	N/A	1/94	4.20E-01	1/94	3.82E-01	8/94	1.91E-02	0.00189 - 0.205
VOA	Methyl acetate	mg/kg	1.84E-03	4.02E-01	2.02E-01	2/70	0/70	N/A	0/70	9.04E+00	0/70	8.22E+00	0/70	4.11E-01	0.00473 - 0.509
VOA	Methylcyclohexane	mg/kg	3.86E-04	2.74E-02	3.38E-03	51/70	0/70	N/A	0/70	3.08E+01	0/70	2.80E+01	0/70	1.40E+00	0.000947 - 0.102
VOA	Methylene chloride	mg/kg	1.96E-03	3.31E-03	2.54E-03	16/70	0/70	N/A	0/70	5.98E-02	0/70	5.44E-02	5/70	2.72E-03	0.00473 - 0.509
VOA	Styrene	mg/kg	3.49E-04	4.22E-04	3.81E-04	3/70	0/70	N/A	0/70	2.93E+00	0/70	2.66E+00	0/70	1.33E-01	0.000947 - 0.102
VOA	Tetrachloroethene	mg/kg	5.10E-04	5.50E-04	5.30E-04	2/94	0/94	N/A	0/94	4.05E-02	0/94	3.69E-02	0/94	1.84E-03	0.000947 - 0.102
VOA	Toluene	mg/kg	4.89E-04	9.60E-01	6.09E-02	92/94	0/94	N/A	0/94	1.68E+00	0/94	1.52E+00	16/94	7.62E-02	0.000947 - 0.102
VOA	Total Xylene	mg/kg	1.22E-03	5.00E+00	1.10E-01	56/94	0/94	N/A	1/94	4.20E-01	1/94	3.82E-01	8/94	1.91E-02	0.00284 - 0.307
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/94	0/94	N/A	0/94	6.40E-02	0/94	5.83E-02	0/94	2.91E-03	0.000947 - 0.102
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/70	0/70	N/A	0/70	3.70E-03	0/70	3.36E-03	0/70	1.68E-04	0.000947 - 0.102

Table C1.18. Sector 1 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Trichloroethene	mg/kg	3.47E-04	5.73E-01	2.39E-02	55/94	0/94	N/A	32/94	2.22E-03	32/94	2.02E-03	55/94	1.01E-04	0.000947 - 0.102
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/70	0/70	N/A	0/70	1.61E+00	0/70	1.46E+00	0/70	7.31E-02	0.000947 - 0.102
VOA	Vinyl chloride	mg/kg	--	--	--	0/94	0/94	N/A	0/94	1.42E-04	0/94	1.29E-04	0/94	6.47E-06	0.000947 - 0.102

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.19. Sector 1 Subsurface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1SSL	DL Range
METAL	Aluminum	mg/kg	5.41E+03	1.91E+04	1.26E+04	51/51	34/51	1.20E+04	0/51	6.60E+04	0/51	5.99E+04	51/51	3.00E+03	9.7 - 124
METAL	Antimony	mg/kg	3.88E-01	8.03E-01	5.65E-01	9/51	9/51	2.10E-01	1/51	7.74E-01	3/51	7.04E-01	9/51	3.52E-02	2.02 - 22.7
METAL	Arsenic	mg/kg	2.19E+00	1.81E+01	5.62E+00	51/51	10/51	7.90E+00	51/51	3.32E-02	51/51	3.02E-02	51/51	1.51E-03	0.97 - 1.24
METAL	Barium	mg/kg	1.62E+01	3.58E+02	1.14E+02	51/51	8/51	1.70E+02	1/51	3.41E+02	1/51	3.11E+02	51/51	1.55E+01	0.776 - 9.64
METAL	Beryllium	mg/kg	1.89E-01	1.26E+00	5.74E-01	51/51	9/51	6.90E-01	0/51	4.29E+01	0/51	3.89E+01	0/51	1.95E+00	0.097 - 0.574
METAL	Boron	mg/kg	9.28E-01	4.09E+00	2.12E+00	40/51	0/51	N/A	0/51	2.82E+01	0/51	2.56E+01	28/51	1.28E+00	2.91 - 17.2
METAL	Cadmium	mg/kg	2.13E-02	2.40E-01	5.90E-02	45/51	1/51	2.10E-01	0/51	1.52E+00	0/51	1.39E+00	6/51	6.93E-02	0.194 - 0.248
METAL	Chromium	mg/kg	1.09E+01	1.07E+02	2.29E+01	51/51	4/51	4.30E+01	0/51	3.96E+06	0/51	3.60E+06	0/51	1.80E+05	0.582 - 3.44
METAL	Cobalt	mg/kg	2.70E+00	1.25E+02	8.99E+00	51/51	4/51	1.30E+01	51/51	5.96E-01	51/51	5.43E-01	51/51	2.71E-02	0.194 - 0.248
METAL	Copper	mg/kg	2.91E+00	1.92E+01	9.78E+00	51/51	0/51	2.50E+01	0/51	6.18E+01	0/51	5.62E+01	51/51	2.81E+00	0.388 - 0.497
METAL	Iron	mg/kg	1.16E+04	3.78E+04	1.88E+04	51/51	4/51	2.80E+04	51/51	7.74E+02	51/51	7.04E+02	51/51	3.52E+01	103 - 248
METAL	Lead	mg/kg	3.11E+00	1.82E+01	8.88E+00	51/51	0/51	2.30E+01	0/51	2.97E+02	0/51	2.70E+02	6/51	1.35E+01	0.388 - 0.497
METAL	Manganese	mg/kg	7.72E+01	3.01E+03	4.37E+02	51/51	4/51	8.20E+02	51/51	6.23E+01	51/51	5.65E+01	51/51	2.83E+00	1.04 - 114
METAL	Mercury	mg/kg	9.34E-03	2.24E-01	2.49E-02	34/51	1/51	1.30E-01	0/51	6.49E-01	0/51	5.91E-01	4/51	2.95E-02	0.0234 - 0.0297
METAL	Molybdenum	mg/kg	1.50E-01	1.64E+00	5.31E-01	51/51	0/51	N/A	0/51	4.44E+00	0/51	4.03E+00	48/51	2.02E-01	0.194 - 0.248
METAL	Nickel	mg/kg	3.49E+00	9.62E+01	1.73E+01	51/51	9/51	2.20E+01	2/51	5.63E+01	2/51	5.12E+01	51/51	2.56E+00	0.388 - 0.497
METAL	Selenium	mg/kg	3.55E-01	2.90E+00	1.31E+00	46/51	35/51	7.00E-01	22/51	1.14E+00	25/51	1.04E+00	46/51	5.19E-02	0.97 - 1.24
METAL	Silver	mg/kg	1.17E-01	1.36E+00	4.35E-01	11/51	0/51	2.70E+00	0/51	1.76E+00	0/51	1.60E+00	11/51	7.99E-02	0.504 - 5.91
METAL	Thallium	mg/kg	1.53E-01	5.20E-01	2.18E-01	15/51	1/51	3.40E-01	15/51	3.12E-02	15/51	2.84E-02	15/51	1.42E-03	0.388 - 0.497
METAL	Uranium	mg/kg	4.73E-01	4.09E+02	2.16E+01	51/51	7/51	4.60E+00	7/51	3.96E+00	7/51	3.60E+00	51/51	1.80E-01	0.0388 - 0.468
METAL	Vanadium	mg/kg	1.25E+01	6.76E+01	3.07E+01	51/51	11/51	3.70E+01	0/51	1.90E+02	0/51	1.73E+02	51/51	8.64E+00	3.88 - 22.6
METAL	Zinc	mg/kg	8.22E+00	8.97E+01	3.01E+01	51/51	3/51	6.00E+01	0/51	8.21E+02	0/51	7.46E+02	13/51	3.73E+01	3.88 - 9.37
ANION	Fluoride	mg/kg	4.59E+00	4.02E+01	1.22E+01	51/51	0/51	N/A	0/51	2.64E+02	0/51	2.40E+02	21/51	1.20E+01	1.03 - 1.25
PPCB	Total PCB	mg/kg	3.20E-03	3.31E-02	1.39E-02	6/44	0/44	N/A	0/44	1.50E-01	0/44	1.36E-01	4/44	6.82E-03	0.0035 - 0.00444
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.92E-02	0/44	1.74E-02	0/44	8.72E-04	0.347 - 1.05
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	8.84E+00	0/44	8.04E+00	0/44	4.02E-01	0.347 - 1.05
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.55E-02	0/44	2.32E-02	0/44	1.16E-03	0.347 - 1.05
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	4.97E-02	0/44	4.52E-02	0/44	2.26E-03	0.347 - 1.05
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	9.26E-01	0/44	8.42E-01	0/44	4.21E-02	0.347 - 1.05
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	9.59E-02	0/44	8.72E-02	0/44	4.36E-03	0.695 - 2.09
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	7.06E-03	0/44	6.42E-03	0/44	3.21E-04	0.347 - 1.05
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.47E-03	0/44	1.33E-03	0/44	6.67E-05	0.347 - 1.05
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	8.47E+00	0/44	7.70E+00	0/44	3.85E-01	0.0347 - 0.105
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.96E-01	0/44	1.78E-01	0/44	8.91E-03	0.347 - 1.05
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.68E-03	0/44	5.16E-03	0/44	2.58E-04	0.347 - 1.05
SVOA	2-Methylnaphthalene	mg/kg	2.60E-02	2.76E-02	2.68E-02	2/44	0/44	N/A	0/44	4.07E-01	0/44	3.70E-01	2/44	1.85E-02	0.0347 - 0.105
SVOA	2-Methylphenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.66E+00	0/44	1.51E+00	0/44	7.53E-02	0.347 - 1.05
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.76E-01	0/44	1.60E-01	0/44	8.01E-03	0.347 - 1.05
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	9.59E-02	0/44	8.72E-02	0/44	4.36E-03	0.347 - 1.05
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.81E-02	0/44	1.65E-02	0/44	8.24E-04	0.347 - 1.05
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.39E-03	0/44	4.90E-03	0/44	2.45E-04	0.347 - 1.05
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/44	0/44	N/A	0/44	7.52E-03	0/44	6.84E-03	0/44	3.42E-04	0.347 - 1.05
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	3.76E+00	0/44	3.42E+00	0/44	1.71E-01	0.347 - 1.05
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	3.41E-03	0/44	3.10E-03	0/44	1.55E-04	0.347 - 1.05
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/44	0/44	N/A	0/44	7.52E-03	0/44	6.84E-03	0/44	3.42E-04	0.347 - 1.05
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	9.59E-02	0/44	8.72E-02	0/44	4.36E-03	0.347 - 1.05
SVOA	Acenaphthene	mg/kg	1.32E-01	1.32E-01	1.32E-01	1/44	0/44	N/A	0/44	1.21E+01	0/44	1.10E+01	0/44	5.49E-01	0.0347 - 0.105
SVOA	Acenaphthylene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.21E+01	0/44	1.10E+01	0/44	5.49E-01	0.0347 - 0.105
SVOA	Acetophenone	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.28E+00	0/44	1.17E+00	0/44	5.84E-02	0.347 - 1.05
SVOA	Anthracene	mg/kg	1.51E-02	2.40E-01	9.11E-02	3/44	0/44	N/A	0/44	1.28E+02	0/44	1.16E+02	0/44	5.81E+00	0.0347 - 0.105
SVOA	Atrazine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	4.29E-02	0/44	4.31E-03	0/44	1.96E-04	0.347 - 1.05
SVOA	Benzaldehyde	mg/kg	--	--	--	0/44	0/44	N/A	0/44	9.13E-02	0/44	8.30E-02	0/44	4.15E-03	0.347 - 1.05

Table C1.19. Sector 1 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1SSL	
SVOA	Benzo(ghi)perylene	mg/kg	4.35E-02	3.45E-01	1.94E-01	2/44	0/44	N/A	0/44	2.90E+01	0/44	2.63E+01	0/44	1.32E+00	0.0347 - 0.105
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.97E-02	0/44	2.70E-02	0/44	1.35E-03	0.347 - 1.05
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/44	0/44	N/A	0/44	7.94E-05	0/44	7.22E-05	0/44	3.61E-06	0.347 - 1.05
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.88E-03	0/44	2.62E-03	0/44	1.31E-04	0.347 - 1.05
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.34E-02	6.05E-02	2.70E-02	10/44	0/44	N/A	0/44	2.93E+01	0/44	2.66E+01	0/44	1.33E+00	0.0347 - 0.105
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.19E+00	0/44	4.72E+00	0/44	2.36E-01	0.0347 - 0.105
SVOA	Caprolactam	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.43E+00	0/44	4.94E+00	0/44	2.47E-01	0.347 - 1.05
SVOA	Carbazole	mg/kg	2.09E-02	2.00E-01	1.10E-01	2/44	0/44	N/A	0/44	8.27E-01	0/44	7.51E-01	1/44	3.76E-02	0.0347 - 0.105
SVOA	Dibenzofuran	mg/kg	1.90E-01	1.90E-01	1.90E-01	1/44	0/44	N/A	0/44	3.21E-01	0/44	2.92E-01	1/44	1.46E-02	0.347 - 1.05
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.34E+01	0/44	1.22E+01	0/44	6.08E-01	0.0347 - 0.105
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.34E+01	0/44	1.22E+01	0/44	6.08E-01	0.0347 - 0.105
SVOA	Di-n-butyl phthalate	mg/kg	1.37E-02	8.02E-02	2.73E-02	11/44	0/44	N/A	0/44	4.99E+00	0/44	4.54E+00	0/44	2.27E-01	0.0347 - 0.105
SVOA	Di-n-octylphthalate	mg/kg	2.11E-02	2.37E-02	2.24E-02	2/44	0/44	N/A	0/44	1.24E+02	0/44	1.13E+02	0/44	5.65E+00	0.0347 - 0.105
SVOA	Diphenylamine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.13E+00	0/44	4.66E+00	0/44	2.33E-01	0.347 - 1.05
SVOA	Fluoranthene	mg/kg	1.22E-02	1.17E+00	4.59E-01	3/44	0/44	N/A	0/44	1.96E+02	0/44	1.78E+02	0/44	8.91E+00	0.0347 - 0.105
SVOA	Fluorene	mg/kg	9.05E-02	9.05E-02	9.05E-02	1/44	0/44	N/A	0/44	1.20E+01	0/44	1.09E+01	0/44	5.45E-01	0.0347 - 0.105
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.71E-03	0/44	2.46E-03	0/44	1.23E-04	0.347 - 1.05
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.87E-03	0/44	5.34E-03	0/44	2.67E-04	0.347 - 1.05
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.82E-03	0/44	2.56E-03	0/44	1.28E-04	0.347 - 1.05
SVOA	Hexachloroethane	mg/kg	--	--	--	0/44	0/44	N/A	0/44	4.40E-03	0/44	4.00E-03	0/44	2.00E-04	0.347 - 1.05
SVOA	Isophorone	mg/kg	--	--	--	0/44	0/44	N/A	0/44	5.68E-01	0/44	5.16E-01	0/44	2.58E-02	0.347 - 1.05
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	6.53E-01	0/44	5.94E-01	0/44	2.97E-02	0.347 - 1.05
SVOA	Naphthalene	mg/kg	1.58E-02	3.13E-02	2.11E-02	3/44	0/44	N/A	3/44	8.47E-03	3/44	7.70E-03	3/44	3.85E-04	0.0347 - 0.105
SVOA	Nitrobenzene	mg/kg	--	--	--	0/44	0/44	N/A	0/44	2.02E-03	0/44	1.83E-03	0/44	9.17E-05	0.347 - 1.05
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.78E-04	0/44	1.62E-04	0/44	8.10E-06	0.347 - 1.05
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	1.26E-03	0/44	1.14E-03	0/44	5.71E-05	0.347 - 1.05
SVOA	Phenanthrene	mg/kg	1.81E-02	1.50E+00	4.33E-01	4/44	0/44	N/A	0/44	1.21E+01	0/44	1.10E+01	1/44	5.49E-01	0.0347 - 0.105
SVOA	Phenol	mg/kg	--	--	--	0/44	0/44	N/A	0/44	7.28E+00	0/44	6.62E+00	0/44	3.31E-01	0.347 - 1.05
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/44	0/44	N/A	0/44	3.48E-02	0/44	3.16E-02	0/44	1.58E-03	0.347 - 1.05
SVOA	Pyrene	mg/kg	9.46E-02	1.20E+00	6.47E-01	2/44	0/44	N/A	0/44	2.90E+01	0/44	2.63E+01	0/44	1.32E+00	0.0347 - 0.105
SVOA	Total PAH	mg/kg	6.34E-02	6.27E-01	3.45E-01	2/44	0/44	N/A	0/44	6.47E-01	1/44	5.89E-01	2/44	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/2	0/2	N/A	0/2	9.72E+00	0/2	8.84E+00	0/2	4.42E-01	0.252 - 0.267
RADS	Americium-241	pCi/g	--	--	--	0/51	0/51	N/A	0/51	2.11E+01	0/51	1.92E+01	0/51	9.58E-01	0.252 - 1.12
RADS	Cesium-137	pCi/g	--	--	--	0/50	0/50	2.80E-01	0/50	1.05E+01	0/50	9.58E+00	0/50	4.79E-01	0.0284 - 0.0959
RADS	Cobalt-60	pCi/g	--	--	--	0/2	0/2	N/A	0/2	3.50E-02	0/2	3.19E-02	0/2	1.59E-03	0.0391 - 0.0464
RADS	Lead-210	pCi/g	--	--	--	0/2	0/2	N/A	0/2	1.95E-01	0/2	1.78E-01	0/2	8.88E-03	2.76 - 3.4
RADS	Neptunium-237	pCi/g	2.97E+00	5.09E+00	4.03E+00	2/51	0/51	N/A	2/51	1.18E+00	2/51	1.07E+00	2/51	5.36E-02	0.292 - 0.893
RADS	Plutonium-238	pCi/g	--	--	--	0/51	0/51	N/A	0/51	4.82E+00	0/51	4.38E+00	0/51	2.19E-01	0.219 - 1.08
RADS	Plutonium-239/240	pCi/g	1.12E+00	1.12E+00	1.12E+00	1/51	0/51	N/A	0/51	4.69E+00	0/51	4.26E+00	1/51	2.13E-01	0.193 - 1.01
RADS	Protactinium-231	pCi/g	--	--	--	0/2	0/2	N/A	0/2	1.33E+01	0/2	1.21E+01	0/2	6.06E-01	0.464 - 0.517
RADS	Radium-226	pCi/g	1.70E+00	2.21E+00	1.96E+00	2/2	2/2	1.50E+00	2/2	3.59E-03	2/2	3.26E-03	2/2	1.63E-04	0.985 - 0.989
RADS	Strontium-90	pCi/g	--	--	--	0/2	0/2	N/A	0/2	2.46E-02	0/2	2.24E-02	0/2	1.12E-03	1.15 - 1.47
RADS	Technetium-99	pCi/g	4.18E+00	1.39E+03	1.77E+02	15/58	15/58	2.80E+00	15/58	1.67E-01	15/58	1.52E-01	15/58	7.60E-03	1.73 - 4.68
RADS	Thorium-228	pCi/g	7.52E-01	8.09E-01	7.81E-01	2/2	0/2	1.60E+00	2/2	2.16E-04	2/2	1.96E-04	2/2	9.80E-06	0.472 - 0.487
RADS	Thorium-230	pCi/g	6.15E-01	4.47E+00	1.37E+00	43/51	17/51	1.40E+00	0/51	4.03E+01	0/51	3.66E+01	4/51	1.83E+00	0.174 - 1.34
RADS	Thorium-232	pCi/g	1.19E+00	1.43E+00	1.31E+00	2/2	0/2	1.50E+00	2/2	2.16E-01	2/2	1.96E-01	2/2	9.80E-03	0.222 - 0.371
RADS	Uranium-233/234	pCi/g	4.68E-01	2.05E+02	8.39E+00	41/51	11/51	1.20E+00	14/51	1.09E+00	19/51	9.90E-01	41/51	4.95E-02	0.405 - 1.5
RADS	Uranium-235/236	pCi/g	2.69E-01	1.45E+01	4.08E+00	6/51	6/51	6.00E-02	3/51	1.07E+00	3/51	9.76E-01	6/51	4.88E-02	0.206 - 1.36
RADS	Uranium-238	pCi/g	4.88E-01	2.63E+02	1.16E+01	45/51	11/51	1.20E+00	26/51	8.87E-01	33/51	8.05E-01	45/51	4.03E-02	0.208 - 1.56
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.18E+00	0/50	5.62E+00	0/50	2.81E-01	0.000842 - 0.00248
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.51E-04	0/50	5.92E-04	0/50	2.96E-05	0.000842 - 0.00248
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	5.63E+01	0/50	5.13E+01	0/50	2.56E+00	0.00421 - 0.0124

Table C1.19. Sector 1 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1SSL	DL Range
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	2.97E-04	0/50	2.69E-04	0/50	1.35E-05	0.000842 - 0.00248
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.72E-02	0/50	1.56E-02	0/50	7.82E-04	0.000842 - 0.00248
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	2.24E-01	0/50	2.04E-01	0/50	1.02E-02	0.000842 - 0.00248
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	4.60E-02	0/50	4.18E-02	0/50	2.09E-03	0.000842 - 0.00248
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	2.55E-02	0/50	2.32E-02	0/50	1.16E-03	0.000842 - 0.00248
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.17E-06	0/50	2.88E-06	0/50	1.44E-07	0.000842 - 0.00248
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	4.62E-05	0/50	4.20E-05	0/50	2.10E-06	0.000842 - 0.00248
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.49E-01	0/50	5.90E-01	0/50	2.95E-02	0.000842 - 0.00248
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.06E-03	0/50	9.69E-04	0/50	4.84E-05	0.000842 - 0.00248
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.03E-03	0/50	5.48E-03	0/50	2.74E-04	0.000842 - 0.00248
VOA	1,2-Dimethylbenzene	mg/kg	5.21E-04	2.85E-03	1.68E-03	3/50	0/50	N/A	0/50	4.18E-01	0/50	3.81E-01	0/50	1.90E-02	0.000842 - 0.00248
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.49E-01	0/50	5.90E-01	0/50	2.95E-02	0.000842 - 0.00248
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.02E-02	0/50	9.24E-03	0/50	4.62E-04	0.000842 - 0.00248
VOA	1,4-Dioxane	mg/kg	--	--	--	0/48	0/48	N/A	0/48	2.07E-03	0/48	1.88E-03	0/48	9.42E-05	0.0421 - 0.111
VOA	2-Butanone	mg/kg	1.47E-03	1.73E-02	4.90E-03	8/50	0/50	N/A	0/50	2.55E+00	0/50	2.32E+00	0/50	1.16E-01	0.00421 - 0.0124
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.04E-05	0/50	2.76E-05	0/50	1.38E-06	0.00421 - 0.0124
VOA	2-Hexanone	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.93E-02	0/50	1.75E-02	0/50	8.75E-04	0.00421 - 0.0124
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	7.08E-02	0/50	6.44E-02	0/50	3.22E-03	0.000842 - 0.00248
VOA	4-Methyl-2-pentanone	mg/kg	3.46E-03	1.56E-01	5.48E-02	3/50	0/50	N/A	0/50	6.18E-01	0/50	5.62E-01	1/50	2.81E-02	0.00421 - 0.0124
VOA	Acetone	mg/kg	2.03E-03	2.99E-02	7.47E-03	35/50	0/50	N/A	0/50	8.10E+00	0/50	7.36E+00	0/50	3.68E-01	0.00421 - 0.0124
VOA	Acrolein	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.85E-05	0/50	1.68E-05	0/50	8.41E-07	0.00421 - 0.0124
VOA	Acrylonitrile	mg/kg	--	--	--	0/50	0/50	N/A	0/50	2.51E-04	0/50	2.28E-04	0/50	1.14E-05	0.00421 - 0.0124
VOA	Benzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	5.13E-03	0/50	4.66E-03	0/50	2.33E-04	0.000842 - 0.00248
VOA	Bromochloromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	4.58E-02	0/50	4.16E-02	0/50	2.08E-03	0.000842 - 0.00248
VOA	Bromodichloromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	8.03E-04	0/50	7.30E-04	0/50	3.65E-05	0.000842 - 0.00248
VOA	Bromoform	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.92E-02	0/50	1.75E-02	0/50	8.73E-04	0.000842 - 0.00248
VOA	Bromomethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	4.20E-03	0/50	3.82E-03	0/50	1.91E-04	0.000842 - 0.00248
VOA	Carbon disulfide	mg/kg	--	--	--	0/50	0/50	N/A	0/50	5.28E-01	0/50	4.80E-01	0/50	2.40E-02	0.00421 - 0.0124
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.89E-03	0/50	3.54E-03	0/50	1.77E-04	0.000842 - 0.00248
VOA	Chlorobenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.16E-01	0/50	1.06E-01	0/50	5.28E-03	0.000842 - 0.00248
VOA	Chloroethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	5.21E+00	0/50	4.74E+00	0/50	2.37E-01	0.000842 - 0.00248
VOA	Chloroform	mg/kg	3.61E-04	3.53E-03	1.05E-03	9/50	0/50	N/A	2/50	1.35E-03	2/50	1.22E-03	9/50	6.12E-05	0.000842 - 0.00248
VOA	Chloromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.16E-02	0/50	1.05E-02	0/50	5.26E-04	0.000842 - 0.00248
VOA	*cis* -1,2-Dichloroethene	mg/kg	5.30E-04	1.77E-03	9.61E-04	3/50	0/50	N/A	0/50	2.33E-02	0/50	2.12E-02	1/50	1.06E-03	0.000842 - 0.00248
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.70E-03	0/50	3.36E-03	0/50	1.68E-04	0.000842 - 0.00248
VOA	Cumene	mg/kg	4.88E-04	4.88E-04	4.88E-04	1/50	0/50	N/A	0/50	1.62E+00	0/50	1.48E+00	0/50	7.38E-02	0.000842 - 0.00248
VOA	Cyclohexane	mg/kg	5.56E-04	9.38E-04	7.47E-04	2/50	0/50	N/A	0/50	2.86E+01	0/50	2.60E+01	0/50	1.30E+00	0.000842 - 0.00248
VOA	Dibromochloromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	5.10E-03	0/50	4.64E-03	0/50	2.32E-04	0.000842 - 0.00248
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.69E-01	0/50	6.08E-01	0/50	3.04E-02	0.000842 - 0.00248
VOA	Ethylbenzene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.70E-02	0/50	3.36E-02	0/50	1.68E-03	0.000842 - 0.00248
VOA	m,p-Xylene	mg/kg	8.22E-04	3.23E-03	1.89E-03	3/50	0/50	N/A	0/50	4.20E-01	0/50	3.82E-01	0/50	1.91E-02	0.00168 - 0.00496
VOA	Methyl acetate	mg/kg	--	--	--	0/50	0/50	N/A	0/50	9.04E+00	0/50	8.22E+00	0/50	4.11E-01	0.00421 - 0.0124
VOA	Methylcyclohexane	mg/kg	6.26E-04	7.31E-04	6.79E-04	2/50	0/50	N/A	0/50	3.08E+01	0/50	2.80E+01	0/50	1.40E+00	0.000842 - 0.00248
VOA	Methylene chloride	mg/kg	2.15E-03	4.36E-03	3.00E-03	3/50	0/50	N/A	0/50	5.98E-02	0/50	5.44E-02	1/50	2.72E-03	0.00421 - 0.0124
VOA	Styrene	mg/kg	1.43E-03	1.43E-03	1.43E-03	1/50	0/50	N/A	0/50	2.93E+00	0/50	2.66E+00	0/50	1.33E-01	0.000842 - 0.00248
VOA	Tetrachloroethene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	4.05E-02	0/50	3.69E-02	0/50	1.84E-03	0.000842 - 0.00248
VOA	Toluene	mg/kg	3.66E-04	3.29E-03	1.24E-03	15/50	0/50	N/A	0/50	1.68E+00	0/50	1.52E+00	0/50	7.62E-02	0.000842 - 0.00248
VOA	Total Xylene	mg/kg	1.34E-03	6.08E-03	3.57E-03	3/50	0/50	N/A	0/50	4.20E-01	0/50	3.82E-01	0/50	1.91E-02	0.00253 - 0.00744
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	6.40E-02	0/50	5.83E-02	0/50	2.91E-03	0.000842 - 0.00248
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/50	0/50	N/A	0/50	3.70E-03	0/50	3.36E-03	0/50	1.68E-04	0.000842 - 0.00248
VOA	Trichloroethene	mg/kg	3.97E-04	4.01E-02	6.62E-03	27/50	0/50	N/A	12/50	2.22E-03	13/50	2.02E-03	27/50	1.01E-04	0.000842 - 0.00248
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.61E+00	0/50	1.46E+00	0/50	7.31E-02	0.000842 - 0.00248

Table C1.19. Sector 1 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1SSL	
VOA	Vinyl chloride	mg/kg	--	--	--	0/50	0/50	N/A	0/50	1.42E-04	0/50	1.29E-04	0/50	6.47E-06	0.000842 - 0.00248

One or more samples exceed background value

One or more samples exceed groundwater protection screening

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Field replicates, or separate samples are counted independently.

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in 2021 RMD.

DAF 20 SSL provided to understand dilution of GW contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans were calculated using TEF Values in 2021 RMD.

Table C1.20. Sector 1 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.05E+03	2.70E+04	8.96E+03	204/204	47/204	1.20E+04	0/204	6.60E+04	0/204	5.99E+04	191/204	3.00E+03	9.59 - 123
METAL	Antimony	mg/kg	3.44E-01	1.88E+01	1.34E+00	46/204	46/204	2.10E-01	22/204	7.74E-01	23/204	7.04E-01	46/204	3.52E-02	1.85 - 22.7
METAL	Arsenic	mg/kg	3.53E-01	1.96E+01	2.70E+00	200/204	6/204	7.90E+00	200/204	3.32E-02	200/204	3.02E-02	200/204	1.51E-03	0.953 - 1.23
METAL	Barium	mg/kg	5.89E+00	1.30E+03	5.20E+01	204/204	7/204	1.70E+02	3/204	3.41E+02	3/204	3.11E+02	157/204	1.55E+01	0.762 - 9.3
METAL	Beryllium	mg/kg	9.81E-02	2.62E+00	6.63E-01	204/204	74/204	6.90E-01	0/204	4.29E+01	0/204	3.89E+01	5/204	1.95E+00	0.0959 - 0.566
METAL	Boron	mg/kg	8.69E-01	4.97E+00	1.42E+00	74/204	N/A	N/A	0/204	2.82E+01	0/204	2.56E+01	32/204	1.28E+00	2.88 - 17
METAL	Cadmium	mg/kg	2.16E-02	1.04E+00	8.74E-02	39/204	3/204	2.10E-01	0/204	1.52E+00	0/204	1.39E+00	12/204	6.93E-02	0.191 - 0.246
METAL	Chromium	mg/kg	3.11E+00	5.49E+01	1.45E+01	204/204	9/204	4.30E+01	0/204	3.96E+06	0/204	3.60E+06	0/204	1.80E+05	0.575 - 3.4
METAL	Cobalt	mg/kg	3.68E-01	1.72E+02	6.39E+00	204/204	16/204	1.30E+01	200/204	5.96E-01	202/204	5.43E-01	204/204	2.71E-02	0.192 - 0.246
METAL	Copper	mg/kg	7.20E-01	1.22E+02	5.63E+00	204/204	2/204	2.50E+01	2/204	6.18E+01	2/204	5.62E+01	152/204	2.81E+00	0.383 - 4.71
METAL	Iron	mg/kg	1.66E+03	1.23E+05	1.72E+04	204/204	29/204	2.80E+04	204/204	7.74E+02	204/204	7.04E+02	204/204	3.52E+01	19.5 - 2220
METAL	Lead	mg/kg	7.96E-01	3.42E+01	5.40E+00	204/204	4/204	2.30E+01	0/204	2.97E+02	0/204	2.70E+02	10/204	1.35E+01	0.381 - 0.492
METAL	Manganese	mg/kg	5.94E+00	8.06E+03	2.40E+02	204/204	9/204	8.20E+02	98/204	6.23E+01	102/204	5.65E+01	204/204	2.83E+00	0.959 - 116
METAL	Mercury	mg/kg	8.83E-03	3.95E-01	3.44E-02	38/204	1/204	1.30E-01	0/204	6.49E-01	0/204	5.91E-01	9/204	2.95E-02	0.0217 - 0.0351
METAL	Molybdenum	mg/kg	8.87E-02	1.79E+00	3.16E-01	178/204	N/A	N/A	0/204	4.44E+00	0/204	4.03E+00	119/204	2.02E-01	0.191 - 0.246
METAL	Nickel	mg/kg	9.99E-01	9.83E+01	8.10E+00	204/204	11/204	2.20E+01	2/204	5.63E+01	2/204	5.12E+01	187/204	2.56E+00	0.383 - 0.492
METAL	Selenium	mg/kg	3.57E-01	4.35E+00	1.06E+00	151/204	103/204	7.00E-01	52/204	1.14E+00	60/204	1.04E+00	151/204	5.19E-02	0.953 - 1.23
METAL	Silver	mg/kg	1.16E-01	6.01E+00	5.91E-01	38/204	1/204	2.70E+00	1/204	1.76E+00	3/204	1.60E+00	38/204	7.99E-02	0.463 - 6.06
METAL	Thallium	mg/kg	1.51E-01	6.68E-01	2.32E-01	21/204	2/204	3.40E-01	21/204	3.12E-02	21/204	2.84E-02	21/204	1.42E-03	0.381 - 0.492
METAL	Uranium	mg/kg	1.64E-01	9.94E+01	2.27E+00	204/204	5/204	4.60E+00	6/204	3.96E+00	6/204	3.60E+00	202/204	1.80E-01	0.0381 - 0.0492
METAL	Vanadium	mg/kg	1.97E+00	1.05E+02	2.27E+01	204/204	30/204	3.70E+01	0/204	1.90E+02	0/204	1.73E+02	180/204	8.64E+00	3.83 - 20.7
METAL	Zinc	mg/kg	1.84E+00	7.03E+01	1.79E+01	204/204	2/204	6.00E+01	0/204	8.21E+02	0/204	7.46E+02	13/204	3.73E+01	3.81 - 4.92
ANION	Fluoride	mg/kg	4.83E-01	6.20E+02	8.43E+00	200/204	N/A	N/A	1/204	2.64E+02	1/204	2.40E+02	9/204	1.20E+01	1.02 - 24.2
PPCB	Total PCB	mg/kg	2.17E-03	2.43E-02	1.26E-02	5/215	N/A	N/A	0/215	1.50E-01	0/215	1.36E-01	3/215	6.82E-03	0.00335 - 0.0045
DI/FURA	Total Dioxin/Furans	mg/kg	4.58E-06	4.92E-06	4.75E-06	2/2	N/A	N/A	2/2	1.30E-06	2/2	1.18E-06	2/2	5.91E-08	-
SVOA	1,1-biphenyl	mg/kg	3.68E-01	3.68E-01	3.68E-01	1/215	N/A	N/A	1/215	1.92E-02	1/215	1.74E-02	1/215	8.72E-04	0.338 - 7.68
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.84E+00	0/215	8.04E+00	0/215	4.02E-01	0.338 - 7.68
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.55E-02	0/215	2.32E-02	0/215	1.16E-03	0.338 - 7.68
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.97E-02	0/215	4.52E-02	0/215	2.26E-03	0.338 - 7.68
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	9.26E-01	0/215	8.42E-01	0/215	4.21E-02	0.338 - 7.68
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	9.59E-02	0/215	8.72E-02	0/215	4.36E-03	0.675 - 15.4
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.06E-03	0/215	6.42E-03	0/215	3.21E-04	0.338 - 7.68
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.47E-03	0/215	1.33E-03	0/215	6.67E-05	0.338 - 7.68
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.47E+00	0/215	7.70E+00	0/215	3.85E-01	0.0338 - 0.768
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.96E-01	0/215	1.78E-01	0/215	8.91E-03	0.338 - 7.68
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.68E-03	0/215	5.16E-03	0/215	2.58E-04	0.338 - 7.68
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.07E-01	0/215	3.70E-01	0/215	1.85E-02	0.0338 - 0.768
SVOA	2-Methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.66E+00	0/215	1.51E+00	0/215	7.53E-02	0.338 - 7.68
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.76E-01	0/215	1.60E-01	0/215	8.01E-03	0.338 - 7.68
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	9.59E-02	0/215	8.72E-02	0/215	4.36E-03	0.338 - 7.68
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/211	N/A	N/A	0/211	1.81E-02	0/211	1.65E-02	0/211	8.24E-04	0.338 - 7.68
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.39E-03	0/215	4.90E-03	0/215	2.45E-04	0.338 - 7.68
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.52E-03	0/215	6.84E-03	0/215	3.42E-04	0.338 - 7.68
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.76E+00	0/215	3.42E+00	0/215	1.71E-01	0.338 - 7.68
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.41E-03	0/215	3.10E-03	0/215	1.55E-04	0.338 - 7.68
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.52E-03	0/215	6.84E-03	0/215	3.42E-04	0.338 - 7.68
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	9.59E-02	0/215	8.72E-02	0/215	4.36E-03	0.338 - 7.68
SVOA	Acenaphthene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.21E+01	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOA	Acenaphthylene	mg/kg	1.20E-02	1.20E-02	1.20E-02	1/215	N/A	N/A	0/215	1.21E+01	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOA	Acetophenone	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.28E+00	0/215	1.17E+00	0/215	5.84E-02	0.338 - 7.68
SVOA	Anthracene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.28E+02	0/215	1.16E+02	0/215	5.81E+00	0.0338 - 0.768
SVOA	Atrazine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.31E-03	0/215	3.92E-03	0/215	1.96E-04	0.338 - 7.68

Table C1.20 Sector 1 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Benzaldehyde	mg/kg	1.16E-01	1.16E-01	1.16E-01	1/208	N/A	N/A	1/208	9.13E-02	1/208	8.30E-02	1/208	4.15E-03	0.338 - 7.68
SVOA	Benzo(ghi)perylene	mg/kg	1.30E-02	1.79E-02	1.55E-02	2/215	N/A	N/A	0/215	2.90E+01	0/215	2.63E+01	0/215	1.32E+00	0.0338 - 0.768
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.97E-02	0/215	2.70E-02	0/215	1.35E-03	0.338 - 7.68
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.94E-05	0/215	7.22E-05	0/215	3.61E-06	0.338 - 7.68
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.88E-03	0/215	2.62E-03	0/215	1.31E-04	0.338 - 7.68
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.14E-02	8.10E-02	1.87E-02	38/215	N/A	N/A	0/215	2.93E+01	0/215	2.66E+01	0/215	1.33E+00	0.0338 - 0.768
SVOA	Butyl benzyl phthalate	mg/kg	1.19E-02	2.48E-02	1.84E-02	2/215	N/A	N/A	0/215	5.19E+00	0/215	4.72E+00	0/215	2.36E-01	0.0338 - 0.768
SVOA	Caprolactam	mg/kg	--	--	--	0/212	N/A	N/A	0/212	5.43E+00	0/212	4.94E+00	0/212	2.47E-01	0.338 - 7.68
SVOA	Carbazole	mg/kg	1.23E-02	1.23E-02	1.23E-02	1/215	N/A	N/A	0/215	8.27E-01	0/215	7.51E-01	0/215	3.76E-02	0.0338 - 0.768
SVOA	Dibenzofuran	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.21E-01	0/215	2.92E-01	0/215	1.46E-02	0.338 - 7.68
SVOA	Diethyl phthalate	mg/kg	1.38E-02	1.39E-02	1.38E-02	3/215	N/A	N/A	0/215	1.34E+01	0/215	1.22E+01	0/215	6.08E-01	0.0338 - 0.768
SVOA	Dimethyl phthalate	mg/kg	1.20E-02	1.20E-02	1.20E-02	1/215	N/A	N/A	0/215	1.34E+01	0/215	1.22E+01	0/215	6.08E-01	0.0338 - 0.768
SVOA	Di-n-butyl phthalate	mg/kg	1.11E-02	5.55E-02	2.26E-02	36/215	N/A	N/A	0/215	4.99E+00	0/215	4.54E+00	0/215	2.27E-01	0.0338 - 0.768
SVOA	Di-n-octylphthalate	mg/kg	1.18E-02	3.75E-02	2.81E-02	9/215	N/A	N/A	0/215	1.24E+02	0/215	1.13E+02	0/215	5.65E+00	0.0338 - 0.768
SVOA	Diphenylamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.13E+00	0/215	4.66E+00	0/215	2.33E-01	0.338 - 7.68
SVOA	Fluoranthene	mg/kg	1.12E-02	1.12E-02	1.12E-02	1/215	N/A	N/A	0/215	1.96E+02	0/215	1.78E+02	0/215	8.91E+00	0.0338 - 0.768
SVOA	Fluorene	mg/kg	1.16E-02	1.16E-02	1.16E-02	1/215	N/A	N/A	0/215	1.20E+01	0/215	1.09E+01	0/215	5.45E-01	0.0338 - 0.768
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.71E-03	0/215	2.46E-03	0/215	1.23E-04	0.338 - 7.68
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.87E-03	0/215	5.34E-03	0/215	2.67E-04	0.338 - 7.68
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.82E-03	0/215	2.56E-03	0/215	1.28E-04	0.338 - 7.68
SVOA	Hexachloroethane	mg/kg	--	--	--	0/215	N/A	N/A	0/215	4.40E-03	0/215	4.00E-03	0/215	2.00E-04	0.338 - 7.68
SVOA	Isophorone	mg/kg	--	--	--	0/215	N/A	N/A	0/215	5.68E-01	0/215	5.16E-01	0/215	2.58E-02	0.338 - 7.68
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	6.53E-01	0/215	5.94E-01	0/215	2.97E-02	0.338 - 7.68
SVOA	Naphthalene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	8.47E-03	0/215	7.70E-03	0/215	3.85E-04	0.0338 - 0.768
SVOA	Nitrobenzene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.02E-03	0/215	1.83E-03	0/215	9.17E-05	0.338 - 7.68
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.78E-04	0/215	1.62E-04	0/215	8.10E-06	0.338 - 7.68
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.26E-03	0/215	1.14E-03	0/215	5.71E-05	0.338 - 7.68
SVOA	Phenanthrene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	1.21E+01	0/215	1.10E+01	0/215	5.49E-01	0.0338 - 0.768
SVOA	Phenol	mg/kg	--	--	--	0/215	N/A	N/A	0/215	7.28E+00	0/215	6.62E+00	0/215	3.31E-01	0.338 - 7.68
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/215	N/A	N/A	0/215	3.48E-02	0/215	3.16E-02	0/215	1.58E-03	0.338 - 7.68
SVOA	Pyrene	mg/kg	--	--	--	0/215	N/A	N/A	0/215	2.90E+01	0/215	2.63E+01	0/215	1.32E+00	0.0338 - 0.768
SVOA	Total PAH	mg/kg	1.31E-03	2.96E-02	1.97E-02	3/215	N/A	N/A	0/215	6.47E-01	0/215	5.89E-01	1/215	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/204	N/A	N/A	0/204	2.11E+01	0/204	1.92E+01	0/204	9.58E-01	0.175 - 1.27
RADS	Cesium-137	pCi/g	8.89E+00	8.89E+00	8.89E+00	1/204	1/204	2.80E-01	0/204	1.05E+01	0/204	9.58E+00	1/204	4.79E-01	0.0206 - 0.0905
RADS	Neptunium-237	pCi/g	1.16E+00	4.78E+00	2.73E+00	8/204	N/A	N/A	7/204	1.18E+00	8/204	1.07E+00	8/204	5.36E-02	0.283 - 1.12
RADS	Plutonium-238	pCi/g	--	--	--	0/204	N/A	N/A	0/204	4.82E+00	0/204	4.38E+00	0/204	2.19E-01	0.158 - 0.879
RADS	Plutonium-239/240	pCi/g	--	--	--	0/204	N/A	N/A	0/204	4.69E+00	0/204	4.26E+00	0/204	2.13E-01	0.225 - 0.959
RADS	Technetium-99	pCi/g	3.86E+00	1.02E+03	1.28E+02	55/223	55/223	2.80E+00	55/223	1.67E-01	55/223	1.52E-01	55/223	7.60E-03	1.66 - 4.42
RADS	Thorium-230	pCi/g	4.96E-01	8.51E+02	7.14E+00	140/204	24/204	1.40E+00	1/204	4.03E+01	1/204	3.66E+01	9/204	1.83E+00	0.233 - 1.06
RADS	Uranium-233/234	pCi/g	4.11E-01	2.24E+01	1.35E+00	124/204	16/204	1.20E+00	22/204	1.09E+00	34/204	9.90E-01	124/204	4.95E-02	0.314 - 1.25
RADS	Uranium-235/236	pCi/g	1.75E-01	1.30E+00	6.39E-01	6/204	6/204	6.00E-02	1/204	1.07E+00	1/204	9.76E-01	6/204	4.88E-02	0.131 - 0.979
VOA	Uranium-238	pCi/g	3.06E-01	2.43E+01	1.33E+00	155/204	23/204	1.20E+00	61/204	8.87E-01	84/204	8.05E-01	155/204	4.03E-02	0.168 - 1.23
VOA	1,1,1-Trichloroethane	mg/kg	5.72E-04	1.14E-03	8.56E-04	2/235	N/A	N/A	0/235	6.18E+00	0/235	5.62E+00	0/235	2.81E-01	0.000859 - 0.101
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.51E-04	0/235	5.92E-04	0/235	2.96E-05	0.000859 - 0.101
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.63E+01	0/235	5.13E+01	0/235	2.56E+00	0.0043 - 0.503
VOA	1,1,2-Trichloroethane	mg/kg	4.62E-04	2.84E-03	8.65E-04	11/235	N/A	N/A	11/235	2.97E-04	11/235	2.69E-04	11/235	1.35E-05	0.000859 - 0.101
VOA	1,1-Dichloroethane	mg/kg	5.88E-04	9.35E-04	7.62E-04	2/235	N/A	N/A	0/235	1.72E-02	0/235	1.56E-02	1/235	7.82E-04	0.000859 - 0.101
VOA	1,1-Dichloroethene	mg/kg	3.48E-04	6.83E-03	1.56E-03	24/235	N/A	N/A	0/235	2.24E-01	0/235	2.04E-01	0/235	1.02E-02	0.000859 - 0.101
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.60E-02	0/235	4.18E-02	0/235	2.09E-03	0.000859 - 0.101
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.55E-02	0/235	2.32E-02	0/235	1.16E-03	0.000859 - 0.101
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.17E-06	0/235	2.88E-06	0/235	1.44E-07	0.000859 - 0.101
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.62E-05	0/235	4.20E-05	0/235	2.10E-06	0.000859 - 0.101

Table C1.20 Sector 1 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.49E-01	0/235	5.90E-01	0/235	2.95E-02	0.000859 - 0.101
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.06E-03	0/235	9.69E-04	0/235	4.84E-05	0.000859 - 0.101
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.03E-03	0/235	5.48E-03	0/235	2.74E-04	0.000859 - 0.101
VOA	1,2-Dimethylbenzene	mg/kg	4.63E-04	4.67E-03	1.86E-03	5/235	N/A	N/A	0/235	4.18E-01	0/235	3.81E-01	0/235	1.90E-02	0.000859 - 0.101
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.49E-01	0/235	5.90E-01	0/235	2.95E-02	0.000859 - 0.101
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.02E-02	0/235	9.24E-03	0/235	4.62E-04	0.000859 - 0.101
VOA	1,4-Dioxane	mg/kg	2.56E-02	1.33E-01	6.06E-02	4/213	N/A	N/A	4/213	2.07E-03	4/213	1.88E-03	4/213	9.42E-05	0.043 - 5.03
VOA	2-Butanone	mg/kg	1.74E-03	3.58E-01	4.55E-02	20/235	N/A	N/A	0/235	2.55E+00	0/235	2.32E+00	3/235	1.16E-01	0.0043 - 0.503
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.04E-05	0/235	2.76E-05	0/235	1.38E-06	0.0043 - 0.503
VOA	2-Hexanone	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.93E-02	0/235	1.75E-02	0/235	8.75E-04	0.0043 - 0.503
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	7.08E-02	0/235	6.44E-02	0/235	3.22E-03	0.000859 - 0.101
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.18E-01	0/235	5.62E-01	0/235	2.81E-02	0.0043 - 0.503
VOA	Acetone	mg/kg	1.74E-03	1.99E-01	9.38E-03	149/235	N/A	N/A	0/235	8.10E+00	0/235	7.36E+00	0/235	3.68E-01	0.0043 - 0.503
VOA	Acrolein	mg/kg	3.87E-03	4.48E-03	4.18E-03	2/235	N/A	N/A	2/235	1.85E-05	2/235	1.68E-05	2/235	8.41E-07	0.0043 - 0.503
VOA	Acrylonitrile	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.51E-04	0/235	2.28E-04	0/235	1.14E-05	0.0043 - 0.503
VOA	Benzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.13E-03	0/235	4.66E-03	0/235	2.33E-04	0.000859 - 0.101
VOA	Bromochloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.58E-02	0/235	4.16E-02	0/235	2.08E-03	0.000859 - 0.101
VOA	Bromodichloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	8.03E-04	0/235	7.30E-04	0/235	3.65E-05	0.000859 - 0.101
VOA	Bromoform	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.92E-02	0/235	1.75E-02	0/235	8.73E-04	0.000859 - 0.101
VOA	Bromomethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	4.20E-03	0/235	3.82E-03	0/235	1.91E-04	0.000859 - 0.101
VOA	Carbon disulfide	mg/kg	3.56E-03	3.56E-03	3.56E-03	1/235	N/A	N/A	0/235	5.28E-01	0/235	4.80E-01	0/235	2.40E-02	0.0043 - 0.503
VOA	Carbon tetrachloride	mg/kg	4.09E-04	6.11E-04	5.02E-04	3/235	N/A	N/A	0/235	3.89E-03	0/235	3.54E-03	3/235	1.77E-04	0.000859 - 0.101
VOA	Chlorobenzene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.16E-01	0/235	1.06E-01	0/235	5.28E-03	0.000859 - 0.101
VOA	Chloroethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.21E+00	0/235	4.74E+00	0/235	2.37E-01	0.000859 - 0.101
VOA	Chloroform	mg/kg	3.78E-04	7.23E-03	1.56E-03	58/235	N/A	N/A	18/235	1.35E-03	21/235	1.22E-03	58/235	6.12E-05	0.000859 - 0.101
VOA	Chloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.16E-02	0/235	1.05E-02	0/235	5.26E-04	0.000859 - 0.101
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.94E-04	8.11E-02	9.26E-03	86/235	N/A	N/A	9/235	2.33E-02	9/235	2.12E-02	65/235	1.06E-03	0.000859 - 0.101
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.70E-03	0/235	3.36E-03	0/235	1.68E-04	0.000859 - 0.101
VOA	Cumene	mg/kg	5.68E-04	5.68E-04	5.68E-04	1/235	N/A	N/A	0/235	1.62E+00	0/235	1.48E+00	0/235	7.38E-02	0.000859 - 0.101
VOA	Cyclohexane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	2.86E+01	0/235	2.60E+01	0/235	1.30E+00	0.000859 - 0.101
VOA	Dibromochloromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	5.10E-03	0/235	4.64E-03	0/235	2.32E-04	0.000859 - 0.101
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	6.69E-01	0/235	6.08E-01	0/235	3.04E-02	0.000859 - 0.101
VOA	Ethylbenzene	mg/kg	3.89E-04	3.89E-04	3.89E-04	1/235	N/A	N/A	0/235	3.70E-02	0/235	3.36E-02	0/235	1.68E-03	0.000859 - 0.101
VOA	m,p-Xylene	mg/kg	1.39E-03	4.46E-03	2.64E-03	3/235	N/A	N/A	0/235	4.20E-01	0/235	3.82E-01	0/235	1.91E-02	0.00172 - 0.201
VOA	Methyl acetate	mg/kg	--	--	--	0/235	N/A	N/A	0/235	9.04E+00	0/235	8.22E+00	0/235	4.11E-01	0.0043 - 0.503
VOA	Methylcyclohexane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.08E+01	0/235	2.80E+01	0/235	1.40E+00	0.000859 - 0.101
VOA	Methylene chloride	mg/kg	1.82E-03	1.67E-01	8.91E-03	28/235	N/A	N/A	1/235	5.98E-02	1/235	5.44E-02	14/235	2.72E-03	0.0043 - 0.503
VOA	Styrene	mg/kg	7.72E-04	1.41E-03	1.07E-03	6/235	N/A	N/A	0/235	2.93E+00	0/235	2.66E+00	0/235	1.33E-01	0.000859 - 0.101
VOA	Tetrachloroethene	mg/kg	3.79E-04	7.10E-04	5.20E-04	5/235	N/A	N/A	0/235	4.05E-02	0/235	3.69E-02	0/235	1.84E-03	0.000859 - 0.101
VOA	Toluene	mg/kg	3.84E-04	4.88E-03	1.33E-03	30/235	N/A	N/A	0/235	1.68E+00	0/235	1.52E+00	0/235	7.62E-02	0.000859 - 0.101
VOA	Total Xylene	mg/kg	2.80E-03	9.14E-03	5.35E-03	3/235	N/A	N/A	0/235	4.20E-01	0/235	3.82E-01	0/235	1.91E-02	0.00258 - 0.302
VOA	*trans* -1,2-Dichloroethene	mg/kg	6.09E-04	6.09E-04	6.09E-04	1/235	N/A	N/A	0/235	6.40E-02	0/235	5.83E-02	0/235	2.91E-03	0.000859 - 0.101
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/235	N/A	N/A	0/235	3.70E-03	0/235	3.36E-03	0/235	1.68E-04	0.000859 - 0.101
VOA	Trichloroethene	mg/kg	4.15E-04	5.54E+00	1.94E-01	162/235	N/A	N/A	127/235	2.22E-03	128/235	2.02E-03	162/235	1.01E-04	0.000859 - 0.212
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.61E+00	0/235	1.46E+00	0/235	7.31E-02	0.000859 - 0.101
VOA	Vinyl chloride	mg/kg	--	--	--	0/235	N/A	N/A	0/235	1.42E-04	0/235	1.29E-04	0/235	6.47E-06	0.000859 - 0.101

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.20 Sector 1 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.21. Sector 1 McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		
			Min	Max	Avg		DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	4.27E+02	2.05E+04	6.80E+03	77/77	55/77	3.00E+03	10.1 - 133
METAL	Antimony	mg/kg	4.15E-01	7.61E+00	1.59E+00	19/77	19/77	3.52E-02	2.1 - 30.5
METAL	Arsenic	mg/kg	6.84E-01	2.20E+02	1.14E+01	76/77	76/77	1.51E-03	1.01 - 1.55
METAL	Barium	mg/kg	2.85E+00	1.15E+03	6.06E+01	77/77	54/77	1.55E+01	0.808 - 10.2
METAL	Beryllium	mg/kg	9.47E-02	2.85E+00	7.25E-01	77/77	5/77	1.95E+00	0.101 - 0.155
METAL	Boron	mg/kg	8.75E-01	3.74E+01	8.43E+00	70/77	64/77	1.28E+00	3.03 - 4.65
METAL	Cadmium	mg/kg	2.84E-02	1.12E+00	1.73E-01	57/77	27/77	6.93E-02	0.202 - 0.31
METAL	Chromium	mg/kg	2.16E+00	1.07E+02	3.13E+01	77/77	0/77	1.80E+05	0.606 - 0.93
METAL	Cobalt	mg/kg	3.14E-01	8.71E+01	6.85E+00	77/77	77/77	2.71E-02	0.202 - 0.31
METAL	Copper	mg/kg	2.00E-01	1.24E+01	4.45E+00	76/77	49/77	2.81E+00	0.404 - 0.62
METAL	Iron	mg/kg	1.18E+03	2.96E+05	4.20E+04	77/77	77/77	3.52E+01	22.2 - 2830
METAL	Lead	mg/kg	1.12E+00	9.66E+01	8.43E+00	77/77	11/77	1.35E+01	0.404 - 0.62
METAL	Manganese	mg/kg	4.63E+00	6.71E+03	2.51E+02	77/77	77/77	2.83E+00	1.01 - 133
METAL	Mercury	mg/kg	1.10E-02	1.39E-01	3.83E-02	26/77	13/77	2.95E-02	0.0221 - 0.0384
METAL	Molybdenum	mg/kg	9.94E-02	5.47E+00	6.82E-01	54/77	41/77	2.02E-01	0.202 - 0.31
METAL	Nickel	mg/kg	6.84E-01	5.32E+01	1.13E+01	77/77	63/77	2.56E+00	0.404 - 0.62
METAL	Selenium	mg/kg	3.80E-01	8.96E+00	1.86E+00	69/77	69/77	5.19E-02	1.01 - 1.55
METAL	Silver	mg/kg	1.41E-01	3.04E+00	8.34E-01	13/77	13/77	7.99E-02	0.52 - 12
METAL	Thallium	mg/kg	1.96E-01	3.54E+00	1.34E+00	4/77	4/77	1.42E-03	0.404 - 0.62
METAL	Uranium	mg/kg	6.49E-02	4.39E+00	1.15E+00	77/77	74/77	1.80E-01	0.0404 - 0.062
METAL	Vanadium	mg/kg	3.47E+00	1.73E+02	3.44E+01	77/77	69/77	8.64E+00	4.04 - 6.2
METAL	Zinc	mg/kg	3.04E+00	3.24E+02	4.69E+01	77/77	38/77	3.73E+01	4.04 - 23.6
ANION	Fluoride	mg/kg	4.65E-01	3.00E+02	7.64E+00	74/77	1/77	1.20E+01	1.08 - 13.6
PPCB	Total PCB	mg/kg	--	--	--	0/79	0/79	6.82E-03	0.00361 - 0.00596
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/79	0/79	8.72E-04	0.365 - 2.25
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/79	0/79	4.02E-01	0.365 - 2.25
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/79	0/79	1.16E-03	0.365 - 2.25
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/79	0/79	2.26E-03	0.365 - 2.25
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/79	0/79	4.21E-02	0.365 - 2.25
SVOA	2,4-Dinitrophenol	mg/kg	4.39E-01	4.39E-01	4.39E-01	1/79	1/79	4.36E-03	0.647 - 4.5
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/79	0/79	3.21E-04	0.365 - 2.25
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/79	0/79	6.67E-05	0.365 - 2.25
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/79	0/79	3.85E-01	0.0365 - 0.225
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/79	0/79	8.91E-03	0.365 - 2.25
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/79	0/79	2.58E-04	0.365 - 2.25
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/79	0/79	1.85E-02	0.0365 - 0.225
SVOA	2-Methylphenol	mg/kg	--	--	--	0/79	0/79	7.53E-02	0.365 - 2.25
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/79	0/79	8.01E-03	0.365 - 2.25
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/79	0/79	4.36E-03	0.365 - 2.25
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/79	0/79	8.24E-04	0.365 - 2.25
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/79	0/79	2.45E-04	0.365 - 2.25

Table C1.21. Sector 1 McNairy Soil Protection of Groundwater Screen (Continued)

			Detected Results				GW Protection Screen		
Type	Analysis	Unit	Min	Max	Avg	FOD	DAF 1	DAF 1 SSL	DL Range
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/79	0/79	3.42E-04	0.365 - 2.25
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/79	0/79	1.71E-01	0.365 - 2.25
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/79	0/79	1.55E-04	0.365 - 2.25
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/79	0/79	3.42E-04	0.365 - 2.25
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/79	0/79	4.36E-03	0.365 - 2.25
SVOA	Acenaphthene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOA	Acenaphthylene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOA	Acetophenone	mg/kg	--	--	--	0/79	0/79	5.84E-02	0.365 - 2.25
SVOA	Anthracene	mg/kg	--	--	--	0/79	0/79	5.81E+00	0.0365 - 0.225
SVOA	Atrazine	mg/kg	--	--	--	0/79	0/79	1.96E-04	0.365 - 2.25
SVOA	Benzaldehyde	mg/kg	--	--	--	0/79	0/79	4.15E-03	0.365 - 2.25
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/79	0/79	1.32E+00	0.0365 - 0.225
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/79	0/79	1.35E-03	0.365 - 2.25
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/79	0/79	3.61E-06	0.365 - 2.25
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/79	0/79	1.31E-04	0.365 - 2.25
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.36E-02	8.09E-02	2.64E-02	11/79	0/79	1.33E+00	0.0365 - 0.225
SVOA	Butyl benzyl phthalate	mg/kg	1.84E-02	2.48E-02	2.16E-02	2/79	0/79	2.36E-01	0.0365 - 0.225
SVOA	Caprolactam	mg/kg	--	--	--	0/79	0/79	2.47E-01	0.365 - 2.25
SVOA	Carbazole	mg/kg	1.58E-02	1.58E-02	1.58E-02	1/79	0/79	3.76E-02	0.0365 - 0.225
SVOA	Dibenzofuran	mg/kg	--	--	--	0/79	0/79	1.46E-02	0.365 - 2.25
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/79	0/79	6.08E-01	0.0365 - 0.225
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/79	0/79	6.08E-01	0.0365 - 0.225
SVOA	Di-n-butyl phthalate	mg/kg	1.34E-02	4.12E-02	1.96E-02	11/79	0/79	2.27E-01	0.0365 - 0.225
SVOA	Di-n-octylphthalate	mg/kg	2.73E-02	5.16E-02	3.95E-02	2/79	0/79	5.65E+00	0.0365 - 0.225
SVOA	Diphenylamine	mg/kg	--	--	--	0/79	0/79	2.33E-01	0.365 - 2.25
SVOA	Fluoranthene	mg/kg	1.67E-02	1.67E-02	1.67E-02	1/79	0/79	8.91E+00	0.0365 - 0.225
SVOA	Fluorene	mg/kg	--	--	--	0/79	0/79	5.45E-01	0.0365 - 0.225
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/79	0/79	1.23E-04	0.365 - 2.25
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/79	0/79	2.67E-04	0.365 - 2.25
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/79	0/79	1.28E-04	0.365 - 2.25
SVOA	Hexachloroethane	mg/kg	--	--	--	0/79	0/79	2.00E-04	0.365 - 2.25
SVOA	Isophorone	mg/kg	--	--	--	0/79	0/79	2.58E-02	0.365 - 2.25
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/79	0/79	2.97E-02	0.365 - 2.25
SVOA	Naphthalene	mg/kg	--	--	--	0/79	0/79	3.85E-04	0.0365 - 0.225
SVOA	Nitrobenzene	mg/kg	--	--	--	0/79	0/79	9.17E-05	0.365 - 2.25
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/78	0/78	8.10E-06	0.365 - 2.25
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/79	0/79	5.71E-05	0.365 - 2.25
SVOA	Phenanthrene	mg/kg	--	--	--	0/79	0/79	5.49E-01	0.0365 - 0.225
SVOA	Phenol	mg/kg	--	--	--	0/79	0/79	3.31E-01	0.365 - 2.25
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/79	0/79	1.58E-03	0.365 - 2.25
SVOA	Pyrene	mg/kg	2.22E-02	2.22E-02	2.22E-02	1/79	0/79	1.32E+00	0.0365 - 0.225

Table C1.21. Sector 1 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	Total PAH	mg/kg	--	--	--	0/79	0/79	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/77	0/77	9.58E-01	0.174 - 1.09
RADS	Cesium-137	pCi/g	--	--	--	0/77	0/77	4.79E-01	0.0246 - 0.0793
RADS	Neptunium-237	pCi/g	--	--	--	0/77	0/77	5.36E-02	0.261 - 0.968
RADS	Plutonium-238	pCi/g	--	--	--	0/77	0/77	2.19E-01	0.202 - 1.04
RADS	Plutonium-239/240	pCi/g	--	--	--	0/77	0/77	2.13E-01	0.225 - 0.866
RADS	Technetium-99	pCi/g	--	--	--	0/81	0/81	7.60E-03	1.97 - 4.82
RADS	Thorium-230	pCi/g	4.80E-01	3.89E+00	1.24E+00	55/77	6/77	1.83E+00	0.358 - 1.58
RADS	Thorium-232	pCi/g	4.35E-01	4.35E-01	4.35E-01	1/1	1/1	9.80E-03	0.264 - 0.264
RADS	Uranium-233/234	pCi/g	4.73E-01	2.94E+00	1.07E+00	39/77	39/77	4.95E-02	0.404 - 1.33
RADS	Uranium-235/236	pCi/g	3.53E-01	4.91E-01	4.22E-01	2/77	2/77	4.88E-02	0.198 - 1.12
RADS	Uranium-238	pCi/g	3.93E-01	2.80E+00	1.06E+00	53/77	53/77	4.03E-02	0.286 - 0.841
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/83	0/83	2.81E-01	0.000956 - 0.00296
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/83	0/83	2.96E-05	0.000956 - 0.00296
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.49E-03	1.02E-02	4.88E-03	7/83	0/83	2.56E+00	0.00478 - 0.0148
VOA	1,1,2-Trichloroethane	mg/kg	4.11E-04	3.33E-03	1.30E-03	23/83	23/83	1.35E-05	0.000956 - 0.00296
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/83	0/83	7.82E-04	0.000956 - 0.00296
VOA	1,1-Dichloroethene	mg/kg	4.54E-04	1.22E-03	8.70E-04	3/83	0/83	1.02E-02	0.000956 - 0.00296
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.09E-03	0.000956 - 0.00296
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/83	0/83	1.16E-03	0.000956 - 0.00296
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/83	0/83	1.44E-07	0.000956 - 0.00296
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/83	0/83	2.10E-06	0.000956 - 0.00296
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.95E-02	0.000956 - 0.00296
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/83	0/83	4.84E-05	0.000956 - 0.00296
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/83	0/83	2.74E-04	0.000956 - 0.00296
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/83	0/83	1.90E-02	0.000956 - 0.00296
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	2.95E-02	0.000956 - 0.00296
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/83	0/83	4.62E-04	0.000956 - 0.00296
VOA	1,4-Dioxane	mg/kg	--	--	--	0/66	0/66	9.42E-05	0.0544 - 0.148
VOA	2-Butanone	mg/kg	1.80E-03	3.56E-03	2.96E-03	8/83	0/83	1.16E-01	0.00478 - 0.0148
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/83	0/83	1.38E-06	0.00478 - 0.0148
VOA	2-Hexanone	mg/kg	--	--	--	0/83	0/83	8.75E-04	0.00478 - 0.0148
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/83	0/83	3.22E-03	0.000956 - 0.00296
VOA	4-Methyl-2-pentanone	mg/kg	3.64E-02	3.64E-02	3.64E-02	1/83	1/83	2.81E-02	0.00478 - 0.0148
VOA	Acetone	mg/kg	2.08E-03	5.15E-02	8.37E-03	60/83	0/83	3.68E-01	0.00478 - 0.0148
VOA	Acrolein	mg/kg	--	--	--	0/83	0/83	8.41E-07	0.00478 - 0.0148
VOA	Acrylonitrile	mg/kg	--	--	--	0/83	0/83	1.14E-05	0.00478 - 0.0148
VOA	Benzene	mg/kg	--	--	--	0/83	0/83	2.33E-04	0.000956 - 0.00296
VOA	Bromochloromethane	mg/kg	--	--	--	0/83	0/83	2.08E-03	0.000956 - 0.00296
VOA	Bromodichloromethane	mg/kg	7.58E-04	7.58E-04	7.58E-04	1/83	1/83	3.65E-05	0.000956 - 0.00296
VOA	Bromoform	mg/kg	--	--	--	0/83	0/83	8.73E-04	0.000956 - 0.00296

Table C1.21. Sector 1 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		
			Min	Max	Avg		DAF 1	DAF 1 SSL	DL Range
VOA	Bromomethane	mg/kg	--	--	--	0/83	0/83	1.91E-04	0.000956 - 0.00296
VOA	Carbon disulfide	mg/kg	1.16E-02	1.16E-02	1.16E-02	1/83	0/83	2.40E-02	0.00478 - 0.0148
VOA	Carbon tetrachloride	mg/kg	4.54E-04	5.93E-04	5.07E-04	3/83	3/83	1.77E-04	0.000956 - 0.00296
VOA	Chlorobenzene	mg/kg	--	--	--	0/83	0/83	5.28E-03	0.000956 - 0.00296
VOA	Chloroethane	mg/kg	--	--	--	0/83	0/83	2.37E-01	0.000956 - 0.00296
VOA	Chloroform	mg/kg	5.16E-04	2.68E-03	1.10E-03	20/83	20/83	6.12E-05	0.000956 - 0.00296
VOA	Chloromethane	mg/kg	--	--	--	0/83	0/83	5.26E-04	0.000956 - 0.00296
VOA	*cis* -1,2-Dichloroethene	mg/kg	6.16E-04	3.08E-02	4.59E-03	25/83	22/83	1.06E-03	0.000956 - 0.00296
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/83	0/83	1.68E-04	0.000956 - 0.00296
VOA	Cumene	mg/kg	--	--	--	0/83	0/83	7.38E-02	0.000956 - 0.00296
VOA	Cyclohexane	mg/kg	--	--	--	0/83	0/83	1.30E+00	0.000956 - 0.00296
VOA	Dibromochloromethane	mg/kg	--	--	--	0/83	0/83	2.32E-04	0.000956 - 0.00296
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/83	0/83	3.04E-02	0.000956 - 0.00296
VOA	Ethylbenzene	mg/kg	--	--	--	0/83	0/83	1.68E-03	0.000956 - 0.00296
VOA	m,p-Xylene	mg/kg	--	--	--	0/83	0/83	1.91E-02	0.00191 - 0.00593
VOA	Methyl acetate	mg/kg	--	--	--	0/83	0/83	4.11E-01	0.00478 - 0.0148
VOA	Methylcyclohexane	mg/kg	--	--	--	0/83	0/83	1.40E+00	0.000956 - 0.00296
VOA	Methylene chloride	mg/kg	2.19E-03	7.58E-03	4.56E-03	14/83	12/83	2.72E-03	0.00478 - 0.0125
VOA	Styrene	mg/kg	1.08E-03	1.72E-03	1.40E-03	2/83	0/83	1.33E-01	0.000956 - 0.00296
VOA	Tetrachloroethene	mg/kg	3.25E-04	5.90E-03	1.84E-03	22/83	9/83	1.84E-03	0.000956 - 0.00296
VOA	Toluene	mg/kg	5.02E-04	6.56E-03	1.70E-03	11/83	0/83	7.62E-02	0.000956 - 0.00296
VOA	Total Xylene	mg/kg	--	--	--	0/83	0/83	1.91E-02	0.00287 - 0.00889
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/83	0/83	2.91E-03	0.000956 - 0.00296
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/83	0/83	1.68E-04	0.000956 - 0.00296
VOA	Trichloroethene	mg/kg	5.48E-04	6.10E+00	1.39E+00	44/83	44/83	1.01E-04	0.00109 - 0.215
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/83	0/83	7.31E-02	0.000956 - 0.00296
VOA	Vinyl chloride	mg/kg	--	--	--	0/83	0/83	6.47E-06	0.000956 - 0.00296

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.22. Sector 2 Surface Soil Data Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen							
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	2.54E+03	1.80E+04	9.91E+03	16/16	3/16	1.30E+04	0/16	6.60E+04	0/16	5.99E+04	15/16	3.00E+03	10.7 - 122
METAL	Antimony	mg/kg	3.86E-01	1.54E+00	9.94E-01	6/16	6/16	2.10E-01	4/16	7.74E-01	4/16	7.04E-01	6/16	3.52E-02	1.94 - 2.36
METAL	Arsenic	mg/kg	1.84E+00	1.25E+01	6.01E+00	16/16	1/16	1.20E+01	16/16	3.32E-02	16/16	3.02E-02	16/16	1.51E-03	1.06 - 5.51
METAL	Barium	mg/kg	6.97E+00	1.64E+02	7.85E+01	16/16	0/16	2.00E+02	0/16	3.41E+02	0/16	3.11E+02	15/16	1.55E+01	0.851 - 0.978
METAL	Beryllium	mg/kg	9.81E-02	6.65E-01	4.10E-01	16/16	0/16	6.70E-01	0/16	4.29E+01	0/16	3.89E+01	0/16	1.95E+00	0.106 - 0.122
METAL	Boron	mg/kg	1.82E+00	4.99E+00	2.91E+00	14/16	N/A	N/A	0/16	2.82E+01	0/16	2.56E+01	14/16	1.28E+00	3.19 - 3.67
METAL	Cadmium	mg/kg	2.45E-02	1.12E+00	2.92E-01	12/16	4/16	2.10E-01	0/16	1.52E+00	0/16	1.39E+00	8/16	6.93E-02	0.213 - 1.1
METAL	Chromium	mg/kg	5.96E+00	5.35E+01	1.91E+01	16/16	8/16	1.60E+01	0/16	3.96E+06	0/16	3.60E+06	0/16	1.80E+05	0.638 - 0.733
METAL	Cobalt	mg/kg	8.34E-01	1.09E+01	6.68E+00	16/16	0/16	1.40E+01	16/16	5.96E-01	16/16	5.43E-01	16/16	2.71E-02	0.213 - 0.244
METAL	Copper	mg/kg	1.86E+00	8.93E+02	6.55E+01	16/16	2/16	1.90E+01	1/16	6.18E+01	1/16	5.62E+01	15/16	2.81E+00	0.425 - 4.5
METAL	Iron	mg/kg	2.72E+03	2.68E+04	1.58E+04	16/16	0/16	2.80E+04	16/16	7.74E+02	16/16	7.04E+02	16/16	3.52E+01	21.4 - 244
METAL	Lead	mg/kg	1.93E+00	2.40E+01	1.10E+01	16/16	0/16	3.60E+01	0/16	2.97E+02	0/16	2.70E+02	4/16	1.35E+01	0.425 - 0.489
METAL	Manganese	mg/kg	8.24E+01	1.35E+03	4.51E+02	16/16	0/16	1.50E+03	16/16	6.23E+01	16/16	5.65E+01	16/16	2.83E+00	1.07 - 12.2
METAL	Mercury	mg/kg	1.51E-02	7.92E-02	2.82E-02	13/16	0/16	2.00E-01	0/16	6.49E-01	0/16	5.91E-01	4/16	2.95E-02	0.0241 - 0.0298
METAL	Molybdenum	mg/kg	3.38E-01	1.28E+00	6.90E-01	16/16	N/A	N/A	0/16	4.44E+00	0/16	4.03E+00	16/16	2.02E-01	0.213 - 1.1
METAL	Nickel	mg/kg	4.94E+00	1.43E+03	9.93E+01	16/16	1/16	2.10E+01	1/16	5.63E+01	1/16	5.12E+01	16/16	2.56E+00	0.425 - 4.41
METAL	Selenium	mg/kg	4.00E-01	1.85E+00	9.92E-01	12/16	8/16	8.00E-01	5/16	1.14E+00	5/16	1.04E+00	12/16	5.19E-02	1.06 - 5.51
METAL	Silver	mg/kg	3.99E-01	1.70E+00	9.05E-01	5/16	0/16	2.30E+00	0/16	1.76E+00	1/16	1.60E+00	5/16	7.99E-02	0.485 - 5.68
METAL	Thallium	mg/kg	1.57E-01	2.47E-01	1.98E-01	8/16	3/16	2.10E-01	8/16	3.12E-02	8/16	2.84E-02	8/16	1.42E-03	0.425 - 0.489
METAL	Uranium	mg/kg	9.52E-01	9.10E+02	6.56E+01	16/16	7/16	4.90E+00	8/16	3.96E+00	8/16	3.60E+00	16/16	1.80E-01	0.0425 - 0.221
METAL	Vanadium	mg/kg	6.18E+00	3.80E+01	2.45E+01	16/16	0/16	3.80E+01	0/16	1.90E+02	0/16	1.73E+02	15/16	8.64E+00	4.25 - 4.89
METAL	Zinc	mg/kg	1.35E+01	1.44E+02	4.10E+01	16/16	2/16	6.50E+01	0/16	8.21E+02	0/16	7.46E+02	7/16	3.73E+01	4.25 - 22.1
ANION	Fluoride	mg/kg	1.18E+00	2.65E+01	9.68E+00	16/16	N/A	N/A	0/16	2.64E+02	0/16	2.40E+02	4/16	1.20E+01	1.09 - 1.24
PPCB	Total PCB	mg/kg	1.85E-03	8.62E-02	3.90E-02	6/16	N/A	N/A	0/16	1.50E-01	0/16	1.36E-01	4/16	6.82E-03	0.00361 - 0.0225
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.92E-02	0/16	1.74E-02	0/16	8.72E-04	0.367 - 3.58
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.84E+00	0/16	8.04E+00	0/16	4.02E-01	0.367 - 3.58
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.55E-02	0/16	2.32E-02	0/16	1.16E-03	0.367 - 3.58
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.97E-02	0/16	4.52E-02	0/16	2.26E-03	0.367 - 3.58
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.26E-01	0/16	8.42E-01	0/16	4.21E-02	0.367 - 3.58
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.59E-02	0/16	8.72E-02	0/16	4.36E-03	0.733 - 7.16
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.06E-03	0/16	6.42E-03	0/16	3.21E-04	0.367 - 3.58
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.47E-03	0/16	1.33E-03	0/16	6.67E-05	0.367 - 3.58
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.47E+00	0/16	7.70E+00	0/16	3.85E-01	0.0367 - 0.358
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.96E-01	0/16	1.78E-01	0/16	8.91E-03	0.367 - 3.58
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.68E-03	0/16	5.16E-03	0/16	2.58E-04	0.367 - 3.58
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.07E-01	0/16	3.70E-01	0/16	1.85E-02	0.0367 - 0.358
SVOA	2-Methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.66E+00	0/16	1.51E+00	0/16	7.53E-02	0.367 - 3.58
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.76E-01	0/16	1.60E-01	0/16	8.01E-03	0.367 - 3.58
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.59E-02	0/16	8.72E-02	0/16	4.36E-03	0.367 - 3.58
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.81E-02	0/16	1.65E-02	0/16	8.24E-04	0.367 - 3.58
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.39E-03	0/16	4.90E-03	0/16	2.45E-04	0.367 - 3.58
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.52E-03	0/16	6.84E-03	0/16	3.42E-04	0.367 - 3.58
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.76E+00	0/16	3.42E+00	0/16	1.71E-01	0.367 - 3.58
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.41E-03	0/16	3.10E-03	0/16	1.55E-04	0.367 - 3.58
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.52E-03	0/16	6.84E-03	0/16	3.42E-04	0.367 - 3.58
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.59E-02	0/16	8.72E-02	0/16	4.36E-03	0.367 - 3.58
SVOA	Acenaphthene	mg/kg	3.87E-02	2.82E-01	1.31E-01	3/16	N/A	N/A	0/16	1.21E+01	0/16	1.10E+01	0/16	5.49E-01	0.0367 - 0.358
SVOA	Acenaphthylene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.21E+01	0/16	1.10E+01	0/16	5.49E-01	0.0367 - 0.358
SVOA	Acetophenone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.28E+00	0/16	1.17E+00	0/16	5.84E-02	0.367 - 3.58
SVOA	Anthracene	mg/kg	5.90E-02	5.42E-01	2.35E-01	3/16	N/A	N/A	0/16	1.28E+02	0/16	1.16E+02	0/16	5.81E+00	0.0367 - 0.358
SVOA	Atrazine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.31E-03	0/16	3.92E-03	0/16	1.96E-04	0.367 - 3.58
SVOA	Benzaldehyde	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.13E-02	0/16	8.30E-02	0/16	4.15E-03	0.367 - 3.58

Table C1.22. Sector 2 Surface Soil Data Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzo(ghi)perylene	mg/kg	9.08E-02	2.01E-01	1.46E-01	5/16	N/A	N/A	0/16	2.90E+01	0/16	2.63E+01	0/16	1.32E+00	0.0367 - 0.358
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.97E-02	0/16	2.70E-02	0/16	1.35E-03	0.367 - 3.58
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.94E-05	0/16	7.22E-05	0/16	3.61E-06	0.367 - 3.58
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.88E-03	0/16	2.62E-03	0/16	1.31E-04	0.367 - 3.58
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.93E+01	0/16	2.66E+01	0/16	1.33E+00	0.0367 - 0.358
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.19E+00	0/16	4.72E+00	0/16	2.36E-01	0.0367 - 0.358
SVOA	Caprolactam	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.43E+00	0/16	4.94E+00	0/16	2.47E-01	0.367 - 3.58
SVOA	Carbazole	mg/kg	3.66E-02	1.38E-01	7.96E-02	3/16	N/A	N/A	0/16	8.27E-01	0/16	7.51E-01	2/16	3.76E-02	0.0367 - 0.358
SVOA	Dibenzofuran	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.21E-01	0/16	2.92E-01	0/16	1.46E-02	0.367 - 3.58
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.34E+01	0/16	1.22E+01	0/16	6.08E-01	0.0367 - 0.358
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.34E+01	0/16	1.22E+01	0/16	6.08E-01	0.0367 - 0.358
SVOA	Di-n-butyl phthalate	mg/kg	1.38E-02	1.78E-02	1.67E-02	4/16	N/A	N/A	0/16	4.99E+00	0/16	4.54E+00	0/16	2.27E-01	0.0367 - 0.358
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.24E+02	0/16	1.13E+02	0/16	5.65E+00	0.0367 - 0.358
SVOA	Diphenylamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.13E+00	0/16	4.66E+00	0/16	2.33E-01	0.367 - 3.58
SVOA	Fluoranthene	mg/kg	1.50E-02	1.46E+00	4.73E-01	7/16	N/A	N/A	0/16	1.96E+02	0/16	1.78E+02	0/16	8.91E+00	0.0367 - 0.358
SVOA	Fluorene	mg/kg	2.11E-02	5.18E-01	1.96E-01	3/16	N/A	N/A	0/16	1.20E+01	0/16	1.09E+01	0/16	5.45E-01	0.0367 - 0.358
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.71E-03	0/16	2.46E-03	0/16	1.23E-04	0.367 - 3.58
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.87E-03	0/16	5.34E-03	0/16	2.67E-04	0.367 - 3.58
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.82E-03	0/16	2.56E-03	0/16	1.28E-04	0.367 - 3.58
SVOA	Hexachloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.40E-03	0/16	4.00E-03	0/16	2.00E-04	0.367 - 3.58
SVOA	Isophorone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.68E-01	0/16	5.16E-01	0/16	2.58E-02	0.367 - 3.58
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.53E-01	0/16	5.94E-01	0/16	2.97E-02	0.367 - 3.58
SVOA	Naphthalene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.47E-03	0/16	7.70E-03	0/16	3.85E-04	0.0367 - 0.358
SVOA	Nitrobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.02E-03	0/16	1.83E-03	0/16	9.17E-05	0.367 - 3.58
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.78E-04	0/16	1.62E-04	0/16	8.10E-06	0.367 - 3.58
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.26E-03	0/16	1.14E-03	0/16	5.71E-05	0.367 - 3.58
SVOA	Phenanthrene	mg/kg	7.54E-02	1.80E+00	5.70E-01	5/16	N/A	N/A	0/16	1.21E+01	0/16	1.10E+01	1/16	5.49E-01	0.0367 - 0.358
SVOA	Phenol	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.28E+00	0/16	6.62E+00	0/16	3.31E-01	0.367 - 3.58
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.48E-02	0/16	3.16E-02	0/16	1.58E-03	0.367 - 3.58
SVOA	Pyrene	mg/kg	1.35E-02	8.02E-01	2.80E-01	8/16	N/A	N/A	0/16	2.90E+01	0/16	2.63E+01	0/16	1.32E+00	0.0367 - 0.358
SVOA	Total PAH	mg/kg	3.11E-03	4.95E-01	2.69E-01	6/16	N/A	N/A	0/16	6.47E-01	0/16	5.89E-01	5/16	2.94E-02	-
RADS	Americium-241	pCi/g	6.59E-01	6.59E-01	6.59E-01	1/17	N/A	N/A	0/17	2.11E+01	0/17	1.92E+01	0/17	9.58E-01	0.238 - 0.874
RADS	Cesium-137	pCi/g	6.34E-02	6.65E-02	6.50E-02	2/17	0/17	4.90E-01	0/17	1.05E+01	0/17	9.58E+00	0/17	4.79E-01	0.0255 - 0.0966
RADS	Neptunium-237	pCi/g	1.15E+00	1.15E+00	1.15E+00	1/17	1/17	1.00E-01	0/17	1.18E+00	1/17	1.07E+00	1/17	5.36E-02	0.364 - 0.919
RADS	Plutonium-238	pCi/g	--	--	--	0/17	0/17	7.30E-02	0/17	4.82E+00	0/17	4.38E+00	0/17	2.19E-01	0.337 - 0.897
RADS	Plutonium-239/240	pCi/g	3.33E+00	3.33E+00	3.33E+00	1/17	1/17	2.50E-02	0/17	4.69E+00	0/17	4.26E+00	1/17	2.13E-01	0.323 - 0.864
RADS	Technetium-99	pCi/g	8.33E+00	2.53E+01	1.90E+01	6/17	6/17	2.50E+00	6/17	1.67E-01	6/17	1.52E-01	6/17	7.60E-03	2.36 - 3.92
RADS	Thorium-230	pCi/g	6.24E-01	1.12E+01	2.09E+00	16/17	5/17	1.50E+00	0/17	4.03E+01	0/17	3.66E+01	5/17	1.83E+00	0.365 - 1.15
RADS	Uranium-233/234	pCi/g	7.64E-01	5.12E+02	3.70E+01	16/17	11/17	1.20E+00	11/17	1.09E+00	11/17	9.90E-01	16/17	4.95E-02	0.385 - 2.27
RADS	Uranium-235/236	pCi/g	3.16E-01	2.84E+01	5.43E+00	6/17	6/17	6.00E-02	3/17	1.07E+00	3/17	9.76E-01	6/17	4.88E-02	0.134 - 0.746
RADS	Uranium-238	pCi/g	4.93E-01	5.54E+02	4.10E+01	16/17	12/17	1.20E+00	14/17	8.87E-01	14/17	8.05E-01	16/17	4.03E-02	0.16 - 1.41
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.18E+00	0/16	5.62E+00	0/16	2.81E-01	0.000986 - 0.053
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.51E-04	0/16	5.92E-04	0/16	2.96E-05	0.000986 - 0.053
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.63E+01	0/16	5.13E+01	0/16	2.56E+00	0.00493 - 0.265
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.97E-04	0/16	2.69E-04	0/16	1.35E-05	0.000986 - 0.053
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.72E-02	0/16	1.56E-02	0/16	7.82E-04	0.000986 - 0.053
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.24E-01	0/16	2.04E-01	0/16	1.02E-02	0.000986 - 0.053
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.60E-02	0/16	4.18E-02	0/16	2.09E-03	0.000986 - 0.053
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.55E-02	0/16	2.32E-02	0/16	1.16E-03	0.000986 - 0.053
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.17E-06	0/16	2.88E-06	0/16	1.44E-07	0.000986 - 0.053
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.62E-05	0/16	4.20E-05	0/16	2.10E-06	0.000986 - 0.053
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.49E-01	0/16	5.90E-01	0/16	2.95E-02	0.000986 - 0.053

Table C1.22. Sector 2 Surface Soil Data Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.06E-03	0/16	9.69E-04	0/16	4.84E-05	0.000986 - 0.053
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.03E-03	0/16	5.48E-03	0/16	2.74E-04	0.000986 - 0.053
VOA	1,2-Dimethylbenzene	mg/kg	5.81E-04	2.08E-02	1.07E-02	2/16	N/A	N/A	0/16	4.18E-01	0/16	3.81E-01	1/16	1.90E-02	0.000986 - 0.053
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.49E-01	0/16	5.90E-01	0/16	2.95E-02	0.000986 - 0.053
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.02E-02	0/16	9.24E-03	0/16	4.62E-04	0.000986 - 0.053
VOA	1,4-Dioxane	mg/kg	5.52E-02	5.52E-02	5.52E-02	1/16	N/A	N/A	1/16	2.07E-03	1/16	1.88E-03	1/16	9.42E-05	0.0493 - 2.65
VOA	2-Butanone	mg/kg	3.18E-03	1.27E-01	6.51E-02	2/16	N/A	N/A	0/16	2.55E+00	0/16	2.32E+00	1/16	1.16E-01	0.00493 - 0.265
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.04E-05	0/16	2.76E-05	0/16	1.38E-06	0.00493 - 0.265
VOA	2-Hexanone	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.93E-02	0/16	1.75E-02	0/16	8.75E-04	0.00493 - 0.265
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	7.08E-02	0/16	6.44E-02	0/16	3.22E-03	0.000986 - 0.053
VOA	4-Methyl-2-pentanone	mg/kg	2.60E-03	2.60E-03	2.60E-03	1/16	N/A	N/A	0/16	6.18E-01	0/16	5.62E-01	0/16	2.81E-02	0.00493 - 0.265
VOA	Acetone	mg/kg	4.37E-03	2.03E-02	1.13E-02	6/16	N/A	N/A	0/16	8.10E+00	0/16	7.36E+00	0/16	3.68E-01	0.00493 - 0.265
VOA	Acrolein	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.85E-05	0/16	1.68E-05	0/16	8.41E-07	0.00493 - 0.265
VOA	Acrylonitrile	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.51E-04	0/16	2.28E-04	0/16	1.14E-05	0.00493 - 0.265
VOA	Benzene	mg/kg	6.16E-04	7.59E-04	6.88E-04	2/16	N/A	N/A	0/16	5.13E-03	0/16	4.66E-03	2/16	2.33E-04	0.000986 - 0.053
VOA	Bromochloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.58E-02	0/16	4.16E-02	0/16	2.08E-03	0.000986 - 0.053
VOA	Bromodichloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	8.03E-04	0/16	7.30E-04	0/16	3.65E-05	0.000986 - 0.053
VOA	Bromoform	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.92E-02	0/16	1.75E-02	0/16	8.73E-04	0.000986 - 0.053
VOA	Bromomethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.20E-03	0/16	3.82E-03	0/16	1.91E-04	0.000986 - 0.053
VOA	Carbon disulfide	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.28E-01	0/16	4.80E-01	0/16	2.40E-02	0.00493 - 0.265
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.89E-03	0/16	3.54E-03	0/16	1.77E-04	0.000986 - 0.053
VOA	Chlorobenzene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.16E-01	0/16	1.06E-01	0/16	5.28E-03	0.000986 - 0.053
VOA	Chloroethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.21E+00	0/16	4.74E+00	0/16	2.37E-01	0.000986 - 0.053
VOA	Chloroform	mg/kg	5.24E-04	2.43E-03	1.22E-03	3/16	N/A	N/A	1/16	1.35E-03	1/16	1.22E-03	3/16	6.12E-05	0.000986 - 0.053
VOA	Chloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.16E-02	0/16	1.05E-02	0/16	5.26E-04	0.000986 - 0.053
VOA	*cis* -1,2-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.33E-02	0/16	2.12E-02	0/16	1.06E-03	0.000986 - 0.053
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.70E-03	0/16	3.36E-03	0/16	1.68E-04	0.000986 - 0.053
VOA	Cumene	mg/kg	4.34E-04	4.34E-04	4.34E-04	1/16	N/A	N/A	0/16	1.62E+00	0/16	1.48E+00	0/16	7.38E-02	0.000986 - 0.053
VOA	Cyclohexane	mg/kg	4.68E-04	3.58E-03	1.77E-03	3/16	N/A	N/A	0/16	2.86E+01	0/16	2.60E+01	0/16	1.30E+00	0.000986 - 0.053
VOA	Dibromochloromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.10E-03	0/16	4.64E-03	0/16	2.32E-04	0.000986 - 0.053
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.69E-01	0/16	6.08E-01	0/16	3.04E-02	0.000986 - 0.053
VOA	Ethylbenzene	mg/kg	3.76E-04	1.24E-02	4.62E-03	3/16	N/A	N/A	0/16	3.70E-02	0/16	3.36E-02	1/16	1.68E-03	0.000986 - 0.053
VOA	m,p-Xylene	mg/kg	7.91E-04	5.56E-02	1.47E-02	4/16	N/A	N/A	0/16	4.20E-01	0/16	3.82E-01	1/16	1.91E-02	0.00197 - 0.106
VOA	Methyl acetate	mg/kg	--	--	--	0/16	N/A	N/A	0/16	9.04E+00	0/16	8.22E+00	0/16	4.11E-01	0.00493 - 0.265
VOA	Methylcyclohexane	mg/kg	3.81E-04	2.45E+00	3.52E-01	7/16	N/A	N/A	0/16	3.08E+01	0/16	2.80E+01	1/16	1.40E+00	0.000989 - 0.108
VOA	Methylene chloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	5.98E-02	0/16	5.44E-02	0/16	2.72E-03	0.00493 - 0.265
VOA	Styrene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	2.93E+00	0/16	2.66E+00	0/16	1.33E-01	0.000986 - 0.053
VOA	Tetrachloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	4.05E-02	0/16	3.69E-02	0/16	1.84E-03	0.000986 - 0.053
VOA	Toluene	mg/kg	5.04E-04	3.92E+00	6.60E-01	6/16	N/A	N/A	1/16	1.68E+00	1/16	1.52E+00	1/16	7.62E-02	0.000989 - 0.108
VOA	Total Xylene	mg/kg	2.31E-03	7.64E-02	3.94E-02	2/16	N/A	N/A	0/16	4.20E-01	0/16	3.82E-01	1/16	1.91E-02	0.00296 - 0.159
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	6.40E-02	0/16	5.83E-02	0/16	2.91E-03	0.000986 - 0.053
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	N/A	N/A	0/16	3.70E-03	0/16	3.36E-03	0/16	1.68E-04	0.000986 - 0.053
VOA	Trichloroethene	mg/kg	2.57E-03	2.57E-03	2.57E-03	1/16	N/A	N/A	1/16	2.22E-03	1/16	2.02E-03	1/16	1.01E-04	0.000986 - 0.053
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.61E+00	0/16	1.46E+00	0/16	7.31E-02	0.000986 - 0.053
VOA	Vinyl chloride	mg/kg	--	--	--	0/16	N/A	N/A	0/16	1.42E-04	0/16	1.29E-04	0/16	6.47E-06	0.000986 - 0.053

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.22. Sector 2 Surface Soil Data Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.23. Sector 2 Subsurface Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	9.50E+03	1.91E+04	1.34E+04	14/14	9/14	1.20E+04	0/14	6.60E+04	0/14	5.99E+04	14/14	3.00E+03	10.8 - 120
METAL	Antimony	mg/kg	4.82E-01	6.67E-01	5.75E-01	2/14	2/14	2.10E-01	0/14	7.74E-01	0/14	7.04E-01	2/14	3.52E-02	1.98 - 2.48
METAL	Arsenic	mg/kg	3.08E+00	9.89E+00	5.93E+00	14/14	2/14	7.90E+00	14/14	3.32E-02	14/14	3.02E-02	14/14	1.51E-03	1.01 - 5.35
METAL	Barium	mg/kg	3.04E+01	2.25E+02	1.12E+02	14/14	3/14	1.70E+02	0/14	3.41E+02	0/14	3.11E+02	14/14	1.55E+01	0.805 - 0.975
METAL	Beryllium	mg/kg	3.38E-01	7.57E-01	5.32E-01	14/14	3/14	6.90E-01	0/14	4.29E+01	0/14	3.89E+01	0/14	1.95E+00	0.101 - 0.122
METAL	Boron	mg/kg	1.50E+00	5.57E+00	2.82E+00	13/14	N/A	N/A	0/14	2.82E+01	0/14	2.56E+01	13/14	1.28E+00	3.02 - 3.66
METAL	Cadmium	mg/kg	3.33E-02	2.76E-01	1.17E-01	10/14	2/14	2.10E-01	0/14	1.52E+00	0/14	1.39E+00	5/14	6.93E-02	0.201 - 0.244
METAL	Chromium	mg/kg	1.32E+01	5.69E+01	2.15E+01	14/14	1/14	4.30E+01	0/14	3.96E+06	0/14	3.60E+06	0/14	1.80E+05	0.604 - 0.731
METAL	Cobalt	mg/kg	2.48E+00	1.22E+01	6.33E+00	14/14	0/14	1.30E+01	14/14	5.96E-01	14/14	5.43E-01	14/14	2.71E-02	0.201 - 0.244
METAL	Copper	mg/kg	5.25E+00	5.94E+01	1.67E+01	14/14	3/14	2.50E+01	0/14	6.18E+01	1/14	5.62E+01	14/14	2.81E+00	0.402 - 4.23
METAL	Iron	mg/kg	1.28E+04	3.03E+04	1.90E+04	14/14	1/14	2.80E+04	14/14	7.74E+02	14/14	7.04E+02	14/14	3.52E+01	107 - 240
METAL	Lead	mg/kg	7.22E+00	6.27E+01	1.53E+01	14/14	1/14	2.30E+01	0/14	2.97E+02	0/14	2.70E+02	5/14	1.35E+01	0.402 - 0.487
METAL	Manganese	mg/kg	4.57E+01	1.05E+03	4.25E+02	14/14	3/14	8.20E+02	13/14	6.23E+01	13/14	5.65E+01	14/14	2.83E+00	1.07 - 12
METAL	Mercury	mg/kg	1.54E-02	9.50E-02	3.56E-02	11/14	0/14	1.30E-01	0/14	6.49E-01	0/14	5.91E-01	4/14	2.95E-02	0.0235 - 0.0279
METAL	Molybdenum	mg/kg	2.17E-01	1.03E+00	5.83E-01	14/14	N/A	N/A	0/14	4.44E+00	0/14	4.03E+00	14/14	2.02E-01	0.201 - 0.244
METAL	Nickel	mg/kg	5.69E+00	1.39E+02	2.54E+01	14/14	5/14	2.20E+01	1/14	5.63E+01	1/14	5.12E+01	14/14	2.56E+00	0.402 - 0.487
METAL	Selenium	mg/kg	4.60E-01	1.69E+00	1.07E+00	13/14	9/14	7.00E-01	6/14	1.14E+00	8/14	1.04E+00	13/14	5.19E-02	1.01 - 5.35
METAL	Silver	mg/kg	1.32E-01	6.53E-01	4.48E-01	3/14	0/14	2.70E+00	0/14	1.76E+00	0/14	1.60E+00	3/14	7.99E-02	0.505 - 4.95
METAL	Thallium	mg/kg	1.55E-01	2.29E-01	1.89E-01	6/14	0/14	3.40E-01	6/14	3.12E-02	6/14	2.84E-02	6/14	1.42E-03	0.402 - 0.487
METAL	Uranium	mg/kg	5.08E-01	2.81E+02	3.49E+01	14/14	6/14	4.60E+00	6/14	3.96E+00	6/14	3.60E+00	14/14	1.80E-01	0.0402 - 0.0487
METAL	Vanadium	mg/kg	2.53E+01	3.98E+01	3.07E+01	14/14	2/14	3.70E+01	0/14	1.90E+02	0/14	1.73E+02	14/14	8.64E+00	4.02 - 4.87
METAL	Zinc	mg/kg	1.15E+01	1.11E+02	4.42E+01	14/14	3/14	6.00E+01	0/14	8.21E+02	0/14	7.46E+02	6/14	3.73E+01	4.02 - 21.4
ANION	Fluoride	mg/kg	3.05E+00	4.04E+01	1.61E+01	14/14	N/A	N/A	0/14	2.64E+02	0/14	2.40E+02	7/14	1.20E+01	1.05 - 1.27
PPCB	Total PCB	mg/kg	7.77E-03	8.14E-02	3.42E-02	3/10	N/A	N/A	0/10	1.50E-01	0/10	1.36E-01	3/10	6.82E-03	0.00368 - 0.0198
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.92E-02	0/10	1.74E-02	0/10	8.72E-04	0.365 - 7.53
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.84E+00	0/10	8.04E+00	0/10	4.02E-01	0.365 - 7.53
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.55E-02	0/10	2.32E-02	0/10	1.16E-03	0.365 - 7.53
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.97E-02	0/10	4.52E-02	0/10	2.26E-03	0.365 - 7.53
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	9.26E-01	0/10	8.42E-01	0/10	4.21E-02	0.365 - 7.53
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	9.59E-02	0/10	8.72E-02	0/10	4.36E-03	0.731 - 15.1
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.06E-03	0/10	6.42E-03	0/10	3.21E-04	0.365 - 7.53
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.47E-03	0/10	1.33E-03	0/10	6.67E-05	0.365 - 7.53
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.47E+00	0/10	7.70E+00	0/10	3.85E-01	0.0365 - 0.753
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.96E-01	0/10	1.78E-01	0/10	8.91E-03	0.365 - 7.53
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.68E-03	0/10	5.16E-03	0/10	2.58E-04	0.365 - 7.53
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.07E-01	0/10	3.70E-01	0/10	1.85E-02	0.0365 - 0.753
SVOA	2-Methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.66E+00	0/10	1.51E+00	0/10	7.53E-02	0.365 - 7.53
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.76E-01	0/10	1.60E-01	0/10	8.01E-03	0.365 - 7.53
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	9.59E-02	0/10	8.72E-02	0/10	4.36E-03	0.365 - 7.53
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.81E-02	0/10	1.65E-02	0/10	8.24E-04	0.365 - 7.53
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.39E-03	0/10	4.90E-03	0/10	2.45E-04	0.365 - 7.53
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.52E-03	0/10	6.84E-03	0/10	3.42E-04	0.365 - 7.53
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.76E+00	0/10	3.42E+00	0/10	1.71E-01	0.365 - 7.53
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.41E-03	0/10	3.10E-03	0/10	1.55E-04	0.365 - 7.53
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.52E-03	0/10	6.84E-03	0/10	3.42E-04	0.365 - 7.53
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	9.59E-02	0/10	8.72E-02	0/10	4.36E-03	0.365 - 7.53
SVOA	Acenaphthene	mg/kg	1.13E-02	1.13E-02	1.13E-02	1/10	N/A	N/A	0/10	1.21E+01	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOA	Acenaphthylene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.21E+01	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOA	Acetophenone	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.28E+00	0/10	1.17E+00	0/10	5.84E-02	0.365 - 7.53
SVOA	Anthracene	mg/kg	1.46E-02	1.46E-02	1.46E-02	1/10	N/A	N/A	0/10	1.28E+02	0/10	1.16E+02	0/10	5.81E+00	0.0365 - 0.753
SVOA	Atrazine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.31E-03	0/10	3.92E-03	0/10	1.96E-04	0.365 - 7.53
SVOA	Benzaldehyde	mg/kg	--	--	--	0/10	N/A	N/A	0/10	9.13E-02	0/10	8.30E-02	0/10	4.15E-03	0.365 - 7.53

Table C1.23. Sector 2 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Benzo(ghi)perylene	mg/kg	1.14E-02	8.66E-02	4.90E-02	2/10	N/A	N/A	0/10	2.90E+01	0/10	2.63E+01	0/10	1.32E+00	0.0365 - 0.753
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.97E-02	0/10	2.70E-02	0/10	1.35E-03	0.365 - 7.53
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.94E-05	0/10	7.22E-05	0/10	3.61E-06	0.365 - 7.53
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.88E-03	0/10	2.62E-03	0/10	1.31E-04	0.365 - 7.53
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.93E+01	0/10	2.66E+01	0/10	1.33E+00	0.0365 - 0.753
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.19E+00	0/10	4.72E+00	0/10	2.36E-01	0.0365 - 0.753
SVOA	Caprolactam	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.43E+00	0/10	4.94E+00	0/10	2.47E-01	0.365 - 7.53
SVOA	Carbazole	mg/kg	1.97E-02	1.97E-02	1.97E-02	1/10	N/A	N/A	0/10	8.27E-01	0/10	7.51E-01	0/10	3.76E-02	0.0365 - 0.753
SVOA	Dibenzofuran	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.21E-01	0/10	2.92E-01	0/10	1.46E-02	0.365 - 7.53
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.34E+01	0/10	1.22E+01	0/10	6.08E-01	0.0365 - 0.753
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.34E+01	0/10	1.22E+01	0/10	6.08E-01	0.0365 - 0.753
SVOA	Di-n-butyl phthalate	mg/kg	1.30E-02	2.41E-02	1.72E-02	4/10	N/A	N/A	0/10	4.99E+00	0/10	4.54E+00	0/10	2.27E-01	0.0365 - 0.753
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.24E+02	0/10	1.13E+02	0/10	5.65E+00	0.0365 - 0.753
SVOA	Diphenylamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.13E+00	0/10	4.66E+00	0/10	2.33E-01	0.365 - 7.53
SVOA	Fluoranthene	mg/kg	2.06E-02	3.00E-01	1.16E-01	3/10	N/A	N/A	0/10	1.96E+02	0/10	1.78E+02	0/10	8.91E+00	0.0365 - 0.753
SVOA	Fluorene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.20E+01	0/10	1.09E+01	0/10	5.45E-01	0.0365 - 0.753
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.71E-03	0/10	2.46E-03	0/10	1.23E-04	0.365 - 7.53
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.87E-03	0/10	5.34E-03	0/10	2.67E-04	0.365 - 7.53
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.82E-03	0/10	2.56E-03	0/10	1.28E-04	0.365 - 7.53
SVOA	Hexachloroethane	mg/kg	--	--	--	0/10	N/A	N/A	0/10	4.40E-03	0/10	4.00E-03	0/10	2.00E-04	0.365 - 7.53
SVOA	Isophorone	mg/kg	--	--	--	0/10	N/A	N/A	0/10	5.68E-01	0/10	5.16E-01	0/10	2.58E-02	0.365 - 7.53
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	6.53E-01	0/10	5.94E-01	0/10	2.97E-02	0.365 - 7.53
SVOA	Naphthalene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	8.47E-03	0/10	7.70E-03	0/10	3.85E-04	0.0365 - 0.753
SVOA	Nitrobenzene	mg/kg	--	--	--	0/10	N/A	N/A	0/10	2.02E-03	0/10	1.83E-03	0/10	9.17E-05	0.365 - 7.53
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.78E-04	0/10	1.62E-04	0/10	8.10E-06	0.365 - 7.53
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	1.26E-03	0/10	1.14E-03	0/10	5.71E-05	0.365 - 7.53
SVOA	Phenanthrene	mg/kg	1.94E-02	1.38E-01	7.87E-02	2/10	N/A	N/A	0/10	1.21E+01	0/10	1.10E+01	0/10	5.49E-01	0.0365 - 0.753
SVOA	Phenol	mg/kg	--	--	--	0/10	N/A	N/A	0/10	7.28E+00	0/10	6.62E+00	0/10	3.31E-01	0.365 - 7.53
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/10	N/A	N/A	0/10	3.48E-02	0/10	3.16E-02	0/10	1.58E-03	0.365 - 7.53
SVOA	Pyrene	mg/kg	2.02E-02	1.88E-01	7.69E-02	3/10	N/A	N/A	0/10	2.90E+01	0/10	2.63E+01	0/10	1.32E+00	0.0365 - 0.753
SVOA	Total PAH	mg/kg	3.52E-03	1.79E-01	6.72E-02	3/10	N/A	N/A	0/10	6.47E-01	0/10	5.89E-01	1/10	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/14	N/A	N/A	0/14	2.11E+01	0/14	1.92E+01	0/14	9.58E-01	0.383 - 0.834
RADS	Cesium-137	pCi/g	1.03E-01	1.03E-01	1.03E-01	1/14	0/14	2.80E-01	0/14	1.05E+01	0/14	9.58E+00	0/14	4.79E-01	0.0369 - 0.0758
RADS	Neptunium-237	pCi/g	--	--	--	0/14	N/A	N/A	0/14	1.18E+00	0/14	1.07E+00	0/14	5.36E-02	0.45 - 0.86
RADS	Plutonium-238	pCi/g	--	--	--	0/14	N/A	N/A	0/14	4.82E+00	0/14	4.38E+00	0/14	2.19E-01	0.285 - 0.761
RADS	Plutonium-239/240	pCi/g	2.06E+00	2.06E+00	2.06E+00	1/14	N/A	N/A	0/14	4.69E+00	0/14	4.26E+00	1/14	2.13E-01	0.329 - 0.791
RADS	Technetium-99	pCi/g	9.17E+00	3.05E+01	2.20E+01	4/16	4/16	2.80E+00	4/16	1.67E-01	4/16	1.52E-01	4/16	7.60E-03	2.47 - 4
RADS	Thorium-230	pCi/g	6.34E-01	6.39E+00	1.70E+00	13/14	4/14	1.40E+00	0/14	4.03E+01	0/14	3.66E+01	3/14	1.83E+00	0.289 - 1.02
RADS	Uranium-233/234	pCi/g	6.53E-01	3.82E+01	1.06E+01	12/14	7/14	1.20E+00	7/14	1.09E+00	8/14	9.90E-01	12/14	4.95E-02	0.334 - 1
RADS	Uranium-235/236	pCi/g	6.75E-01	2.45E+00	1.41E+00	5/14	5/14	6.00E-02	3/14	1.07E+00	3/14	9.76E-01	5/14	4.88E-02	0.129 - 0.544
RADS	Uranium-238	pCi/g	7.82E-01	5.06E+01	1.33E+01	12/14	7/14	1.20E+00	9/14	8.87E-01	11/14	8.05E-01	12/14	4.03E-02	0.245 - 0.711
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.18E+00	0/11	5.62E+00	0/11	2.81E-01	0.000882 - 0.00121
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.51E-04	0/11	5.92E-04	0/11	2.96E-05	0.000882 - 0.00121
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.63E+01	0/11	5.13E+01	0/11	2.56E+00	0.00441 - 0.00607
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.97E-04	0/11	2.69E-04	0/11	1.35E-05	0.000882 - 0.00121
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.72E-02	0/11	1.56E-02	0/11	7.82E-04	0.000882 - 0.00121
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.24E-01	0/11	2.04E-01	0/11	1.02E-02	0.000882 - 0.00121
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.60E-02	0/11	4.18E-02	0/11	2.09E-03	0.000882 - 0.00121
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.55E-02	0/11	2.32E-02	0/11	1.16E-03	0.000882 - 0.00121
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.17E-06	0/11	2.88E-06	0/11	1.44E-07	0.000882 - 0.00121
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.62E-05	0/11	4.20E-05	0/11	2.10E-06	0.000882 - 0.00121
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.49E-01	0/11	5.90E-01	0/11	2.95E-02	0.000882 - 0.00121

Table C1.23. Sector 2 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.06E-03	0/11	9.69E-04	0/11	4.84E-05	0.000882 - 0.00121
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.03E-03	0/11	5.48E-03	0/11	2.74E-04	0.000882 - 0.00121
VOA	1,2-Dimethylbenzene	mg/kg	4.90E-04	4.90E-04	4.90E-04	1/11	N/A	N/A	0/11	4.18E-01	0/11	3.81E-01	0/11	1.90E-02	0.000882 - 0.00121
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.49E-01	0/11	5.90E-01	0/11	2.95E-02	0.000882 - 0.00121
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.02E-02	0/11	9.24E-03	0/11	4.62E-04	0.000882 - 0.00121
VOA	1,4-Dioxane	mg/kg	4.63E-02	4.63E-02	4.63E-02	1/11	N/A	N/A	1/11	2.07E-03	1/11	1.88E-03	1/11	9.42E-05	0.0441 - 0.0607
VOA	2-Butanone	mg/kg	1.83E-03	3.84E-03	2.84E-03	2/11	N/A	N/A	0/11	2.55E+00	0/11	2.32E+00	0/11	1.16E-01	0.00441 - 0.00607
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.04E-05	0/11	2.76E-05	0/11	1.38E-06	0.00441 - 0.00607
VOA	2-Hexanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.93E-02	0/11	1.75E-02	0/11	8.75E-04	0.00441 - 0.00607
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.08E-02	0/11	6.44E-02	0/11	3.22E-03	0.000882 - 0.00121
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.18E-01	0/11	5.62E-01	0/11	2.81E-02	0.00441 - 0.00607
VOA	Acetone	mg/kg	3.31E-03	2.01E-02	1.15E-02	5/11	N/A	N/A	0/11	8.10E+00	0/11	7.36E+00	0/11	3.68E-01	0.00441 - 0.00607
VOA	Acrolein	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.85E-05	0/11	1.68E-05	0/11	8.41E-07	0.00441 - 0.00607
VOA	Acrylonitrile	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.51E-04	0/11	2.28E-04	0/11	1.14E-05	0.00441 - 0.00607
VOA	Benzene	mg/kg	8.10E-04	8.10E-04	8.10E-04	1/11	N/A	N/A	0/11	5.13E-03	0/11	4.66E-03	1/11	2.33E-04	0.000882 - 0.00121
VOA	Bromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.58E-02	0/11	4.16E-02	0/11	2.08E-03	0.000882 - 0.00121
VOA	Bromodichloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.03E-04	0/11	7.30E-04	0/11	3.65E-05	0.000882 - 0.00121
VOA	Bromoform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.92E-02	0/11	1.75E-02	0/11	8.73E-04	0.000882 - 0.00121
VOA	Bromomethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.20E-03	0/11	3.82E-03	0/11	1.91E-04	0.000882 - 0.00121
VOA	Carbon disulfide	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.28E-01	0/11	4.80E-01	0/11	2.40E-02	0.00441 - 0.00607
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.89E-03	0/11	3.54E-03	0/11	1.77E-04	0.000882 - 0.00121
VOA	Chlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.16E-01	0/11	1.06E-01	0/11	5.28E-03	0.000882 - 0.00121
VOA	Chloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.21E+00	0/11	4.74E+00	0/11	2.37E-01	0.000882 - 0.00121
VOA	Chloroform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.35E-03	0/11	1.22E-03	0/11	6.12E-05	0.000882 - 0.00121
VOA	Chloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.16E-02	0/11	1.05E-02	0/11	5.26E-04	0.000882 - 0.00121
VOA	*cis* -1,2-Dichloroethene	mg/kg	8.59E-04	8.59E-04	8.59E-04	1/11	N/A	N/A	0/11	2.33E-02	0/11	2.12E-02	0/11	1.06E-03	0.000882 - 0.00121
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-03	0/11	3.36E-03	0/11	1.68E-04	0.000882 - 0.00121
VOA	Cumene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.62E+00	0/11	1.48E+00	0/11	7.38E-02	0.000882 - 0.00121
VOA	Cyclohexane	mg/kg	6.10E-04	4.31E-03	2.46E-03	2/11	N/A	N/A	0/11	2.86E+01	0/11	2.60E+01	0/11	1.30E+00	0.000882 - 0.00121
VOA	Dibromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.10E-03	0/11	4.64E-03	0/11	2.32E-04	0.000882 - 0.00121
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.69E-01	0/11	6.08E-01	0/11	3.04E-02	0.000882 - 0.00121
VOA	Ethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-02	0/11	3.36E-02	0/11	1.68E-03	0.000882 - 0.00121
VOA	m,p-Xylene	mg/kg	1.72E-03	1.72E-03	1.72E-03	1/11	N/A	N/A	0/11	4.20E-01	0/11	3.82E-01	0/11	1.91E-02	0.00176 - 0.00243
VOA	Methyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.04E+00	0/11	8.22E+00	0/11	4.11E-01	0.00441 - 0.00607
VOA	Methylcyclohexane	mg/kg	5.08E-04	5.20E-03	2.37E-03	3/11	N/A	N/A	0/11	3.08E+01	0/11	2.80E+01	0/11	1.40E+00	0.000882 - 0.00121
VOA	Methylene chloride	mg/kg	1.80E-03	1.80E-03	1.80E-03	1/11	N/A	N/A	0/11	5.98E-02	0/11	5.44E-02	0/11	2.72E-03	0.00441 - 0.00607
VOA	Styrene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.93E+00	0/11	2.66E+00	0/11	1.33E-01	0.000882 - 0.00121
VOA	Tetrachloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.05E-02	0/11	3.69E-02	0/11	1.84E-03	0.000882 - 0.00121
VOA	Toluene	mg/kg	5.10E-04	1.55E-03	9.37E-04	3/11	N/A	N/A	0/11	1.68E+00	0/11	1.52E+00	0/11	7.62E-02	0.000882 - 0.00121
VOA	Total Xylene	mg/kg	2.21E-03	2.21E-03	2.21E-03	1/11	N/A	N/A	0/11	4.20E-01	0/11	3.82E-01	0/11	1.91E-02	0.00265 - 0.00364
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.40E-02	0/11	5.83E-02	0/11	2.91E-03	0.000882 - 0.00121
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-03	0/11	3.36E-03	0/11	1.68E-04	0.000882 - 0.00121
VOA	Trichloroethene	mg/kg	5.13E-03	5.13E-03	5.13E-03	1/11	N/A	N/A	1/11	2.22E-03	1/11	2.02E-03	1/11	1.01E-04	0.000882 - 0.00121
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.61E+00	0/11	1.46E+00	0/11	7.31E-02	0.000882 - 0.00121
VOA	Vinyl chloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.42E-04	0/11	1.29E-04	0/11	6.47E-06	0.000882 - 0.00121

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.23. Sector 2 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.24. Sector 2 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.56E+03	1.95E+04	9.96E+03	54/54	20/54	1.20E+04	0/54	6.60E+04	0/54	5.99E+04	53/54	3.00E+03	9.74 - 121
METAL	Antimony	mg/kg	5.40E-01	1.00E+00	7.72E-01	3/54	3/54	2.10E-01	2/54	7.74E-01	2/54	7.04E-01	3/54	3.52E-02	2 - 22.4
METAL	Arsenic	mg/kg	4.95E-01	1.58E+01	2.43E+00	54/54	2/54	7.90E+00	54/54	3.32E-02	54/54	3.02E-02	54/54	1.51E-03	0.974 - 1.24
METAL	Barium	mg/kg	8.15E+00	2.30E+03	1.29E+02	54/54	4/54	1.70E+02	4/54	3.41E+02	4/54	3.11E+02	42/54	1.55E+01	0.779 - 19
METAL	Beryllium	mg/kg	2.44E-01	2.92E+00	7.38E-01	54/54	26/54	6.90E-01	0/54	4.29E+01	0/54	3.89E+01	1/54	1.95E+00	0.0974 - 0.124
METAL	Boron	mg/kg	9.30E-01	2.79E+00	1.45E+00	26/54	N/A	N/A	0/54	2.82E+01	0/54	2.56E+01	15/54	1.28E+00	2.92 - 3.71
METAL	Cadmium	mg/kg	2.32E-02	4.84E-01	1.00E-01	17/54	2/54	2.10E-01	0/54	1.52E+00	0/54	1.39E+00	5/54	6.93E-02	0.195 - 0.247
METAL	Chromium	mg/kg	4.67E+00	5.28E+01	1.41E+01	54/54	2/54	4.30E+01	0/54	3.96E+06	0/54	3.60E+06	0/54	1.80E+05	0.584 - 0.741
METAL	Cobalt	mg/kg	7.98E-01	1.32E+02	9.56E+00	54/54	5/54	1.30E+01	54/54	5.96E-01	54/54	5.43E-01	54/54	2.71E-02	0.195 - 0.247
METAL	Copper	mg/kg	1.20E+00	1.38E+01	4.91E+00	54/54	0/54	2.50E+01	0/54	6.18E+01	0/54	5.62E+01	42/54	2.81E+00	0.39 - 0.494
METAL	Iron	mg/kg	4.14E+03	1.43E+05	1.69E+04	54/54	2/54	2.80E+04	54/54	7.74E+02	54/54	7.04E+02	54/54	3.52E+01	19.8 - 476
METAL	Lead	mg/kg	1.13E+00	2.43E+01	5.61E+00	54/54	1/54	2.30E+01	0/54	2.97E+02	0/54	2.70E+02	3/54	1.35E+01	0.39 - 0.494
METAL	Manganese	mg/kg	9.41E+00	1.28E+04	6.78E+02	54/54	7/54	8.20E+02	30/54	6.23E+01	30/54	5.65E+01	54/54	2.83E+00	0.974 - 119
METAL	Mercury	mg/kg	9.36E-03	5.88E-02	2.63E-02	16/54	0/54	1.30E-01	0/54	6.49E-01	0/54	5.91E-01	5/54	2.95E-02	0.0224 - 0.0289
METAL	Molybdenum	mg/kg	9.86E-02	2.36E+00	3.18E-01	48/54	N/A	N/A	0/54	4.44E+00	0/54	4.03E+00	27/54	2.02E-01	0.195 - 0.247
METAL	Nickel	mg/kg	1.93E+00	2.32E+01	7.26E+00	54/54	1/54	2.20E+01	0/54	5.63E+01	0/54	5.12E+01	49/54	2.56E+00	0.39 - 0.494
METAL	Selenium	mg/kg	4.02E-01	2.48E+00	8.82E-01	40/54	25/54	7.00E-01	8/54	1.14E+00	9/54	1.04E+00	40/54	5.19E-02	0.974 - 1.24
METAL	Silver	mg/kg	1.04E-01	4.17E+00	5.50E-01	21/54	1/54	2.70E+00	2/54	1.76E+00	2/54	1.60E+00	21/54	7.99E-02	0.499 - 5.99
METAL	Thallium	mg/kg	1.56E-01	1.77E+00	3.67E-01	12/54	2/54	3.40E-01	12/54	3.12E-02	12/54	2.84E-02	12/54	1.42E-03	0.39 - 0.494
METAL	Uranium	mg/kg	1.76E-01	3.71E+00	9.06E-01	54/54	0/54	4.60E+00	0/54	3.96E+00	1/54	3.60E+00	53/54	1.80E-01	0.039 - 0.0494
METAL	Vanadium	mg/kg	4.18E+00	3.80E+01	2.00E+01	54/54	1/54	3.70E+01	0/54	1.90E+02	0/54	1.73E+02	51/54	8.64E+00	3.9 - 4.94
METAL	Zinc	mg/kg	3.84E+00	9.37E+01	2.30E+01	54/54	1/54	6.00E+01	0/54	8.21E+02	0/54	7.46E+02	8/54	3.73E+01	3.9 - 4.94
ANION	Fluoride	mg/kg	7.42E-01	8.19E+01	7.08E+00	54/54	N/A	N/A	0/54	2.64E+02	0/54	2.40E+02	6/54	1.20E+01	1.02 - 2.36
PPCB	Total PCB	mg/kg	8.97E-03	8.97E-03	8.97E-03	1/58	N/A	N/A	0/58	1.50E-01	0/58	1.36E-01	1/58	6.82E-03	0.00363 - 0.00437
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.92E-02	0/58	1.74E-02	0/58	8.72E-04	0.365 - 0.435
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.84E+00	0/58	8.04E+00	0/58	4.02E-01	0.365 - 0.435
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.55E-02	0/58	2.32E-02	0/58	1.16E-03	0.365 - 0.435
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.97E-02	0/58	4.52E-02	0/58	2.26E-03	0.365 - 0.435
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	9.26E-01	0/58	8.42E-01	0/58	4.21E-02	0.365 - 0.435
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	9.59E-02	0/58	8.72E-02	0/58	4.36E-03	0.731 - 0.87
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.06E-03	0/58	6.42E-03	0/58	3.21E-04	0.365 - 0.435
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.47E-03	0/58	1.33E-03	0/58	6.67E-05	0.365 - 0.435
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.47E+00	0/58	7.70E+00	0/58	3.85E-01	0.0365 - 0.0435
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.96E-01	0/58	1.78E-01	0/58	8.91E-03	0.365 - 0.435
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.68E-03	0/58	5.16E-03	0/58	2.58E-04	0.365 - 0.435
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.07E-01	0/58	3.70E-01	0/58	1.85E-02	0.0365 - 0.0435
SVOA	2-Methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.66E+00	0/58	1.51E+00	0/58	7.53E-02	0.365 - 0.435
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.76E-01	0/58	1.60E-01	0/58	8.01E-03	0.365 - 0.435
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	9.59E-02	0/58	8.72E-02	0/58	4.36E-03	0.365 - 0.435
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.81E-02	0/58	1.65E-02	0/58	8.24E-04	0.365 - 0.435
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.39E-03	0/58	4.90E-03	0/58	2.45E-04	0.365 - 0.435
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.52E-03	0/58	6.84E-03	0/58	3.42E-04	0.365 - 0.435
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.76E+00	0/58	3.42E+00	0/58	1.71E-01	0.365 - 0.435
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.41E-03	0/58	3.10E-03	0/58	1.55E-04	0.365 - 0.435
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.52E-03	0/58	6.84E-03	0/58	3.42E-04	0.365 - 0.435
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	9.59E-02	0/58	8.72E-02	0/58	4.36E-03	0.365 - 0.435
SVOA	Acenaphthene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.21E+01	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOA	Acenaphthylene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.21E+01	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOA	Acetophenone	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.28E+00	0/58	1.17E+00	0/58	5.84E-02	0.365 - 0.435
SVOA	Anthracene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.28E+02	0/58	1.16E+02	0/58	5.81E+00	0.0365 - 0.0435
SVOA	Atrazine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.31E-03	0/58	3.92E-03	0/58	1.96E-04	0.365 - 0.435
SVOA	Benzaldehyde	mg/kg	--	--	--	0/58	N/A	N/A	0/58	9.13E-02	0/58	8.30E-02	0/58	4.15E-03	0.365 - 0.435

Table C1.24. Sector 2 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Benzo(ghi)perylene	mg/kg	1.52E-02	1.52E-02	1.52E-02	1/58	N/A	N/A	0/58	2.90E+01	0/58	2.63E+01	0/58	1.32E+00	0.0365 - 0.0435
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.97E-02	0/58	2.70E-02	0/58	1.35E-03	0.365 - 0.435
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.94E-05	0/58	7.22E-05	0/58	3.61E-06	0.365 - 0.435
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.88E-03	0/58	2.62E-03	0/58	1.31E-04	0.365 - 0.435
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.69E-02	1.69E-02	1.69E-02	1/58	N/A	N/A	0/58	2.93E+01	0/58	2.66E+01	0/58	1.33E+00	0.0365 - 0.0435
SVOA	Butyl benzyl phthalate	mg/kg	1.55E-02	1.55E-02	1.55E-02	1/58	N/A	N/A	0/58	5.19E+00	0/58	4.72E+00	0/58	2.36E-01	0.0365 - 0.0435
SVOA	Caprolactam	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.43E+00	0/58	4.94E+00	0/58	2.47E-01	0.365 - 0.435
SVOA	Carbazole	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.27E-01	0/58	7.51E-01	0/58	3.76E-02	0.0365 - 0.0435
SVOA	Dibenzofuran	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.21E-01	0/58	2.92E-01	0/58	1.46E-02	0.365 - 0.435
SVOA	Diethyl phthalate	mg/kg	3.64E-02	2.79E-01	1.58E-01	2/58	N/A	N/A	0/58	1.34E+01	0/58	1.22E+01	0/58	6.08E-01	0.0365 - 0.0435
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.34E+01	0/58	1.22E+01	0/58	6.08E-01	0.0365 - 0.0435
SVOA	Di-n-butyl phthalate	mg/kg	1.16E-02	3.55E-02	1.84E-02	22/58	N/A	N/A	0/58	4.99E+00	0/58	4.54E+00	0/58	2.27E-01	0.0365 - 0.0435
SVOA	Di-n-octylphthalate	mg/kg	2.55E-02	2.72E-02	2.64E-02	2/58	N/A	N/A	0/58	1.24E+02	0/58	1.13E+02	0/58	5.65E+00	0.0365 - 0.0435
SVOA	Diphenylamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.13E+00	0/58	4.66E+00	0/58	2.33E-01	0.365 - 0.435
SVOA	Fluoranthene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.96E+02	0/58	1.78E+02	0/58	8.91E+00	0.0365 - 0.0435
SVOA	Fluorene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.20E+01	0/58	1.09E+01	0/58	5.45E-01	0.0365 - 0.0435
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.71E-03	0/58	2.46E-03	0/58	1.23E-04	0.365 - 0.435
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.87E-03	0/58	5.34E-03	0/58	2.67E-04	0.365 - 0.435
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.82E-03	0/58	2.56E-03	0/58	1.28E-04	0.365 - 0.435
SVOA	Hexachloroethane	mg/kg	--	--	--	0/58	N/A	N/A	0/58	4.40E-03	0/58	4.00E-03	0/58	2.00E-04	0.365 - 0.435
SVOA	Isophorone	mg/kg	--	--	--	0/58	N/A	N/A	0/58	5.68E-01	0/58	5.16E-01	0/58	2.58E-02	0.365 - 0.435
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.53E-01	0/58	5.94E-01	0/58	2.97E-02	0.365 - 0.435
SVOA	Naphthalene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	8.47E-03	0/58	7.70E-03	0/58	3.85E-04	0.0365 - 0.0435
SVOA	Nitrobenzene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.02E-03	0/58	1.83E-03	0/58	9.17E-05	0.365 - 0.435
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.78E-04	0/58	1.62E-04	0/58	8.10E-06	0.365 - 0.435
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.26E-03	0/58	1.14E-03	0/58	5.71E-05	0.365 - 0.435
SVOA	Phenanthrene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	1.21E+01	0/58	1.10E+01	0/58	5.49E-01	0.0365 - 0.0435
SVOA	Phenol	mg/kg	--	--	--	0/58	N/A	N/A	0/58	7.28E+00	0/58	6.62E+00	0/58	3.31E-01	0.365 - 0.435
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/58	N/A	N/A	0/58	3.48E-02	0/58	3.16E-02	0/58	1.58E-03	0.365 - 0.435
SVOA	Pyrene	mg/kg	--	--	--	0/58	N/A	N/A	0/58	2.90E+01	0/58	2.63E+01	0/58	1.32E+00	0.0365 - 0.0435
SVOA	Total PAH	mg/kg	--	--	--	0/58	N/A	N/A	0/58	6.47E-01	0/58	5.89E-01	0/58	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/54	N/A	N/A	0/54	2.11E+01	0/54	1.92E+01	0/54	9.58E-01	0.183 - 1.27
RADS	Cesium-137	pCi/g	--	--	--	0/54	0/54	2.80E-01	0/54	1.05E+01	0/54	9.58E+00	0/54	4.79E-01	0.0205 - 0.1
RADS	Neptunium-237	pCi/g	--	--	--	0/54	N/A	N/A	0/54	1.18E+00	0/54	1.07E+00	0/54	5.36E-02	0.356 - 0.872
RADS	Plutonium-238	pCi/g	--	--	--	0/54	N/A	N/A	0/54	4.82E+00	0/54	4.38E+00	0/54	2.19E-01	0.213 - 0.702
RADS	Plutonium-239/240	pCi/g	--	--	--	0/54	N/A	N/A	0/54	4.69E+00	0/54	4.26E+00	0/54	2.13E-01	0.315 - 0.844
RADS	Technetium-99	pCi/g	--	--	--	0/58	0/58	2.80E+00	0/58	1.67E-01	0/58	1.52E-01	0/58	7.60E-03	2.28 - 4.13
RADS	Thorium-230	pCi/g	5.86E-01	1.51E+00	9.04E-01	27/54	1/54	1.40E+00	0/54	4.03E+01	0/54	3.66E+01	0/54	1.83E+00	0.308 - 0.849
RADS	Uranium-233/234	pCi/g	4.73E-01	1.90E+00	9.16E-01	28/54	5/54	1.20E+00	7/54	1.09E+00	8/54	9.90E-01	28/54	4.95E-02	0.337 - 0.968
RADS	Uranium-235/236	pCi/g	5.85E-01	5.85E-01	5.85E-01	1/54	1/54	6.00E-02	0/54	1.07E+00	0/54	9.76E-01	1/54	4.88E-02	0.201 - 0.725
RADS	Uranium-238	pCi/g	4.30E-01	1.72E+00	9.08E-01	38/54	7/54	1.20E+00	19/54	8.87E-01	21/54	8.05E-01	38/54	4.03E-02	0.161 - 0.962
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.18E+00	0/63	5.62E+00	0/63	2.81E-01	0.000902 - 0.0574
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.51E-04	0/63	5.92E-04	0/63	2.96E-05	0.000902 - 0.0574
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.63E+01	0/63	5.13E+01	0/63	2.56E+00	0.00451 - 0.287
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.97E-04	0/63	2.69E-04	0/63	1.35E-05	0.000902 - 0.0574
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.72E-02	0/63	1.56E-02	0/63	7.82E-04	0.000902 - 0.0574
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.24E-01	0/63	2.04E-01	0/63	1.02E-02	0.000902 - 0.0574
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.60E-02	0/63	4.18E-02	0/63	2.09E-03	0.000902 - 0.0574
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.55E-02	0/63	2.32E-02	0/63	1.16E-03	0.000902 - 0.0574
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.17E-06	0/63	2.88E-06	0/63	1.44E-07	0.000902 - 0.0574
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.62E-05	0/63	4.20E-05	0/63	2.10E-06	0.000902 - 0.0574
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.49E-01	0/63	5.90E-01	0/63	2.95E-02	0.000902 - 0.0574

Table C1.24. Sector 2 Deep Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.06E-03	0/63	9.69E-04	0/63	4.84E-05	0.000902 - 0.0574
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.03E-03	0/63	5.48E-03	0/63	2.74E-04	0.000902 - 0.0574
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.18E-01	0/63	3.81E-01	0/63	1.90E-02	0.000902 - 0.0574
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.49E-01	0/63	5.90E-01	0/63	2.95E-02	0.000902 - 0.0574
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.02E-02	0/63	9.24E-03	0/63	4.62E-04	0.000902 - 0.0574
VOA	1,4-Dioxane	mg/kg	3.28E-02	4.73E-02	4.03E-02	4/63	N/A	N/A	4/63	2.07E-03	4/63	1.88E-03	4/63	9.42E-05	0.0451 - 2.87
VOA	2-Butanone	mg/kg	2.12E-03	1.71E-01	1.05E-01	5/63	N/A	N/A	0/63	2.55E+00	0/63	2.32E+00	3/63	1.16E-01	0.00451 - 0.287
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.04E-05	0/63	2.76E-05	0/63	1.38E-06	0.00451 - 0.287
VOA	2-Hexanone	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.93E-02	0/63	1.75E-02	0/63	8.75E-04	0.00451 - 0.287
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	7.08E-02	0/63	6.44E-02	0/63	3.22E-03	0.000902 - 0.0574
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.18E-01	0/63	5.62E-01	0/63	2.81E-02	0.00451 - 0.287
VOA	Acetone	mg/kg	2.39E-03	1.72E-02	5.38E-03	31/63	N/A	N/A	0/63	8.10E+00	0/63	7.36E+00	0/63	3.68E-01	0.00451 - 0.287
VOA	Acrolein	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.85E-05	0/63	1.68E-05	0/63	8.41E-07	0.00451 - 0.287
VOA	Acrylonitrile	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.51E-04	0/63	2.28E-04	0/63	1.14E-05	0.00451 - 0.287
VOA	Benzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.13E-03	0/63	4.66E-03	0/63	2.33E-04	0.000902 - 0.0574
VOA	Bromochloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.58E-02	0/63	4.16E-02	0/63	2.08E-03	0.000902 - 0.0574
VOA	Bromodichloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	8.03E-04	0/63	7.30E-04	0/63	3.65E-05	0.000902 - 0.0574
VOA	Bromoform	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.92E-02	0/63	1.75E-02	0/63	8.73E-04	0.000902 - 0.0574
VOA	Bromomethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.20E-03	0/63	3.82E-03	0/63	1.91E-04	0.000902 - 0.0574
VOA	Carbon disulfide	mg/kg	2.85E-03	2.85E-03	2.85E-03	1/63	N/A	N/A	0/63	5.28E-01	0/63	4.80E-01	0/63	2.40E-02	0.00451 - 0.287
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.89E-03	0/63	3.54E-03	0/63	1.77E-04	0.000902 - 0.0574
VOA	Chlorobenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.16E-01	0/63	1.06E-01	0/63	5.28E-03	0.000902 - 0.0574
VOA	Chloroethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.21E+00	0/63	4.74E+00	0/63	2.37E-01	0.000902 - 0.0574
VOA	Chloroform	mg/kg	3.68E-04	1.24E-03	6.79E-04	4/63	N/A	N/A	0/63	1.35E-03	1/63	1.22E-03	4/63	6.12E-05	0.000902 - 0.0574
VOA	Chloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.16E-02	0/63	1.05E-02	0/63	5.26E-04	0.000902 - 0.0574
VOA	*cis* -1,2-Dichloroethene	mg/kg	5.16E-04	5.16E-04	5.16E-04	1/63	N/A	N/A	0/63	2.33E-02	0/63	2.12E-02	0/63	1.06E-03	0.000902 - 0.0574
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.70E-03	0/63	3.36E-03	0/63	1.68E-04	0.000902 - 0.0574
VOA	Cumene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.62E+00	0/63	1.48E+00	0/63	7.38E-02	0.000902 - 0.0574
VOA	Cyclohexane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.86E+01	0/63	2.60E+01	0/63	1.30E+00	0.000902 - 0.0574
VOA	Dibromochloromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	5.10E-03	0/63	4.64E-03	0/63	2.32E-04	0.000902 - 0.0574
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.69E-01	0/63	6.08E-01	0/63	3.04E-02	0.000902 - 0.0574
VOA	Ethylbenzene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.70E-02	0/63	3.36E-02	0/63	1.68E-03	0.000902 - 0.0574
VOA	m,p-Xylene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.20E-01	0/63	3.82E-01	0/63	1.91E-02	0.0018 - 0.115
VOA	Methyl acetate	mg/kg	--	--	--	0/63	N/A	N/A	0/63	9.04E+00	0/63	8.22E+00	0/63	4.11E-01	0.00451 - 0.287
VOA	Methylcyclohexane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.08E+01	0/63	2.80E+01	0/63	1.40E+00	0.000902 - 0.0574
VOA	Methylene chloride	mg/kg	1.77E-03	2.98E-03	2.34E-03	12/63	N/A	N/A	0/63	5.98E-02	0/63	5.44E-02	1/63	2.72E-03	0.00451 - 0.287
VOA	Styrene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	2.93E+00	0/63	2.66E+00	0/63	1.33E-01	0.000902 - 0.0574
VOA	Tetrachloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.05E-02	0/63	3.69E-02	0/63	1.84E-03	0.000902 - 0.0574
VOA	Toluene	mg/kg	3.90E-04	1.56E-03	7.49E-04	5/63	N/A	N/A	0/63	1.68E+00	0/63	1.52E+00	0/63	7.62E-02	0.000902 - 0.0574
VOA	Total Xylene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	4.20E-01	0/63	3.82E-01	0/63	1.91E-02	0.00271 - 0.172
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	6.40E-02	0/63	5.83E-02	0/63	2.91E-03	0.000902 - 0.0574
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/63	N/A	N/A	0/63	3.70E-03	0/63	3.36E-03	0/63	1.68E-04	0.000902 - 0.0574
VOA	Trichloroethene	mg/kg	4.43E-04	1.50E-02	3.70E-03	23/63	N/A	N/A	14/63	2.22E-03	14/63	2.02E-03	23/63	1.01E-04	0.000902 - 0.119
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.61E+00	0/63	1.46E+00	0/63	7.31E-02	0.000902 - 0.0574
VOA	Vinyl chloride	mg/kg	--	--	--	0/63	N/A	N/A	0/63	1.42E-04	0/63	1.29E-04	0/63	6.47E-06	0.000902 - 0.0574

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.24. Sector 2 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.25. Sector 2 McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	1.22E+03	1.56E+04	7.81E+03	13/13	10/13	3.00E+03	12.1 - 126
METAL	Antimony	mg/kg	--	--	--	0/13	0/13	3.52E-02	2.37 - 26.8
METAL	Arsenic	mg/kg	1.01E+00	3.80E+01	9.58E+00	13/13	13/13	1.51E-03	1.21 - 1.39
METAL	Barium	mg/kg	6.04E+00	1.92E+02	5.29E+01	13/13	11/13	1.55E+01	0.965 - 1.11
METAL	Beryllium	mg/kg	5.61E-02	1.12E+00	4.27E-01	13/13	0/13	1.95E+00	0.121 - 0.139
METAL	Boron	mg/kg	1.14E+00	1.91E+01	5.80E+00	13/13	12/13	1.28E+00	3.62 - 4.18
METAL	Cadmium	mg/kg	4.15E-02	5.14E-01	2.45E-01	3/13	2/13	6.93E-02	0.241 - 0.279
METAL	Chromium	mg/kg	3.70E+00	7.85E+01	2.88E+01	13/13	0/13	1.80E+05	0.724 - 0.836
METAL	Cobalt	mg/kg	6.14E-01	4.84E+01	7.98E+00	13/13	13/13	2.71E-02	0.241 - 0.279
METAL	Copper	mg/kg	9.38E-01	8.51E+00	5.10E+00	12/13	10/13	2.81E+00	0.483 - 0.557
METAL	Iron	mg/kg	3.50E+03	2.51E+05	3.57E+04	13/13	13/13	3.52E+01	24.6 - 519
METAL	Lead	mg/kg	1.52E+00	1.56E+01	6.29E+00	13/13	1/13	1.35E+01	0.483 - 0.557
METAL	Manganese	mg/kg	4.90E+00	1.69E+03	1.99E+02	13/13	13/13	2.83E+00	1.21 - 26
METAL	Mercury	mg/kg	1.65E-02	1.39E-01	5.58E-02	4/13	2/13	2.95E-02	0.0264 - 0.0346
METAL	Molybdenum	mg/kg	1.01E-01	7.98E-01	2.60E-01	11/13	6/13	2.02E-01	0.241 - 0.279
METAL	Nickel	mg/kg	6.72E-01	3.27E+01	9.12E+00	13/13	9/13	2.56E+00	0.483 - 0.557
METAL	Selenium	mg/kg	5.22E-01	4.51E+00	1.62E+00	11/13	11/13	5.19E-02	1.21 - 1.39
METAL	Silver	mg/kg	5.05E+00	5.05E+00	5.05E+00	1/13	1/13	7.99E-02	0.593 - 6.71
METAL	Thallium	mg/kg	2.61E-01	2.61E-01	2.61E-01	1/13	1/13	1.42E-03	0.483 - 0.557
METAL	Uranium	mg/kg	2.22E-01	3.02E+00	1.35E+00	13/13	13/13	1.80E-01	0.0483 - 0.0557
METAL	Vanadium	mg/kg	5.03E+00	1.11E+02	3.90E+01	13/13	12/13	8.64E+00	4.83 - 5.57
METAL	Zinc	mg/kg	3.68E+00	8.54E+01	3.73E+01	13/13	6/13	3.73E+01	4.83 - 5.57
ANION	Fluoride	mg/kg	4.70E-01	5.11E+00	3.31E+00	13/13	0/13	1.20E+01	1.14 - 1.44
PPCB	Total PCB	mg/kg	--	--	--	0/13	0/13	6.82E-03	0.00412 - 0.00585
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/13	0/13	8.72E-04	0.418 - 0.588
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/13	0/13	4.02E-01	0.418 - 0.588
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/13	0/13	1.16E-03	0.418 - 0.588
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/13	0/13	2.26E-03	0.418 - 0.588
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/13	0/13	4.21E-02	0.418 - 0.588
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.837 - 1.18
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/13	0/13	3.21E-04	0.418 - 0.588
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/13	0/13	6.67E-05	0.418 - 0.588
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/13	0/13	3.85E-01	0.0418 - 0.0588
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/13	0/13	8.91E-03	0.418 - 0.588
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/13	0/13	2.58E-04	0.418 - 0.588
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/13	0/13	1.85E-02	0.0418 - 0.0588
SVOA	2-Methylphenol	mg/kg	--	--	--	0/13	0/13	7.53E-02	0.418 - 0.588
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/13	0/13	8.01E-03	0.418 - 0.588
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.418 - 0.588
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/13	0/13	8.24E-04	0.418 - 0.588

Table C1.25. Sector 2 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/13	0/13	2.45E-04	0.418 - 0.588
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/13	0/13	3.42E-04	0.418 - 0.588
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/13	0/13	1.71E-01	0.418 - 0.588
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/13	0/13	1.55E-04	0.418 - 0.588
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/13	0/13	3.42E-04	0.418 - 0.588
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/13	0/13	4.36E-03	0.418 - 0.588
SVOA	Acenaphthene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOA	Acenaphthylene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOA	Acetophenone	mg/kg	--	--	--	0/13	0/13	5.84E-02	0.418 - 0.588
SVOA	Anthracene	mg/kg	--	--	--	0/13	0/13	5.81E+00	0.0418 - 0.0588
SVOA	Atrazine	mg/kg	--	--	--	0/13	0/13	1.96E-04	0.418 - 0.588
SVOA	Benzaldehyde	mg/kg	--	--	--	0/13	0/13	4.15E-03	0.418 - 0.588
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/13	0/13	1.32E+00	0.0418 - 0.0588
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/13	0/13	1.35E-03	0.418 - 0.588
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/13	0/13	3.61E-06	0.418 - 0.588
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/13	0/13	1.31E-04	0.418 - 0.588
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/13	0/13	1.33E+00	0.0418 - 0.0588
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/13	0/13	2.36E-01	0.0418 - 0.0588
SVOA	Caprolactam	mg/kg	--	--	--	0/13	0/13	2.47E-01	0.418 - 0.588
SVOA	Carbazole	mg/kg	--	--	--	0/13	0/13	3.76E-02	0.0418 - 0.0588
SVOA	Dibenzofuran	mg/kg	--	--	--	0/13	0/13	1.46E-02	0.418 - 0.588
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/13	0/13	6.08E-01	0.0418 - 0.0588
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/13	0/13	6.08E-01	0.0418 - 0.0588
SVOA	Di-n-butyl phthalate	mg/kg	1.50E-02	3.61E-02	2.22E-02	4/13	0/13	2.27E-01	0.0418 - 0.0588
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/13	0/13	5.65E+00	0.0418 - 0.0588
SVOA	Diphenylamine	mg/kg	--	--	--	0/13	0/13	2.33E-01	0.418 - 0.588
SVOA	Fluoranthene	mg/kg	--	--	--	0/13	0/13	8.91E+00	0.0418 - 0.0588
SVOA	Fluorene	mg/kg	--	--	--	0/13	0/13	5.45E-01	0.0418 - 0.0588
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/13	0/13	1.23E-04	0.418 - 0.588
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/13	0/13	2.67E-04	0.418 - 0.588
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/13	0/13	1.28E-04	0.418 - 0.588
SVOA	Hexachloroethane	mg/kg	--	--	--	0/13	0/13	2.00E-04	0.418 - 0.588
SVOA	Isophorone	mg/kg	--	--	--	0/13	0/13	2.58E-02	0.418 - 0.588
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/13	0/13	2.97E-02	0.418 - 0.588
SVOA	Naphthalene	mg/kg	--	--	--	0/13	0/13	3.85E-04	0.0418 - 0.0588
SVOA	Nitrobenzene	mg/kg	--	--	--	0/13	0/13	9.17E-05	0.418 - 0.588
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/13	0/13	8.10E-06	0.418 - 0.588
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/13	0/13	5.71E-05	0.418 - 0.588
SVOA	Phenanthrene	mg/kg	--	--	--	0/13	0/13	5.49E-01	0.0418 - 0.0588
SVOA	Phenol	mg/kg	--	--	--	0/13	0/13	3.31E-01	0.418 - 0.588

Table C1.25. Sector 2 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/13	0/13	1.58E-03	0.418 - 0.588
SVOA	Pyrene	mg/kg	--	--	--	0/13	0/13	1.32E+00	0.0418 - 0.0588
SVOA	Total PAH	mg/kg	--	--	--	0/13	0/13	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/13	0/13	9.58E-01	0.311 - 0.945
RADS	Cesium-137	pCi/g	--	--	--	0/13	0/13	4.79E-01	0.0309 - 0.0684
RADS	Neptunium-237	pCi/g	--	--	--	0/13	0/13	5.36E-02	0.505 - 1.42
RADS	Plutonium-238	pCi/g	--	--	--	0/13	0/13	2.19E-01	0.186 - 0.851
RADS	Plutonium-239/240	pCi/g	--	--	--	0/13	0/13	2.13E-01	0.342 - 0.821
RADS	Technetium-99	pCi/g	--	--	--	0/16	0/16	7.60E-03	3 - 4.67
RADS	Thorium-230	pCi/g	5.12E-01	2.55E+00	1.21E+00	9/13	2/13	1.83E+00	0.328 - 1.63
RADS	Uranium-233/234	pCi/g	7.51E-01	1.90E+00	1.16E+00	4/13	4/13	4.95E-02	0.376 - 0.954
RADS	Uranium-235/236	pCi/g	--	--	--	0/13	0/13	4.88E-02	0.151 - 0.743
RADS	Uranium-238	pCi/g	6.79E-01	2.36E+00	1.20E+00	8/13	8/13	4.03E-02	0.307 - 0.74
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/16	0/16	2.81E-01	0.00118 - 0.00235
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/16	0/16	2.96E-05	0.00118 - 0.00235
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.12E-03	7.27E-03	5.11E-03	5/16	0/16	2.56E+00	0.00589 - 0.0117
VOA	1,1,2-Trichloroethane	mg/kg	8.02E-04	1.04E-03	9.21E-04	2/16	2/16	1.35E-05	0.00118 - 0.00235
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/16	0/16	7.82E-04	0.00118 - 0.00235
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/16	0/16	1.02E-02	0.00118 - 0.00235
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.09E-03	0.00118 - 0.00235
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/16	0/16	1.16E-03	0.00118 - 0.00235
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/16	0/16	1.44E-07	0.00118 - 0.00235
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/16	0/16	2.10E-06	0.00118 - 0.00235
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.95E-02	0.00118 - 0.00235
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/16	0/16	4.84E-05	0.00118 - 0.00235
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/16	0/16	2.74E-04	0.00118 - 0.00235
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/16	0/16	1.90E-02	0.00118 - 0.00235
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	2.95E-02	0.00118 - 0.00235
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/16	0/16	4.62E-04	0.00118 - 0.00235
VOA	1,4-Dioxane	mg/kg	--	--	--	0/16	0/16	9.42E-05	0.0589 - 0.117
VOA	2-Butanone	mg/kg	6.24E-03	6.24E-03	6.24E-03	1/16	0/16	1.16E-01	0.00589 - 0.0117
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/16	0/16	1.38E-06	0.00589 - 0.0117
VOA	2-Hexanone	mg/kg	--	--	--	0/16	0/16	8.75E-04	0.00589 - 0.0117
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/16	0/16	3.22E-03	0.00118 - 0.00235
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/16	0/16	2.81E-02	0.00589 - 0.0117
VOA	Acetone	mg/kg	3.02E-03	5.05E-02	1.42E-02	10/16	0/16	3.68E-01	0.00589 - 0.0117
VOA	Acrolein	mg/kg	--	--	--	0/16	0/16	8.41E-07	0.00589 - 0.0117
VOA	Acrylonitrile	mg/kg	--	--	--	0/16	0/16	1.14E-05	0.00589 - 0.0117
VOA	Benzene	mg/kg	--	--	--	0/16	0/16	2.33E-04	0.00118 - 0.00235
VOA	Bromochloromethane	mg/kg	--	--	--	0/16	0/16	2.08E-03	0.00118 - 0.00235

Table C1.25. Sector 2 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	FOD	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
VOA	Bromodichloromethane	mg/kg	--	--	--	0/16	0/16	3.65E-05	0.00118 - 0.00235
VOA	Bromoform	mg/kg	--	--	--	0/16	0/16	8.73E-04	0.00118 - 0.00235
VOA	Bromomethane	mg/kg	--	--	--	0/16	0/16	1.91E-04	0.00118 - 0.00235
VOA	Carbon disulfide	mg/kg	--	--	--	0/16	0/16	2.40E-02	0.00589 - 0.0117
VOA	Carbon tetrachloride	mg/kg	5.33E-04	6.21E-04	5.73E-04	4/16	4/16	1.77E-04	0.00118 - 0.00235
VOA	Chlorobenzene	mg/kg	--	--	--	0/16	0/16	5.28E-03	0.00118 - 0.00235
VOA	Chloroethane	mg/kg	--	--	--	0/16	0/16	2.37E-01	0.00118 - 0.00235
VOA	Chloroform	mg/kg	4.79E-04	7.14E-04	5.75E-04	3/16	3/16	6.12E-05	0.00118 - 0.00235
VOA	Chloromethane	mg/kg	--	--	--	0/16	0/16	5.26E-04	0.00118 - 0.00235
VOA	*cis* -1,2-Dichloroethene	mg/kg	9.89E-04	1.70E-02	6.19E-03	6/16	5/16	1.06E-03	0.00118 - 0.00235
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	0/16	1.68E-04	0.00118 - 0.00235
VOA	Cumene	mg/kg	--	--	--	0/16	0/16	7.38E-02	0.00118 - 0.00235
VOA	Cyclohexane	mg/kg	--	--	--	0/16	0/16	1.30E+00	0.00118 - 0.00235
VOA	Dibromochloromethane	mg/kg	--	--	--	0/16	0/16	2.32E-04	0.00118 - 0.00235
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/16	0/16	3.04E-02	0.00118 - 0.00235
VOA	Ethylbenzene	mg/kg	--	--	--	0/16	0/16	1.68E-03	0.00118 - 0.00235
VOA	m,p-Xylene	mg/kg	--	--	--	0/16	0/16	1.91E-02	0.00236 - 0.00469
VOA	Methyl acetate	mg/kg	--	--	--	0/16	0/16	4.11E-01	0.00589 - 0.0117
VOA	Methylcyclohexane	mg/kg	--	--	--	0/16	0/16	1.40E+00	0.00118 - 0.00235
VOA	Methylene chloride	mg/kg	2.62E-03	1.63E-02	9.14E-03	3/16	2/16	2.72E-03	0.00589 - 0.0117
VOA	Styrene	mg/kg	--	--	--	0/16	0/16	1.33E-01	0.00118 - 0.00235
VOA	Tetrachloroethene	mg/kg	2.09E-03	8.69E-03	5.74E-03	6/16	6/16	1.84E-03	0.00118 - 0.00235
VOA	Toluene	mg/kg	6.50E-04	7.65E-04	7.14E-04	3/16	0/16	7.62E-02	0.00118 - 0.00235
VOA	Total Xylene	mg/kg	--	--	--	0/16	0/16	1.91E-02	0.00354 - 0.00704
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/16	0/16	2.91E-03	0.00118 - 0.00235
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/16	0/16	1.68E-04	0.00118 - 0.00235
VOA	Trichloroethene	mg/kg	7.03E-04	1.68E+00	6.70E-01	8/16	8/16	1.01E-04	0.00123 - 0.156
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/16	0/16	7.31E-02	0.00118 - 0.00235
VOA	Vinyl chloride	mg/kg	--	--	--	0/16	0/16	6.47E-06	0.00118 - 0.00235

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.26. Sector 3 Surface Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	4.44E+03	1.73E+04	1.11E+04	12/12	5/12	1.30E+04	0/12	6.60E+04	0/12	5.99E+04	12/12	3.00E+03	10.2 - 114
METAL	Antimony	mg/kg	6.86E-01	2.10E+00	1.22E+00	6/12	6/12	2.10E-01	5/12	7.74E-01	5/12	7.04E-01	6/12	3.52E-02	1.96 - 2.4
METAL	Arsenic	mg/kg	2.82E+00	1.31E+01	6.34E+00	12/12	1/12	1.20E+01	12/12	3.32E-02	12/12	3.02E-02	12/12	1.51E-03	1.01 - 1.2
METAL	Barium	mg/kg	2.92E+01	1.29E+02	8.44E+01	12/12	0/12	2.00E+02	0/12	3.41E+02	0/12	3.11E+02	12/12	1.55E+01	0.806 - 0.958
METAL	Beryllium	mg/kg	1.83E-01	6.10E-01	4.03E-01	12/12	0/12	6.70E-01	0/12	4.29E+01	0/12	3.89E+01	0/12	1.95E+00	0.101 - 0.12
METAL	Boron	mg/kg	1.11E+00	5.93E+00	3.87E+00	12/12	N/A	N/A	0/12	2.82E+01	0/12	2.56E+01	11/12	1.28E+00	3.02 - 3.59
METAL	Cadmium	mg/kg	3.04E-02	3.49E-01	1.43E-01	10/12	2/12	2.10E-01	0/12	1.52E+00	0/12	1.39E+00	6/12	6.93E-02	0.202 - 0.24
METAL	Chromium	mg/kg	1.03E+01	2.08E+01	1.64E+01	12/12	7/12	1.60E+01	0/12	3.96E+06	0/12	3.60E+06	0/12	1.80E+05	0.605 - 0.719
METAL	Cobalt	mg/kg	2.26E+00	8.99E+00	5.60E+00	12/12	0/12	1.40E+01	12/12	5.96E-01	12/12	5.43E-01	12/12	2.71E-02	0.202 - 0.24
METAL	Copper	mg/kg	3.49E+00	1.70E+01	1.11E+01	12/12	0/12	1.90E+01	0/12	6.18E+01	0/12	5.62E+01	12/12	2.81E+00	0.403 - 0.479
METAL	Iron	mg/kg	5.71E+03	2.42E+04	1.60E+04	12/12	0/12	2.80E+04	12/12	7.74E+02	12/12	7.04E+02	12/12	3.52E+01	20.3 - 228
METAL	Lead	mg/kg	5.33E+00	1.61E+01	1.11E+01	12/12	0/12	3.60E+01	0/12	2.97E+02	0/12	2.70E+02	3/12	1.35E+01	0.403 - 0.479
METAL	Manganese	mg/kg	1.75E+02	5.97E+02	3.65E+02	12/12	0/12	1.50E+03	12/12	6.23E+01	12/12	5.65E+01	12/12	2.83E+00	1.02 - 11.4
METAL	Mercury	mg/kg	1.04E-02	5.02E-02	2.64E-02	11/12	0/12	2.00E-01	0/12	6.49E-01	0/12	5.91E-01	5/12	2.95E-02	0.0225 - 0.0281
METAL	Molybdenum	mg/kg	3.00E-01	8.65E-01	5.96E-01	12/12	N/A	N/A	0/12	4.44E+00	0/12	4.03E+00	12/12	2.02E-01	0.202 - 0.24
METAL	Nickel	mg/kg	4.10E+00	1.83E+01	1.17E+01	12/12	0/12	2.10E+01	0/12	5.63E+01	0/12	5.12E+01	12/12	2.56E+00	0.403 - 0.479
METAL	Selenium	mg/kg	5.76E-01	1.65E+00	9.65E-01	12/12	8/12	8.00E-01	3/12	1.14E+00	4/12	1.04E+00	12/12	5.19E-02	1.01 - 1.2
METAL	Silver	mg/kg	3.43E-01	4.43E-01	3.93E-01	2/12	0/12	2.30E+00	0/12	1.76E+00	0/12	1.60E+00	2/12	7.99E-02	0.531 - 5.45
METAL	Thallium	mg/kg	1.70E-01	2.42E-01	2.01E-01	7/12	3/12	2.10E-01	7/12	3.12E-02	7/12	2.84E-02	7/12	1.42E-03	0.403 - 0.479
METAL	Uranium	mg/kg	1.08E+00	2.97E+01	9.31E+00	12/12	9/12	4.90E+00	9/12	3.96E+00	9/12	3.60E+00	12/12	1.80E-01	0.0403 - 0.0479
METAL	Vanadium	mg/kg	1.27E+01	3.69E+01	2.59E+01	12/12	0/12	3.80E+01	0/12	1.90E+02	0/12	1.73E+02	12/12	8.64E+00	4.03 - 4.79
METAL	Zinc	mg/kg	1.27E+01	2.39E+02	6.78E+01	12/12	3/12	6.50E+01	0/12	8.21E+02	0/12	7.46E+02	8/12	3.73E+01	4.03 - 4.79
ANION	Fluoride	mg/kg	3.15E+00	5.24E+01	2.03E+01	12/12	N/A	N/A	0/12	2.64E+02	0/12	2.40E+02	6/12	1.20E+01	1.06 - 1.21
DI/FURA	Total Dioxin/Furans	mg/kg	3.33E-06	3.33E-06	3.33E-06	1/1	N/A	N/A	1/1	1.30E-06	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB	mg/kg	1.69E-03	1.98E-01	5.94E-02	10/11	N/A	N/A	1/11	1.50E-01	2/11	1.36E-01	8/11	6.82E-03	0.00364 - 0.0364
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.92E-02	0/11	1.74E-02	0/11	8.72E-04	0.36 - 7.36
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.84E+00	0/11	8.04E+00	0/11	4.02E-01	0.36 - 7.36
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.55E-02	0/11	2.32E-02	0/11	1.16E-03	0.36 - 7.36
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.97E-02	0/11	4.52E-02	0/11	2.26E-03	0.36 - 7.36
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.26E-01	0/11	8.42E-01	0/11	4.21E-02	0.36 - 7.36
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.59E-02	0/11	8.72E-02	0/11	4.36E-03	0.72 - 14.7
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.06E-03	0/11	6.42E-03	0/11	3.21E-04	0.36 - 7.36
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.47E-03	0/11	1.33E-03	0/11	6.67E-05	0.36 - 7.36
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.47E+00	0/11	7.70E+00	0/11	3.85E-01	0.036 - 0.736
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.96E-01	0/11	1.78E-01	0/11	8.91E-03	0.36 - 7.36
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.68E-03	0/11	5.16E-03	0/11	2.58E-04	0.36 - 7.36
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.07E-01	0/11	3.70E-01	0/11	1.85E-02	0.036 - 0.736
SVOA	2-Methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.66E+00	0/11	1.51E+00	0/11	7.53E-02	0.36 - 7.36
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.76E-01	0/11	1.60E-01	0/11	8.01E-03	0.36 - 7.36
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.59E-02	0/11	8.72E-02	0/11	4.36E-03	0.36 - 7.36
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.81E-02	0/11	1.65E-02	0/11	8.24E-04	0.36 - 7.36
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.39E-03	0/11	4.90E-03	0/11	2.45E-04	0.36 - 7.36
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.52E-03	0/11	6.84E-03	0/11	3.42E-04	0.36 - 7.36
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.76E+00	0/11	3.42E+00	0/11	1.71E-01	0.36 - 7.36
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.41E-03	0/11	3.10E-03	0/11	1.55E-04	0.36 - 7.36
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.52E-03	0/11	6.84E-03	0/11	3.42E-04	0.36 - 7.36
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.59E-02	0/11	8.72E-02	0/11	4.36E-03	0.36 - 7.36
SVOA	Acenaphthene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.21E+01	0/11	1.10E+01	0/11	5.49E-01	0.036 - 0.736
SVOA	Acenaphthylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.21E+01	0/11	1.10E+01	0/11	5.49E-01	0.036 - 0.736
SVOA	Acetophenone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.28E+00	0/11	1.17E+00	0/11	5.84E-02	0.36 - 7.36
SVOA	Anthracene	mg/kg	9.28E-02	9.39E-02	9.34E-02	2/11	N/A	N/A	0/11	1.28E+02	0/11	1.16E+02	0/11	5.81E+00	0.036 - 0.736
SVOA	Atrazine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.31E-03	0/11	3.92E-03	0/11	1.96E-04	0.36 - 7.36

Table C1.26. Sector 3 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzaldehyde	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.13E-02	0/11	8.30E-02	0/11	4.15E-03	0.36 - 7.36
SVOA	Benzo(ghi)perylene	mg/kg	1.66E-02	2.75E-01	8.20E-02	6/11	N/A	N/A	0/11	2.90E+01	0/11	2.63E+01	0/11	1.32E+00	0.036 - 0.736
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.97E-02	0/11	2.70E-02	0/11	1.35E-03	0.36 - 7.36
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.94E-05	0/11	7.22E-05	0/11	3.61E-06	0.36 - 7.36
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.88E-03	0/11	2.62E-03	0/11	1.31E-04	0.36 - 7.36
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.93E+01	0/11	2.66E+01	0/11	1.33E+00	0.036 - 0.736
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.19E+00	0/11	4.72E+00	0/11	2.36E-01	0.036 - 0.736
SVOA	Caprolactam	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.43E+00	0/11	4.94E+00	0/11	2.47E-01	0.36 - 7.36
SVOA	Carbazole	mg/kg	7.77E-02	7.77E-02	7.77E-02	1/11	N/A	N/A	0/11	8.27E-01	0/11	7.51E-01	1/11	3.76E-02	0.036 - 0.736
SVOA	Dibenzofuran	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.21E-01	0/11	2.92E-01	0/11	1.46E-02	0.36 - 7.36
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.34E+01	0/11	1.22E+01	0/11	6.08E-01	0.036 - 0.736
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.34E+01	0/11	1.22E+01	0/11	6.08E-01	0.036 - 0.736
SVOA	Di-n-butyl phthalate	mg/kg	1.43E-02	1.80E-02	1.62E-02	2/11	N/A	N/A	0/11	4.99E+00	0/11	4.54E+00	0/11	2.27E-01	0.036 - 0.736
SVOA	Di-n-octylphthalate	mg/kg	1.28E-02	5.96E-02	3.62E-02	2/11	N/A	N/A	0/11	1.24E+02	0/11	1.13E+02	0/11	5.65E+00	0.036 - 0.736
SVOA	Diphenylamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.13E+00	0/11	4.66E+00	0/11	2.33E-01	0.36 - 7.36
SVOA	Fluoranthene	mg/kg	1.22E-02	3.99E+00	5.68E-01	11/11	N/A	N/A	0/11	1.96E+02	0/11	1.78E+02	0/11	8.91E+00	0.036 - 0.736
SVOA	Fluorene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.20E+01	0/11	1.09E+01	0/11	5.45E-01	0.036 - 0.736
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.71E-03	0/11	2.46E-03	0/11	1.23E-04	0.36 - 7.36
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.87E-03	0/11	5.34E-03	0/11	2.67E-04	0.36 - 7.36
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.82E-03	0/11	2.56E-03	0/11	1.28E-04	0.36 - 7.36
SVOA	Hexachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.40E-03	0/11	4.00E-03	0/11	2.00E-04	0.36 - 7.36
SVOA	Isophorone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.68E-01	0/11	5.16E-01	0/11	2.58E-02	0.36 - 7.36
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.53E-01	0/11	5.94E-01	0/11	2.97E-02	0.36 - 7.36
SVOA	Naphthalene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.47E-03	0/11	7.70E-03	0/11	3.85E-04	0.036 - 0.736
SVOA	Nitrobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.02E-03	0/11	1.83E-03	0/11	9.17E-05	0.36 - 7.36
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.78E-04	0/11	1.62E-04	0/11	8.10E-06	0.36 - 7.36
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.26E-03	0/11	1.14E-03	0/11	5.71E-05	0.36 - 7.36
SVOA	Phenanthrene	mg/kg	1.25E-02	1.69E+00	2.85E-01	10/11	N/A	N/A	0/11	1.21E+01	0/11	1.10E+01	1/11	5.49E-01	0.036 - 0.736
SVOA	Phenol	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.28E+00	0/11	6.62E+00	0/11	3.31E-01	0.36 - 7.36
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.48E-02	0/11	3.16E-02	0/11	1.58E-03	0.36 - 7.36
SVOA	Pyrene	mg/kg	1.77E-02	3.62E+00	5.41E-01	10/11	N/A	N/A	0/11	2.90E+01	0/11	2.63E+01	1/11	1.32E+00	0.036 - 0.736
SVOA	Total PAH	mg/kg	1.95E-02	1.09E+00	2.43E-01	10/11	N/A	N/A	2/11	6.47E-01	2/11	5.89E-01	6/11	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/13	N/A	N/A	0/13	2.11E+01	0/13	1.92E+01	0/13	9.58E-01	0.277 - 0.936
RADS	Cesium-137	pCi/g	5.37E-02	1.57E-01	1.00E-01	6/13	0/13	4.90E-01	0/13	1.05E+01	0/13	9.58E+00	0/13	4.79E-01	0.0369 - 0.0859
RADS	Neptunium-237	pCi/g	--	--	--	0/13	0/13	1.00E-01	0/13	1.18E+00	0/13	1.07E+00	0/13	5.36E-02	0.432 - 1.01
RADS	Plutonium-238	pCi/g	--	--	--	0/13	0/13	7.30E-02	0/13	4.82E+00	0/13	4.38E+00	0/13	2.19E-01	0.245 - 0.788
RADS	Plutonium-239/240	pCi/g	1.05E+00	1.05E+00	1.05E+00	1/13	1/13	2.50E-02	0/13	4.69E+00	0/13	4.26E+00	1/13	2.13E-01	0.367 - 0.815
RADS	Technetium-99	pCi/g	3.92E+00	1.96E+01	9.91E+00	3/13	3/13	2.50E+00	3/13	1.67E-01	3/13	1.52E-01	3/13	7.60E-03	2.28 - 3.97
RADS	Thorium-230	pCi/g	5.50E-01	2.24E+00	1.39E+00	12/13	3/13	1.50E+00	0/13	4.03E+01	0/13	3.66E+01	3/13	1.83E+00	0.51 - 1.33
RADS	Uranium-233/234	pCi/g	1.28E+00	3.58E+01	6.56E+00	13/13	13/13	1.20E+00	13/13	1.09E+00	13/13	9.90E-01	13/13	4.95E-02	0.502 - 1.02
RADS	Uranium-235/236	pCi/g	1.06E+00	1.57E+00	1.32E+00	2/13	2/13	6.00E-02	1/13	1.07E+00	2/13	9.76E-01	2/13	4.88E-02	0.33 - 0.578
RADS	Uranium-238	pCi/g	1.60E+00	3.86E+01	7.49E+00	13/13	13/13	1.20E+00	13/13	8.87E-01	13/13	8.05E-01	13/13	4.03E-02	0.274 - 0.733
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.18E+00	0/11	5.62E+00	0/11	2.81E-01	0.000933 - 0.107
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.51E-04	0/11	5.92E-04	0/11	2.96E-05	0.000933 - 0.107
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.63E+01	0/11	5.13E+01	0/11	2.56E+00	0.00466 - 0.535
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.97E-04	0/11	2.69E-04	0/11	1.35E-05	0.000933 - 0.107
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.72E-02	0/11	1.56E-02	0/11	7.82E-04	0.000933 - 0.107
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.24E-01	0/11	2.04E-01	0/11	1.02E-02	0.000933 - 0.107
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.60E-02	0/11	4.18E-02	0/11	2.09E-03	0.000933 - 0.107
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.55E-02	0/11	2.32E-02	0/11	1.16E-03	0.000933 - 0.107
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.17E-06	0/11	2.88E-06	0/11	1.44E-07	0.000933 - 0.107
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.62E-05	0/11	4.20E-05	0/11	2.10E-06	0.000933 - 0.107

Table C1.26. Sector 3 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.49E-01	0/11	5.90E-01	0/11	2.95E-02	0.000933 - 0.107
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.06E-03	0/11	9.69E-04	0/11	4.84E-05	0.000933 - 0.107
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.03E-03	0/11	5.48E-03	0/11	2.74E-04	0.000933 - 0.107
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.18E-01	0/11	3.81E-01	0/11	1.90E-02	0.000933 - 0.107
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.49E-01	0/11	5.90E-01	0/11	2.95E-02	0.000933 - 0.107
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.02E-02	0/11	9.24E-03	0/11	4.62E-04	0.000933 - 0.107
VOA	1,4-Dioxane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.07E-03	0/11	1.88E-03	0/11	9.42E-05	0.0466 - 5.35
VOA	2-Butanone	mg/kg	7.33E-03	1.53E-02	1.13E-02	2/11	N/A	N/A	0/11	2.55E+00	0/11	2.32E+00	0/11	1.16E-01	0.00466 - 0.535
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.04E-05	0/11	2.76E-05	0/11	1.38E-06	0.00466 - 0.535
VOA	2-Hexanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.93E-02	0/11	1.75E-02	0/11	8.75E-04	0.00466 - 0.535
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	7.08E-02	0/11	6.44E-02	0/11	3.22E-03	0.000933 - 0.107
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.18E-01	0/11	5.62E-01	0/11	2.81E-02	0.00466 - 0.535
VOA	Acetone	mg/kg	1.77E-03	7.41E-02	1.89E-02	7/11	N/A	N/A	0/11	8.10E+00	0/11	7.36E+00	0/11	3.68E-01	0.00466 - 0.535
VOA	Acrolein	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.85E-05	0/11	1.68E-05	0/11	8.41E-07	0.00466 - 0.535
VOA	Acrylonitrile	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.51E-04	0/11	2.28E-04	0/11	1.14E-05	0.00466 - 0.535
VOA	Benzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.13E-03	0/11	4.66E-03	0/11	2.33E-04	0.000933 - 0.107
VOA	Bromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.58E-02	0/11	4.16E-02	0/11	2.08E-03	0.000933 - 0.107
VOA	Bromodichloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	8.03E-04	0/11	7.30E-04	0/11	3.65E-05	0.000933 - 0.107
VOA	Bromoform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.92E-02	0/11	1.75E-02	0/11	8.73E-04	0.000933 - 0.107
VOA	Bromomethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.20E-03	0/11	3.82E-03	0/11	1.91E-04	0.000933 - 0.107
VOA	Carbon disulfide	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.28E-01	0/11	4.80E-01	0/11	2.40E-02	0.00466 - 0.535
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.89E-03	0/11	3.54E-03	0/11	1.77E-04	0.000933 - 0.107
VOA	Chlorobenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.16E-01	0/11	1.06E-01	0/11	5.28E-03	0.000933 - 0.107
VOA	Chloroethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.21E+00	0/11	4.74E+00	0/11	2.37E-01	0.000933 - 0.107
VOA	Chloroform	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.35E-03	0/11	1.22E-03	0/11	6.12E-05	0.000933 - 0.107
VOA	Chloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.16E-02	0/11	1.05E-02	0/11	5.26E-04	0.000933 - 0.107
VOA	*cis* -1,2-Dichloroethene	mg/kg	5.02E-04	7.66E-02	3.86E-02	2/11	N/A	N/A	1/11	2.33E-02	1/11	2.12E-02	1/11	1.06E-03	0.000933 - 0.107
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-03	0/11	3.36E-03	0/11	1.68E-04	0.000933 - 0.107
VOA	Cumene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.62E+00	0/11	1.48E+00	0/11	7.38E-02	0.000933 - 0.107
VOA	Cyclohexane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.86E+01	0/11	2.60E+01	0/11	1.30E+00	0.000933 - 0.107
VOA	Dibromochloromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	5.10E-03	0/11	4.64E-03	0/11	2.32E-04	0.000933 - 0.107
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	6.69E-01	0/11	6.08E-01	0/11	3.04E-02	0.000933 - 0.107
VOA	Ethylbenzene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-02	0/11	3.36E-02	0/11	1.68E-03	0.000933 - 0.107
VOA	m,p-Xylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.20E-01	0/11	3.82E-01	0/11	1.91E-02	0.00187 - 0.214
VOA	Methyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	9.04E+00	0/11	8.22E+00	0/11	4.11E-01	0.00466 - 0.535
VOA	Methylcyclohexane	mg/kg	4.17E-04	4.17E-04	4.17E-04	1/11	N/A	N/A	0/11	3.08E+01	0/11	2.80E+01	0/11	1.40E+00	0.000933 - 0.107
VOA	Methylene chloride	mg/kg	2.00E-03	2.60E-03	2.21E-03	3/11	N/A	N/A	0/11	5.98E-02	0/11	5.44E-02	0/11	2.72E-03	0.00466 - 0.535
VOA	Styrene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	2.93E+00	0/11	2.66E+00	0/11	1.33E-01	0.000933 - 0.107
VOA	Tetrachloroethene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.05E-02	0/11	3.69E-02	0/11	1.84E-03	0.000933 - 0.107
VOA	Toluene	mg/kg	3.71E-04	8.23E-04	6.11E-04	5/11	N/A	N/A	0/11	1.68E+00	0/11	1.52E+00	0/11	7.62E-02	0.000933 - 0.107
VOA	Total Xylene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	4.20E-01	0/11	3.82E-01	0/11	1.91E-02	0.0028 - 0.321
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.50E-04	5.50E-04	5.50E-04	1/11	N/A	N/A	0/11	6.40E-02	0/11	5.83E-02	0/11	2.91E-03	0.000933 - 0.107
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/11	N/A	N/A	0/11	3.70E-03	0/11	3.36E-03	0/11	1.68E-04	0.000933 - 0.107
VOA	Trichloroethene	mg/kg	5.93E-04	3.01E+00	4.32E-01	7/11	N/A	N/A	3/11	2.22E-03	4/11	2.02E-03	7/11	1.01E-04	0.000933 - 0.112
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.61E+00	0/11	1.46E+00	0/11	7.31E-02	0.000933 - 0.107
VOA	Vinyl chloride	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.42E-04	0/11	1.29E-04	0/11	6.47E-06	0.000933 - 0.107

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.26. Sector 3 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.27. Sector 3 Subsurface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	**Analysis**	**Unit**	**Min**	**Max**	**Avg**	**FOD**	**FOE**	**Bkgd**	**DAF 22**	**DAF 22 SSL**	**DAF 20**	**DAF 20 SSL**	**DAF 1**	**DAF 1 SSL**	**DL Range**
METAL	Aluminum	mg/kg	1.04E+04	1.97E+04	1.44E+04	12/12	10/12	1.20E+04	0/12	6.60E+04	0/12	5.99E+04	12/12	3.00E+03	11.3 - 1130
METAL	Antimony	mg/kg	7.00E-01	1.67E+00	1.19E+00	2/12	2/12	2.10E-01	1/12	7.74E-01	1/12	7.04E-01	2/12	3.52E-02	2.16 - 2.41
METAL	Arsenic	mg/kg	2.47E+00	8.82E+00	5.84E+00	12/12	4/12	7.90E+00	12/12	3.32E-02	12/12	3.02E-02	12/12	1.51E-03	1.09 - 1.28
METAL	Barium	mg/kg	6.50E+01	2.64E+02	1.42E+02	12/12	5/12	1.70E+02	0/12	3.41E+02	0/12	3.11E+02	12/12	1.55E+01	0.872 - 90.8
METAL	Beryllium	mg/kg	2.21E-01	9.95E-01	5.61E-01	12/12	4/12	6.90E-01	0/12	4.29E+01	0/12	3.89E+01	0/12	1.95E+00	0.109 - 0.128
METAL	Boron	mg/kg	1.26E+00	5.05E+00	2.56E+00	12/12	N/A	N/A	0/12	2.82E+01	0/12	2.56E+01	10/12	1.28E+00	3.27 - 3.84
METAL	Cadmium	mg/kg	2.62E-02	8.90E-02	5.15E-02	9/12	0/12	2.10E-01	0/12	1.52E+00	0/12	1.39E+00	2/12	6.93E-02	0.218 - 0.256
METAL	Chromium	mg/kg	1.15E+01	2.46E+01	1.84E+01	12/12	0/12	4.30E+01	0/12	3.96E+06	0/12	3.60E+06	0/12	1.80E+05	0.654 - 0.768
METAL	Cobalt	mg/kg	2.32E+00	2.71E+01	1.06E+01	12/12	3/12	1.30E+01	12/12	5.96E-01	12/12	5.43E-01	12/12	2.71E-02	0.218 - 0.256
METAL	Copper	mg/kg	6.02E+00	1.78E+01	1.10E+01	12/12	0/12	2.50E+01	0/12	6.18E+01	0/12	5.62E+01	12/12	2.81E+00	0.436 - 0.512
METAL	Iron	mg/kg	1.20E+04	2.51E+04	1.78E+04	12/12	0/12	2.80E+04	12/12	7.74E+02	12/12	7.04E+02	12/12	3.52E+01	24.1 - 2270
METAL	Lead	mg/kg	6.06E+00	1.42E+01	1.01E+01	12/12	0/12	2.30E+01	0/12	2.97E+02	0/12	2.70E+02	1/12	1.35E+01	0.436 - 0.512
METAL	Manganese	mg/kg	9.83E+01	3.11E+03	7.73E+02	12/12	4/12	8.20E+02	12/12	6.23E+01	12/12	5.65E+01	12/12	2.83E+00	1.2 - 113
METAL	Mercury	mg/kg	1.06E-02	1.06E-01	3.43E-02	8/12	0/12	1.30E-01	0/12	6.49E-01	0/12	5.91E-01	3/12	2.95E-02	0.0233 - 0.0304
METAL	Molybdenum	mg/kg	1.95E-01	7.76E-01	5.11E-01	12/12	N/A	N/A	0/12	4.44E+00	0/12	4.03E+00	11/12	2.02E-01	0.218 - 0.256
METAL	Nickel	mg/kg	6.76E+00	2.60E+01	1.48E+01	12/12	3/12	2.20E+01	0/12	5.63E+01	0/12	5.12E+01	12/12	2.56E+00	0.436 - 0.512
METAL	Selenium	mg/kg	5.97E-01	3.02E+00	1.64E+00	12/12	11/12	7.00E-01	9/12	1.14E+00	9/12	1.04E+00	12/12	5.19E-02	1.09 - 1.28
METAL	Silver	mg/kg	3.79E-01	3.79E-01	3.79E-01	1/12	0/12	2.70E+00	0/12	1.76E+00	0/12	1.60E+00	1/12	7.99E-02	0.54 - 5.54
METAL	Thallium	mg/kg	1.70E-01	4.00E-01	2.33E-01	8/12	1/12	3.40E-01	8/12	3.12E-02	8/12	2.84E-02	8/12	1.42E-03	0.436 - 0.512
METAL	Uranium	mg/kg	5.57E-01	3.58E+00	1.25E+00	12/12	0/12	4.60E+00	0/12	3.96E+00	0/12	3.60E+00	12/12	1.80E-01	0.0436 - 0.0512
METAL	Vanadium	mg/kg	2.12E+01	3.49E+01	2.84E+01	12/12	0/12	3.70E+01	0/12	1.90E+02	0/12	1.73E+02	12/12	8.64E+00	4.36 - 5.12
METAL	Zinc	mg/kg	1.60E+01	7.31E+01	3.87E+01	12/12	3/12	6.00E+01	0/12	8.21E+02	0/12	7.46E+02	5/12	3.73E+01	4.36 - 5.12
ANION	Fluoride	mg/kg	2.34E+00	1.71E+01	1.00E+01	12/12	N/A	N/A	0/12	2.64E+02	0/12	2.40E+02	6/12	1.20E+01	1.14 - 1.27
DI/FURA	Total Dioxin/Furans	mg/kg	2.42E-06	2.42E-06	2.42E-06	1/1	N/A	N/A	1/1	1.30E-06	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB	mg/kg	2.32E-03	5.69E-03	4.01E-03	2/9	N/A	N/A	0/9	1.50E-01	0/9	1.36E-01	0/9	6.82E-03	0.00377 - 0.00413
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.92E-02	0/9	1.74E-02	0/9	8.72E-04	0.381 - 2.06
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.84E+00	0/9	8.04E+00	0/9	4.02E-01	0.381 - 2.06
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.55E-02	0/9	2.32E-02	0/9	1.16E-03	0.381 - 2.06
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.97E-02	0/9	4.52E-02	0/9	2.26E-03	0.381 - 2.06
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.26E-01	0/9	8.42E-01	0/9	4.21E-02	0.381 - 2.06
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.59E-02	0/9	8.72E-02	0/9	4.36E-03	0.761 - 4.12
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.06E-03	0/9	6.42E-03	0/9	3.21E-04	0.381 - 2.06
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.47E-03	0/9	1.33E-03	0/9	6.67E-05	0.381 - 2.06
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.47E+00	0/9	7.70E+00	0/9	3.85E-01	0.0381 - 0.206
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.96E-01	0/9	1.78E-01	0/9	8.91E-03	0.381 - 2.06
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.68E-03	0/9	5.16E-03	0/9	2.58E-04	0.381 - 2.06
SVOA	2-Methylnaphthalene	mg/kg	7.00E-02	7.13E-02	7.07E-02	2/9	N/A	N/A	0/9	4.07E-01	0/9	3.70E-01	2/9	1.85E-02	0.0381 - 0.206
SVOA	2-Methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.66E+00	0/9	1.51E+00	0/9	7.53E-02	0.381 - 2.06
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.76E-01	0/9	1.60E-01	0/9	8.01E-03	0.381 - 2.06
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.59E-02	0/9	8.72E-02	0/9	4.36E-03	0.381 - 2.06
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.81E-02	0/9	1.65E-02	0/9	8.24E-04	0.381 - 2.06
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.39E-03	0/9	4.90E-03	0/9	2.45E-04	0.381 - 2.06
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.52E-03	0/9	6.84E-03	0/9	3.42E-04	0.381 - 2.06
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.76E+00	0/9	3.42E+00	0/9	1.71E-01	0.381 - 2.06
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.41E-03	0/9	3.10E-03	0/9	1.55E-04	0.381 - 2.06
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.52E-03	0/9	6.84E-03	0/9	3.42E-04	0.381 - 2.06
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.59E-02	0/9	8.72E-02	0/9	4.36E-03	0.381 - 2.06
SVOA	Acenaphthene	mg/kg	2.33E-02	3.40E-01	1.82E-01	2/9	N/A	N/A	0/9	1.21E+01	0/9	1.10E+01	0/9	5.49E-01	0.0381 - 0.206
SVOA	Acenaphthylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.21E+01	0/9	1.10E+01	0/9	5.49E-01	0.0381 - 0.206
SVOA	Acetophenone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.28E+00	0/9	1.17E+00	0/9	5.84E-02	0.381 - 2.06
SVOA	Anthracene	mg/kg	4.17E-02	5.05E-01	2.73E-01	2/9	N/A	N/A	0/9	1.28E+02	0/9	1.16E+02	0/9	5.81E+00	0.0381 - 0.206
SVOA	Atrazine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.31E-03	0/9	3.92E-03	0/9	1.96E-04	0.381 - 2.06

Table C1.27. Sector 3 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzaldehyde	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.13E-02	0/9	8.30E-02	0/9	4.15E-03	0.381 - 2.06
SVOA	Benzo(ghi)perylene	mg/kg	1.05E-01	3.79E-01	2.42E-01	2/9	N/A	N/A	0/9	2.90E+01	0/9	2.63E+01	0/9	1.32E+00	0.0381 - 0.206
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.97E-02	0/9	2.70E-02	0/9	1.35E-03	0.381 - 2.06
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.94E-05	0/9	7.22E-05	0/9	3.61E-06	0.381 - 2.06
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.88E-03	0/9	2.62E-03	0/9	1.31E-04	0.381 - 2.06
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.23E-02	1.23E-02	1.23E-02	1/9	N/A	N/A	0/9	2.93E+01	0/9	2.66E+01	0/9	1.33E+00	0.0381 - 0.206
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.19E+00	0/9	4.72E+00	0/9	2.36E-01	0.0381 - 0.206
SVOA	Caprolactam	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.43E+00	0/9	4.94E+00	0/9	2.47E-01	0.381 - 2.06
SVOA	Carbazole	mg/kg	2.41E-02	2.49E-01	1.37E-01	2/9	N/A	N/A	0/9	8.27E-01	0/9	7.51E-01	1/9	3.76E-02	0.0381 - 0.206
SVOA	Dibenzofuran	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.21E-01	0/9	2.92E-01	0/9	1.46E-02	0.381 - 2.06
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.34E+01	0/9	1.22E+01	0/9	6.08E-01	0.0381 - 0.206
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.34E+01	0/9	1.22E+01	0/9	6.08E-01	0.0381 - 0.206
SVOA	Di-n-butyl phthalate	mg/kg	1.89E-02	1.89E-02	1.89E-02	1/9	N/A	N/A	0/9	4.99E+00	0/9	4.54E+00	0/9	2.27E-01	0.0381 - 0.206
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.24E+02	0/9	1.13E+02	0/9	5.65E+00	0.0381 - 0.206
SVOA	Diphenylamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.13E+00	0/9	4.66E+00	0/9	2.33E-01	0.381 - 2.06
SVOA	Fluoranthene	mg/kg	3.01E-02	2.84E+00	7.95E-01	4/9	N/A	N/A	0/9	1.96E+02	0/9	1.78E+02	0/9	8.91E+00	0.0381 - 0.206
SVOA	Fluorene	mg/kg	1.80E-02	2.80E-01	1.49E-01	2/9	N/A	N/A	0/9	1.20E+01	0/9	1.09E+01	0/9	5.45E-01	0.0381 - 0.206
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.71E-03	0/9	2.46E-03	0/9	1.23E-04	0.381 - 2.06
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.87E-03	0/9	5.34E-03	0/9	2.67E-04	0.381 - 2.06
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.82E-03	0/9	2.56E-03	0/9	1.28E-04	0.381 - 2.06
SVOA	Hexachloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.40E-03	0/9	4.00E-03	0/9	2.00E-04	0.381 - 2.06
SVOA	Isophorone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.68E-01	0/9	5.16E-01	0/9	2.58E-02	0.381 - 2.06
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.53E-01	0/9	5.94E-01	0/9	2.97E-02	0.381 - 2.06
SVOA	Naphthalene	mg/kg	1.66E-02	2.78E-01	1.47E-01	2/9	N/A	N/A	2/9	8.47E-03	2/9	7.70E-03	2/9	3.85E-04	0.0381 - 0.206
SVOA	Nitrobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.02E-03	0/9	1.83E-03	0/9	9.17E-05	0.381 - 2.06
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.78E-04	0/9	1.62E-04	0/9	8.10E-06	0.381 - 2.06
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.26E-03	0/9	1.14E-03	0/9	5.71E-05	0.381 - 2.06
SVOA	Phenanthrene	mg/kg	1.33E-02	2.13E+00	5.86E-01	4/9	N/A	N/A	0/9	1.21E+01	0/9	1.10E+01	1/9	5.49E-01	0.0381 - 0.206
SVOA	Phenol	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.28E+00	0/9	6.62E+00	0/9	3.31E-01	0.381 - 2.06
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.48E-02	0/9	3.16E-02	0/9	1.58E-03	0.381 - 2.06
SVOA	Pyrene	mg/kg	2.74E-02	1.87E+00	5.50E-01	4/9	N/A	N/A	0/9	2.90E+01	0/9	2.63E+01	1/9	1.32E+00	0.0381 - 0.206
SVOA	Total PAH	mg/kg	2.09E-02	1.21E+00	3.74E-01	4/9	N/A	N/A	1/9	6.47E-01	1/9	5.89E-01	2/9	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/12	N/A	N/A	0/12	2.11E+01	0/12	1.92E+01	0/12	9.58E-01	0.341 - 0.676
RADS	Cesium-137	pCi/g	--	--	--	0/12	0/12	2.80E-01	0/12	1.05E+01	0/12	9.58E+00	0/12	4.79E-01	0.0349 - 0.0946
RADS	Neptunium-237	pCi/g	--	--	--	0/12	N/A	N/A	0/12	1.18E+00	0/12	1.07E+00	0/12	5.36E-02	0.486 - 0.84
RADS	Plutonium-238	pCi/g	--	--	--	0/12	N/A	N/A	0/12	4.82E+00	0/12	4.38E+00	0/12	2.19E-01	0.228 - 0.991
RADS	Plutonium-239/240	pCi/g	--	--	--	0/12	N/A	N/A	0/12	4.69E+00	0/12	4.26E+00	0/12	2.13E-01	0.317 - 0.894
RADS	Technetium-99	pCi/g	--	--	--	0/12	0/12	2.80E+00	0/12	1.67E-01	0/12	1.52E-01	0/12	7.60E-03	2.48 - 3.97
RADS	Thorium-230	pCi/g	6.44E-01	1.90E+00	1.09E+00	11/12	2/12	1.40E+00	0/12	4.03E+01	0/12	3.66E+01	1/12	1.83E+00	0.518 - 0.878
RADS	Uranium-233/234	pCi/g	6.54E-01	2.45E+00	1.11E+00	8/12	2/12	1.20E+00	3/12	1.09E+00	3/12	9.90E-01	8/12	4.95E-02	0.425 - 0.957
RADS	Uranium-235/236	pCi/g	--	--	--	0/12	0/12	6.00E-02	0/12	1.07E+00	0/12	9.76E-01	0/12	4.88E-02	0.292 - 0.699
RADS	Uranium-238	pCi/g	6.77E-01	1.70E+00	1.19E+00	10/12	4/12	1.20E+00	8/12	8.87E-01	9/12	8.05E-01	10/12	4.03E-02	0.264 - 0.777
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.18E+00	0/9	5.62E+00	0/9	2.81E-01	0.00108 - 0.103
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.51E-04	0/9	5.92E-04	0/9	2.96E-05	0.00108 - 0.103
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.63E+01	0/9	5.13E+01	0/9	2.56E+00	0.0054 - 0.514
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.97E-04	0/9	2.69E-04	0/9	1.35E-05	0.00108 - 0.103
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.72E-02	0/9	1.56E-02	0/9	7.82E-04	0.00108 - 0.103
VOA	1,1-Dichloroethene	mg/kg	1.45E-03	1.45E-03	1.45E-03	1/9	N/A	N/A	0/9	2.24E-01	0/9	2.04E-01	0/9	1.02E-02	0.00108 - 0.103
VOA	1,2,3-Trichlorobenzene	mg/kg	1.63E-03	1.63E-03	1.63E-03	1/9	N/A	N/A	0/9	4.60E-02	0/9	4.18E-02	0/9	2.09E-03	0.00108 - 0.103
VOA	1,2,4-Trichlorobenzene	mg/kg	1.17E-03	1.17E-03	1.17E-03	1/9	N/A	N/A	0/9	2.55E-02	0/9	2.32E-02	1/9	1.16E-03	0.00108 - 0.103
VOA	1,2-Dibromo-3-chloropropane	mg/kg	6.61E-04	6.61E-04	6.61E-04	1/9	N/A	N/A	1/9	3.17E-06	1/9	2.88E-06	1/9	1.44E-07	0.00108 - 0.103
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.62E-05	0/9	4.20E-05	0/9	2.10E-06	0.00108 - 0.103

Table C1.27. Sector 3 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichlorobenzene	mg/kg	6.07E-04	6.07E-04	6.07E-04	1/9	N/A	N/A	0/9	6.49E-01	0/9	5.90E-01	0/9	2.95E-02	0.00108 - 0.103
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.06E-03	0/9	9.69E-04	0/9	4.84E-05	0.00108 - 0.103
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.03E-03	0/9	5.48E-03	0/9	2.74E-04	0.00108 - 0.103
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.18E-01	0/9	3.81E-01	0/9	1.90E-02	0.00108 - 0.103
VOA	1,3-Dichlorobenzene	mg/kg	4.66E-04	4.66E-04	4.66E-04	1/9	N/A	N/A	0/9	6.49E-01	0/9	5.90E-01	0/9	2.95E-02	0.00108 - 0.103
VOA	1,4-Dichlorobenzene	mg/kg	5.96E-04	5.96E-04	5.96E-04	1/9	N/A	N/A	0/9	1.02E-02	0/9	9.24E-03	1/9	4.62E-04	0.00108 - 0.103
VOA	1,4-Dioxane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.07E-03	0/9	1.88E-03	0/9	9.42E-05	0.054 - 5.14
VOA	2-Butanone	mg/kg	4.62E-03	1.99E-01	7.23E-02	3/9	N/A	N/A	0/9	2.55E+00	0/9	2.32E+00	1/9	1.16E-01	0.0054 - 0.514
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.04E-05	0/9	2.76E-05	0/9	1.38E-06	0.0054 - 0.514
VOA	2-Hexanone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.93E-02	0/9	1.75E-02	0/9	8.75E-04	0.0054 - 0.514
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	7.08E-02	0/9	6.44E-02	0/9	3.22E-03	0.00108 - 0.103
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.18E-01	0/9	5.62E-01	0/9	2.81E-02	0.0054 - 0.514
VOA	Acetone	mg/kg	2.60E-03	6.17E-02	1.74E-02	6/9	N/A	N/A	0/9	8.10E+00	0/9	7.36E+00	0/9	3.68E-01	0.0054 - 0.514
VOA	Acrolein	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.85E-05	0/9	1.68E-05	0/9	8.41E-07	0.0054 - 0.514
VOA	Acrylonitrile	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.51E-04	0/9	2.28E-04	0/9	1.14E-05	0.0054 - 0.514
VOA	Benzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.13E-03	0/9	4.66E-03	0/9	2.33E-04	0.00108 - 0.103
VOA	Bromochloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.58E-02	0/9	4.16E-02	0/9	2.08E-03	0.00108 - 0.103
VOA	Bromodichloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	8.03E-04	0/9	7.30E-04	0/9	3.65E-05	0.00108 - 0.103
VOA	Bromoform	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.92E-02	0/9	1.75E-02	0/9	8.73E-04	0.00108 - 0.103
VOA	Bromomethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.20E-03	0/9	3.82E-03	0/9	1.91E-04	0.00108 - 0.103
VOA	Carbon disulfide	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.28E-01	0/9	4.80E-01	0/9	2.40E-02	0.0054 - 0.514
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.89E-03	0/9	3.54E-03	0/9	1.77E-04	0.00108 - 0.103
VOA	Chlorobenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.16E-01	0/9	1.06E-01	0/9	5.28E-03	0.00108 - 0.103
VOA	Chloroethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.21E+00	0/9	4.74E+00	0/9	2.37E-01	0.00108 - 0.103
VOA	Chloroform	mg/kg	5.14E-04	5.14E-04	5.14E-04	1/9	N/A	N/A	0/9	1.35E-03	0/9	1.22E-03	1/9	6.12E-05	0.00108 - 0.103
VOA	Chloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.16E-02	0/9	1.05E-02	0/9	5.26E-04	0.00108 - 0.103
VOA	*cis* -1,2-Dichloroethene	mg/kg	6.59E-04	3.43E-02	1.31E-02	5/9	N/A	N/A	1/9	2.33E-02	1/9	2.12E-02	4/9	1.06E-03	0.00108 - 0.103
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.70E-03	0/9	3.36E-03	0/9	1.68E-04	0.00108 - 0.103
VOA	Cumene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.62E+00	0/9	1.48E+00	0/9	7.38E-02	0.00108 - 0.103
VOA	Cyclohexane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.86E+01	0/9	2.60E+01	0/9	1.30E+00	0.00108 - 0.103
VOA	Dibromochloromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	5.10E-03	0/9	4.64E-03	0/9	2.32E-04	0.00108 - 0.103
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	6.69E-01	0/9	6.08E-01	0/9	3.04E-02	0.00108 - 0.103
VOA	Ethylbenzene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.70E-02	0/9	3.36E-02	0/9	1.68E-03	0.00108 - 0.103
VOA	m,p-Xylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.20E-01	0/9	3.82E-01	0/9	1.91E-02	0.00216 - 0.206
VOA	Methyl acetate	mg/kg	--	--	--	0/9	N/A	N/A	0/9	9.04E+00	0/9	8.22E+00	0/9	4.11E-01	0.0054 - 0.514
VOA	Methylcyclohexane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.08E+01	0/9	2.80E+01	0/9	1.40E+00	0.00108 - 0.103
VOA	Methylene chloride	mg/kg	2.58E-03	3.73E-03	3.10E-03	3/9	N/A	N/A	0/9	5.98E-02	0/9	5.44E-02	2/9	2.72E-03	0.0054 - 0.514
VOA	Styrene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	2.93E+00	0/9	2.66E+00	0/9	1.33E-01	0.00108 - 0.103
VOA	Tetrachloroethene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.05E-02	0/9	3.69E-02	0/9	1.84E-03	0.00108 - 0.103
VOA	Toluene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.68E+00	0/9	1.52E+00	0/9	7.62E-02	0.00108 - 0.103
VOA	Total Xylene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	4.20E-01	0/9	3.82E-01	0/9	1.91E-02	0.00324 - 0.308
VOA	*trans-1,2-Dichloroethene*	mg/kg	9.70E-04	2.56E-03	1.77E-03	2/9	N/A	N/A	0/9	6.40E-02	0/9	5.83E-02	0/9	2.91E-03	0.00108 - 0.103
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/9	N/A	N/A	0/9	3.70E-03	0/9	3.36E-03	0/9	1.68E-04	0.00108 - 0.103
VOA	Trichloroethene	mg/kg	1.78E-03	2.96E-01	9.73E-02	5/9	N/A	N/A	4/9	2.22E-03	4/9	2.02E-03	5/9	1.01E-04	0.00108 - 0.11
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.61E+00	0/9	1.46E+00	0/9	7.31E-02	0.00108 - 0.103
VOA	Vinyl chloride	mg/kg	--	--	--	0/9	N/A	N/A	0/9	1.42E-04	0/9	1.29E-04	0/9	6.47E-06	0.00108 - 0.103

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.27. Sector 3 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.28. Sector 3 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.96E+03	2.13E+04	8.83E+03	36/36	8/36	1.20E+04	0/36	6.60E+04	0/36	5.99E+04	33/36	3.00E+03	10 - 115
METAL	Antimony	mg/kg	4.02E-01	1.10E+00	6.42E-01	7/36	7/36	2.10E-01	2/36	7.74E-01	2/36	7.04E-01	7/36	3.52E-02	1.96 - 21.1
METAL	Arsenic	mg/kg	7.25E-01	5.88E+01	4.82E+00	36/36	6/36	7.90E+00	36/36	3.32E-02	36/36	3.02E-02	36/36	1.51E-03	1 - 1.19
METAL	Barium	mg/kg	1.21E+01	6.52E+02	9.49E+01	36/36	5/36	1.70E+02	4/36	3.41E+02	4/36	3.11E+02	33/36	1.55E+01	0.803 - 9.31
METAL	Beryllium	mg/kg	2.63E-01	1.96E+00	7.56E-01	36/36	16/36	6.90E-01	0/36	4.29E+01	0/36	3.89E+01	1/36	1.95E+00	0.1 - 0.119
METAL	Boron	mg/kg	8.95E-01	1.96E+00	1.31E+00	12/36	N/A	N/A	0/36	2.82E+01	0/36	2.56E+01	4/36	1.28E+00	3.01 - 3.56
METAL	Cadmium	mg/kg	2.40E-02	7.19E-02	4.65E-02	9/36	0/36	2.10E-01	0/36	1.52E+00	0/36	1.39E+00	1/36	6.93E-02	0.201 - 0.237
METAL	Chromium	mg/kg	3.73E+00	6.48E+01	1.24E+01	36/36	1/36	4.30E+01	0/36	3.96E+06	0/36	3.60E+06	0/36	1.80E+05	0.602 - 0.712
METAL	Cobalt	mg/kg	6.76E-01	6.58E+01	9.03E+00	36/36	8/36	1.30E+01	36/36	5.96E-01	36/36	5.43E-01	36/36	2.71E-02	0.201 - 0.237
METAL	Copper	mg/kg	1.50E+00	8.34E+00	4.09E+00	36/36	0/36	2.50E+01	0/36	6.18E+01	0/36	5.62E+01	25/36	2.81E+00	0.402 - 0.475
METAL	Iron	mg/kg	5.07E+03	1.46E+05	2.39E+04	36/36	8/36	2.80E+04	36/36	7.74E+02	36/36	7.04E+02	36/36	3.52E+01	20.2 - 2200
METAL	Lead	mg/kg	1.48E+00	1.97E+01	4.74E+00	36/36	0/36	2.30E+01	0/36	2.97E+02	0/36	2.70E+02	1/36	1.35E+01	0.402 - 0.475
METAL	Manganese	mg/kg	1.32E+01	4.67E+03	5.38E+02	36/36	6/36	8.20E+02	19/36	6.23E+01	20/36	5.65E+01	36/36	2.83E+00	1 - 116
METAL	Mercury	mg/kg	8.37E-03	7.01E-02	2.09E-02	20/36	0/36	1.30E-01	0/36	6.49E-01	0/36	5.91E-01	3/36	2.95E-02	0.0223 - 0.0282
METAL	Molybdenum	mg/kg	9.90E-02	2.26E+00	4.24E-01	31/36	N/A	N/A	0/36	4.44E+00	0/36	4.03E+00	19/36	2.02E-01	0.201 - 0.237
METAL	Nickel	mg/kg	2.35E+00	1.68E+01	6.68E+00	36/36	0/36	2.20E+01	0/36	5.63E+01	0/36	5.12E+01	33/36	2.56E+00	0.402 - 0.475
METAL	Selenium	mg/kg	3.96E-01	2.62E+00	9.25E-01	30/36	19/36	7.00E-01	8/36	1.14E+00	9/36	1.04E+00	30/36	5.19E-02	1 - 1.19
METAL	Silver	mg/kg	1.41E-01	9.44E+00	2.07E+00	7/36	2/36	2.70E+00	2/36	1.76E+00	2/36	1.60E+00	7/36	7.99E-02	0.489 - 5.26
METAL	Thallium	mg/kg	2.16E-01	3.28E-01	2.81E-01	5/36	0/36	3.40E-01	5/36	3.12E-02	5/36	2.84E-02	5/36	1.42E-03	0.402 - 0.475
METAL	Uranium	mg/kg	3.40E-01	1.95E+00	8.72E-01	36/36	0/36	4.60E+00	0/36	3.96E+00	0/36	3.60E+00	36/36	1.80E-01	0.0402 - 0.0475
METAL	Vanadium	mg/kg	4.93E+00	8.59E+01	2.00E+01	36/36	2/36	3.70E+01	0/36	1.90E+02	0/36	1.73E+02	28/36	8.64E+00	4.02 - 4.75
METAL	Zinc	mg/kg	5.36E+00	5.66E+01	1.89E+01	36/36	0/36	6.00E+01	0/36	8.21E+02	0/36	7.46E+02	4/36	3.73E+01	4.02 - 4.75
ANION	Fluoride	mg/kg	9.45E-01	1.22E+01	3.26E+00	36/36	N/A	N/A	0/36	2.64E+02	0/36	2.40E+02	1/36	1.20E+01	1.03 - 1.22
PPCB	Total PCB	mg/kg	2.02E-03	4.65E-03	3.34E-03	2/40	N/A	N/A	0/40	1.50E-01	0/40	1.36E-01	0/40	6.82E-03	0.00358 - 0.123
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.92E-02	0/40	1.74E-02	0/40	8.72E-04	0.363 - 0.442
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.84E+00	0/40	8.04E+00	0/40	4.02E-01	0.363 - 0.442
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.55E-02	0/40	2.32E-02	0/40	1.16E-03	0.363 - 0.442
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.97E-02	0/40	4.52E-02	0/40	2.26E-03	0.363 - 0.442
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.26E-01	0/40	8.42E-01	0/40	4.21E-02	0.363 - 0.442
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.726 - 0.885
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.06E-03	0/40	6.42E-03	0/40	3.21E-04	0.363 - 0.442
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.47E-03	0/40	1.33E-03	0/40	6.67E-05	0.363 - 0.442
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.47E+00	0/40	7.70E+00	0/40	3.85E-01	0.0363 - 0.0442
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.96E-01	0/40	1.78E-01	0/40	8.91E-03	0.363 - 0.442
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.68E-03	0/40	5.16E-03	0/40	2.58E-04	0.363 - 0.442
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.07E-01	0/40	3.70E-01	0/40	1.85E-02	0.0363 - 0.0442
SVOA	2-Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.66E+00	0/40	1.51E+00	0/40	7.53E-02	0.363 - 0.442
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.76E-01	0/40	1.60E-01	0/40	8.01E-03	0.363 - 0.442
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.363 - 0.442
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.81E-02	0/40	1.65E-02	0/40	8.24E-04	0.363 - 0.442
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.39E-03	0/40	4.90E-03	0/40	2.45E-04	0.363 - 0.442
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.52E-03	0/40	6.84E-03	0/40	3.42E-04	0.363 - 0.442
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.76E+00	0/40	3.42E+00	0/40	1.71E-01	0.363 - 0.442
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.41E-03	0/40	3.10E-03	0/40	1.55E-04	0.363 - 0.442
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.52E-03	0/40	6.84E-03	0/40	3.42E-04	0.363 - 0.442
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.363 - 0.442
SVOA	Acenaphthene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442
SVOA	Acenaphthylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442
SVOA	Acetophenone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.28E+00	0/40	1.17E+00	0/40	5.84E-02	0.363 - 0.442
SVOA	Anthracene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.28E+02	0/40	1.16E+02	0/40	5.81E+00	0.0363 - 0.0442
SVOA	Atrazine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.31E-03	0/40	3.92E-03	0/40	1.96E-04	0.363 - 0.442
SVOA	Benzaldehyde	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.13E-02	0/40	8.30E-02	0/40	4.15E-03	0.363 - 0.442

Table C1.28. Sector 3 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.90E+01	0/40	2.63E+01	0/40	1.32E+00	0.0363 - 0.0442
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.97E-02	0/40	2.70E-02	0/40	1.35E-03	0.363 - 0.442
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.94E-05	0/40	7.22E-05	0/40	3.61E-06	0.363 - 0.442
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.88E-03	0/40	2.62E-03	0/40	1.31E-04	0.363 - 0.442
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.69E-02	1.69E-02	1.69E-02	1/40	N/A	N/A	0/40	2.93E+01	0/40	2.66E+01	0/40	1.33E+00	0.0363 - 0.0442
SVOA	Butyl benzyl phthalate	mg/kg	1.25E-02	1.25E-02	1.25E-02	1/40	N/A	N/A	0/40	5.19E+00	0/40	4.72E+00	0/40	2.36E-01	0.0363 - 0.0442
SVOA	Caprolactam	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.43E+00	0/40	4.94E+00	0/40	2.47E-01	0.363 - 0.442
SVOA	Carbazole	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.27E-01	0/40	7.51E-01	0/40	3.76E-02	0.0363 - 0.0442
SVOA	Dibenzofuran	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.21E-01	0/40	2.92E-01	0/40	1.46E-02	0.363 - 0.442
SVOA	Diethyl phthalate	mg/kg	1.33E-02	1.33E-02	1.33E-02	1/40	N/A	N/A	0/40	1.34E+01	0/40	1.22E+01	0/40	6.08E-01	0.0363 - 0.0442
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.34E+01	0/40	1.22E+01	0/40	6.08E-01	0.0363 - 0.0442
SVOA	Di-n-butyl phthalate	mg/kg	1.25E-02	4.12E-02	1.90E-02	10/40	N/A	N/A	0/40	4.99E+00	0/40	4.54E+00	0/40	2.27E-01	0.0363 - 0.0442
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.24E+02	0/40	1.13E+02	0/40	5.65E+00	0.0363 - 0.0442
SVOA	Diphenylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.13E+00	0/40	4.66E+00	0/40	2.33E-01	0.363 - 0.442
SVOA	Fluoranthene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.96E+02	0/40	1.78E+02	0/40	8.91E+00	0.0363 - 0.0442
SVOA	Fluorene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.20E+01	0/40	1.09E+01	0/40	5.45E-01	0.0363 - 0.0442
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.71E-03	0/40	2.46E-03	0/40	1.23E-04	0.363 - 0.442
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.87E-03	0/40	5.34E-03	0/40	2.67E-04	0.363 - 0.442
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.82E-03	0/40	2.56E-03	0/40	1.28E-04	0.363 - 0.442
SVOA	Hexachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.40E-03	0/40	4.00E-03	0/40	2.00E-04	0.363 - 0.442
SVOA	Isophorone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.68E-01	0/40	5.16E-01	0/40	2.58E-02	0.363 - 0.442
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.53E-01	0/40	5.94E-01	0/40	2.97E-02	0.363 - 0.442
SVOA	Naphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.47E-03	0/40	7.70E-03	0/40	3.85E-04	0.0363 - 0.0442
SVOA	Nitrobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.02E-03	0/40	1.83E-03	0/40	9.17E-05	0.363 - 0.442
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.78E-04	0/40	1.62E-04	0/40	8.10E-06	0.363 - 0.442
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.26E-03	0/40	1.14E-03	0/40	5.71E-05	0.363 - 0.442
SVOA	Phenanthrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	0/40	5.49E-01	0.0363 - 0.0442
SVOA	Phenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.28E+00	0/40	6.62E+00	0/40	3.31E-01	0.363 - 0.442
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.48E-02	0/40	3.16E-02	0/40	1.58E-03	0.363 - 0.442
SVOA	Pyrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.90E+01	0/40	2.63E+01	0/40	1.32E+00	0.0363 - 0.0442
SVOA	Total PAH	mg/kg	1.25E-03	1.25E-03	1.25E-03	1/40	N/A	N/A	0/40	6.47E-01	0/40	5.89E-01	0/40	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/36	N/A	N/A	0/36	2.11E+01	0/36	1.92E+01	0/36	9.58E-01	0.259 - 0.877
RADS	Cesium-137	pCi/g	--	--	--	0/36	0/36	2.80E-01	0/36	1.05E+01	0/36	9.58E+00	0/36	4.79E-01	0.0274 - 0.0716
RADS	Neptunium-237	pCi/g	--	--	--	0/36	N/A	N/A	0/36	1.18E+00	0/36	1.07E+00	0/36	5.36E-02	0.361 - 1.11
RADS	Plutonium-238	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.82E+00	0/36	4.38E+00	0/36	2.19E-01	0.171 - 1.06
RADS	Plutonium-239/240	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.69E+00	0/36	4.26E+00	0/36	2.13E-01	0.301 - 0.89
RADS	Technetium-99	pCi/g	--	--	--	0/36	0/36	2.80E+00	0/36	1.67E-01	0/36	1.52E-01	0/36	7.60E-03	2.14 - 4.15
RADS	Thorium-230	pCi/g	5.47E-01	1.48E+00	9.08E-01	23/36	1/36	1.40E+00	0/36	4.03E-01	0/36	3.66E-01	0/36	1.83E+00	0.301 - 0.995
RADS	Uranium-233/234	pCi/g	5.21E-01	1.02E+00	7.64E-01	14/36	0/36	1.20E+00	0/36	1.09E+00	1/36	9.90E-01	14/36	4.95E-02	0.441 - 1.08
RADS	Uranium-235/236	pCi/g	--	--	--	0/36	0/36	6.00E-02	0/36	1.07E+00	0/36	9.76E-01	0/36	4.88E-02	0.197 - 0.868
RADS	Uranium-238	pCi/g	4.39E-01	1.03E+00	6.81E-01	27/36	0/36	1.20E+00	1/36	8.87E-01	4/36	8.05E-01	27/36	4.03E-02	0.269 - 0.956
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.18E+00	0/40	5.62E+00	0/40	2.81E-01	0.000921 - 0.00137
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.51E-04	0/40	5.92E-04	0/40	2.96E-05	0.000921 - 0.00137
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.63E+01	0/40	5.13E+01	0/40	2.56E+00	0.00461 - 0.00683
VOA	1,1,2-Trichloroethane	mg/kg	4.31E-04	1.99E-03	9.72E-04	4/40	N/A	N/A	4/40	2.97E-04	4/40	2.69E-04	4/40	1.35E-05	0.000921 - 0.00137
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.72E-02	0/40	1.56E-02	0/40	7.82E-04	0.000921 - 0.00137
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.24E-01	0/40	2.04E-01	0/40	1.02E-02	0.000921 - 0.00137
VOA	1,2,3-Trichlorobenzene	mg/kg	4.49E-04	4.49E-04	4.49E-04	1/40	N/A	N/A	0/40	4.60E-02	0/40	4.18E-02	0/40	2.09E-03	0.000921 - 0.00137
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.55E-02	0/40	2.32E-02	0/40	1.16E-03	0.000921 - 0.00137
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.17E-06	0/40	2.88E-06	0/40	1.44E-07	0.000921 - 0.00137
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.62E-05	0/40	4.20E-05	0/40	2.10E-06	0.000921 - 0.00137
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.49E-01	0/40	5.90E-01	0/40	2.95E-02	0.000921 - 0.00137

Table C1.28. Sector 3 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.06E-03	0/40	9.69E-04	0/40	4.84E-05	0.000921 - 0.00137
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.03E-03	0/40	5.48E-03	0/40	2.74E-04	0.000921 - 0.00137
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.18E-01	0/40	3.81E-01	0/40	1.90E-02	0.000921 - 0.00137
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.49E-01	0/40	5.90E-01	0/40	2.95E-02	0.000921 - 0.00137
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.02E-02	0/40	9.24E-03	0/40	4.62E-04	0.000921 - 0.00137
VOA	1,4-Dioxane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.07E-03	0/40	1.88E-03	0/40	9.42E-05	0.0461 - 0.0683
VOA	2-Butanone	mg/kg	4.17E-03	4.17E-03	4.17E-03	1/40	N/A	N/A	0/40	2.55E+00	0/40	2.32E+00	0/40	1.16E-01	0.00461 - 0.00683
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.04E-05	0/40	2.76E-05	0/40	1.38E-06	0.00461 - 0.00688
VOA	2-Hexanone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.93E-02	0/40	1.75E-02	0/40	8.75E-04	0.00461 - 0.00683
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.08E-02	0/40	6.44E-02	0/40	3.22E-03	0.000921 - 0.00137
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.18E-01	0/40	5.62E-01	0/40	2.81E-02	0.00461 - 0.00683
VOA	Acetone	mg/kg	1.59E-03	2.31E-02	4.45E-03	30/40	N/A	N/A	0/40	8.10E+00	0/40	7.36E+00	0/40	3.68E-01	0.00461 - 0.00683
VOA	Acrolein	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.85E-05	0/40	1.68E-05	0/40	8.41E-07	0.00461 - 0.00683
VOA	Acrylonitrile	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.51E-04	0/40	2.28E-04	0/40	1.14E-05	0.00461 - 0.00683
VOA	Benzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.13E-03	0/40	4.66E-03	0/40	2.33E-04	0.000921 - 0.00137
VOA	Bromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.58E-02	0/40	4.16E-02	0/40	2.08E-03	0.000921 - 0.00137
VOA	Bromodichloromethane	mg/kg	4.63E-04	4.63E-04	4.63E-04	1/40	N/A	N/A	0/40	8.03E-04	0/40	7.30E-04	1/40	3.65E-05	0.000921 - 0.00137
VOA	Bromoform	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.92E-02	0/40	1.75E-02	0/40	8.73E-04	0.000921 - 0.00137
VOA	Bromomethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-03	0/40	3.82E-03	0/40	1.91E-04	0.000921 - 0.00137
VOA	Carbon disulfide	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.28E-01	0/40	4.80E-01	0/40	2.40E-02	0.00461 - 0.00683
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.89E-03	0/40	3.54E-03	0/40	1.77E-04	0.000921 - 0.00137
VOA	Chlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.16E-01	0/40	1.06E-01	0/40	5.28E-03	0.000921 - 0.00137
VOA	Chloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.21E+00	0/40	4.74E+00	0/40	2.37E-01	0.000921 - 0.00137
VOA	Chloroform	mg/kg	5.67E-04	1.78E-03	1.07E-03	3/40	N/A	N/A	1/40	1.35E-03	1/40	1.22E-03	3/40	6.12E-05	0.000921 - 0.00137
VOA	Chloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.16E-02	0/40	1.05E-02	0/40	5.26E-04	0.000921 - 0.00137
VOA	*cis* -1,2-Dichloroethene	mg/kg	4.66E-04	7.78E-02	1.09E-02	15/40	N/A	N/A	2/40	2.33E-02	2/40	2.12E-02	12/40	1.06E-03	0.000921 - 0.00137
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-03	0/40	3.36E-03	0/40	1.68E-04	0.000921 - 0.00137
VOA	Cumene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.62E+00	0/40	1.48E+00	0/40	7.38E-02	0.000921 - 0.00137
VOA	Cyclohexane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.86E+01	0/40	2.60E+01	0/40	1.30E+00	0.000921 - 0.00137
VOA	Dibromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.10E-03	0/40	4.64E-03	0/40	2.32E-04	0.000921 - 0.00137
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.69E-01	0/40	6.08E-01	0/40	3.04E-02	0.000921 - 0.00137
VOA	Ethylbenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-02	0/40	3.36E-02	0/40	1.68E-03	0.000921 - 0.00137
VOA	m,p-Xylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-01	0/40	3.82E-01	0/40	1.91E-02	0.00184 - 0.00273
VOA	Methyl acetate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.04E+00	0/40	8.22E+00	0/40	4.11E-01	0.00461 - 0.00683
VOA	Methylcyclohexane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.08E+01	0/40	2.80E+01	0/40	1.40E+00	0.000921 - 0.00137
VOA	Methylene chloride	mg/kg	1.96E-03	2.08E-03	2.02E-03	2/40	N/A	N/A	0/40	5.98E-02	0/40	5.44E-02	0/40	2.72E-03	0.00461 - 0.00683
VOA	Styrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.93E+00	0/40	2.66E+00	0/40	1.33E-01	0.000921 - 0.00137
VOA	Tetrachloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.05E-02	0/40	3.69E-02	0/40	1.84E-03	0.000921 - 0.00137
VOA	Toluene	mg/kg	6.34E-04	4.72E-03	1.49E-03	6/40	N/A	N/A	0/40	1.68E+00	0/40	1.52E+00	0/40	7.62E-02	0.000921 - 0.00137
VOA	Total Xylene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-01	0/40	3.82E-01	0/40	1.91E-02	0.00276 - 0.0041
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.40E-02	0/40	5.83E-02	0/40	2.91E-03	0.000921 - 0.00137
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-03	0/40	3.36E-03	0/40	1.68E-04	0.000921 - 0.00137
VOA	Trichloroethene	mg/kg	4.07E-04	1.23E+00	9.12E-02	34/40	N/A	N/A	24/40	2.22E-03	24/40	2.02E-03	34/40	1.01E-04	0.000921 - 0.123
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.61E+00	0/40	1.46E+00	0/40	7.31E-02	0.000921 - 0.00137
VOA	Vinyl chloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.42E-04	0/40	1.29E-04	0/40	6.47E-06	0.000921 - 0.00137

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.28. Sector 3 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.29. McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	9.52E+02	1.05E+04	5.60E+03	14/14	12/14	3.00E+03	12 - 119
METAL	Antimony	mg/kg	9.32E-01	1.26E+00	1.10E+00	2/14	2/14	3.52E-02	2.26 - 26.2
METAL	Arsenic	mg/kg	6.27E-01	2.30E+01	7.21E+00	14/14	14/14	1.51E-03	1.19 - 1.41
METAL	Barium	mg/kg	2.54E+00	7.10E+01	2.92E+01	14/14	10/14	1.55E+01	0.952 - 1.13
METAL	Beryllium	mg/kg	1.07E-01	1.26E+00	4.66E-01	14/14	0/14	1.95E+00	0.119 - 0.141
METAL	Boron	mg/kg	1.40E+00	3.61E+01	5.95E+00	14/14	14/14	1.28E+00	3.57 - 4.22
METAL	Cadmium	mg/kg	3.78E-02	3.07E-01	9.75E-02	6/14	2/14	6.93E-02	0.238 - 0.281
METAL	Chromium	mg/kg	2.69E+00	6.97E+01	2.29E+01	14/14	0/14	1.80E+05	0.714 - 0.844
METAL	Cobalt	mg/kg	3.00E-01	3.07E+01	6.39E+00	14/14	14/14	2.71E-02	0.238 - 0.281
METAL	Copper	mg/kg	5.13E-01	9.59E+00	3.52E+00	14/14	6/14	2.81E+00	0.476 - 0.563
METAL	Iron	mg/kg	3.68E+03	8.93E+04	2.28E+04	14/14	14/14	3.52E+01	25.5 - 2430
METAL	Lead	mg/kg	1.08E+00	1.60E+01	6.33E+00	14/14	1/14	1.35E+01	0.476 - 0.563
METAL	Manganese	mg/kg	8.55E+00	4.17E+02	8.56E+01	14/14	14/14	2.83E+00	1.19 - 12.4
METAL	Mercury	mg/kg	1.06E-02	1.97E-01	4.66E-02	7/14	2/14	2.95E-02	0.0263 - 0.032
METAL	Molybdenum	mg/kg	1.50E-01	1.32E+00	4.56E-01	9/14	4/14	2.02E-01	0.238 - 0.281
METAL	Nickel	mg/kg	5.47E-01	1.41E+01	6.64E+00	14/14	11/14	2.56E+00	0.476 - 0.563
METAL	Selenium	mg/kg	6.12E-01	3.82E+00	1.61E+00	13/14	13/14	5.19E-02	1.19 - 1.41
METAL	Silver	mg/kg	--	--	--	0/14	0/14	7.99E-02	0.565 - 6.54
METAL	Thallium	mg/kg	--	--	--	0/14	0/14	1.42E-03	0.476 - 0.563
METAL	Uranium	mg/kg	2.15E-01	3.34E+00	1.10E+00	14/14	14/14	1.80E-01	0.0476 - 0.0563
METAL	Vanadium	mg/kg	8.61E+00	6.72E+01	2.82E+01	14/14	13/14	8.64E+00	4.76 - 5.63
METAL	Zinc	mg/kg	5.58E+00	1.01E+02	3.46E+01	14/14	4/14	3.73E+01	4.76 - 5.63
ANION	Fluoride	mg/kg	2.13E+00	5.42E+00	4.05E+00	14/14	0/14	1.20E+01	1.17 - 1.39
PPCB	Total PCB	mg/kg	--	--	--	0/14	0/14	6.82E-03	0.00394 - 0.00508
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/14	0/14	8.72E-04	0.389 - 0.51
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/14	0/14	4.02E-01	0.389 - 0.51
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/14	0/14	1.16E-03	0.389 - 0.51
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/14	0/14	2.26E-03	0.389 - 0.51
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/14	0/14	4.21E-02	0.389 - 0.51
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.778 - 1.02
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/14	0/14	3.21E-04	0.389 - 0.51
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/14	0/14	6.67E-05	0.389 - 0.51
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/14	0/14	3.85E-01	0.0389 - 0.051
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/14	0/14	8.91E-03	0.389 - 0.51
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/14	0/14	2.58E-04	0.389 - 0.51
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/14	0/14	1.85E-02	0.0389 - 0.051
SVOA	2-Methylphenol	mg/kg	--	--	--	0/14	0/14	7.53E-02	0.389 - 0.51
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/14	0/14	8.01E-03	0.389 - 0.51
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.389 - 0.51
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/14	0/14	8.24E-04	0.389 - 0.51
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/14	0/14	2.45E-04	0.389 - 0.51
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/14	0/14	3.42E-04	0.389 - 0.51

Table C1.29. McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/14	0/14	1.71E-01	0.389 - 0.51
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/14	0/14	1.55E-04	0.389 - 0.51
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/14	0/14	3.42E-04	0.389 - 0.51
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/14	0/14	4.36E-03	0.389 - 0.51
SVOA	Acenaphthene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOA	Acenaphthylene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOA	Acetophenone	mg/kg	--	--	--	0/14	0/14	5.84E-02	0.389 - 0.51
SVOA	Anthracene	mg/kg	--	--	--	0/14	0/14	5.81E+00	0.0389 - 0.051
SVOA	Atrazine	mg/kg	--	--	--	0/14	0/14	1.96E-04	0.389 - 0.51
SVOA	Benzaldehyde	mg/kg	--	--	--	0/14	0/14	4.15E-03	0.389 - 0.51
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/14	0/14	1.32E+00	0.0389 - 0.051
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/14	0/14	1.35E-03	0.389 - 0.51
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/14	0/14	3.61E-06	0.389 - 0.51
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/14	0/14	1.31E-04	0.389 - 0.51
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	4.65E-02	4.65E-02	4.65E-02	1/14	0/14	1.33E+00	0.0389 - 0.051
SVOA	Butyl benzyl phthalate	mg/kg	1.80E-02	2.89E-02	2.34E-02	3/14	0/14	2.36E-01	0.0389 - 0.051
SVOA	Caprolactam	mg/kg	--	--	--	0/14	0/14	2.47E-01	0.389 - 0.51
SVOA	Carbazole	mg/kg	--	--	--	0/14	0/14	3.76E-02	0.0389 - 0.051
SVOA	Dibenzofuran	mg/kg	--	--	--	0/14	0/14	1.46E-02	0.389 - 0.51
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/14	0/14	6.08E-01	0.0389 - 0.051
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/14	0/14	6.08E-01	0.0389 - 0.051
SVOA	Di-n-butyl phthalate	mg/kg	1.38E-02	2.93E-02	2.16E-02	2/14	0/14	2.27E-01	0.0389 - 0.051
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/14	0/14	5.65E+00	0.0389 - 0.051
SVOA	Diphenylamine	mg/kg	--	--	--	0/14	0/14	2.33E-01	0.389 - 0.51
SVOA	Fluoranthene	mg/kg	--	--	--	0/14	0/14	8.91E+00	0.0389 - 0.051
SVOA	Fluorene	mg/kg	--	--	--	0/14	0/14	5.45E-01	0.0389 - 0.051
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/14	0/14	1.23E-04	0.389 - 0.51
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/14	0/14	2.67E-04	0.389 - 0.51
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/14	0/14	1.28E-04	0.389 - 0.51
SVOA	Hexachloroethane	mg/kg	--	--	--	0/14	0/14	2.00E-04	0.389 - 0.51
SVOA	Isophorone	mg/kg	--	--	--	0/14	0/14	2.58E-02	0.389 - 0.51
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/14	0/14	2.97E-02	0.389 - 0.51
SVOA	Naphthalene	mg/kg	--	--	--	0/14	0/14	3.85E-04	0.0389 - 0.051
SVOA	Nitrobenzene	mg/kg	--	--	--	0/14	0/14	9.17E-05	0.389 - 0.51
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/14	0/14	8.10E-06	0.389 - 0.51
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/14	0/14	5.71E-05	0.389 - 0.51
SVOA	Phenanthrene	mg/kg	--	--	--	0/14	0/14	5.49E-01	0.0389 - 0.051
SVOA	Phenol	mg/kg	--	--	--	0/14	0/14	3.31E-01	0.389 - 0.51
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/14	0/14	1.58E-03	0.389 - 0.51
SVOA	Pyrene	mg/kg	--	--	--	0/14	0/14	1.32E+00	0.0389 - 0.051
SVOA	Total PAH	mg/kg	--	--	--	0/14	0/14	2.94E-02	-

Table C1.29. McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
RADS	Americium-241	pCi/g	--	--	--	0/14	0/14	9.58E-01	0.406 - 0.994
RADS	Cesium-137	pCi/g	--	--	--	0/14	0/14	4.79E-01	0.0348 - 0.0948
RADS	Neptunium-237	pCi/g	--	--	--	0/14	0/14	5.36E-02	0.45 - 0.845
RADS	Plutonium-238	pCi/g	--	--	--	0/14	0/14	2.19E-01	0.333 - 0.795
RADS	Plutonium-239/240	pCi/g	--	--	--	0/14	0/14	2.13E-01	0.374 - 1.07
RADS	Technetium-99	pCi/g	--	--	--	0/14	0/14	7.60E-03	2.73 - 4.67
RADS	Thorium-230	pCi/g	5.83E-01	2.38E+00	1.30E+00	11/14	2/14	1.83E+00	0.329 - 0.808
RADS	Uranium-233/234	pCi/g	5.87E-01	1.78E+00	1.00E+00	6/14	6/14	4.95E-02	0.463 - 0.765
RADS	Uranium-235/236	pCi/g	--	--	--	0/14	0/14	4.88E-02	0.241 - 0.641
RADS	Uranium-238	pCi/g	4.20E-01	1.55E+00	8.17E-01	9/14	9/14	4.03E-02	0.209 - 0.7
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/14	0/14	2.81E-01	0.00122 - 0.0587
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/14	0/14	2.96E-05	0.00122 - 0.0587
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.52E-03	7.08E-03	5.80E-03	2/14	0/14	2.56E+00	0.00608 - 0.293
VOA	1,1,2-Trichloroethane	mg/kg	6.55E-04	9.62E-04	8.09E-04	2/14	2/14	1.35E-05	0.00122 - 0.0587
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/14	0/14	7.82E-04	0.00122 - 0.0587
VOA	1,1-Dichloroethene	mg/kg	4.50E-04	4.50E-04	4.50E-04	1/14	0/14	1.02E-02	0.00122 - 0.0587
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.09E-03	0.00122 - 0.0587
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/14	0/14	1.16E-03	0.00122 - 0.0587
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/14	0/14	1.44E-07	0.00122 - 0.0587
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/14	0/14	2.10E-06	0.00122 - 0.0587
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.95E-02	0.00122 - 0.0587
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/14	0/14	4.84E-05	0.00122 - 0.0587
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/14	0/14	2.74E-04	0.00122 - 0.0587
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/14	0/14	1.90E-02	0.00122 - 0.0587
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	2.95E-02	0.00122 - 0.0587
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/14	0/14	4.62E-04	0.00122 - 0.0587
VOA	1,4-Dioxane	mg/kg	--	--	--	0/14	0/14	9.42E-05	0.0608 - 2.93
VOA	2-Butanone	mg/kg	1.03E-01	1.03E-01	1.03E-01	1/14	0/14	1.16E-01	0.00608 - 0.293
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/14	0/14	1.38E-06	0.00576 - 0.293
VOA	2-Hexanone	mg/kg	--	--	--	0/14	0/14	8.75E-04	0.00608 - 0.293
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/14	0/14	3.22E-03	0.00122 - 0.0587
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/14	0/14	2.81E-02	0.00608 - 0.293
VOA	Acetone	mg/kg	2.63E-03	2.01E-02	6.48E-03	11/14	0/14	3.68E-01	0.00608 - 0.293
VOA	Acrolein	mg/kg	--	--	--	0/14	0/14	8.41E-07	0.00608 - 0.293
VOA	Acrylonitrile	mg/kg	--	--	--	0/14	0/14	1.14E-05	0.00608 - 0.293
VOA	Benzene	mg/kg	--	--	--	0/14	0/14	2.33E-04	0.00122 - 0.0587
VOA	Bromochloromethane	mg/kg	--	--	--	0/14	0/14	2.08E-03	0.00122 - 0.0587
VOA	Bromodichloromethane	mg/kg	--	--	--	0/14	0/14	3.65E-05	0.00122 - 0.0587
VOA	Bromoform	mg/kg	--	--	--	0/14	0/14	8.73E-04	0.00122 - 0.0587
VOA	Bromomethane	mg/kg	--	--	--	0/14	0/14	1.91E-04	0.00122 - 0.0587
VOA	Carbon disulfide	mg/kg	--	--	--	0/14	0/14	2.40E-02	0.00608 - 0.293
VOA	Carbon tetrachloride	mg/kg	6.56E-04	6.56E-04	6.56E-04	1/14	1/14	1.77E-04	0.00122 - 0.0587

Table C1.29. McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results Min	Max	Avg	FOD	GW Protection Screen DAF 1	DAF 1 SSL	DL Range
VOA	Chlorobenzene	mg/kg	--	--	--	0/14	0/14	5.28E-03	0.00122 - 0.0587
VOA	Chloroethane	mg/kg	--	--	--	0/14	0/14	2.37E-01	0.00122 - 0.0587
VOA	Chloroform	mg/kg	7.84E-04	8.24E-04	8.04E-04	2/14	2/14	6.12E-05	0.00122 - 0.0587
VOA	Chloromethane	mg/kg	--	--	--	0/14	0/14	5.26E-04	0.00122 - 0.0587
VOA	*cis* -1,2-Dichloroethene	mg/kg	2.57E-03	2.88E-02	1.55E-02	4/14	4/14	1.06E-03	0.00122 - 0.0587
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/14	0/14	1.68E-04	0.00122 - 0.0587
VOA	Cumene	mg/kg	--	--	--	0/14	0/14	7.38E-02	0.00122 - 0.0587
VOA	Cyclohexane	mg/kg	--	--	--	0/14	0/14	1.30E+00	0.00122 - 0.0587
VOA	Dibromochloromethane	mg/kg	--	--	--	0/14	0/14	2.32E-04	0.00122 - 0.0587
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/14	0/14	3.04E-02	0.00122 - 0.0587
VOA	Ethylbenzene	mg/kg	--	--	--	0/14	0/14	1.68E-03	0.00122 - 0.0587
VOA	m,p-Xylene	mg/kg	--	--	--	0/14	0/14	1.91E-02	0.00243 - 0.117
VOA	Methyl acetate	mg/kg	--	--	--	0/14	0/14	4.11E-01	0.00608 - 0.293
VOA	Methylcyclohexane	mg/kg	--	--	--	0/14	0/14	1.40E+00	0.00122 - 0.0587
VOA	Methylene chloride	mg/kg	7.43E-03	7.43E-03	7.43E-03	1/14	1/14	2.72E-03	0.00608 - 0.293
VOA	Styrene	mg/kg	--	--	--	0/14	0/14	1.33E-01	0.00122 - 0.0587
VOA	Tetrachloroethene	mg/kg	7.30E-04	1.16E-02	4.39E-03	5/14	3/14	1.84E-03	0.00122 - 0.0587
VOA	Toluene	mg/kg	--	--	--	0/14	0/14	7.62E-02	0.00122 - 0.0587
VOA	Total Xylene	mg/kg	--	--	--	0/14	0/14	1.91E-02	0.00365 - 0.176
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/14	0/14	2.91E-03	0.00122 - 0.0587
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/14	0/14	1.68E-04	0.00122 - 0.0587
VOA	Trichloroethene	mg/kg	7.48E-02	2.36E+00	6.86E-01	6/14	6/14	1.01E-04	0.00126 - 0.144
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/14	0/14	7.31E-02	0.00122 - 0.0587
VOA	Vinyl chloride	mg/kg	--	--	--	0/14	0/14	6.47E-06	0.00122 - 0.0587

(shaded) One or more samples exceed groundwater protection screening
FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
-- = No calculation completed, analyte not detected
Notes:
Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).
Field replicates, or separate samples, are counted independently.
Uranium was screened against uranium (soluble salts).
Total PCBs calculated by laboratory.
Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.30. Sector 4 Surface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	1.72E+03	1.63E+04	7.86E+03	45/45	3/45	1.30E+04	0/45	6.60E+04	0/45	5.99E+04	40/45	3.00E+03	9.76 - 112
METAL	Antimony	mg/kg	4.74E-01	3.85E+00	1.30E+00	17/27	17/27	2.10E-01	13/27	7.74E-01	13/27	7.04E-01	17/27	3.52E-02	1.97 - 20
METAL	Arsenic	mg/kg	2.19E+00	1.10E+01	4.69E+00	30/46	0/46	1.20E+01	30/46	3.32E-02	30/46	3.02E-02	30/46	1.51E-03	1.02 - 20
METAL	Barium	mg/kg	1.46E+01	3.29E+02	6.24E+01	46/46	1/46	2.00E+02	0/46	3.41E+02	1/46	3.11E+02	44/46	1.55E+01	0.781 - 8.18
METAL	Beryllium	mg/kg	1.23E-01	5.83E-01	3.30E-01	26/27	0/27	6.70E-01	0/27	4.29E+01	0/27	3.89E+01	0/27	1.95E+00	0.0976 - 0.5
METAL	Boron	mg/kg	1.17E+00	6.12E+00	3.22E+00	24/26	N/A	N/A	0/26	2.82E+01	0/26	2.56E+01	22/26	1.28E+00	2.93 - 3.53
METAL	Cadmium	mg/kg	2.54E-02	2.40E+00	2.94E-01	25/27	11/27	2.10E-01	1/27	1.52E+00	1/27	1.39E+00	18/27	6.93E-02	0.195 - 2
METAL	Calcium	mg/kg	1.09E+03	1.65E+05	1.93E+04	19/19	0/19	2.00E+05	N/A	N/A	N/A	N/A	N/A	N/A	100 - 2000
METAL	Chromium	mg/kg	7.21E+00	4.50E+01	1.86E+01	46/46	21/46	1.60E+01	0/46	3.96E+06	0/46	3.60E+06	0/46	1.80E+05	0.586 - 2.5
METAL	Cobalt	mg/kg	9.46E-01	9.35E+00	4.64E+00	26/26	0/26	1.40E+01	26/26	5.96E-01	26/26	5.43E-01	26/26	2.71E-02	0.195 - 0.235
METAL	Copper	mg/kg	1.66E+00	3.14E+01	8.70E+00	27/27	2/27	1.90E+01	0/27	6.18E+01	0/27	5.62E+01	25/27	2.81E+00	0.39 - 2.5
METAL	Iron	mg/kg	2.54E+03	3.09E+04	1.44E+04	46/46	1/46	2.80E+04	46/46	7.74E+02	46/46	7.04E+02	46/46	3.52E+01	19.5 - 235
METAL	Lead	mg/kg	1.84E+00	3.66E+01	1.08E+01	27/46	1/46	3.60E+01	0/46	2.97E+02	0/46	2.70E+02	6/46	1.35E+01	0.39 - 20
METAL	Magnesium	mg/kg	3.19E+02	3.96E+03	1.23E+03	19/19	0/19	7.70E+03	N/A	N/A	N/A	N/A	N/A	N/A	2.5 - 5
METAL	Manganese	mg/kg	5.68E+01	1.10E+03	2.58E+02	45/45	0/45	1.50E+03	43/45	6.23E+01	45/45	5.65E+01	45/45	2.83E+00	0.976 - 11.6
METAL	Mercury	mg/kg	9.66E-03	2.90E-01	3.26E-02	22/46	1/46	2.00E-01	0/46	6.49E-01	0/46	5.91E-01	2/46	2.95E-02	0.0215 - 0.2
METAL	Molybdenum	mg/kg	2.53E-01	5.92E+00	8.78E-01	26/26	N/A	N/A	1/26	4.44E+00	1/26	4.03E+00	26/26	2.02E-01	0.195 - 0.235
METAL	Nickel	mg/kg	4.51E+00	5.71E+01	1.05E+01	42/46	2/46	2.10E+01	1/46	5.63E+01	1/46	5.12E+01	42/46	2.56E+00	0.39 - 5
METAL	Potassium	mg/kg	1.61E+02	6.26E+02	4.07E+02	17/19	0/19	1.30E+03	N/A	N/A	N/A	N/A	N/A	N/A	100 - 200
METAL	Selenium	mg/kg	4.39E-01	1.26E+00	7.61E-01	21/45	6/45	8.00E-01	3/45	1.14E+00	5/45	1.04E+00	21/45	5.19E-02	1 - 20
METAL	Silver	mg/kg	1.31E-01	9.97E+00	2.51E+00	11/27	4/27	2.30E+00	4/27	1.76E+00	5/27	1.60E+00	11/27	7.99E-02	0.504 - 5.82
METAL	Sodium	mg/kg	2.40E+02	3.11E+02	2.72E+02	3/19	0/19	3.20E+02	N/A	N/A	N/A	N/A	N/A	N/A	200 - 250
METAL	Thallium	mg/kg	1.50E-01	2.15E-01	1.83E-01	3/27	1/27	2.10E-01	3/27	3.12E-02	3/27	2.84E-02	3/27	1.42E-03	0.39 - 20
METAL	Uranium	mg/kg	7.32E-01	2.38E+02	3.95E+01	30/45	18/45	4.90E+00	20/45	3.96E+00	20/45	3.60E+00	30/45	1.80E-01	0.039 - 100
METAL	Vanadium	mg/kg	6.69E+00	4.41E+01	2.08E+01	45/45	2/45	3.80E+01	0/45	1.90E+02	0/45	1.73E+02	44/45	8.64E+00	2.5 - 4.71
METAL	Zinc	mg/kg	1.15E+01	9.27E+02	8.89E+01	27/27	5/27	6.50E+01	1/27	8.21E+02	1/27	7.46E+02	11/27	3.73E+01	4.09 - 45.9
ANION	Fluoride	mg/kg	4.80E-01	3.69E+01	9.59E+00	26/26	N/A	N/A	0/26	2.64E+02	0/26	2.40E+02	8/26	1.20E+01	1.03 - 1.2
DI/FURA	Total Dioxin/Furans	mg/kg	2.81E-06	5.32E-06	4.14E-06	8/8	N/A	N/A	8/8	1.30E-06	8/8	1.18E-06	8/8	5.91E-08	-
PPCB	Total PCB	mg/kg	1.19E-03	9.99E-01	1.04E-01	20/27	N/A	N/A	3/27	1.50E-01	4/27	1.36E-01	16/27	6.82E-03	0.00336 - 0.182
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.92E-02	0/26	1.74E-02	0/26	8.72E-04	0.332 - 3.83
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.84E+00	0/26	8.04E+00	0/26	4.02E-01	0.332 - 3.83
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.55E-02	0/26	2.32E-02	0/26	1.16E-03	0.332 - 3.83
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.97E-02	0/26	4.52E-02	0/26	2.26E-03	0.332 - 3.83
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.26E-01	0/26	8.42E-01	0/26	4.21E-02	0.332 - 3.83
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.59E-02	0/26	8.72E-02	0/26	4.36E-03	0.664 - 7.66
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.06E-03	0/26	6.42E-03	0/26	3.21E-04	0.332 - 3.83
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.47E-03	0/26	1.33E-03	0/26	6.67E-05	0.332 - 3.83
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.47E+00	0/26	7.70E+00	0/26	3.85E-01	0.0332 - 0.383
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.96E-01	0/26	1.78E-01	0/26	8.91E-03	0.332 - 3.83
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.68E-03	0/26	5.16E-03	0/26	2.58E-04	0.332 - 3.83
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.07E-01	0/26	3.70E-01	0/26	1.85E-02	0.0332 - 0.383
SVOA	2-Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.66E+00	0/26	1.51E+00	0/26	7.53E-02	0.332 - 3.83
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.76E-01	0/26	1.60E-01	0/26	8.01E-03	0.332 - 3.83
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.59E-02	0/26	8.72E-02	0/26	4.36E-03	0.332 - 3.83
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.81E-02	0/26	1.65E-02	0/26	8.24E-04	0.332 - 3.83
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.39E-03	0/26	4.90E-03	0/26	2.45E-04	0.332 - 3.83
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.52E-03	0/26	6.84E-03	0/26	3.42E-04	0.332 - 3.83
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.76E+00	0/26	3.42E+00	0/26	1.71E-01	0.332 - 3.83
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.41E-03	0/26	3.10E-03	0/26	1.55E-04	0.332 - 3.83
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.52E-03	0/26	6.84E-03	0/26	3.42E-04	0.332 - 3.83
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.59E-02	0/26	8.72E-02	0/26	4.36E-03	0.332 - 3.83
SVOA	Acenaphthene	mg/kg	3.40E-02	1.35E-01	7.24E-02	3/26	N/A	N/A	0/26	1.21E+01	0/26	1.10E+01	0/26	5.49E-01	0.0332 - 0.383

Table C1.30. Sector 4 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Acenaphthylene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.21E+01	0/26	1.10E+01	0/26	5.49E-01	0.0332 - 0.383
SVOA	Acetophenone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.28E+00	0/26	1.17E+00	0/26	5.84E-02	0.332 - 3.83
SVOA	Anthracene	mg/kg	1.36E-02	2.59E-01	7.91E-02	6/26	N/A	N/A	0/26	1.28E+02	0/26	1.16E+02	0/26	5.81E+00	0.0332 - 0.383
SVOA	Atrazine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.31E-03	0/26	3.92E-03	0/26	1.96E-04	0.332 - 3.83
SVOA	Benzaldehyde	mg/kg	--	--	--	0/26	N/A	N/A	0/26	9.13E-02	0/26	8.30E-02	0/26	4.15E-03	0.332 - 3.83
SVOA	Benzo(ghi)perylene	mg/kg	1.64E-02	2.03E-01	8.65E-02	11/26	N/A	N/A	0/26	2.90E+01	0/26	2.63E+01	0/26	1.32E+00	0.0332 - 0.383
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.97E-02	0/26	2.70E-02	0/26	1.35E-03	0.332 - 3.83
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.94E-05	0/26	7.22E-05	0/26	3.61E-06	0.332 - 3.83
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.88E-03	0/26	2.62E-03	0/26	1.31E-04	0.332 - 3.83
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.06E-02	3.32E-02	1.72E-02	5/26	N/A	N/A	0/26	2.93E+01	0/26	2.66E+01	0/26	1.33E+00	0.0332 - 0.383
SVOA	Butyl benzyl phthalate	mg/kg	3.08E-02	3.08E-02	3.08E-02	1/26	N/A	N/A	0/26	5.19E+00	0/26	4.72E+00	0/26	2.36E-01	0.0332 - 0.383
SVOA	Caprolactam	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.43E+00	0/26	4.94E+00	0/26	2.47E-01	0.332 - 3.83
SVOA	Carbazole	mg/kg	1.30E-02	4.28E-02	3.12E-02	3/26	N/A	N/A	0/26	8.27E-01	0/26	7.51E-01	2/26	3.76E-02	0.0332 - 0.383
SVOA	Dibenzofuran	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.21E-01	0/26	2.92E-01	0/26	1.46E-02	0.332 - 3.83
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.34E+01	0/26	1.22E+01	0/26	6.08E-01	0.0332 - 0.383
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.34E+01	0/26	1.22E+01	0/26	6.08E-01	0.0332 - 0.383
SVOA	Di-n-butyl phthalate	mg/kg	1.53E-02	3.12E-02	2.01E-02	6/26	N/A	N/A	0/26	4.99E+00	0/26	4.54E+00	0/26	2.27E-01	0.0332 - 0.383
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.24E+02	0/26	1.13E+02	0/26	5.65E+00	0.0332 - 0.383
SVOA	Diphenylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.13E+00	0/26	4.66E+00	0/26	2.33E-01	0.332 - 3.83
SVOA	Fluoranthene	mg/kg	1.43E-02	1.10E+00	2.36E-01	16/26	N/A	N/A	0/26	1.96E+02	0/26	1.78E+02	0/26	8.91E+00	0.0332 - 0.383
SVOA	Fluorene	mg/kg	2.73E-02	4.28E-02	3.51E-02	2/26	N/A	N/A	0/26	1.20E+01	0/26	1.09E+01	0/26	5.45E-01	0.0332 - 0.383
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.71E-03	0/26	2.46E-03	0/26	1.23E-04	0.332 - 3.83
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.87E-03	0/26	5.34E-03	0/26	2.67E-04	0.332 - 3.83
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.82E-03	0/26	2.56E-03	0/26	1.28E-04	0.332 - 3.83
SVOA	Hexachloroethane	mg/kg	--	--	--	0/26	N/A	N/A	0/26	4.40E-03	0/26	4.00E-03	0/26	2.00E-04	0.332 - 3.83
SVOA	Isophorone	mg/kg	--	--	--	0/26	N/A	N/A	0/26	5.68E-01	0/26	5.16E-01	0/26	2.58E-02	0.332 - 3.83
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	6.53E-01	0/26	5.94E-01	0/26	2.97E-02	0.332 - 3.83
SVOA	Naphthalene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	8.47E-03	0/26	7.70E-03	0/26	3.85E-04	0.0332 - 0.383
SVOA	Nitrobenzene	mg/kg	--	--	--	0/26	N/A	N/A	0/26	2.02E-03	0/26	1.83E-03	0/26	9.17E-05	0.332 - 3.83
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.78E-04	0/26	1.62E-04	0/26	8.10E-06	0.332 - 3.83
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	1.26E-03	0/26	1.14E-03	0/26	5.71E-05	0.332 - 3.83
SVOA	Phenanthrene	mg/kg	1.19E-02	7.74E-01	1.70E-01	13/26	N/A	N/A	0/26	1.21E+01	0/26	1.10E+01	1/26	5.49E-01	0.0332 - 0.383
SVOA	Phenol	mg/kg	--	--	--	0/26	N/A	N/A	0/26	7.28E+00	0/26	6.62E+00	0/26	3.31E-01	0.332 - 3.83
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/26	N/A	N/A	0/26	3.48E-02	0/26	3.16E-02	0/26	1.58E-03	0.332 - 3.83
SVOA	Pyrene	mg/kg	1.56E-02	1.03E+00	2.31E-01	15/26	N/A	N/A	0/26	2.90E+01	0/26	2.63E+01	0/26	1.32E+00	0.0332 - 0.383
SVOA	Total PAH	mg/kg	1.70E-03	5.69E-01	1.79E-01	16/26	N/A	N/A	0/26	6.47E-01	0/26	5.89E-01	11/26	2.94E-02	-
RADS	Americium-241	pCi/g	1.52E+00	2.02E+00	1.77E+00	2/47	N/A	N/A	0/47	2.11E+01	0/47	1.92E+01	2/47	9.58E-01	0.0723 - 1.03
RADS	Americium-243	pCi/g	--	--	--	0/1	N/A	N/A	0/1	4.44E-02	0/1	4.03E-02	0/1	2.02E-03	0.0491 - 0.0491
RADS	Cesium-134	pCi/g	--	--	--	0/1	N/A	N/A	0/1	2.77E-01	0/1	2.53E-01	0/1	1.26E-02	0.0162 - 0.0162
RADS	Cesium-137	pCi/g	2.50E-02	2.82E+00	3.92E-01	17/47	2/47	4.90E-01	0/47	1.05E+01	0/47	9.58E+00	2/47	4.79E-01	0.0154 - 0.0778
RADS	Cobalt-60	pCi/g	--	--	--	0/19	N/A	N/A	0/19	3.50E-02	0/19	3.19E-02	0/19	1.59E-03	0.0119 - 0.0533
RADS	Neptunium-237	pCi/g	1.53E-01	8.10E+00	3.46E+00	5/47	5/47	1.00E-01	2/47	1.18E+00	2/47	1.07E+00	5/47	5.36E-02	0.0323 - 1.26
RADS	Neptunium-239	pCi/g	--	--	--	0/1	N/A	N/A	0/1	8.80E-02	0/1	8.00E-02	0/1	4.00E-03	0.169 - 0.169
RADS	Plutonium-238	pCi/g	--	--	--	0/29	0/29	7.30E-02	0/29	4.82E+00	0/29	4.38E+00	0/29	2.19E-01	0.161 - 1.19
RADS	Plutonium-239/240	pCi/g	6.39E-02	1.97E+01	3.57E+00	9/48	9/48	2.50E-02	2/48	4.69E+00	2/48	4.26E+00	4/48	2.13E-01	0.0435 - 1.19
RADS	Technetium-99	pCi/g	2.95E+00	3.23E+02	5.13E+01	14/48	14/48	2.50E+00	14/48	1.67E-01	14/48	1.52E-01	14/48	7.60E-03	1.58 - 4.76
RADS	Thorium-228	pCi/g	3.98E-01	3.98E-01	3.98E-01	1/1	0/1	1.60E+00	1/1	2.16E-04	1/1	1.96E-04	1/1	9.80E-06	0.0642 - 0.0642
RADS	Thorium-230	pCi/g	2.65E-01	7.78E+01	4.87E+00	39/48	12/48	1.50E+00	2/48	4.03E+01	2/48	3.66E+01	11/48	1.83E+00	0.0882 - 1.15
RADS	Thorium-232	pCi/g	4.17E-01	4.17E-01	4.17E-01	1/1	0/1	1.50E+00	1/1	2.16E-01	1/1	1.96E-01	1/1	9.80E-03	0.0438 - 0.0438
RADS	Uranium-233/234	pCi/g	5.37E-01	2.27E+02	1.67E+01	26/28	21/28	1.20E+00	22/28	1.09E+00	23/28	9.90E-01	26/28	4.95E-02	0.255 - 0.976
RADS	Uranium-234	pCi/g	1.92E+00	3.32E+00	2.48E+00	6/17	6/17	1.20E+00	6/17	1.09E+00	6/17	9.90E-01	6/17	4.95E-02	0.217 - 1.3
RADS	Uranium-235	pCi/g	3.08E-02	2.64E-01	1.20E-01	18/19	15/19	6.00E-02	0/19	1.07E+00	0/19	9.76E-01	16/19	4.88E-02	0.0176 - 0.0489

Table C1.30. Sector 4 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Uranium-235/236	pCi/g	3.42E-01	1.61E+01	4.48E+00	6/28	6/28	6.00E-02	2/28	1.07E+00	2/28	9.76E-01	6/28	4.88E-02	0.135 - 0.913
RADS	Uranium-238	pCi/g	5.34E-01	3.30E+02	1.54E+01	45/46	37/46	1.20E+00	41/46	8.87E-01	42/46	8.05E-01	45/46	4.03E-02	0.188 - 1.31
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.18E+00	0/39	5.62E+00	0/39	2.81E-01	0.000808 - 1.3
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.51E-04	0/39	5.92E-04	0/39	2.96E-05	0.000808 - 1.3
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.63E+01	0/28	5.13E+01	0/28	2.56E+00	0.00404 - 0.00735
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.97E-04	0/39	2.69E-04	0/39	1.35E-05	0.000808 - 1.3
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.72E-02	0/39	1.56E-02	0/39	7.82E-04	0.000808 - 1.3
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.24E-01	0/39	2.04E-01	0/39	1.02E-02	0.000808 - 1.3
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.60E-02	0/28	4.18E-02	0/28	2.09E-03	0.000808 - 0.00147
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.55E-02	0/28	2.32E-02	0/28	1.16E-03	0.000808 - 0.00147
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.17E-06	0/28	2.88E-06	0/28	1.44E-07	0.000808 - 0.00147
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.62E-05	0/28	4.20E-05	0/28	2.10E-06	0.000808 - 0.00147
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.49E-01	0/28	5.90E-01	0/28	2.95E-02	0.000808 - 0.00147
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.06E-03	0/39	9.69E-04	0/39	4.84E-05	0.000808 - 1.3
VOA	1,2-Dichloroethene	mg/kg	--	--	--	0/1	N/A	N/A	0/1	1.05E-01	0/1	9.56E-02	0/1	4.78E-03	0.14 - 0.14
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.03E-03	0/39	5.48E-03	0/39	2.74E-04	0.000808 - 1.3
VOA	1,2-Dimethylbenzene	mg/kg	3.15E-04	2.21E-02	1.12E-02	2/39	N/A	N/A	0/39	4.18E-01	0/39	3.81E-01	1/39	1.90E-02	0.000808 - 1.3
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.49E-01	0/28	5.90E-01	0/28	2.95E-02	0.000808 - 0.00147
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.02E-02	0/28	9.24E-03	0/28	4.62E-04	0.000808 - 0.00147
VOA	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.07E-03	0/28	1.88E-03	0/28	9.42E-05	0.0404 - 0.0735
VOA	2-Butanone	mg/kg	1.63E-03	1.80E-02	7.25E-03	8/39	N/A	N/A	0/39	2.55E+00	0/39	2.32E+00	0/39	1.16E-01	0.00404 - 1.3
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.04E-05	0/28	2.76E-05	0/28	1.38E-06	0.00404 - 0.00735
VOA	2-Hexanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.93E-02	0/39	1.75E-02	0/39	8.75E-04	0.00404 - 1.3
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.08E-02	0/28	6.44E-02	0/28	3.22E-03	0.000808 - 0.00147
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/39	N/A	N/A	0/39	6.18E-01	0/39	5.62E-01	0/39	2.81E-02	0.00404 - 1.3
VOA	Acetone	mg/kg	1.94E-03	1.40E-01	2.58E-02	29/39	N/A	N/A	0/39	8.10E+00	0/39	7.36E+00	0/39	3.68E-01	0.00404 - 1.3
VOA	Acrolein	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.85E-05	0/28	1.68E-05	0/28	8.41E-07	0.00404 - 0.00735
VOA	Acrylonitrile	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.51E-04	0/28	2.28E-04	0/28	1.14E-05	0.00404 - 0.00735
VOA	Benzene	mg/kg	3.47E-04	4.02E-03	1.59E-03	4/39	N/A	N/A	0/39	5.13E-03	0/39	4.66E-03	4/39	2.33E-04	0.000808 - 1.3
VOA	Bromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.58E-02	0/28	4.16E-02	0/28	2.08E-03	0.000808 - 0.00147
VOA	Bromodichloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	8.03E-04	0/39	7.30E-04	0/39	3.65E-05	0.000808 - 1.3
VOA	Bromoform	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.92E-02	0/39	1.75E-02	0/39	8.73E-04	0.000808 - 1.3
VOA	Bromomethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	4.20E-03	0/39	3.82E-03	0/39	1.91E-04	0.000808 - 1.3
VOA	Carbon disulfide	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.28E-01	0/39	4.80E-01	0/39	2.40E-02	0.00404 - 1.3
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.89E-03	0/39	3.54E-03	0/39	1.77E-04	0.000808 - 1.3
VOA	Chlorobenzene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.16E-01	0/39	1.06E-01	0/39	5.28E-03	0.000808 - 1.3
VOA	Chloroethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.21E+00	0/39	4.74E+00	0/39	2.37E-01	0.000808 - 1.3
VOA	Chloroform	mg/kg	6.38E-04	1.55E-03	1.02E-03	7/39	N/A	N/A	2/39	1.35E-03	2/39	1.22E-03	7/39	6.12E-05	0.000808 - 1.3
VOA	Chloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	1.16E-02	0/39	1.05E-02	0/39	5.26E-04	0.000808 - 1.3
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.50E-04	7.46E-02	8.35E-03	16/38	N/A	N/A	1/38	2.33E-02	2/38	2.12E-02	11/38	1.06E-03	0.000808 - 1.3
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.70E-03	0/39	3.36E-03	0/39	1.68E-04	0.000808 - 1.3
VOA	Cumene	mg/kg	1.69E-03	1.69E-03	1.69E-03	1/28	N/A	N/A	0/28	1.62E+00	0/28	1.48E+00	0/28	7.38E-02	0.000808 - 0.00147
VOA	Cyclohexane	mg/kg	4.15E-04	4.81E-02	7.61E-03	7/28	N/A	N/A	0/28	2.86E+01	0/28	2.60E+01	0/28	1.30E+00	0.000808 - 0.00147
VOA	Dibromochloromethane	mg/kg	--	--	--	0/39	N/A	N/A	0/39	5.10E-03	0/39	4.64E-03	0/39	2.32E-04	0.000808 - 1.3
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.69E-01	0/28	6.08E-01	0/28	3.04E-02	0.000808 - 0.00147
VOA	Ethylbenzene	mg/kg	3.49E-04	2.32E-02	8.19E-03	3/39	N/A	N/A	0/39	3.70E-02	0/39	3.36E-02	1/39	1.68E-03	0.000808 - 1.3
VOA	m,p-Xylene	mg/kg	8.30E-04	6.29E-02	2.15E-02	3/39	N/A	N/A	0/39	4.20E-01	0/39	3.82E-01	1/39	1.91E-02	0.00162 - 2.5
VOA	Methyl acetate	mg/kg	1.88E-02	1.88E-02	1.88E-02	1/28	N/A	N/A	0/28	9.04E+00	0/28	8.22E+00	0/28	4.11E-01	0.00404 - 0.00735
VOA	Methylcyclohexane	mg/kg	3.66E-04	6.34E-02	7.27E-03	12/28	N/A	N/A	0/28	3.08E+01	0/28	2.80E+01	0/28	1.40E+00	0.000808 - 0.00147
VOA	Methylene chloride	mg/kg	2.72E-03	7.12E-03	4.69E-03	10/39	N/A	N/A	0/39	5.98E-02	0/39	5.44E-02	9/39	2.72E-03	0.00404 - 1.3
VOA	Styrene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	2.93E+00	0/39	2.66E+00	0/39	1.33E-01	0.000808 - 1.3
VOA	Tetrachloroethene	mg/kg	3.81E-04	3.81E-04	3.81E-04	1/39	N/A	N/A	0/39	4.05E-02	0/39	3.69E-02	0/39	1.84E-03	0.000808 - 1.3

Table C1.30. Sector 4 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Toluene	mg/kg	3.43E-04	6.06E-02	8.58E-03	17/39	N/A	N/A	0/39	1.68E+00	0/39	1.52E+00	0/39	7.62E-02	0.000808 - 1.3
VOA	Total Xylene	mg/kg	1.14E-03	8.50E-02	4.31E-02	2/28	N/A	N/A	0/28	4.20E-01	0/28	3.82E-01	1/28	1.91E-02	0.00242 - 0.00441
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.33E-04	1.18E-03	8.57E-04	2/38	N/A	N/A	0/38	6.40E-02	0/38	5.83E-02	0/38	2.91E-03	0.000808 - 1.3
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/39	N/A	N/A	0/39	3.70E-03	0/39	3.36E-03	0/39	1.68E-04	0.000808 - 1.3
VOA	Trichloroethene	mg/kg	4.68E-04	6.02E-01	8.92E-02	33/39	N/A	N/A	27/39	2.22E-03	27/39	2.02E-03	33/39	1.01E-04	0.000808 - 0.3
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.61E+00	0/28	1.46E+00	0/28	7.31E-02	0.000808 - 0.00147
VOA	Vinyl acetate	mg/kg	--	--	--	0/11	N/A	N/A	0/11	1.91E-01	0/11	1.74E-01	0/11	8.70E-03	0.01 - 1.3
VOA	Vinyl chloride	mg/kg	1.53E-03	1.53E-03	1.53E-03	1/39	N/A	N/A	1/39	1.42E-04	1/39	1.29E-04	1/39	6.47E-06	0.000808 - 1.3

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.31. Sector 4 Subsurface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	3.02E+03	2.39E+04	9.77E+03	172/172	38/172	1.20E+04	0/172	6.60E+04	0/172	5.99E+04	172/172	3.00E+03	10.9 - 125
METAL	Antimony	mg/kg	4.43E-01	1.41E+00	9.06E-01	24/36	24/36	2.10E-01	14/36	7.74E-01	14/36	7.04E-01	24/36	3.52E-02	2.11 - 2.49
METAL	Arsenic	mg/kg	2.27E+00	2.29E+01	6.27E+00	57/172	10/172	7.90E+00	57/172	3.32E-02	57/172	3.02E-02	57/172	1.51E-03	1.02 - 20
METAL	Barium	mg/kg	2.24E+01	1.62E+03	1.05E+02	172/172	12/172	1.70E+02	2/172	3.41E+02	2/172	3.11E+02	172/172	1.55E+01	0.819 - 9.58
METAL	Beryllium	mg/kg	2.32E-01	9.57E-01	4.93E-01	36/36	4/36	6.90E-01	0/36	4.29E+01	0/36	3.89E+01	0/36	1.95E+00	0.102 - 0.583
METAL	Boron	mg/kg	9.61E-01	4.41E+00	2.03E+00	29/36	N/A	N/A	0/36	2.82E+01	0/36	2.56E+01	22/36	1.28E+00	3.07 - 17.5
METAL	Cadmium	mg/kg	2.42E-02	3.39E-01	6.75E-02	21/36	1/36	2.10E-01	0/36	1.52E+00	0/36	1.39E+00	5/36	6.93E-02	0.205 - 0.254
METAL	Calcium	mg/kg	2.40E+02	2.52E+05	6.01E+03	136/136	10/136	6.10E+03	0/136	N/A	0/136	N/A	0/136	N/A	100 - 2000
METAL	Chromium	mg/kg	6.16E+00	1.17E+02	1.55E+01	172/172	1/172	4.30E+01	0/172	3.96E+06	0/172	3.60E+06	0/172	1.80E+05	0.614 - 3.5
METAL	Cobalt	mg/kg	3.93E+00	1.20E+01	5.94E+00	36/36	0/36	1.30E+01	36/36	5.96E-01	36/36	5.43E-01	36/36	2.71E-02	0.205 - 1.17
METAL	Copper	mg/kg	5.10E+00	2.00E+01	9.40E+00	36/36	0/36	2.50E+01	0/36	6.18E+01	0/36	5.62E+01	36/36	2.81E+00	0.409 - 2.33
METAL	Iron	mg/kg	4.36E+03	5.51E+04	1.49E+04	172/172	4/172	2.80E+04	172/172	7.74E+02	172/172	7.04E+02	172/172	3.52E+01	20 - 446
METAL	Lead	mg/kg	7.01E+00	1.07E+02	1.63E+01	41/172	6/172	2.30E+01	0/172	2.97E+02	0/172	2.70E+02	8/172	1.35E+01	0.409 - 20
METAL	Magnesium	mg/kg	1.16E+02	7.84E+03	1.34E+03	136/136	5/136	2.10E+03	0/136	N/A	0/136	N/A	0/136	N/A	2.5 - 5
METAL	Manganese	mg/kg	7.86E+01	3.05E+03	3.86E+02	172/172	9/172	8.20E+02	172/172	6.23E+01	172/172	5.65E+01	172/172	2.83E+00	1.17 - 119
METAL	Mercury	mg/kg	1.02E-02	5.70E-01	4.13E-02	26/172	1/172	1.30E-01	0/172	6.49E-01	0/172	5.91E-01	4/172	2.95E-02	0.0247 - 0.2
METAL	Molybdenum	mg/kg	1.96E-01	1.22E+00	4.33E-01	36/36	N/A	N/A	0/36	4.44E+00	0/36	4.03E+00	34/36	2.02E-01	0.205 - 0.254
METAL	Nickel	mg/kg	4.71E+00	7.36E+01	1.00E+01	138/172	1/172	2.20E+01	1/172	5.63E+01	1/172	5.12E+01	138/172	2.56E+00	0.409 - 5
METAL	Potassium	mg/kg	1.69E+02	1.07E+03	4.50E+02	136/136	2/136	9.50E+02	0/136	N/A	0/136	N/A	0/136	N/A	100 - 200
METAL	Selenium	mg/kg	5.64E-01	3.46E+00	1.14E+00	48/165	43/165	7.00E-01	18/165	1.14E+00	26/165	1.04E+00	48/165	5.19E-02	1 - 20
METAL	Silver	mg/kg	3.38E-01	1.25E+00	7.16E-01	3/36	0/36	2.70E+00	0/36	1.76E+00	0/36	1.60E+00	3/36	7.99E-02	0.526 - 6.21
METAL	Sodium	mg/kg	2.06E+02	4.94E+02	3.34E+02	77/136	31/136	3.40E+02	0/136	N/A	0/136	N/A	0/136	N/A	200 - 250
METAL	Thallium	mg/kg	1.63E-01	2.54E-01	2.07E-01	14/36	0/36	3.40E-01	14/36	3.12E-02	14/36	2.84E-02	14/36	1.42E-03	0.409 - 0.509
METAL	Uranium	mg/kg	5.16E-01	3.40E+02	8.47E+01	69/172	36/172	4.60E+00	36/172	3.96E+00	36/172	3.60E+00	69/172	1.80E-01	0.0409 - 1000
METAL	Vanadium	mg/kg	8.44E+00	5.22E+01	2.44E+01	172/172	14/172	3.70E+01	0/172	1.90E+02	0/172	1.73E+02	171/172	8.64E+00	2.5 - 23.3
METAL	Zinc	mg/kg	1.57E+01	3.36E+02	4.73E+01	36/36	4/36	6.00E+01	0/36	8.21E+02	0/36	7.46E+02	11/36	3.73E+01	4.09 - 5.09
ANION	Fluoride	mg/kg	8.80E-01	2.38E+01	8.16E+00	36/36	N/A	N/A	0/36	2.64E+02	0/36	2.40E+02	8/36	1.20E+01	1.09 - 1.27
PPCB	Total PCB	mg/kg	1.52E-03	9.87E-02	1.83E-02	16/60	N/A	N/A	0/60	1.50E-01	0/60	1.36E-01	5/60	6.82E-03	0.00339 - 0.0185
DI/FURA	Total Dioxin/Furans	mg/kg	2.75E-06	5.39E-05	1.25E-05	18/18	N/A	N/A	18/18	1.30E-06	18/18	1.18E-06	18/18	5.91E-08	-
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/35	N/A	N/A	0/35	1.92E-02	0/35	1.74E-02	0/35	8.72E-04	0.344 - 4
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.84E+00	0/60	8.04E+00	0/60	4.02E-01	0.344 - 4
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.55E-02	0/60	2.32E-02	0/60	1.16E-03	0.344 - 4
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.97E-02	0/60	4.52E-02	0/60	2.26E-03	0.344 - 4
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	9.26E-01	0/60	8.42E-01	0/60	4.21E-02	0.344 - 4
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	9.59E-02	0/60	8.72E-02	0/60	4.36E-03	0.688 - 8.01
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.06E-03	0/60	6.42E-03	0/60	3.21E-04	0.344 - 4
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.47E-03	0/60	1.33E-03	0/60	6.67E-05	0.344 - 4
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	8.47E+00	0/60	7.70E+00	0/60	3.85E-01	0.0344 - 0.4
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.96E-01	0/60	1.78E-01	0/60	8.91E-03	0.344 - 4
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.68E-03	0/60	5.16E-03	0/60	2.58E-04	0.344 - 4
SVOA	2-Methylnaphthalene	mg/kg	1.21E-02	1.78E-01	4.73E-02	7/60	N/A	N/A	0/60	4.07E-01	0/60	3.70E-01	4/60	1.85E-02	0.0344 - 0.4
SVOA	2-Methylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.66E+00	0/60	1.51E+00	0/60	7.53E-02	0.344 - 4
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.76E-01	0/60	1.60E-01	0/60	8.01E-03	0.344 - 4
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	9.59E-02	0/60	8.72E-02	0/60	4.36E-03	0.344 - 4
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.81E-02	0/60	1.65E-02	0/60	8.24E-04	0.344 - 4
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.39E-03	0/60	4.90E-03	0/60	2.45E-04	0.344 - 4
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.52E-03	0/60	6.84E-03	0/60	3.42E-04	0.344 - 4
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.76E+00	0/60	3.42E+00	0/60	1.71E-01	0.344 - 4
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.41E-03	0/60	3.10E-03	0/60	1.55E-04	0.344 - 4
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.52E-03	0/60	6.84E-03	0/60	3.42E-04	0.344 - 4
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	9.59E-02	0/60	8.72E-02	0/60	4.36E-03	0.344 - 4
SVOA	Acenaphthene	mg/kg	1.32E-02	7.73E-01	1.98E-01	7/60	N/A	N/A	0/60	1.21E+01	0/60	1.10E+01	1/60	5.49E-01	0.0344 - 0.4

Table C1.31. Sector 4 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Acenaphthylene	mg/kg	1.17E-02	1.17E-02	1.17E-02	1/60	N/A	N/A	0/60	1.21E+01	0/60	1.10E+01	0/60	5.49E-01	0.0344 - 0.4
SVOA	Acetophenone	mg/kg	--	--	--	0/35	N/A	N/A	0/35	1.28E+00	0/35	1.17E+00	0/35	5.84E-02	0.344 - 4
SVOA	Anthracene	mg/kg	1.35E-02	1.84E+00	2.81E-01	8/60	N/A	N/A	0/60	1.28E+02	0/60	1.16E+02	0/60	5.81E+00	0.0344 - 0.4
SVOA	Atrazine	mg/kg	--	--	--	0/35	N/A	N/A	0/35	4.31E-03	0/35	3.92E-03	0/35	1.96E-04	0.344 - 4
SVOA	Benzaldehyde	mg/kg	--	--	--	0/35	N/A	N/A	0/35	9.13E-02	0/35	8.30E-02	0/35	4.15E-03	0.344 - 4
SVOA	Benzenemethanol	mg/kg	1.73E-01	2.80E-01	2.46E-01	4/25	N/A	N/A	0/25	1.05E+00	0/25	9.52E-01	4/25	4.76E-02	0.345 - 3.92
SVOA	Benzo(ghi)perylene	mg/kg	2.07E-02	1.10E+00	2.49E-01	5/60	N/A	N/A	0/60	2.90E+01	0/60	2.63E+01	0/60	1.32E+00	0.0344 - 0.4
SVOA	Benzoic acid	mg/kg	--	--	--	0/25	N/A	N/A	0/25	3.32E+01	0/25	3.02E+01	0/25	1.51E+00	0.689 - 7.83
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.97E-02	0/60	2.70E-02	0/60	1.35E-03	0.344 - 4
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.94E-05	0/60	7.22E-05	0/60	3.61E-06	0.344 - 4
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.88E-03	0/60	2.62E-03	0/60	1.31E-04	0.344 - 4
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.32E-02	2.50E-01	8.04E-02	4/60	N/A	N/A	0/60	2.93E+01	0/60	2.66E+01	0/60	1.33E+00	0.0344 - 3.92
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.19E+00	0/60	4.72E+00	0/60	2.36E-01	0.0344 - 3.92
SVOA	Caprolactam	mg/kg	--	--	--	0/35	N/A	N/A	0/35	5.43E+00	0/35	4.94E+00	0/35	2.47E-01	0.344 - 4
SVOA	Carbazole	mg/kg	1.48E-02	7.66E-01	2.65E-01	4/35	N/A	N/A	0/35	8.27E-01	1/35	7.51E-01	3/35	3.76E-02	0.0344 - 0.4
SVOA	Dibenzofuran	mg/kg	3.24E-01	4.87E-01	4.06E-01	2/60	N/A	N/A	2/60	3.21E-01	2/60	2.92E-01	2/60	1.46E-02	0.344 - 4
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.34E+01	0/60	1.22E+01	0/60	6.08E-01	0.0344 - 3.92
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.34E+01	0/60	1.22E+01	0/60	6.08E-01	0.0344 - 3.92
SVOA	Di-n-butyl phthalate	mg/kg	1.31E-02	2.38E-02	1.82E-02	7/60	N/A	N/A	0/60	4.99E+00	0/60	4.54E+00	0/60	2.27E-01	0.0344 - 3.92
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.24E+02	0/60	1.13E+02	0/60	5.65E+00	0.0344 - 3.92
SVOA	Diphenylamine	mg/kg	--	--	--	0/35	N/A	N/A	0/35	5.13E+00	0/35	4.66E+00	0/35	2.33E-01	0.344 - 4
SVOA	Fluoranthene	mg/kg	1.31E-02	7.38E+00	6.01E-01	16/60	N/A	N/A	0/60	1.96E+02	0/60	1.78E+02	0/60	8.91E+00	0.0344 - 0.4
SVOA	Fluorene	mg/kg	1.58E-02	1.01E+00	2.52E-01	6/60	N/A	N/A	0/60	1.20E+01	0/60	1.09E+01	1/60	5.45E-01	0.0344 - 0.4
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.71E-03	0/60	2.46E-03	0/60	1.23E-04	0.344 - 4
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.87E-03	0/60	5.34E-03	0/60	2.67E-04	0.344 - 4
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.82E-03	0/60	2.56E-03	0/60	1.28E-04	0.344 - 4
SVOA	Hexachloroethane	mg/kg	--	--	--	0/60	N/A	N/A	0/60	4.40E-03	0/60	4.00E-03	0/60	2.00E-04	0.344 - 4
SVOA	Isophorone	mg/kg	--	--	--	0/60	N/A	N/A	0/60	5.68E-01	0/60	5.16E-01	0/60	2.58E-02	0.344 - 4
SVOA	m,p-Cresol	mg/kg	--	--	--	0/25	N/A	N/A	0/25	6.53E-01	0/25	5.94E-01	0/25	2.97E-02	0.345 - 3.92
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/35	N/A	N/A	0/35	6.53E-01	0/35	5.94E-01	0/35	2.97E-02	0.344 - 4
SVOA	Naphthalene	mg/kg	1.76E-02	3.67E-01	1.55E-01	4/60	N/A	N/A	4/60	8.47E-03	4/60	7.70E-03	4/60	3.85E-04	0.0344 - 0.4
SVOA	Nitrobenzene	mg/kg	--	--	--	0/60	N/A	N/A	0/60	2.02E-03	0/60	1.83E-03	0/60	9.17E-05	0.344 - 4
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.78E-04	0/60	1.62E-04	0/60	8.10E-06	0.344 - 4
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	1.26E-03	0/60	1.14E-03	0/60	5.71E-05	0.344 - 4
SVOA	Phenanthrene	mg/kg	1.31E-02	7.80E+00	5.38E-01	19/60	N/A	N/A	0/60	1.21E+01	0/60	1.10E+01	2/60	5.49E-01	0.0344 - 0.4
SVOA	Phenol	mg/kg	--	--	--	0/60	N/A	N/A	0/60	7.28E+00	0/60	6.62E+00	0/60	3.31E-01	0.344 - 4
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/60	N/A	N/A	0/60	3.48E-02	0/60	3.16E-02	0/60	1.58E-03	0.344 - 4
SVOA	Pyrene	mg/kg	1.26E-02	5.60E+00	4.89E-01	15/60	N/A	N/A	0/60	2.90E+01	0/60	2.63E+01	1/60	1.32E+00	0.0344 - 0.4
SVOA	Total PAH	mg/kg	2.08E-03	3.55E+00	4.03E-01	11/60	N/A	N/A	1/60	6.47E-01	1/60	5.89E-01	7/60	2.94E-02	-
RADS	Americium-241	pCi/g	6.96E-01	6.96E-01	6.96E-01	1/173	N/A	N/A	0/173	2.11E+01	0/173	1.92E+01	0/173	9.58E-01	0.0597 - 1.11
RADS	Cesium-137	pCi/g	2.71E-02	8.68E-02	5.23E-02	6/173	0/173	2.80E-01	0/173	1.05E+01	0/173	9.58E+00	0/173	4.79E-01	0.0148 - 0.105
RADS	Cobalt-60	pCi/g	--	--	--	0/137	N/A	N/A	0/137	3.50E-02	0/137	3.19E-02	0/137	1.59E-03	0.0128 - 0.0713
RADS	Neptunium-237	pCi/g	2.09E+00	2.09E+00	2.09E+00	1/173	N/A	N/A	1/173	1.18E+00	1/173	1.07E+00	1/173	5.36E-02	0.0293 - 1.41
RADS	Plutonium-238	pCi/g	--	--	--	0/36	N/A	N/A	0/36	4.82E+00	0/36	4.38E+00	0/36	2.19E-01	0.239 - 0.985
RADS	Plutonium-239/240	pCi/g	5.94E-02	3.00E+00	1.53E+00	2/173	N/A	N/A	0/173	4.69E+00	0/173	4.26E+00	1/173	2.13E-01	0.05 - 1.08
RADS	Technetium-99	pCi/g	2.30E+00	1.95E+01	4.85E+00	10/173	6/173	2.80E+00	10/173	1.67E-01	10/173	1.52E-01	10/173	7.60E-03	1.58 - 4.76
RADS	Thorium-230	pCi/g	1.49E-01	2.24E+00	5.41E-01	164/173	4/173	1.40E+00	0/173	4.03E+01	0/173	3.66E+01	1/173	1.83E+00	0.0852 - 0.944
RADS	Uranium-233/234	pCi/g	6.06E-01	3.71E+00	1.26E+00	27/36	12/36	1.20E+00	13/36	1.09E+00	18/36	9.90E-01	27/36	4.95E-02	0.308 - 1.15
RADS	Uranium-234	pCi/g	1.23E+00	2.61E+00	1.96E+00	4/97	4/97	1.20E+00	4/97	1.09E+00	4/97	9.90E-01	4/97	4.95E-02	0.061 - 1.43
RADS	Uranium-235	pCi/g	2.55E-02	1.67E-01	5.45E-02	100/137	22/137	6.00E-02	0/137	1.07E+00	0/137	9.76E-01	44/137	4.88E-02	0.0198 - 0.0971
RADS	Uranium-235/236	pCi/g	6.10E-01	6.10E-01	6.10E-01	1/36	1/36	6.00E-02	0/36	1.07E+00	0/36	9.76E-01	1/36	4.88E-02	0.125 - 1.03
RADS	Uranium-238	pCi/g	5.12E-01	5.43E+00	1.26E+00	129/142	50/142	1.20E+00	97/142	8.87E-01	108/142	8.05E-01	129/142	4.03E-02	0.125 - 1.47

Table C1.31. Sector 4 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	6.18E+00	0/113	5.62E+00	0/113	2.81E-01	0.000864 - 1.3
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	6.51E-04	0/113	5.92E-04	0/113	2.96E-05	0.000864 - 1.3
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	5.63E+01	0/48	5.13E+01	0/48	2.56E+00	0.00432 - 0.00938
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	2.97E-04	0/113	2.69E-04	0/113	1.35E-05	0.000864 - 1.3
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.72E-02	0/113	1.56E-02	0/113	7.82E-04	0.000864 - 1.3
VOA	1,1-Dichloroethene	mg/kg	3.78E-04	4.65E-02	5.98E-03	10/138	N/A	N/A	0/138	2.24E-01	0/138	2.04E-01	1/138	1.02E-02	0.000862 - 1.3
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.60E-02	0/48	4.18E-02	0/48	2.09E-03	0.000864 - 0.00188
VOA	1,2,4-Trichlorobenzene	mg/kg	1.95E-03	1.95E-03	1.95E-03	1/48	N/A	N/A	0/48	2.55E-02	0/48	2.32E-02	1/48	1.16E-03	0.000864 - 0.00188
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	3.17E-06	0/48	2.88E-06	0/48	1.44E-07	0.000864 - 0.00188
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.62E-05	0/48	4.20E-05	0/48	2.10E-06	0.000864 - 0.00188
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	6.49E-01	0/48	5.90E-01	0/48	2.95E-02	0.000864 - 0.00188
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.06E-03	0/113	9.69E-04	0/113	4.84E-05	0.000864 - 1.3
VOA	1,2-Dichloroethene	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.05E-01	0/6	9.56E-02	0/6	4.78E-03	0.15 - 0.19
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	6.03E-03	0/113	5.48E-03	0/113	2.74E-04	0.000864 - 1.3
VOA	1,2-Dimethylbenzene	mg/kg	1.29E-03	1.29E-03	1.29E-03	1/113	N/A	N/A	0/113	4.18E-01	0/113	3.81E-01	0/113	1.90E-02	0.000864 - 1.3
VOA	1,3-Dichlorobenzene	mg/kg	4.58E-04	4.58E-04	4.58E-04	1/48	N/A	N/A	0/48	6.49E-01	0/48	5.90E-01	0/48	2.95E-02	0.000864 - 0.00188
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/48	N/A	N/A	0/48	1.02E-02	0/48	9.24E-03	0/48	4.62E-04	0.000864 - 0.00188
VOA	1,4-Dioxane	mg/kg	--	--	--	0/47	N/A	N/A	0/47	2.07E-03	0/47	1.88E-03	0/47	9.42E-05	0.0432 - 0.0938
VOA	2-Butanone	mg/kg	1.97E-03	5.27E-02	1.19E-02	17/113	N/A	N/A	0/113	2.55E+00	0/113	2.32E+00	0/113	1.16E-01	0.00432 - 1.3
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/48	N/A	N/A	0/48	3.04E-05	0/48	2.76E-05	0/48	1.38E-06	0.00432 - 0.00938
VOA	2-Hexanone	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.93E-02	0/113	1.75E-02	0/113	8.75E-04	0.00432 - 1.3
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	7.08E-02	0/48	6.44E-02	0/48	3.22E-03	0.000864 - 0.00188
VOA	4-Methyl-2-pentanone	mg/kg	2.75E-03	2.75E-03	2.75E-03	1/113	N/A	N/A	0/113	6.18E-01	0/113	5.62E-01	0/113	2.81E-02	0.00432 - 1.3
VOA	Acetone	mg/kg	2.08E-03	4.60E-01	4.13E-02	70/113	N/A	N/A	0/113	8.10E+00	0/113	7.36E+00	1/113	3.68E-01	0.00432 - 1.3
VOA	Acrolein	mg/kg	2.71E-03	2.76E-03	2.74E-03	2/48	N/A	N/A	2/48	1.85E-05	2/48	1.68E-05	2/48	8.41E-07	0.00432 - 0.00938
VOA	Acrylonitrile	mg/kg	--	--	--	0/48	N/A	N/A	0/48	2.51E-04	0/48	2.28E-04	0/48	1.14E-05	0.00432 - 0.00938
VOA	Benzene	mg/kg	3.82E-04	8.32E-04	6.07E-04	2/113	N/A	N/A	0/113	5.13E-03	0/113	4.66E-03	2/113	2.33E-04	0.000864 - 1.3
VOA	Bromochloromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	4.58E-02	0/48	4.16E-02	0/48	2.08E-03	0.000864 - 0.00188
VOA	Bromodichloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	8.03E-04	0/113	7.30E-04	0/113	3.65E-05	0.000864 - 1.3
VOA	Bromoform	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.92E-02	0/113	1.75E-02	0/113	8.73E-04	0.000864 - 1.3
VOA	Bromomethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	4.20E-03	0/113	3.82E-03	0/113	1.91E-04	0.000864 - 1.3
VOA	Carbon disulfide	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.28E-01	0/113	4.80E-01	0/113	2.40E-02	0.00432 - 1.3
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.89E-03	0/113	3.54E-03	0/113	1.77E-04	0.000864 - 1.3
VOA	Chlorobenzene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.16E-01	0/113	1.06E-01	0/113	5.28E-03	0.000864 - 1.3
VOA	Chloroethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.21E+00	0/113	4.74E+00	0/113	2.37E-01	0.000864 - 1.3
VOA	Chloroform	mg/kg	6.87E-04	1.74E-03	1.04E-03	3/113	N/A	N/A	1/113	1.35E-03	1/113	1.22E-03	3/113	6.12E-05	0.000864 - 1.3
VOA	Chloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	1.16E-02	0/113	1.05E-02	0/113	5.26E-04	0.000864 - 1.3
VOA	*cis* -1,2-Dichloroethene	mg/kg	4.21E-04	2.50E+00	1.42E-01	54/132	N/A	N/A	16/132	2.33E-02	18/132	2.12E-02	51/132	1.06E-03	0.000862 - 1.3
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.70E-03	0/113	3.36E-03	0/113	1.68E-04	0.000864 - 1.3
VOA	Cumene	mg/kg	4.34E-04	4.34E-04	4.34E-04	1/48	N/A	N/A	0/48	1.62E+00	0/48	1.48E+00	0/48	7.38E-02	0.000864 - 0.00188
VOA	Cyclohexane	mg/kg	2.34E-03	2.34E-03	2.34E-03	1/48	N/A	N/A	0/48	2.86E+01	0/48	2.60E+01	0/48	1.30E+00	0.000864 - 0.00188
VOA	Dibromochloromethane	mg/kg	--	--	--	0/113	N/A	N/A	0/113	5.10E-03	0/113	4.64E-03	0/113	2.32E-04	0.000864 - 1.3
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	6.69E-01	0/48	6.08E-01	0/48	3.04E-02	0.000864 - 0.00188
VOA	Ethylbenzene	mg/kg	1.64E-03	1.64E-03	1.64E-03	1/113	N/A	N/A	0/113	3.70E-02	0/113	3.36E-02	0/113	1.68E-03	0.000864 - 1.3
VOA	m,p-Xylene	mg/kg	3.69E-03	3.69E-03	3.69E-03	1/113	N/A	N/A	0/113	4.20E-01	0/113	3.82E-01	0/113	1.91E-02	0.00173 - 2.5
VOA	Methyl acetate	mg/kg	--	--	--	0/48	N/A	N/A	0/48	9.04E+00	0/48	8.22E+00	0/48	4.11E-01	0.00432 - 0.00938
VOA	Methylcyclohexane	mg/kg	4.41E-04	3.33E-03	1.45E-03	5/48	N/A	N/A	0/48	3.08E+01	0/48	2.80E+01	0/48	1.40E+00	0.000864 - 0.00188
VOA	Methylene chloride	mg/kg	1.73E-03	8.58E-03	4.07E-03	31/113	N/A	N/A	0/113	5.98E-02	0/113	5.44E-02	23/113	2.72E-03	0.00432 - 1.3
VOA	Styrene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	2.93E+00	0/113	2.66E+00	0/113	1.33E-01	0.000864 - 1.3
VOA	Tetrachloroethene	mg/kg	6.85E-04	1.36E-03	1.06E-03	4/113	N/A	N/A	0/113	4.05E-02	0/113	3.69E-02	0/113	1.84E-03	0.000864 - 1.3
VOA	Toluene	mg/kg	3.20E-04	1.84E-02	4.17E-03	9/113	N/A	N/A	0/113	1.68E+00	0/113	1.52E+00	0/113	7.62E-02	0.000864 - 1.3
VOA	Total Xylene	mg/kg	4.97E-03	4.97E-03	4.97E-03	1/48	N/A	N/A	0/48	4.20E-01	0/48	3.82E-01	0/48	1.91E-02	0.00259 - 0.00563

Table C1.31. Sector 4 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.17E-04	2.80E-02	4.14E-03	16/132	N/A	N/A	0/132	6.40E-02	0/132	5.83E-02	4/132	2.91E-03	0.000862 - 1.3
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/113	N/A	N/A	0/113	3.70E-03	0/113	3.36E-03	0/113	1.68E-04	0.000864 - 1.3
VOA	Trichloroethene	mg/kg	3.95E-04	1.13E+02	2.51E+00	114/142	N/A	N/A	102/142	2.22E-03	104/142	2.02E-03	114/142	1.01E-04	0.000862 - 5
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/48	N/A	N/A	0/48	1.61E+00	0/48	1.46E+00	0/48	7.31E-02	0.000864 - 0.00188
VOA	Vinyl acetate	mg/kg	--	--	--	0/65	N/A	N/A	0/65	1.91E-01	0/65	1.74E-01	0/65	8.70E-03	0.01 - 1.3
VOA	Vinyl chloride	mg/kg	5.97E-04	7.55E-02	1.12E-02	12/138	N/A	N/A	12/138	1.42E-04	12/138	1.29E-04	12/138	6.47E-06	0.000862 - 1.3

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.32. Sector 4 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	8.65E+02	2.02E+04	6.80E+03	454/454	41/454	1.20E+04	0/454	6.60E+04	0/454	5.99E+04	407/454	3.00E+03	9.62 - 125
METAL	Antimony	mg/kg	3.99E-01	5.84E+00	1.42E+00	13/71	13/71	2.10E-01	9/71	7.74E-01	9/71	7.04E-01	13/71	3.52E-02	1 - 21.8
METAL	Arsenic	mg/kg	4.20E-01	5.26E+01	3.95E+00	74/454	4/454	7.90E+00	74/454	3.32E-02	74/454	3.02E-02	74/454	1.51E-03	0.962 - 200
METAL	Barium	mg/kg	2.83E+00	4.09E+02	2.76E+01	454/454	4/454	1.70E+02	1/454	3.41E+02	1/454	3.11E+02	358/454	1.55E+01	0.769 - 8.84
METAL	Beryllium	mg/kg	9.60E-02	1.89E+00	5.76E-01	68/71	20/71	6.90E-01	0/71	4.29E+01	0/71	3.89E+01	0/71	1.95E+00	0.0962 - 0.593
METAL	Boron	mg/kg	8.97E-01	4.23E+00	1.36E+00	27/68	N/A	N/A	0/68	2.82E+01	0/68	2.56E+01	9/68	1.28E+00	2.88 - 17.8
METAL	Cadmium	mg/kg	2.43E-02	5.39E-01	1.29E-01	6/71	1/71	2.10E-01	0/71	1.52E+00	0/71	1.39E+00	3/71	6.93E-02	0.192 - 0.5
METAL	Calcium	mg/kg	1.55E+02	7.82E+03	7.68E+02	385/386	1/386	6.10E+03	0/386	N/A	0/386	N/A	0/386	N/A	100 - 200
METAL	Chromium	mg/kg	2.50E+00	1.11E+02	1.36E+01	443/454	20/454	4.30E+01	0/454	3.96E+06	0/454	3.60E+06	0/454	1.80E+05	0.577 - 3.56
METAL	Cobalt	mg/kg	4.37E-01	7.77E+01	4.91E+00	69/71	3/71	1.30E+01	63/71	5.96E-01	67/71	5.43E-01	69/71	2.71E-02	0.192 - 5
METAL	Copper	mg/kg	1.00E+00	1.25E+01	4.41E+00	71/71	0/71	2.50E+01	0/71	6.18E+01	0/71	5.62E+01	50/71	2.81E+00	0.385 - 2.5
METAL	Iron	mg/kg	1.29E+03	1.20E+05	1.09E+04	454/454	19/454	2.80E+04	454/454	7.74E+02	454/454	7.04E+02	454/454	3.52E+01	20 - 438
METAL	Lead	mg/kg	8.58E-01	1.44E+01	4.74E+00	71/454	0/454	2.30E+01	0/454	2.97E+02	0/454	2.70E+02	2/454	1.35E+01	0.385 - 20
METAL	Magnesium	mg/kg	5.77E+01	2.25E+03	4.46E+02	386/386	1/386	2.10E+03	0/386	N/A	0/386	N/A	0/386	N/A	2.5 - 5
METAL	Manganese	mg/kg	2.72E+00	1.42E+03	4.50E+01	453/454	1/454	8.20E+02	67/454	6.23E+01	80/454	5.65E+01	452/454	2.83E+00	0.962 - 11.9
METAL	Mercury	mg/kg	8.85E-03	3.00E-01	3.43E-02	15/454	1/454	1.30E-01	0/454	6.49E-01	0/454	5.91E-01	3/454	2.95E-02	0.02 - 0.2
METAL	Molybdenum	mg/kg	9.15E-02	1.66E+00	3.31E-01	55/68	N/A	N/A	0/68	4.44E+00	0/68	4.03E+00	36/68	2.02E-01	0.192 - 0.25
METAL	Nickel	mg/kg	1.15E+00	2.63E+02	8.25E+00	111/454	1/454	2.20E+01	1/454	5.63E+01	1/454	5.12E+01	99/454	2.56E+00	0.385 - 5
METAL	Potassium	mg/kg	1.05E+02	7.96E+02	2.86E+02	307/386	0/386	9.50E+02	0/386	N/A	0/386	N/A	0/386	N/A	100 - 200
METAL	Selenium	mg/kg	3.64E-01	8.32E+00	1.25E+00	68/442	50/442	7.00E-01	29/442	1.14E+00	33/442	1.04E+00	68/442	5.19E-02	0.962 - 200
METAL	Silver	mg/kg	1.09E-01	2.83E-01	1.87E-01	7/71	0/71	2.70E+00	0/71	1.76E+00	0/71	1.60E+00	7/71	7.99E-02	0.492 - 5.45
METAL	Sodium	mg/kg	2.01E+02	3.47E+03	3.20E+02	130/386	23/386	3.40E+02	0/386	N/A	0/386	N/A	0/386	N/A	100 - 250
METAL	Thallium	mg/kg	1.54E-01	3.80E-01	2.14E-01	5/71	1/71	3.40E-01	5/71	3.12E-02	5/71	2.84E-02	5/71	1.42E-03	0.385 - 2
METAL	Uranium	mg/kg	1.25E-01	7.91E+02	6.72E+01	107/454	39/454	4.60E+00	39/454	3.96E+00	39/454	3.60E+00	106/454	1.80E-01	0.0385 - 1000
METAL	Vanadium	mg/kg	2.58E+00	1.85E+02	2.06E+01	452/454	44/454	3.70E+01	0/454	1.90E+02	1/454	1.73E+02	389/454	8.64E+00	2.5 - 23.7
METAL	Zinc	mg/kg	3.91E+00	4.56E+01	1.45E+01	68/71	0/71	6.00E+01	0/71	8.21E+02	0/71	7.46E+02	3/71	3.73E+01	3.85 - 20
ANION	Fluoride	mg/kg	6.22E-01	9.81E+00	3.07E+00	68/68	N/A	N/A	0/68	2.64E+02	0/68	2.40E+02	0/68	1.20E+01	1.02 - 2.05
PPCB	Total PCB	mg/kg	1.46E-03	8.69E-02	1.66E-02	29/191	N/A	N/A	0/191	1.50E-01	0/191	1.36E-01	14/191	6.82E-03	0.00341 - 0.1
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/69	N/A	N/A	0/69	1.92E-02	0/69	1.74E-02	0/69	8.72E-04	0.36 - 1.89
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.84E+00	0/191	8.04E+00	0/191	4.02E-01	0.341 - 1.89
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.55E-02	0/191	2.32E-02	0/191	1.16E-03	0.341 - 1.89
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	4.97E-02	0/191	4.52E-02	0/191	2.26E-03	0.341 - 1.89
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	9.26E-01	0/191	8.42E-01	0/191	4.21E-02	0.341 - 1.89
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	9.59E-02	0/191	8.72E-02	0/191	4.36E-03	0.47 - 3.78
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.06E-03	0/191	6.42E-03	0/191	3.21E-04	0.341 - 1.89
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.47E-03	0/191	1.33E-03	0/191	6.67E-05	0.341 - 1.89
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	8.47E+00	0/191	7.70E+00	0/191	3.85E-01	0.0341 - 0.5
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.96E-01	0/191	1.78E-01	0/191	8.91E-03	0.341 - 1.89
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.68E-03	0/191	5.16E-03	0/191	2.58E-04	0.341 - 1.89
SVOA	2-Methylnaphthalene	mg/kg	1.36E-02	4.10E-02	2.64E-02	4/191	N/A	N/A	0/191	4.07E-01	0/191	3.70E-01	2/191	1.85E-02	0.0341 - 0.5
SVOA	2-Methylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.66E+00	0/191	1.51E+00	0/191	7.53E-02	0.341 - 1.89
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.76E-01	0/191	1.60E-01	0/191	8.01E-03	0.341 - 1.89
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	9.59E-02	0/191	8.72E-02	0/191	4.36E-03	0.341 - 1.89
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.81E-02	0/191	1.65E-02	0/191	8.24E-04	0.341 - 1.89
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.39E-03	0/191	4.90E-03	0/191	2.45E-04	0.341 - 1.89
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.52E-03	0/191	6.84E-03	0/191	3.42E-04	0.341 - 1.89
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.76E+00	0/191	3.42E+00	0/191	1.71E-01	0.341 - 1.89
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.41E-03	0/191	3.10E-03	0/191	1.55E-04	0.341 - 1.89
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.52E-03	0/191	6.84E-03	0/191	3.42E-04	0.341 - 1.89
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	9.59E-02	0/191	8.72E-02	0/191	4.36E-03	0.341 - 1.89
SVOA	Acenaphthene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.21E+01	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5
SVOA	Acenaphthylene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.21E+01	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5

Table C1.32. Sector 4 Deep Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Acetophenone	mg/kg	--	--	--	0/69	N/A	N/A	0/69	1.28E+00	0/69	1.17E+00	0/69	5.84E-02	0.36 - 1.89
SVOA	Anthracene	mg/kg	1.96E-02	1.96E-02	1.96E-02	1/191	N/A	N/A	0/191	1.28E+02	0/191	1.16E+02	0/191	5.81E+00	0.0341 - 0.5
SVOA	Atrazine	mg/kg	--	--	--	0/69	N/A	N/A	0/69	4.31E-03	0/69	3.92E-03	0/69	1.96E-04	0.36 - 1.89
SVOA	Benzaldehyde	mg/kg	--	--	--	0/69	N/A	N/A	0/69	9.13E-02	0/69	8.30E-02	0/69	4.15E-03	0.36 - 1.89
SVOA	Benzenemethanol	mg/kg	1.13E-01	3.22E-01	1.81E-01	16/122	N/A	N/A	0/122	1.05E+00	0/122	9.52E-01	16/122	4.76E-02	0.341 - 0.726
SVOA	Benzo(ghi)perylene	mg/kg	2.06E-02	2.29E-02	2.18E-02	2/191	N/A	N/A	0/191	2.90E+01	0/191	2.63E+01	0/191	1.32E+00	0.0341 - 0.5
SVOA	Benzoic acid	mg/kg	--	--	--	0/112	N/A	N/A	0/112	3.32E+01	0/112	3.02E+01	0/112	1.51E+00	0.49 - 1.45
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.97E-02	0/191	2.70E-02	0/191	1.35E-03	0.341 - 1.89
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.94E-05	0/191	7.22E-05	0/191	3.61E-06	0.341 - 1.89
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.88E-03	0/191	2.62E-03	0/191	1.31E-04	0.341 - 1.89
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.29E-02	1.77E+00	2.43E-01	12/191	N/A	N/A	0/191	2.93E+01	0/191	2.66E+01	1/191	1.33E+00	0.036 - 0.726
SVOA	Butyl benzyl phthalate	mg/kg	1.46E-02	1.46E-02	1.46E-02	1/191	N/A	N/A	0/191	5.19E+00	0/191	4.72E+00	0/191	2.36E-01	0.036 - 0.726
SVOA	Caprolactam	mg/kg	--	--	--	0/69	N/A	N/A	0/69	5.43E+00	0/69	4.94E+00	0/69	2.47E-01	0.36 - 1.89
SVOA	Carbazole	mg/kg	--	--	--	0/69	N/A	N/A	0/69	8.27E-01	0/69	7.51E-01	0/69	3.76E-02	0.036 - 0.189
SVOA	Dibenzofuran	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.21E-01	0/191	2.92E-01	0/191	1.46E-02	0.341 - 1.89
SVOA	Diethyl phthalate	mg/kg	2.27E-02	2.27E-02	2.27E-02	1/191	N/A	N/A	0/191	1.34E+01	0/191	1.22E+01	0/191	6.08E-01	0.036 - 0.726
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.34E+01	0/191	1.22E+01	0/191	6.08E-01	0.036 - 0.726
SVOA	Di-n-butyl phthalate	mg/kg	1.09E-02	5.68E-02	1.90E-02	32/191	N/A	N/A	0/191	4.99E+00	0/191	4.54E+00	0/191	2.27E-01	0.036 - 0.726
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.24E+02	0/191	1.13E+02	0/191	5.65E+00	0.036 - 0.726
SVOA	Diphenylamine	mg/kg	--	--	--	0/69	N/A	N/A	0/69	5.13E+00	0/69	4.66E+00	0/69	2.33E-01	0.36 - 1.89
SVOA	Fluoranthene	mg/kg	9.55E-02	9.55E-02	9.55E-02	1/191	N/A	N/A	0/191	1.96E+02	0/191	1.78E+02	0/191	8.91E+00	0.0341 - 0.5
SVOA	Fluorene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.20E+01	0/191	1.09E+01	0/191	5.45E-01	0.0341 - 0.5
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.71E-03	0/191	2.46E-03	0/191	1.23E-04	0.341 - 1.89
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.87E-03	0/191	5.34E-03	0/191	2.67E-04	0.341 - 1.89
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.82E-03	0/191	2.56E-03	0/191	1.28E-04	0.341 - 1.89
SVOA	Hexachloroethane	mg/kg	--	--	--	0/191	N/A	N/A	0/191	4.40E-03	0/191	4.00E-03	0/191	2.00E-04	0.341 - 1.89
SVOA	Isophorone	mg/kg	--	--	--	0/191	N/A	N/A	0/191	5.68E-01	0/191	5.16E-01	0/191	2.58E-02	0.341 - 1.89
SVOA	m,p-Cresol	mg/kg	--	--	--	0/122	N/A	N/A	0/122	6.53E-01	0/122	5.94E-01	0/122	2.97E-02	0.341 - 0.726
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/69	N/A	N/A	0/69	6.53E-01	0/69	5.94E-01	0/69	2.97E-02	0.36 - 1.89
SVOA	Naphthalene	mg/kg	1.19E-02	2.50E-02	2.03E-02	3/191	N/A	N/A	3/191	8.47E-03	3/191	7.70E-03	3/191	3.85E-04	0.0341 - 0.5
SVOA	Nitrobenzene	mg/kg	--	--	--	0/191	N/A	N/A	0/191	2.02E-03	0/191	1.83E-03	0/191	9.17E-05	0.341 - 1.89
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.78E-04	0/191	1.62E-04	0/191	8.10E-06	0.341 - 1.89
SVOA	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/37	N/A	N/A	0/37	1.47E+00	0/37	1.33E+00	0/37	6.66E-02	0.47 - 0.5
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	1.26E-03	0/191	1.14E-03	0/191	5.71E-05	0.341 - 1.89
SVOA	Phenanthrene	mg/kg	1.12E-02	7.79E-02	2.95E-02	5/191	N/A	N/A	0/191	1.21E+01	0/191	1.10E+01	0/191	5.49E-01	0.0341 - 0.5
SVOA	Phenol	mg/kg	--	--	--	0/191	N/A	N/A	0/191	7.28E+00	0/191	6.62E+00	0/191	3.31E-01	0.341 - 1.89
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/191	N/A	N/A	0/191	3.48E-02	0/191	3.16E-02	0/191	1.58E-03	0.341 - 1.89
SVOA	Pyrene	mg/kg	5.79E-02	5.79E-02	5.79E-02	1/191	N/A	N/A	0/191	2.90E+01	0/191	2.63E+01	0/191	1.32E+00	0.0341 - 0.5
SVOA	Total PAH	mg/kg	4.47E-02	4.47E-02	4.47E-02	1/191	N/A	N/A	0/191	6.47E-01	0/191	5.89E-01	1/191	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/444	N/A	N/A	0/444	2.11E+01	0/444	1.92E+01	0/444	9.58E-01	0.0435 - 1.31
RADS	Cesium-137	pCi/g	4.54E-02	4.54E-02	4.54E-02	1/444	0/444	2.80E-01	0/444	1.05E+01	0/444	9.58E+00	0/444	4.79E-01	0.0115 - 0.104
RADS	Cobalt-60	pCi/g	--	--	--	0/376	N/A	N/A	0/376	3.50E-02	0/376	3.19E-02	0/376	1.59E-03	0.0101 - 0.145
RADS	Neptunium-237	pCi/g	--	--	--	0/447	N/A	N/A	0/447	1.18E+00	0/447	1.07E+00	0/447	5.36E-02	0.0199 - 1.24
RADS	Plutonium-238	pCi/g	--	--	--	0/68	N/A	N/A	0/68	4.82E+00	0/68	4.38E+00	0/68	2.19E-01	0.093 - 1.02
RADS	Plutonium-239/240	pCi/g	--	--	--	0/447	N/A	N/A	0/447	4.69E+00	0/447	4.26E+00	0/447	2.13E-01	0.018 - 0.893
RADS	Technetium-99	pCi/g	1.95E+00	5.58E+00	2.90E+00	22/447	9/447	2.80E+00	22/447	1.67E-01	22/447	1.52E-01	22/447	7.60E-03	1.58 - 4.76
RADS	Thorium-230	pCi/g	9.16E-02	2.16E+00	3.75E-01	267/444	4/444	1.40E+00	0/444	4.03E+01	0/444	3.66E+01	1/444	1.83E+00	0.0867 - 0.91
RADS	Uranium-233/234	pCi/g	3.18E-01	1.37E+00	7.60E-01	35/68	3/68	1.20E+00	5/68	1.09E+00	6/68	9.90E-01	35/68	4.95E-02	0.25 - 1.34
RADS	Uranium-234	pCi/g	7.47E-01	2.42E+00	1.86E+00	8/239	7/239	1.20E+00	7/239	1.09E+00	7/239	9.90E-01	8/239	4.95E-02	0.0514 - 2.35
RADS	Uranium-235	pCi/g	1.64E-02	2.07E-01	4.89E-02	242/379	37/379	6.00E-02	0/379	1.07E+00	0/379	9.76E-01	85/379	4.88E-02	0.0146 - 0.231
RADS	Uranium-235/236	pCi/g	1.33E-01	2.73E-01	1.93E-01	3/68	3/68	6.00E-02	0/68	1.07E+00	0/68	9.76E-01	3/68	4.88E-02	0.133 - 1.33
RADS	Uranium-238	pCi/g	3.10E-01	6.75E+00	1.03E+00	275/332	58/332	1.20E+00	142/332	8.87E-01	180/332	8.05E-01	275/332	4.03E-02	0.0089 - 2.34

Table C1.32. Sector 4 Deep Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	6.18E+00	0/288	5.62E+00	0/288	2.81E-01	0.000818 - 1.3
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	6.51E-04	0/288	5.92E-04	0/288	2.96E-05	0.000818 - 1.3
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	5.63E+01	0/143	5.13E+01	0/143	2.56E+00	0.00409 - 0.588
VOA	1,1,2-Trichloroethane	mg/kg	4.47E-04	3.10E-03	1.12E-03	9/288	N/A	N/A	9/288	2.97E-04	9/288	2.69E-04	9/288	1.35E-05	0.000818 - 1.3
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.72E-02	0/288	1.56E-02	0/288	7.82E-04	0.000818 - 1.3
VOA	1,1-Dichloroethene	mg/kg	4.38E-04	1.80E-03	8.89E-04	6/416	N/A	N/A	0/416	2.24E-01	0/416	2.04E-01	0/416	1.02E-02	0.000763 - 1.3
VOA	1,2,3-Trichlorobenzene	mg/kg	1.27E-03	1.27E-03	1.27E-03	1/143	N/A	N/A	0/143	4.60E-02	0/143	4.18E-02	0/143	2.09E-03	0.000818 - 0.118
VOA	1,2,4-Trichlorobenzene	mg/kg	6.57E-04	6.57E-04	6.57E-04	1/143	N/A	N/A	0/143	2.55E-02	0/143	2.32E-02	0/143	1.16E-03	0.000818 - 0.118
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	3.17E-06	0/143	2.88E-06	0/143	1.44E-07	0.000818 - 0.118
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	4.62E-05	0/143	4.20E-05	0/143	2.10E-06	0.000818 - 0.118
VOA	1,2-Dichlorobenzene	mg/kg	1.42E-03	1.42E-03	1.42E-03	1/143	N/A	N/A	0/143	6.49E-01	0/143	5.90E-01	0/143	2.95E-02	0.000818 - 0.118
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.06E-03	0/288	9.69E-04	0/288	4.84E-05	0.000818 - 1.3
VOA	1,2-Dichloroethene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.05E-01	0/21	9.56E-02	0/21	4.78E-03	0.15 - 2.6
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	6.03E-03	0/288	5.48E-03	0/288	2.74E-04	0.000818 - 1.3
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	4.18E-01	0/288	3.81E-01	0/288	1.90E-02	0.000818 - 1.3
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	6.49E-01	0/143	5.90E-01	0/143	2.95E-02	0.000818 - 0.118
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.02E-02	0/143	9.24E-03	0/143	4.62E-04	0.000818 - 0.118
VOA	1,4-Dioxane	mg/kg	2.20E-02	2.20E-02	2.20E-02	1/139	N/A	N/A	1/139	2.07E-03	1/139	1.88E-03	1/139	9.42E-05	0.0409 - 5.88
VOA	2-Butanone	mg/kg	2.36E-03	3.03E-01	5.73E-02	16/288	N/A	N/A	0/288	2.55E+00	0/288	2.32E+00	3/288	1.16E-01	0.001 - 1.3
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/143	N/A	N/A	0/143	3.04E-05	0/143	2.76E-05	0/143	1.38E-06	0.00409 - 0.588
VOA	2-Hexanone	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.93E-02	0/288	1.75E-02	0/288	8.75E-04	0.001 - 1.3
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	7.08E-02	0/143	6.44E-02	0/143	3.22E-03	0.000818 - 0.118
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/288	N/A	N/A	0/288	6.18E-01	0/288	5.62E-01	0/288	2.81E-02	0.001 - 1.3
VOA	Acetone	mg/kg	1.91E-03	3.01E+00	1.54E-01	179/288	N/A	N/A	0/288	8.10E+00	0/288	7.36E+00	15/288	3.68E-01	0.001 - 1.3
VOA	Acrolein	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.85E-05	0/143	1.68E-05	0/143	8.41E-07	0.00409 - 0.588
VOA	Acrylonitrile	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.51E-04	0/143	2.28E-04	0/143	1.14E-05	0.00409 - 0.588
VOA	Benzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.13E-03	0/288	4.66E-03	0/288	2.33E-04	0.000818 - 1.3
VOA	Bromochloromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	4.58E-02	0/143	4.16E-02	0/143	2.08E-03	0.000818 - 0.118
VOA	Bromodichloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	8.03E-04	0/288	7.30E-04	0/288	3.65E-05	0.000818 - 1.3
VOA	Bromoform	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.92E-02	0/288	1.75E-02	0/288	8.73E-04	0.000818 - 1.3
VOA	Bromomethane	mg/kg	1.00E-03	1.00E-03	1.00E-03	1/288	N/A	N/A	0/288	4.20E-03	0/288	3.82E-03	1/288	1.91E-04	0.000818 - 1.3
VOA	Carbon disulfide	mg/kg	2.17E-03	3.75E-03	2.83E-03	3/288	N/A	N/A	0/288	5.28E-01	0/288	4.80E-01	0/288	2.40E-02	0.001 - 1.3
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.89E-03	0/288	3.54E-03	0/288	1.77E-04	0.000818 - 1.3
VOA	Chlorobenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.16E-01	0/288	1.06E-01	0/288	5.28E-03	0.000818 - 1.3
VOA	Chloroethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.21E+00	0/288	4.74E+00	0/288	2.37E-01	0.000818 - 1.3
VOA	Chloroform	mg/kg	3.08E-04	4.32E-03	8.88E-04	34/288	N/A	N/A	5/288	1.35E-03	6/288	1.22E-03	34/288	6.12E-05	0.000818 - 1.3
VOA	Chloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	1.16E-02	0/288	1.05E-02	0/288	5.26E-04	0.000818 - 1.3
VOA	*cis*-1,2-Dichloroethene	mg/kg	3.41E-04	2.21E-01	1.62E-02	106/395	N/A	N/A	21/395	2.33E-02	23/395	2.12E-02	76/395	1.06E-03	0.000763 - 0.39
VOA	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.70E-03	0/288	3.36E-03	0/288	1.68E-04	0.000818 - 1.3
VOA	Cumene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.62E+00	0/143	1.48E+00	0/143	7.38E-02	0.000818 - 0.118
VOA	Cyclohexane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	2.86E+01	0/143	2.60E+01	0/143	1.30E+00	0.000818 - 0.118
VOA	Dibromochloromethane	mg/kg	--	--	--	0/288	N/A	N/A	0/288	5.10E-03	0/288	4.64E-03	0/288	2.32E-04	0.000818 - 1.3
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	6.69E-01	0/143	6.08E-01	0/143	3.04E-02	0.000818 - 0.118
VOA	Ethylbenzene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.70E-02	0/288	3.36E-02	0/288	1.68E-03	0.000818 - 1.3
VOA	m,p-Xylene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	4.20E-01	0/288	3.82E-01	0/288	1.91E-02	0.00164 - 2.5
VOA	Methyl acetate	mg/kg	--	--	--	0/143	N/A	N/A	0/143	9.04E+00	0/143	8.22E+00	0/143	4.11E-01	0.00409 - 0.588
VOA	Methylcyclohexane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	3.08E+01	0/143	2.80E+01	0/143	1.40E+00	0.000818 - 0.118
VOA	Methylene chloride	mg/kg	1.70E-03	1.64E-01	6.87E-03	43/288	N/A	N/A	1/288	5.98E-02	1/288	5.44E-02	24/288	2.72E-03	0.001 - 1.3
VOA	Styrene	mg/kg	6.28E-04	8.46E-04	7.46E-04	5/288	N/A	N/A	0/288	2.93E+00	0/288	2.66E+00	0/288	1.33E-01	0.000818 - 1.3
VOA	Tetrachloroethene	mg/kg	3.95E-04	1.21E-03	7.35E-04	14/288	N/A	N/A	0/288	4.05E-02	0/288	3.69E-02	0/288	1.84E-03	0.000818 - 1.3
VOA	Toluene	mg/kg	5.79E-04	1.19E-03	7.93E-04	4/288	N/A	N/A	0/288	1.68E+00	0/288	1.52E+00	0/288	7.62E-02	0.000818 - 1.3
VOA	Total Xylene	mg/kg	--	--	--	0/143	N/A	N/A	0/143	4.20E-01	0/143	3.82E-01	0/143	1.91E-02	0.00246 - 0.353

Table C1.32. Sector 4 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	*trans* -1,2-Dichloroethene	mg/kg	1.10E-03	1.21E-03	1.16E-03	2/395	N/A	N/A	0/395	6.40E-02	0/395	5.83E-02	0/395	2.91E-03	0.000763 - 0.39
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/288	N/A	N/A	0/288	3.70E-03	0/288	3.36E-03	0/288	1.68E-04	0.000818 - 1.3
VOA	Trichloroethene	mg/kg	3.38E-04	4.92E+01	1.26E+00	308/431	N/A	N/A	258/431	2.22E-03	260/431	2.02E-03	308/431	1.01E-04	0.000763 - 5
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/143	N/A	N/A	0/143	1.61E+00	0/143	1.46E+00	0/143	7.31E-02	0.000818 - 0.118
VOA	Vinyl acetate	mg/kg	--	--	--	0/142	N/A	N/A	0/142	1.91E-01	0/142	1.74E-01	0/142	8.70E-03	0.01 - 1.3
VOA	Vinyl chloride	mg/kg	4.91E-04	2.25E-03	9.86E-04	5/416	N/A	N/A	5/416	1.42E-04	5/416	1.29E-04	5/416	6.47E-06	0.000763 - 1.3

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.33. Sector 4 McNairy Soil Protection of Groundwater Screen

			Detected Results				GW Protection Screen		
Type	Analysis	Unit	Min	Max	Avg	FOD	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	4.27E+02	1.37E+04	4.35E+03	57/57	29/57	3.00E+03	10.5 - 20
METAL	Antimony	mg/kg	6.92E-01	9.42E+00	2.70E+00	5/54	5/54	3.52E-02	2.09 - 26.1
METAL	Arsenic	mg/kg	4.27E-01	1.38E+02	8.46E+00	54/57	54/57	1.51E-03	1.05 - 5
METAL	Barium	mg/kg	2.12E+00	9.92E+01	2.16E+01	57/57	27/57	1.55E+01	0.837 - 2.5
METAL	Beryllium	mg/kg	2.91E-02	3.06E+00	6.12E-01	54/54	5/54	1.95E+00	0.105 - 0.143
METAL	Boron	mg/kg	9.08E-01	6.58E+00	2.27E+00	40/54	33/54	1.28E+00	3.14 - 4.3
METAL	Cadmium	mg/kg	2.62E-02	8.91E-01	1.41E-01	34/54	19/54	6.93E-02	0.209 - 0.286
METAL	Calcium	mg/kg	2.25E+03	1.62E+04	9.23E+03	2/3	0/3		200 - 200
METAL	Chromium	mg/kg	1.09E+00	9.21E+01	1.38E+01	56/57	0/57	1.80E+05	0.628 - 2.5
METAL	Cobalt	mg/kg	1.47E-01	1.87E+01	3.38E+00	54/54	54/54	2.71E-02	0.209 - 0.286
METAL	Copper	mg/kg	1.74E-01	1.27E+01	3.15E+00	54/54	24/54	2.81E+00	0.418 - 0.573
METAL	Iron	mg/kg	6.65E+02	2.18E+05	1.99E+04	57/57	57/57	3.52E+01	20 - 2290
METAL	Lead	mg/kg	1.03E+00	3.24E+01	6.67E+00	54/57	6/57	1.35E+01	0.418 - 20
METAL	Magnesium	mg/kg	9.53E+01	1.55E+03	9.42E+02	3/3	0/3		2.5 - 2.5
METAL	Manganese	mg/kg	1.01E+00	3.17E+02	4.60E+01	56/57	55/57	2.83E+00	1.05 - 2.5
METAL	Mercury	mg/kg	8.38E-03	2.99E-01	3.78E-02	20/57	5/57	2.95E-02	0.0237 - 0.2
METAL	Molybdenum	mg/kg	9.92E-02	4.14E+00	4.91E-01	33/54	21/54	2.02E-01	0.209 - 0.286
METAL	Nickel	mg/kg	3.00E-01	1.84E+01	5.77E+00	56/57	37/57	2.56E+00	0.418 - 5
METAL	Potassium	mg/kg	4.47E+02	5.39E+02	4.93E+02	2/3	0/3		200 - 200
METAL	Selenium	mg/kg	3.81E-01	4.81E+00	1.42E+00	48/57	48/57	5.19E-02	1 - 1.43
METAL	Silver	mg/kg	1.28E-01	1.91E-01	1.51E-01	7/54	7/54	7.99E-02	0.521 - 11.9
METAL	Sodium	mg/kg	--	--	--	0/3	0/3		250 - 250
METAL	Thallium	mg/kg	1.69E-01	1.69E-01	1.69E-01	1/54	1/54	1.42E-03	0.418 - 0.573
METAL	Uranium	mg/kg	5.19E-02	3.73E+00	9.67E-01	54/57	50/57	1.80E-01	0.0418 - 100
METAL	Vanadium	mg/kg	1.73E+00	2.63E+02	2.54E+01	57/57	51/57	8.64E+00	2.5 - 5.73
METAL	Zinc	mg/kg	2.45E+00	1.27E+02	3.44E+01	54/54	16/54	3.73E+01	4.18 - 5.73
ANION	Fluoride	mg/kg	8.08E-01	5.81E+00	3.10E+00	52/54	0/54	1.20E+01	1.1 - 1.47
PPCB	Total PCB	mg/kg	--	--	--	0/54	0/54	6.82E-03	0.00353 - 0.00542
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/54	0/54	8.72E-04	0.349 - 0.545
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/54	0/54	4.02E-01	0.349 - 0.545
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/54	0/54	1.16E-03	0.349 - 0.545
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/54	0/54	2.26E-03	0.349 - 0.545
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/54	0/54	4.21E-02	0.349 - 0.545
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.698 - 1.09
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/54	0/54	3.21E-04	0.349 - 0.545
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/54	0/54	6.67E-05	0.349 - 0.545
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/54	0/54	3.85E-01	0.0349 - 0.0545
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/54	0/54	8.91E-03	0.349 - 0.545
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/54	0/54	2.58E-04	0.349 - 0.545
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/54	0/54	1.85E-02	0.0349 - 0.0545
SVOA	2-Methylphenol	mg/kg	--	--	--	0/54	0/54	7.53E-02	0.349 - 0.545
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/54	0/54	8.01E-03	0.349 - 0.545

Table C1.33. Sector 4 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.349 - 0.545
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/54	0/54	8.24E-04	0.349 - 0.545
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/54	0/54	2.45E-04	0.349 - 0.545
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/54	0/54	3.42E-04	0.349 - 0.545
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/54	0/54	1.71E-01	0.349 - 0.545
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/54	0/54	1.55E-04	0.349 - 0.545
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/54	0/54	3.42E-04	0.349 - 0.545
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/54	0/54	4.36E-03	0.349 - 0.545
SVOA	Acenaphthene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOA	Acenaphthylene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOA	Acetophenone	mg/kg	--	--	--	0/54	0/54	5.84E-02	0.349 - 0.545
SVOA	Anthracene	mg/kg	--	--	--	0/54	0/54	5.81E+00	0.0349 - 0.0545
SVOA	Atrazine	mg/kg	--	--	--	0/54	0/54	1.96E-04	0.349 - 0.545
SVOA	Benzaldehyde	mg/kg	--	--	--	0/54	0/54	4.15E-03	0.349 - 0.545
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/54	0/54	1.32E+00	0.0349 - 0.0545
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/54	0/54	1.35E-03	0.349 - 0.545
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/54	0/54	3.61E-06	0.349 - 0.545
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/54	0/54	1.31E-04	0.349 - 0.545
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.54E-02	2.34E-02	1.94E-02	2/54	0/54	1.33E+00	0.0349 - 0.0545
SVOA	Butyl benzyl phthalate	mg/kg	2.30E+00	2.30E+00	2.30E+00	1/54	1/54	2.36E-01	0.0349 - 0.0545
SVOA	Caprolactam	mg/kg	--	--	--	0/54	0/54	2.47E-01	0.349 - 0.545
SVOA	Carbazole	mg/kg	--	--	--	0/54	0/54	3.76E-02	0.0349 - 0.0545
SVOA	Dibenzofuran	mg/kg	--	--	--	0/54	0/54	1.46E-02	0.349 - 0.545
SVOA	Diethyl phthalate	mg/kg	1.42E-02	2.88E-02	2.06E-02	4/54	0/54	6.08E-01	0.0349 - 0.0545
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/54	0/54	6.08E-01	0.0349 - 0.0545
SVOA	Di-n-butyl phthalate	mg/kg	1.30E-02	4.59E-02	2.68E-02	24/54	0/54	2.27E-01	0.0349 - 0.0545
SVOA	Di-n-octylphthalate	mg/kg	3.23E-02	3.97E-02	3.60E-02	2/54	0/54	5.65E+00	0.0349 - 0.0545
SVOA	Diphenylamine	mg/kg	--	--	--	0/54	0/54	2.33E-01	0.349 - 0.545
SVOA	Fluoranthene	mg/kg	--	--	--	0/54	0/54	8.91E+00	0.0349 - 0.0545
SVOA	Fluorene	mg/kg	--	--	--	0/54	0/54	5.45E-01	0.0349 - 0.0545
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/54	0/54	1.23E-04	0.349 - 0.545
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/54	0/54	2.67E-04	0.349 - 0.545
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/54	0/54	1.28E-04	0.349 - 0.545
SVOA	Hexachloroethane	mg/kg	--	--	--	0/54	0/54	2.00E-04	0.349 - 0.545
SVOA	Isophorone	mg/kg	--	--	--	0/54	0/54	2.58E-02	0.349 - 0.545
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/54	0/54	2.97E-02	0.349 - 0.545
SVOA	Naphthalene	mg/kg	--	--	--	0/54	0/54	3.85E-04	0.0349 - 0.0545
SVOA	Nitrobenzene	mg/kg	--	--	--	0/54	0/54	9.17E-05	0.349 - 0.545
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/54	0/54	8.10E-06	0.349 - 0.545
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/54	0/54	5.71E-05	0.349 - 0.545
SVOA	Phenanthrene	mg/kg	--	--	--	0/54	0/54	5.49E-01	0.0349 - 0.0545
SVOA	Phenol	mg/kg	--	--	--	0/54	0/54	3.31E-01	0.349 - 0.545

Table C1.33. Sector 4 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	FOD	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/54	0/54	1.58E-03	0.349 - 0.545
SVOA	Pyrene	mg/kg	--	--	--	0/54	0/54	1.32E+00	0.0349 - 0.0545
SVOA	Total PAH	mg/kg	1.19E-03	1.19E-03	1.19E-03	1/54	0/54	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/57	0/57	9.58E-01	0.0451 - 0.969
RADS	Cesium-137	pCi/g	--	--	--	0/57	0/57	4.79E-01	0.0165 - 0.0906
RADS	Cobalt-60	pCi/g	--	--	--	0/3	0/3	1.59E-03	0.0147 - 0.0286
RADS	Neptunium-237	pCi/g	--	--	--	0/57	0/57	5.36E-02	0.024 - 1.3
RADS	Plutonium-238	pCi/g	--	--	--	0/54	0/54	2.19E-01	0.158 - 0.876
RADS	Plutonium-239/240	pCi/g	--	--	--	0/57	0/57	2.13E-01	0.0567 - 0.917
RADS	Technetium-99	pCi/g	--	--	--	0/57	0/57	7.60E-03	2.7 - 4.66
RADS	Thorium-230	pCi/g	2.01E-01	2.23E+00	1.07E+00	31/57	6/57	1.83E+00	0.131 - 1.41
RADS	Uranium-233/234	pCi/g	3.88E-01	1.97E+00	1.01E+00	18/54	18/54	4.95E-02	0.271 - 1.31
RADS	Uranium-234	pCi/g	--	--	--	0/2	0/2	4.95E-02	0.0913 - 0.283
RADS	Uranium-235	pCi/g	3.83E-02	6.24E-02	5.04E-02	2/3	1/3	4.88E-02	0.0186 - 0.0284
RADS	Uranium-235/236	pCi/g	3.32E-01	3.32E-01	3.32E-01	1/54	1/54	4.88E-02	0.144 - 1.08
RADS	Uranium-238	pCi/g	2.79E-01	1.96E+00	9.00E-01	31/56	31/56	4.03E-02	0.161 - 1.33
VOA	1,1,1-Trichloroethane	mg/kg	6.64E-04	8.95E-04	7.80E-04	2/86	0/86	2.81E-01	0.000932 - 1.2
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/85	0/85	2.96E-05	0.000932 - 0.21
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	2.05E-03	1.10E-02	5.48E-03	11/84	0/84	2.56E+00	0.00466 - 1.05
VOA	1,1,2-Trichloroethane	mg/kg	4.07E-04	1.56E-02	3.24E-03	13/85	13/85	1.35E-05	0.000932 - 0.21
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/86	0/86	7.82E-04	0.000932 - 1.2
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/86	0/86	1.02E-02	0.000932 - 0.21
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.09E-03	0.000932 - 0.21
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/84	0/84	1.16E-03	0.000932 - 0.21
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/84	0/84	1.44E-07	0.000932 - 0.21
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/84	0/84	2.10E-06	0.000932 - 0.21
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.95E-02	0.000932 - 0.21
VOA	1,2-Dichloroethane	mg/kg	7.47E-04	7.47E-04	7.47E-04	1/86	1/86	4.84E-05	0.000932 - 1.2
VOA	1,2-Dichloroethene	mg/kg	--	--	--	0/1	0/1	4.78E-03	0.19 - 0.19
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/85	0/85	2.74E-04	0.000932 - 0.21
VOA	1,2-Dimethylbenzene	mg/kg	9.32E-04	9.32E-04	9.32E-04	1/85	0/85	1.90E-02	0.000932 - 0.21
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	2.95E-02	0.000932 - 0.21
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/84	0/84	4.62E-04	0.000932 - 0.21
VOA	1,4-Dioxane	mg/kg	--	--	--	0/73	0/73	9.42E-05	0.0466 - 10.5
VOA	2-Butanone	mg/kg	2.56E-03	4.70E-01	1.81E-01	14/85	7/85	1.16E-01	0.00466 - 1.05
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/84	0/84	1.38E-06	0.00466 - 1.05
VOA	2-Hexanone	mg/kg	--	--	--	0/85	0/85	8.75E-04	0.00466 - 1.05
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/84	0/84	3.22E-03	0.000932 - 0.21
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/85	0/85	2.81E-02	0.00466 - 1.05
VOA	Acetone	mg/kg	1.97E-03	5.07E-01	2.43E-02	49/85	1/85	3.68E-01	0.00466 - 1.05
VOA	Acrolein	mg/kg	--	--	--	0/84	0/84	8.41E-07	0.00466 - 1.05
VOA	Acrylonitrile	mg/kg	--	--	--	0/84	0/84	1.14E-05	0.00466 - 1.05

Table C1.33. Sector 4 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
VOA	Benzene	mg/kg	--	--	--	0/85	0/85	2.33E-04	0.000932 - 0.21
VOA	Bromochloromethane	mg/kg	--	--	--	0/84	0/84	2.08E-03	0.000932 - 0.21
VOA	Bromodichloromethane	mg/kg	4.47E-04	2.74E-03	1.36E-03	4/85	4/85	3.65E-05	0.000932 - 0.21
VOA	Bromoform	mg/kg	--	--	--	0/85	0/85	8.73E-04	0.000932 - 0.21
VOA	Bromomethane	mg/kg	--	--	--	0/85	0/85	1.91E-04	0.000932 - 0.21
VOA	Carbon disulfide	mg/kg	--	--	--	0/85	0/85	2.40E-02	0.00466 - 1.05
VOA	Carbon tetrachloride	mg/kg	5.69E-04	5.35E-02	1.21E-02	7/86	7/86	1.77E-04	0.000932 - 1.2
VOA	Chlorobenzene	mg/kg	--	--	--	0/85	0/85	5.28E-03	0.000932 - 0.21
VOA	Chloroethane	mg/kg	--	--	--	0/86	0/86	2.37E-01	0.000932 - 1.2
VOA	Chloroform	mg/kg	4.01E-04	8.44E-03	1.82E-03	13/86	13/86	6.12E-05	0.000932 - 1.2
VOA	Chloromethane	mg/kg	--	--	--	0/86	0/86	5.26E-04	0.000932 - 1.2
VOA	*cis* -1,2-Dichloroethene	mg/kg	5.44E-04	2.63E-02	6.47E-03	14/86	10/86	1.06E-03	0.000932 - 1.2
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/85	0/85	1.68E-04	0.000932 - 0.21
VOA	Cumene	mg/kg	--	--	--	0/84	0/84	7.38E-02	0.000932 - 0.21
VOA	Cyclohexane	mg/kg	--	--	--	0/84	0/84	1.30E+00	0.000932 - 0.21
VOA	Dibromochloromethane	mg/kg	--	--	--	0/85	0/85	2.32E-04	0.000932 - 0.21
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/84	0/84	3.04E-02	0.000932 - 0.21
VOA	Ethylbenzene	mg/kg	--	--	--	0/85	0/85	1.68E-03	0.000932 - 0.21
VOA	m,p-Xylene	mg/kg	--	--	--	0/85	0/85	1.91E-02	0.00186 - 0.419
VOA	Methyl acetate	mg/kg	--	--	--	0/84	0/84	4.11E-01	0.00466 - 1.05
VOA	Methylcyclohexane	mg/kg	--	--	--	0/84	0/84	1.40E+00	0.000932 - 0.21
VOA	Methylene chloride	mg/kg	2.05E-03	3.76E-01	1.95E-02	23/86	12/86	2.72E-03	0.00466 - 1.2
VOA	Styrene	mg/kg	--	--	--	0/85	0/85	1.33E-01	0.000932 - 0.21
VOA	Tetrachloroethene	mg/kg	4.37E-04	1.08E-02	3.98E-03	17/85	11/85	1.84E-03	0.00103 - 25.9
VOA	Toluene	mg/kg	3.45E-04	8.60E-04	6.87E-04	5/85	0/85	7.62E-02	0.000932 - 0.21
VOA	Total Xylene	mg/kg	9.32E-04	9.32E-04	9.32E-04	1/84	0/84	1.91E-02	0.0028 - 0.629
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/86	0/86	2.91E-03	0.000932 - 1.2
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/85	0/85	1.68E-04	0.000932 - 0.21
VOA	Trichloroethene	mg/kg	4.06E-04	6.94E+03	1.31E+02	60/87	60/87	1.01E-04	0.00103 - 240
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/84	0/84	7.31E-02	0.000932 - 0.21
VOA	Vinyl acetate	mg/kg	--	--	--	0/1	0/1	8.70E-03	0.094 - 0.094
VOA	Vinyl chloride	mg/kg	--	--	--	0/87	0/87	6.47E-06	0.000932 - 1.2

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.34. Sector 5 Surface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	6.84E+02	1.39E+04	8.51E+03	32/32	4/32	1.30E+04	0/32	6.60E+04	0/32	5.99E+04	31/32	3.00E+03	9.77 - 114
METAL	Antimony	mg/kg	4.48E-01	3.94E+00	1.42E+00	16/32	16/32	2.10E-01	12/32	7.74E-01	12/32	7.04E-01	16/32	3.52E-02	1.85 - 21.9
METAL	Arsenic	mg/kg	2.28E+00	2.00E+01	5.61E+00	31/32	2/32	1.20E+01	31/32	3.32E-02	31/32	3.02E-02	31/32	1.51E-03	1.01 - 5.66
METAL	Barium	mg/kg	6.19E+00	3.66E+02	1.05E+02	32/32	2/32	2.00E+02	1/32	3.41E+02	1/32	3.11E+02	31/32	1.55E+01	0.782 - 4.82
METAL	Beryllium	mg/kg	1.95E-01	1.30E+00	4.49E-01	31/32	3/32	6.70E-01	0/32	4.29E+01	0/32	3.89E+01	0/32	1.95E+00	0.0977 - 0.493
METAL	Boron	mg/kg	1.01E+00	9.68E+00	3.02E+00	26/32	N/A	N/A	0/32	2.82E+01	0/32	2.56E+01	22/32	1.28E+00	2.93 - 14.8
METAL	Cadmium	mg/kg	2.44E-02	6.06E-01	2.41E-01	28/32	16/32	2.10E-01	0/32	1.52E+00	0/32	1.39E+00	22/32	6.93E-02	0.195 - 1.06
METAL	Chromium	mg/kg	4.79E+00	4.24E+01	1.62E+01	32/32	12/32	1.60E+01	0/32	3.96E+06	0/32	3.60E+06	0/32	1.80E+05	0.586 - 2.96
METAL	Cobalt	mg/kg	4.18E-01	1.80E+01	7.08E+00	32/32	2/32	1.40E+01	31/32	5.96E-01	31/32	5.43E-01	32/32	2.71E-02	0.195 - 0.986
METAL	Copper	mg/kg	1.41E+00	3.50E+01	8.57E+00	32/32	2/32	1.90E+01	0/32	6.18E+01	0/32	5.62E+01	29/32	2.81E+00	0.391 - 1.97
METAL	Iron	mg/kg	1.57E+03	3.45E+04	1.55E+04	32/32	2/32	2.80E+04	32/32	7.74E+02	32/32	7.04E+02	32/32	3.52E+01	19.5 - 238
METAL	Lead	mg/kg	9.07E-01	4.92E+01	1.10E+01	32/32	1/32	3.60E+01	0/32	2.97E+02	0/32	2.70E+02	6/32	1.35E+01	0.391 - 1.97
METAL	Manganese	mg/kg	3.79E+01	2.65E+03	5.85E+02	32/32	3/32	1.50E+03	31/32	6.23E+01	31/32	5.65E+01	32/32	2.83E+00	1.02 - 24.1
METAL	Mercury	mg/kg	9.05E-03	5.81E-02	2.09E-02	26/32	0/32	2.00E-01	0/32	6.49E-01	0/32	5.91E-01	3/32	2.95E-02	0.0218 - 0.0294
METAL	Molybdenum	mg/kg	2.36E-01	2.53E+00	7.08E-01	30/32	N/A	N/A	0/32	4.44E+00	0/32	4.03E+00	30/32	2.02E-01	0.195 - 1.06
METAL	Nickel	mg/kg	4.24E+00	1.63E+01	9.59E+00	32/32	0/32	2.10E+01	0/32	5.63E+01	0/32	5.12E+01	32/32	2.56E+00	0.391 - 1.97
METAL	Selenium	mg/kg	4.26E-01	2.08E+00	9.90E-01	24/32	12/32	8.00E-01	8/32	1.14E+00	10/32	1.04E+00	24/32	5.19E-02	1.01 - 5.66
METAL	Silver	mg/kg	1.28E-01	2.81E+00	1.11E+00	7/32	1/32	2.30E+00	1/32	1.76E+00	2/32	1.60E+00	7/32	7.99E-02	0.502 - 5.47
METAL	Thallium	mg/kg	1.60E-01	2.66E-01	1.86E-01	10/32	1/32	2.10E-01	10/32	3.12E-02	10/32	2.84E-02	10/32	1.42E-03	0.391 - 1.97
METAL	Uranium	mg/kg	8.16E-01	8.98E+01	1.21E+01	32/32	15/32	4.90E+00	18/32	3.96E+00	18/32	3.60E+00	32/32	1.80E-01	0.0391 - 0.409
METAL	Vanadium	mg/kg	3.44E+00	5.37E+01	2.20E+01	32/32	2/32	3.80E+01	0/32	1.90E+02	0/32	1.73E+02	29/32	8.64E+00	3.91 - 19.7
METAL	Zinc	mg/kg	1.37E+01	2.75E+02	4.65E+01	32/32	4/32	6.50E+01	0/32	8.21E+02	0/32	7.46E+02	12/32	3.73E+01	4.03 - 22.7
ANION	Fluoride	mg/kg	6.14E-01	2.05E+01	8.85E+00	32/32	N/A	N/A	0/32	2.64E+02	0/32	2.40E+02	8/32	1.20E+01	1 - 1.23
DI/FURA	Total Dioxin/Furans	mg/kg	3.33E-06	1.06E-05	4.72E-06	10/10	N/A	N/A	10/10	1.30E-06	10/10	1.18E-06	10/10	5.91E-08	-
PPCB	Total PCB	mg/kg	1.93E-03	7.40E-02	2.05E-02	15/32	N/A	N/A	0/32	1.50E-01	0/32	1.36E-01	8/32	6.82E-03	0.00336 - 0.0386
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.92E-02	0/32	1.74E-02	0/32	8.72E-04	0.341 - 3.96
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.84E+00	0/32	8.04E+00	0/32	4.02E-01	0.341 - 3.96
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.55E-02	0/32	2.32E-02	0/32	1.16E-03	0.341 - 3.96
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.97E-02	0/32	4.52E-02	0/32	2.26E-03	0.341 - 3.96
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.26E-01	0/32	8.42E-01	0/32	4.21E-02	0.341 - 3.96
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.59E-02	0/32	8.72E-02	0/32	4.36E-03	0.681 - 7.92
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.06E-03	0/32	6.42E-03	0/32	3.21E-04	0.341 - 3.96
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.47E-03	0/32	1.33E-03	0/32	6.67E-05	0.341 - 3.96
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.47E+00	0/32	7.70E+00	0/32	3.85E-01	0.0341 - 0.396
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.96E-01	0/32	1.78E-01	0/32	8.91E-03	0.341 - 3.96
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.68E-03	0/32	5.16E-03	0/32	2.58E-04	0.341 - 3.96
SVOA	2-Methylnaphthalene	mg/kg	1.77E-02	6.36E-02	3.68E-02	4/32	N/A	N/A	0/32	4.07E-01	0/32	3.70E-01	3/32	1.85E-02	0.0341 - 0.396
SVOA	2-Methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.66E+00	0/32	1.51E+00	0/32	7.53E-02	0.341 - 3.96
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.76E-01	0/32	1.60E-01	0/32	8.01E-03	0.341 - 3.96
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.59E-02	0/32	8.72E-02	0/32	4.36E-03	0.341 - 3.96
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.81E-02	0/32	1.65E-02	0/32	8.24E-04	0.341 - 3.96
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.39E-03	0/32	4.90E-03	0/32	2.45E-04	0.341 - 3.96
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.52E-03	0/32	6.84E-03	0/32	3.42E-04	0.341 - 3.96
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.76E+00	0/32	3.42E+00	0/32	1.71E-01	0.341 - 3.96
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.41E-03	0/32	3.10E-03	0/32	1.55E-04	0.341 - 3.96
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.52E-03	0/32	6.84E-03	0/32	3.42E-04	0.341 - 3.96
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.59E-02	0/32	8.72E-02	0/32	4.36E-03	0.341 - 3.96
SVOA	Acenaphthene	mg/kg	1.34E-02	7.65E-01	1.87E-01	8/32	N/A	N/A	0/32	1.21E+01	0/32	1.10E+01	1/32	5.49E-01	0.0341 - 0.396
SVOA	Acenaphthylene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.21E+01	0/32	1.10E+01	0/32	5.49E-01	0.0341 - 0.396
SVOA	Acetophenone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.28E+00	0/32	1.17E+00	0/32	5.84E-02	0.341 - 3.96
SVOA	Anthracene	mg/kg	1.17E-02	1.28E+00	2.17E-01	14/32	N/A	N/A	0/32	1.28E+02	0/32	1.16E+02	0/32	5.81E+00	0.0341 - 0.396
SVOA	Atrazine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.31E-03	0/32	3.92E-03	0/32	1.96E-04	0.341 - 3.96

Table C1.34. Sector 5 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzaldehyde	mg/kg	--	--	--	0/32	N/A	N/A	0/32	9.13E-02	0/32	8.30E-02	0/32	4.15E-03	0.341 - 3.96
SVOA	Benzo(ghi)perylene	mg/kg	1.32E-02	3.22E+00	4.56E-01	15/32	N/A	N/A	0/32	2.90E+01	0/32	2.63E+01	2/32	1.32E+00	0.0341 - 0.396
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.97E-02	0/32	2.70E-02	0/32	1.35E-03	0.341 - 3.96
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.94E-05	0/32	7.22E-05	0/32	3.61E-06	0.341 - 3.96
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.88E-03	0/32	2.62E-03	0/32	1.31E-04	0.341 - 3.96
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.93E+01	0/32	2.66E+01	0/32	1.33E+00	0.0341 - 0.396
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.19E+00	0/32	4.72E+00	0/32	2.36E-01	0.0341 - 0.396
SVOA	Caprolactam	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.43E+00	0/32	4.94E+00	0/32	2.47E-01	0.341 - 3.96
SVOA	Carbazole	mg/kg	1.15E-02	7.23E-01	1.57E-01	8/32	N/A	N/A	0/32	8.27E-01	0/32	7.51E-01	3/32	3.76E-02	0.0341 - 0.396
SVOA	Dibenzofuran	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.21E-01	0/32	2.92E-01	0/32	1.46E-02	0.341 - 3.96
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.34E+01	0/32	1.22E+01	0/32	6.08E-01	0.0341 - 0.396
SVOA	Dimethyl phthalate	mg/kg	2.11E-01	2.11E-01	2.11E-01	1/32	N/A	N/A	0/32	1.34E+01	0/32	1.22E+01	0/32	6.08E-01	0.0341 - 0.396
SVOA	Di-n-butyl phthalate	mg/kg	1.07E-02	1.81E-02	1.40E-02	3/32	N/A	N/A	0/32	4.99E+00	0/32	4.54E+00	0/32	2.27E-01	0.0341 - 0.396
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.24E+02	0/32	1.13E+02	0/32	5.65E+00	0.0341 - 0.396
SVOA	Diphenylamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.13E+00	0/32	4.66E+00	0/32	2.33E-01	0.341 - 3.96
SVOA	Fluoranthene	mg/kg	1.29E-02	9.10E+00	1.12E+00	24/32	N/A	N/A	0/32	1.96E+02	0/32	1.78E+02	1/32	8.91E+00	0.0341 - 0.396
SVOA	Fluorene	mg/kg	1.13E-02	6.59E-01	1.39E-01	8/32	N/A	N/A	0/32	1.20E+01	0/32	1.09E+01	1/32	5.45E-01	0.0341 - 0.396
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.71E-03	0/32	2.46E-03	0/32	1.23E-04	0.341 - 3.96
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.87E-03	0/32	5.34E-03	0/32	2.67E-04	0.341 - 3.96
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.82E-03	0/32	2.56E-03	0/32	1.28E-04	0.341 - 3.96
SVOA	Hexachloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.40E-03	0/32	4.00E-03	0/32	2.00E-04	0.341 - 3.96
SVOA	Isophorone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.68E-01	0/32	5.16E-01	0/32	2.58E-02	0.341 - 3.96
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.53E-01	0/32	5.94E-01	0/32	2.97E-02	0.341 - 3.96
SVOA	Naphthalene	mg/kg	1.43E-02	1.53E-01	6.53E-02	4/32	N/A	N/A	4/32	8.47E-03	4/32	7.70E-03	4/32	3.85E-04	0.0341 - 0.396
SVOA	Nitrobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.02E-03	0/32	1.83E-03	0/32	9.17E-05	0.341 - 3.96
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.78E-04	0/32	1.62E-04	0/32	8.10E-06	0.341 - 3.96
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.26E-03	0/32	1.14E-03	0/32	5.71E-05	0.341 - 3.96
SVOA	Phenanthrene	mg/kg	1.09E-02	6.76E+00	6.41E-01	24/32	N/A	N/A	0/32	1.21E+01	0/32	1.10E+01	4/32	5.49E-01	0.0341 - 0.396
SVOA	Phenol	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.28E+00	0/32	6.62E+00	0/32	3.31E-01	0.341 - 3.96
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.48E-02	0/32	3.16E-02	0/32	1.58E-03	0.341 - 3.96
SVOA	Pyrene	mg/kg	1.40E-02	8.22E+00	1.03E+00	23/32	N/A	N/A	0/32	2.90E+01	0/32	2.63E+01	3/32	1.32E+00	0.0341 - 0.396
SVOA	Total PAH	mg/kg	1.56E-03	6.90E+00	7.07E-01	14/32	N/A	N/A	2/32	6.47E-01	2/32	5.89E-01	11/32	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	N/A	N/A	0/1	9.72E+00	0/1	8.84E+00	0/1	4.42E-01	0.312 - 0.312
RADS	Americium-241	pCi/g	--	--	--	0/33	N/A	N/A	0/33	2.11E+01	0/33	1.92E+01	0/33	9.58E-01	0.224 - 1.18
RADS	Cesium-137	pCi/g	9.16E-02	8.09E+00	2.54E+00	5/32	2/32	4.90E-01	0/32	1.05E+01	0/32	9.58E+00	2/32	4.79E-01	0.0286 - 0.144
RADS	Cobalt-60	pCi/g	--	--	--	0/1	N/A	N/A	0/1	3.50E-02	0/1	3.19E-02	0/1	1.59E-03	0.0404 - 0.0404
RADS	Lead-210	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.95E-01	0/1	1.78E-01	0/1	8.88E-03	12.3 - 12.3
RADS	Neptunium-237	pCi/g	3.54E+00	3.54E+00	3.54E+00	1/33	1/33	1.00E-01	1/33	1.18E+00	1/33	1.07E+00	1/33	5.36E-02	0.238 - 1.05
RADS	Plutonium-238	pCi/g	--	--	--	0/33	0/33	7.30E-02	0/33	4.82E+00	0/33	4.38E+00	0/33	2.19E-01	0.261 - 0.856
RADS	Plutonium-239/240	pCi/g	1.25E+01	1.25E+01	1.25E+01	1/33	1/33	2.50E-02	1/33	4.69E+00	1/33	4.26E+00	1/33	2.13E-01	0.262 - 1.07
RADS	Protactinium-231	pCi/g	--	--	--	0/1	N/A	N/A	0/1	1.33E+01	0/1	1.21E+01	0/1	6.06E-01	0.53 - 0.53
RADS	Radium-226	pCi/g	1.21E+00	1.21E+00	1.21E+00	1/1	0/1	1.50E+00	1/1	3.59E-03	1/1	3.26E-03	1/1	1.63E-04	0.455 - 0.455
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	2.46E-02	0/1	2.24E-02	0/1	1.12E-03	1.9 - 1.9
RADS	Technetium-99	pCi/g	4.51E+00	4.16E+02	6.39E+01	9/33	9/33	2.50E+00	9/33	1.67E-01	9/33	1.52E-01	9/33	7.60E-03	2.74 - 4.3
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	2.16E-04	0/1	1.96E-04	0/1	9.80E-06	0.83 - 0.83
RADS	Thorium-230	pCi/g	5.37E-01	5.40E+01	3.15E+00	29/33	9/33	1.50E+00	1/33	4.03E+01	1/33	3.66E+01	5/33	1.83E+00	0.331 - 1.08
RADS	Thorium-232	pCi/g	1.59E+00	1.59E+00	1.59E+00	1/1	1/1	1.50E+00	1/1	2.16E-01	1/1	1.96E-01	1/1	9.80E-03	0.468 - 0.468
RADS	Uranium-233/234	pCi/g	5.79E-01	2.90E+03	9.15E+01	33/33	25/33	1.20E+00	27/33	1.09E+00	28/33	9.90E-01	33/33	4.95E-02	0.328 - 16.6
RADS	Uranium-235/236	pCi/g	2.13E-01	1.77E+02	2.01E+01	9/33	9/33	6.00E-02	1/33	1.07E+00	1/33	9.76E-01	9/33	4.88E-02	0.141 - 14.1
RADS	Uranium-238	pCi/g	4.53E-01	3.00E+03	9.58E+01	33/33	26/33	1.20E+00	29/33	8.87E-01	30/33	8.05E-01	33/33	4.03E-02	0.17 - 16
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.18E+00	0/32	5.62E+00	0/32	2.81E-01	0.000884 - 0.362
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.51E-04	0/32	5.92E-04	0/32	2.96E-05	0.000884 - 0.362

Table C1.34. Sector 5 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.63E+01	0/32	5.13E+01	0/32	2.56E+00	0.00442 - 1.81
VOA	1,1,2-Trichloroethane	mg/kg	9.22E-04	2.41E-03	1.67E-03	2/32	N/A	N/A	2/32	2.97E-04	2/32	2.69E-04	2/32	1.35E-05	0.000884 - 0.362
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.72E-02	0/32	1.56E-02	0/32	7.82E-04	0.000884 - 0.362
VOA	1,1-Dichloroethene	mg/kg	9.45E-04	5.97E-03	3.90E-03	3/32	N/A	N/A	0/32	2.24E-01	0/32	2.04E-01	0/32	1.02E-02	0.000884 - 0.362
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.60E-02	0/32	4.18E-02	0/32	2.09E-03	0.000884 - 0.362
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.55E-02	0/32	2.32E-02	0/32	1.16E-03	0.000884 - 0.362
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.17E-06	0/32	2.88E-06	0/32	1.44E-07	0.000884 - 0.362
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.62E-05	0/32	4.20E-05	0/32	2.10E-06	0.000884 - 0.362
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.49E-01	0/32	5.90E-01	0/32	2.95E-02	0.000884 - 0.362
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.06E-03	0/32	9.69E-04	0/32	4.84E-05	0.000884 - 0.362
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.03E-03	0/32	5.48E-03	0/32	2.74E-04	0.000884 - 0.362
VOA	1,2-Dimethylbenzene	mg/kg	4.09E-04	1.71E-02	3.16E-03	7/32	N/A	N/A	0/32	4.18E-01	0/32	3.81E-01	0/32	1.90E-02	0.000884 - 0.362
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.49E-01	0/32	5.90E-01	0/32	2.95E-02	0.000884 - 0.362
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.02E-02	0/32	9.24E-03	0/32	4.62E-04	0.000884 - 0.362
VOA	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.07E-03	0/28	1.88E-03	0/28	9.42E-05	0.0442 - 18.1
VOA	2-Butanone	mg/kg	1.84E-03	2.25E-01	2.76E-02	10/32	N/A	N/A	0/32	2.55E+00	0/32	2.32E+00	1/32	1.16E-01	0.00442 - 1.81
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.04E-05	0/32	2.76E-05	0/32	1.38E-06	0.00442 - 1.81
VOA	2-Hexanone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.93E-02	0/32	1.75E-02	0/32	8.75E-04	0.00442 - 1.81
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	7.08E-02	0/32	6.44E-02	0/32	3.22E-03	0.000884 - 0.362
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.18E-01	0/32	5.62E-01	0/32	2.81E-02	0.00442 - 1.81
VOA	Acetone	mg/kg	2.88E-03	2.49E-01	3.17E-02	20/32	N/A	N/A	0/32	8.10E+00	0/32	7.36E+00	0/32	3.68E-01	0.00442 - 1.81
VOA	Acrolein	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.85E-05	0/32	1.68E-05	0/32	8.41E-07	0.00442 - 1.81
VOA	Acrylonitrile	mg/kg	--	--	--	0/32	N/A	N/A	0/32	2.51E-04	0/32	2.28E-04	0/32	1.14E-05	0.00442 - 1.81
VOA	Benzene	mg/kg	3.83E-04	8.47E-04	5.89E-04	5/32	N/A	N/A	0/32	5.13E-03	0/32	4.66E-03	5/32	2.33E-04	0.000884 - 0.362
VOA	Bromochloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.58E-02	0/32	4.16E-02	0/32	2.08E-03	0.000884 - 0.362
VOA	Bromodichloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	8.03E-04	0/32	7.30E-04	0/32	3.65E-05	0.000884 - 0.362
VOA	Bromoform	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.92E-02	0/32	1.75E-02	0/32	8.73E-04	0.000884 - 0.362
VOA	Bromomethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	4.20E-03	0/32	3.82E-03	0/32	1.91E-04	0.000884 - 0.362
VOA	Carbon disulfide	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/32	N/A	N/A	0/32	5.28E-01	0/32	4.80E-01	0/32	2.40E-02	0.00442 - 1.81
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.89E-03	0/32	3.54E-03	0/32	1.77E-04	0.000884 - 0.362
VOA	Chlorobenzene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.16E-01	0/32	1.06E-01	0/32	5.28E-03	0.000884 - 0.362
VOA	Chloroethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.21E+00	0/32	4.74E+00	0/32	2.37E-01	0.000884 - 0.362
VOA	Chloroform	mg/kg	3.36E-04	6.58E-04	5.29E-04	5/32	N/A	N/A	0/32	1.35E-03	0/32	1.22E-03	5/32	6.12E-05	0.000884 - 0.362
VOA	Chloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.16E-02	0/32	1.05E-02	0/32	5.26E-04	0.000884 - 0.362
VOA	*cis* -1,2-Dichloroethene	mg/kg	4.55E-04	1.85E+00	4.98E-01	9/32	N/A	N/A	6/32	2.33E-02	6/32	2.12E-02	8/32	1.06E-03	0.000884 - 0.362
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.70E-03	0/32	3.36E-03	0/32	1.68E-04	0.000884 - 0.362
VOA	Cumene	mg/kg	1.30E-03	1.30E-03	1.30E-03	1/32	N/A	N/A	0/32	1.62E+00	0/32	1.48E+00	0/32	7.38E-02	0.000884 - 0.362
VOA	Cyclohexane	mg/kg	4.66E-04	1.15E-03	7.59E-04	6/32	N/A	N/A	0/32	2.86E+01	0/32	2.60E+01	0/32	1.30E+00	0.000884 - 0.362
VOA	Dibromochloromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	5.10E-03	0/32	4.64E-03	0/32	2.32E-04	0.000884 - 0.362
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	6.69E-01	0/32	6.08E-01	0/32	3.04E-02	0.000884 - 0.362
VOA	Ethylbenzene	mg/kg	4.25E-04	1.03E-02	2.10E-03	7/32	N/A	N/A	0/32	3.70E-02	0/32	3.36E-02	2/32	1.68E-03	0.000884 - 0.362
VOA	m,p-Xylene	mg/kg	7.77E-04	4.81E-02	7.92E-03	8/32	N/A	N/A	0/32	4.20E-01	0/32	3.82E-01	1/32	1.91E-02	0.00177 - 0.724
VOA	Methyl acetate	mg/kg	2.33E-03	2.33E-03	2.33E-03	1/32	N/A	N/A	0/32	9.04E+00	0/32	8.22E+00	0/32	4.11E-01	0.00442 - 1.81
VOA	Methylcyclohexane	mg/kg	5.99E-04	2.34E-03	1.31E-03	8/32	N/A	N/A	0/32	3.08E+01	0/32	2.80E+01	0/32	1.40E+00	0.000884 - 0.362
VOA	Methylene chloride	mg/kg	1.66E-03	5.26E-03	3.39E-03	14/32	N/A	N/A	0/32	5.98E-02	0/32	5.44E-02	10/32	2.72E-03	0.00442 - 1.81
VOA	Styrene	mg/kg	1.18E-03	1.18E-03	1.18E-03	1/32	N/A	N/A	0/32	2.93E+00	0/32	2.66E+00	0/32	1.33E-01	0.000884 - 0.362
VOA	Tetrachloroethene	mg/kg	3.63E-04	8.35E-02	2.86E-02	5/32	N/A	N/A	1/32	4.05E-02	1/32	3.69E-02	3/32	1.84E-03	0.000884 - 0.362
VOA	Toluene	mg/kg	3.89E-04	1.40E-02	2.76E-03	17/32	N/A	N/A	0/32	1.68E+00	0/32	1.52E+00	0/32	7.62E-02	0.000884 - 0.362
VOA	Total Xylene	mg/kg	1.20E-03	6.53E-02	1.21E-02	7/32	N/A	N/A	0/32	4.20E-01	0/32	3.82E-01	1/32	1.91E-02	0.00265 - 1.09
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.80E-04	2.71E-02	1.39E-02	4/32	N/A	N/A	0/32	6.40E-02	0/32	5.83E-02	3/32	2.91E-03	0.000884 - 0.362
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/32	N/A	N/A	0/32	3.70E-03	0/32	3.36E-03	0/32	1.68E-04	0.000884 - 0.362
VOA	Trichloroethene	mg/kg	3.72E-04	2.36E+01	2.39E+00	12/32	N/A	N/A	8/32	2.22E-03	8/32	2.02E-03	12/32	1.01E-04	0.000884 - 0.362

Table C1.34. Sector 5 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/32	N/A	N/A	0/32	1.61E+00	0/32	1.46E+00	0/32	7.31E-02	0.000884 - 0.362
VOA	Vinyl chloride	mg/kg	6.69E-04	2.21E-01	7.41E-02	3/32	N/A	N/A	3/32	1.42E-04	3/32	1.29E-04	3/32	6.47E-06	0.000884 - 0.362

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.35. Sector 5 Subsurface Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	3.98E+03	2.12E+04	1.27E+04	41/41	25/41	1.20E+04	0/41	6.60E+04	0/41	5.99E+04	41/41	3.00E+03	10.5 - 123
METAL	Antimony	mg/kg	3.95E-01	1.87E+00	9.54E-01	12/41	12/41	2.10E-01	6/41	7.74E-01	6/41	7.04E-01	12/41	3.52E-02	2.04 - 2.45
METAL	Arsenic	mg/kg	2.52E+00	1.69E+01	5.62E+00	40/41	5/41	7.90E+00	40/41	3.32E-02	40/41	3.02E-02	40/41	1.51E-03	1.03 - 5.4
METAL	Barium	mg/kg	2.50E+01	2.24E+02	1.07E+02	41/41	4/41	1.70E+02	0/41	3.41E+02	0/41	3.11E+02	41/41	1.55E+01	0.826 - 9.55
METAL	Beryllium	mg/kg	1.62E-01	8.43E-01	5.24E-01	41/41	5/41	6.90E-01	0/41	4.29E+01	0/41	3.89E+01	0/41	1.95E+00	0.103 - 0.123
METAL	Boron	mg/kg	8.98E-01	8.07E+00	2.02E+00	32/41	N/A	N/A	0/41	2.82E+01	0/41	2.56E+01	28/41	1.28E+00	3.1 - 3.68
METAL	Cadmium	mg/kg	2.24E-02	1.80E-01	6.34E-02	23/41	0/41	2.10E-01	0/41	1.52E+00	0/41	1.39E+00	6/41	6.93E-02	0.206 - 0.246
METAL	Chromium	mg/kg	9.20E+00	5.14E+01	1.82E+01	41/41	2/41	4.30E+01	0/41	3.96E+06	0/41	3.60E+06	0/41	1.80E+05	0.619 - 0.737
METAL	Cobalt	mg/kg	2.36E+00	2.53E+01	7.55E+00	41/41	3/41	1.30E+01	41/41	5.96E-01	41/41	5.43E-01	41/41	2.71E-02	0.206 - 0.246
METAL	Copper	mg/kg	4.79E+00	2.69E+01	1.00E+01	41/41	1/41	2.50E+01	0/41	6.18E+01	0/41	5.62E+01	41/41	2.81E+00	0.413 - 0.491
METAL	Iron	mg/kg	6.34E+03	2.92E+04	1.75E+04	41/41	1/41	2.80E+04	41/41	7.74E+02	41/41	7.04E+02	41/41	3.52E+01	21.6 - 246
METAL	Lead	mg/kg	2.98E+00	2.01E+01	1.07E+01	41/41	0/41	2.30E+01	0/41	2.97E+02	0/41	2.70E+02	7/41	1.35E+01	0.413 - 0.491
METAL	Manganese	mg/kg	5.60E+01	2.86E+03	5.43E+02	41/41	6/41	8.20E+02	40/41	6.23E+01	40/41	5.65E+01	41/41	2.83E+00	1.03 - 285
METAL	Mercury	mg/kg	9.18E-03	5.96E-02	2.09E-02	30/41	0/41	1.30E-01	0/41	6.49E-01	0/41	5.91E-01	3/41	2.95E-02	0.023 - 0.0299
METAL	Molybdenum	mg/kg	1.57E-01	1.42E+00	5.02E-01	41/41	N/A	N/A	0/41	4.44E+00	0/41	4.03E+00	38/41	2.02E-01	0.206 - 0.246
METAL	Nickel	mg/kg	5.49E+00	2.06E+01	1.07E+01	41/41	0/41	2.20E+01	0/41	5.63E+01	0/41	5.12E+01	41/41	2.56E+00	0.413 - 0.491
METAL	Selenium	mg/kg	4.17E-01	3.25E+00	1.32E+00	40/41	34/41	7.00E-01	19/41	1.14E+00	23/41	1.04E+00	40/41	5.19E-02	1.03 - 5.4
METAL	Silver	mg/kg	3.23E-01	1.45E+00	5.74E-01	8/41	0/41	2.70E+00	0/41	1.76E+00	0/41	1.60E+00	8/41	7.99E-02	0.51 - 5.73
METAL	Thallium	mg/kg	1.51E-01	2.82E-01	1.99E-01	19/41	0/41	3.40E-01	19/41	3.12E-02	19/41	2.84E-02	19/41	1.42E-03	0.413 - 0.491
METAL	Uranium	mg/kg	5.42E-01	1.81E+01	1.76E+00	41/41	2/41	4.60E+00	2/41	3.96E+00	2/41	3.60E+00	41/41	1.80E-01	0.0413 - 0.0491
METAL	Vanadium	mg/kg	7.93E+00	6.20E+01	2.87E+01	41/41	5/41	3.70E+01	0/41	1.90E+02	0/41	1.73E+02	40/41	8.64E+00	4.13 - 4.91
METAL	Zinc	mg/kg	1.15E+01	6.73E+01	3.15E+01	41/41	2/41	6.00E+01	0/41	8.21E+02	0/41	7.46E+02	11/41	3.73E+01	4.13 - 21.6
ANION	Fluoride	mg/kg	1.47E+00	1.69E+01	7.11E+00	41/41	N/A	N/A	0/41	2.64E+02	0/41	2.40E+02	7/41	1.20E+01	1.06 - 2.36
DI/FURA	Total Dioxin/Furans	mg/kg	3.07E-06	1.58E-05	6.07E-06	22/22	N/A	N/A	22/22	1.30E-06	22/22	1.18E-06	22/22	5.91E-08	-
PPCB	Total PCB	mg/kg	1.53E-03	1.48E-02	4.73E-03	8/40	N/A	N/A	0/40	1.50E-01	0/40	1.36E-01	1/40	6.82E-03	0.00345 - 0.0209
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.92E-02	0/40	1.74E-02	0/40	8.72E-04	0.341 - 0.435
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.84E+00	0/40	8.04E+00	0/40	4.02E-01	0.341 - 0.435
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.55E-02	0/40	2.32E-02	0/40	1.16E-03	0.341 - 0.435
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.97E-02	0/40	4.52E-02	0/40	2.26E-03	0.341 - 0.435
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.26E-01	0/40	8.42E-01	0/40	4.21E-02	0.341 - 0.435
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.681 - 0.87
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.06E-03	0/40	6.42E-03	0/40	3.21E-04	0.341 - 0.435
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.47E-03	0/40	1.33E-03	0/40	6.67E-05	0.341 - 0.435
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.47E+00	0/40	7.70E+00	0/40	3.85E-01	0.0341 - 0.0435
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.96E-01	0/40	1.78E-01	0/40	8.91E-03	0.341 - 0.435
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.68E-03	0/40	5.16E-03	0/40	2.58E-04	0.341 - 0.435
SVOA	2-Methylnaphthalene	mg/kg	1.73E-02	1.97E-02	1.85E-02	2/40	N/A	N/A	0/40	4.07E-01	0/40	3.70E-01	1/40	1.85E-02	0.0341 - 0.0435
SVOA	2-Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.66E+00	0/40	1.51E+00	0/40	7.53E-02	0.341 - 0.435
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.76E-01	0/40	1.60E-01	0/40	8.01E-03	0.341 - 0.435
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.341 - 0.435
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.81E-02	0/40	1.65E-02	0/40	8.24E-04	0.341 - 0.435
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.39E-03	0/40	4.90E-03	0/40	2.45E-04	0.341 - 0.435
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.52E-03	0/40	6.84E-03	0/40	3.42E-04	0.341 - 0.435
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.76E+00	0/40	3.42E+00	0/40	1.71E-01	0.341 - 0.435
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.41E-03	0/40	3.10E-03	0/40	1.55E-04	0.341 - 0.435
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.52E-03	0/40	6.84E-03	0/40	3.42E-04	0.341 - 0.435
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.59E-02	0/40	8.72E-02	0/40	4.36E-03	0.341 - 0.435
SVOA	Acenaphthene	mg/kg	1.29E-02	2.13E-02	1.63E-02	4/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	0/40	5.49E-01	0.0341 - 0.0435
SVOA	Acenaphthylene	mg/kg	1.62E-02	1.62E-02	1.62E-02	1/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	0/40	5.49E-01	0.0341 - 0.0435
SVOA	Acetophenone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.28E+00	0/40	1.17E+00	0/40	5.84E-02	0.341 - 0.435
SVOA	Anthracene	mg/kg	1.34E-02	2.36E-01	4.94E-02	8/40	N/A	N/A	0/40	1.28E+02	0/40	1.16E+02	0/40	5.81E+00	0.0341 - 0.0435
SVOA	Atrazine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.31E-03	0/40	3.92E-03	0/40	1.96E-04	0.341 - 0.435

Table C1.35. Sector 5 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Benzaldehyde	mg/kg	--	--	--	0/40	N/A	N/A	0/40	9.13E-02	0/40	8.30E-02	0/40	4.15E-03	0.341 - 0.435
SVOA	Benzo(ghi)perylene	mg/kg	1.12E-02	3.81E-01	9.86E-02	8/40	N/A	N/A	0/40	2.90E+01	0/40	2.63E+01	0/40	1.32E+00	0.0341 - 0.0435
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.97E-02	0/40	2.70E-02	0/40	1.35E-03	0.341 - 0.435
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.94E-05	0/40	7.22E-05	0/40	3.61E-06	0.341 - 0.435
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.88E-03	0/40	2.62E-03	0/40	1.31E-04	0.341 - 0.435
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.39E-02	1.63E-02	1.51E-02	2/40	N/A	N/A	0/40	2.93E+01	0/40	2.66E+01	0/40	1.33E+00	0.0341 - 0.0435
SVOA	Butyl benzyl phthalate	mg/kg	1.66E-02	1.66E-02	1.66E-02	1/40	N/A	N/A	0/40	5.19E+00	0/40	4.72E+00	0/40	2.36E-01	0.0341 - 0.0435
SVOA	Caprolactam	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.43E+00	0/40	4.94E+00	0/40	2.47E-01	0.341 - 0.435
SVOA	Carbazole	mg/kg	1.50E-02	2.50E-02	2.15E-02	3/40	N/A	N/A	0/40	8.27E-01	0/40	7.51E-01	0/40	3.76E-02	0.0341 - 0.0435
SVOA	Dibenzofuran	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.21E-01	0/40	2.92E-01	0/40	1.46E-02	0.341 - 0.435
SVOA	Diethyl phthalate	mg/kg	1.82E-02	1.82E-02	1.82E-02	1/40	N/A	N/A	0/40	1.34E+01	0/40	1.22E+01	0/40	6.08E-01	0.0341 - 0.0435
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.34E+01	0/40	1.22E+01	0/40	6.08E-01	0.0341 - 0.0435
SVOA	Di-n-butyl phthalate	mg/kg	1.24E-02	3.38E-02	1.82E-02	6/40	N/A	N/A	0/40	4.99E+00	0/40	4.54E+00	0/40	2.27E-01	0.0341 - 0.0435
SVOA	Di-n-octylphthalate	mg/kg	1.70E-02	1.70E-02	1.70E-02	1/40	N/A	N/A	0/40	1.24E+02	0/40	1.13E+02	0/40	5.65E+00	0.0341 - 0.0435
SVOA	Diphenylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.13E+00	0/40	4.66E+00	0/40	2.33E-01	0.341 - 0.435
SVOA	Fluoranthene	mg/kg	1.02E-02	2.40E+00	1.95E-01	21/40	N/A	N/A	0/40	1.96E+02	0/40	1.78E+02	0/40	8.91E+00	0.0341 - 0.0435
SVOA	Fluorene	mg/kg	1.16E-02	2.27E-02	1.52E-02	5/40	N/A	N/A	0/40	1.20E+01	0/40	1.09E+01	0/40	5.45E-01	0.0341 - 0.0435
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.71E-03	0/40	2.46E-03	0/40	1.23E-04	0.341 - 0.435
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.87E-03	0/40	5.34E-03	0/40	2.67E-04	0.341 - 0.435
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.82E-03	0/40	2.56E-03	0/40	1.28E-04	0.341 - 0.435
SVOA	Hexachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.40E-03	0/40	4.00E-03	0/40	2.00E-04	0.341 - 0.435
SVOA	Isophorone	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.68E-01	0/40	5.16E-01	0/40	2.58E-02	0.341 - 0.435
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.53E-01	0/40	5.94E-01	0/40	2.97E-02	0.341 - 0.435
SVOA	Naphthalene	mg/kg	1.33E-02	3.69E-02	2.51E-02	2/40	N/A	N/A	2/40	8.47E-03	2/40	7.70E-03	2/40	3.85E-04	0.0341 - 0.0435
SVOA	Nitrobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.02E-03	0/40	1.83E-03	0/40	9.17E-05	0.341 - 0.435
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.78E-04	0/40	1.62E-04	0/40	8.10E-06	0.341 - 0.435
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.26E-03	0/40	1.14E-03	0/40	5.71E-05	0.341 - 0.435
SVOA	Phenanthrene	mg/kg	1.80E-02	7.57E-01	1.26E-01	13/40	N/A	N/A	0/40	1.21E+01	0/40	1.10E+01	1/40	5.49E-01	0.0341 - 0.0435
SVOA	Phenol	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.28E+00	0/40	6.62E+00	0/40	3.31E-01	0.341 - 0.435
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.48E-02	0/40	3.16E-02	0/40	1.58E-03	0.341 - 0.435
SVOA	Pyrene	mg/kg	1.19E-02	1.98E+00	1.94E-01	18/40	N/A	N/A	0/40	2.90E+01	0/40	2.63E+01	1/40	1.32E+00	0.0341 - 0.0435
SVOA	Total PAH	mg/kg	1.23E-03	1.61E+00	1.52E-01	15/40	N/A	N/A	1/40	6.47E-01	1/40	5.89E-01	7/40	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/41	N/A	N/A	0/41	2.11E+01	0/41	1.92E+01	0/41	9.58E-01	0.0764 - 0.846
RADS	Cesium-137	pCi/g	--	--	--	0/41	0/41	2.80E-01	0/41	1.05E+01	0/41	9.58E+00	0/41	4.79E-01	0.0303 - 0.0676
RADS	Neptunium-237	pCi/g	--	--	--	0/41	N/A	N/A	0/41	1.18E+00	0/41	1.07E+00	0/41	5.36E-02	0.373 - 0.883
RADS	Plutonium-238	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.82E+00	0/41	4.38E+00	0/41	2.19E-01	0.324 - 0.862
RADS	Plutonium-239/240	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.69E+00	0/41	4.26E+00	0/41	2.13E-01	0.234 - 1.09
RADS	Technetium-99	pCi/g	6.72E+00	2.62E+01	1.33E+01	5/41	5/41	2.80E+00	5/41	1.67E-01	5/41	1.52E-01	5/41	7.60E-03	2.8 - 4.97
RADS	Thorium-230	pCi/g	7.38E-01	2.44E+00	1.26E+00	36/41	9/41	1.40E+00	0/41	4.03E+01	0/41	3.66E+01	1/41	1.83E+00	0.398 - 0.828
RADS	Uranium-233/234	pCi/g	5.72E-01	1.70E+01	1.80E+00	35/41	11/41	1.20E+00	16/41	1.09E+00	20/41	9.90E-01	35/41	4.95E-02	0.255 - 0.912
RADS	Uranium-235/236	pCi/g	1.87E-01	6.53E-01	3.64E-01	5/41	5/41	6.00E-02	0/41	1.07E+00	0/41	9.76E-01	5/41	4.88E-02	0.116 - 0.883
RADS	Uranium-238	pCi/g	5.32E-01	1.84E+01	1.79E+00	41/41	15/41	1.20E+00	30/41	8.87E-01	32/41	8.05E-01	41/41	4.03E-02	0.136 - 0.714
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.18E+00	0/40	5.62E+00	0/40	2.81E-01	0.000922 - 2.24
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.51E-04	0/40	5.92E-04	0/40	2.96E-05	0.000922 - 2.24
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.63E+01	0/40	5.13E+01	0/40	2.56E+00	0.00461 - 11.2
VOA	1,1,2-Trichloroethane	mg/kg	5.26E-03	1.94E-02	1.03E-02	3/40	N/A	N/A	3/40	2.97E-04	3/40	2.69E-04	3/40	1.35E-05	0.000922 - 2.24
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.72E-02	0/40	1.56E-02	0/40	7.82E-04	0.000922 - 2.24
VOA	1,1-Dichloroethene	mg/kg	2.21E-03	9.14E-03	6.23E-03	4/40	N/A	N/A	0/40	2.24E-01	0/40	2.04E-01	0/40	1.02E-02	0.000922 - 2.24
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.60E-02	0/40	4.18E-02	0/40	2.09E-03	0.000922 - 2.24
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.55E-02	0/40	2.32E-02	0/40	1.16E-03	0.000922 - 2.24
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.17E-06	0/40	2.88E-06	0/40	1.44E-07	0.000922 - 2.24
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.62E-05	0/40	4.20E-05	0/40	2.10E-06	0.000922 - 2.24

Table C1.35. Sector 5 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.49E-01	0/40	5.90E-01	0/40	2.95E-02	0.000922 - 2.24
VOA	1,2-Dichloroethane	mg/kg	4.96E-04	1.55E-03	1.02E-03	2/40	N/A	N/A	1/40	1.06E-03	1/40	9.69E-04	2/40	4.84E-05	0.000922 - 2.24
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.03E-03	0/40	5.48E-03	0/40	2.74E-04	0.000922 - 2.24
VOA	1,2-Dimethylbenzene	mg/kg	6.64E-04	3.89E-03	1.83E-03	3/40	N/A	N/A	0/40	4.18E-01	0/40	3.81E-01	0/40	1.90E-02	0.000922 - 2.24
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.49E-01	0/40	5.90E-01	0/40	2.95E-02	0.000922 - 2.24
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.02E-02	0/40	9.24E-03	0/40	4.62E-04	0.000922 - 2.24
VOA	1,4-Dioxane	mg/kg	--	--	--	0/34	N/A	N/A	0/34	2.07E-03	0/34	1.88E-03	0/34	9.42E-05	0.0461 - 112
VOA	2-Butanone	mg/kg	2.37E-03	2.48E-02	8.57E-03	18/40	N/A	N/A	0/40	2.55E+00	0/40	2.32E+00	0/40	1.16E-01	0.00461 - 11.2
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.04E-05	0/40	2.76E-05	0/40	1.38E-06	0.00461 - 11.2
VOA	2-Hexanone	mg/kg	2.34E-03	2.34E-03	2.34E-03	1/40	N/A	N/A	0/40	1.93E-02	0/40	1.75E-02	1/40	8.75E-04	0.00461 - 11.2
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	7.08E-02	0/40	6.44E-02	0/40	3.22E-03	0.000922 - 2.24
VOA	4-Methyl-2-pentanone	mg/kg	2.15E-03	2.15E-03	2.15E-03	1/40	N/A	N/A	0/40	6.18E-01	0/40	5.62E-01	0/40	2.81E-02	0.00461 - 11.2
VOA	Acetone	mg/kg	2.26E-03	2.51E-01	4.84E-02	33/40	N/A	N/A	0/40	8.10E+00	0/40	7.36E+00	0/40	3.68E-01	0.00461 - 11.2
VOA	Acrolein	mg/kg	2.98E-03	2.98E-03	2.98E-03	1/40	N/A	N/A	1/40	1.85E-05	1/40	1.68E-05	1/40	8.41E-07	0.00461 - 11.2
VOA	Acrylonitrile	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.51E-04	0/40	2.28E-04	0/40	1.14E-05	0.00461 - 11.2
VOA	Benzene	mg/kg	3.59E-04	1.01E-03	7.28E-04	4/40	N/A	N/A	0/40	5.13E-03	0/40	4.66E-03	4/40	2.33E-04	0.000922 - 2.24
VOA	Bromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.58E-02	0/40	4.16E-02	0/40	2.08E-03	0.000922 - 2.24
VOA	Bromodichloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	8.03E-04	0/40	7.30E-04	0/40	3.65E-05	0.000922 - 2.24
VOA	Bromoform	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.92E-02	0/40	1.75E-02	0/40	8.73E-04	0.000922 - 2.24
VOA	Bromomethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	4.20E-03	0/40	3.82E-03	0/40	1.91E-04	0.000922 - 2.24
VOA	Carbon disulfide	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.28E-01	0/40	4.80E-01	0/40	2.40E-02	0.00461 - 11.2
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.89E-03	0/40	3.54E-03	0/40	1.77E-04	0.000922 - 2.24
VOA	Chlorobenzene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.16E-01	0/40	1.06E-01	0/40	5.28E-03	0.000922 - 2.24
VOA	Chloroethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.21E+00	0/40	4.74E+00	0/40	2.37E-01	0.000922 - 2.24
VOA	Chloroform	mg/kg	4.72E-04	6.93E-03	4.46E-03	3/40	N/A	N/A	2/40	1.35E-03	2/40	1.22E-03	3/40	6.12E-05	0.000922 - 2.24
VOA	Chloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.16E-02	0/40	1.05E-02	0/40	5.26E-04	0.000922 - 2.24
VOA	*cis* -1,2-Dichloroethene	mg/kg	4.87E-04	9.11E+00	1.51E+00	18/40	N/A	N/A	8/40	2.33E-02	8/40	2.12E-02	14/40	1.06E-03	0.000922 - 2.24
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-03	0/40	3.36E-03	0/40	1.68E-04	0.000922 - 2.24
VOA	Cumene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.62E+00	0/40	1.48E+00	0/40	7.38E-02	0.000922 - 2.24
VOA	Cyclohexane	mg/kg	4.35E-04	4.35E-04	4.35E-04	1/40	N/A	N/A	0/40	2.86E+01	0/40	2.60E+01	0/40	1.30E+00	0.000922 - 2.24
VOA	Dibromochloromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	5.10E-03	0/40	4.64E-03	0/40	2.32E-04	0.000922 - 2.24
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	6.69E-01	0/40	6.08E-01	0/40	3.04E-02	0.000922 - 2.24
VOA	Ethylbenzene	mg/kg	3.59E-04	3.21E-03	1.41E-03	3/40	N/A	N/A	0/40	3.70E-02	0/40	3.36E-02	1/40	1.68E-03	0.000922 - 2.24
VOA	m,p-Xylene	mg/kg	1.29E-03	1.33E-02	5.46E-03	3/40	N/A	N/A	0/40	4.20E-01	0/40	3.82E-01	0/40	1.91E-02	0.00184 - 4.49
VOA	Methyl acetate	mg/kg	2.27E-03	2.27E-03	2.27E-03	1/40	N/A	N/A	0/40	9.04E+00	0/40	8.22E+00	0/40	4.11E-01	0.00461 - 11.2
VOA	Methylcyclohexane	mg/kg	4.15E-04	1.48E-03	8.49E-04	6/40	N/A	N/A	0/40	3.08E+01	0/40	2.80E+01	0/40	1.40E+00	0.000922 - 2.24
VOA	Methylene chloride	mg/kg	1.76E-03	6.99E-03	3.87E-03	23/40	N/A	N/A	0/40	5.98E-02	0/40	5.44E-02	16/40	2.72E-03	0.00461 - 11.2
VOA	Styrene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	2.93E+00	0/40	2.66E+00	0/40	1.33E-01	0.000922 - 2.24
VOA	Tetrachloroethene	mg/kg	6.27E-04	4.11E-03	1.98E-03	3/40	N/A	N/A	0/40	4.05E-02	0/40	3.69E-02	1/40	1.84E-03	0.000922 - 2.24
VOA	Toluene	mg/kg	3.95E-04	7.19E-03	1.62E-03	13/40	N/A	N/A	0/40	1.68E+00	0/40	1.52E+00	0/40	7.62E-02	0.000922 - 2.24
VOA	Total Xylene	mg/kg	1.96E-03	1.72E-02	7.30E-03	3/40	N/A	N/A	0/40	4.20E-01	0/40	3.82E-01	0/40	1.91E-02	0.00277 - 6.73
VOA	*trans* -1,2-Dichloroethene	mg/kg	4.96E-04	4.62E-02	2.05E-02	7/40	N/A	N/A	0/40	6.40E-02	0/40	5.83E-02	5/40	2.91E-03	0.000922 - 2.24
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/40	N/A	N/A	0/40	3.70E-03	0/40	3.36E-03	0/40	1.68E-04	0.000922 - 2.24
VOA	Trichloroethene	mg/kg	5.13E-04	1.44E+02	1.48E+01	10/40	N/A	N/A	6/40	2.22E-03	6/40	2.02E-03	10/40	1.01E-04	0.000922 - 2.24
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/40	N/A	N/A	0/40	1.61E+00	0/40	1.46E+00	0/40	7.31E-02	0.000922 - 2.24
VOA	Vinyl chloride	mg/kg	5.93E-04	4.79E-01	1.00E-01	7/40	N/A	N/A	7/40	1.42E-04	7/40	1.29E-04	7/40	6.47E-06	0.000922 - 2.24

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Table C1.35. Sector 5 Subsurface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Total Dioxin and Furans calculated using TEF values in the 2021 RMD.

Table C1.36. Sector 5 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	2.22E+03	1.66E+04	9.00E+03	43/43	9/43	1.20E+04	0/43	6.60E+04	0/43	5.99E+04	42/43	3.00E+03	9.41 - 119
METAL	Antimony	mg/kg	4.05E-01	5.09E+00	1.01E+00	16/43	16/43	2.10E-01	6/43	7.74E-01	6/43	7.04E-01	16/43	3.52E-02	1 - 20.4
METAL	Arsenic	mg/kg	4.31E-01	1.19E+01	2.52E+00	40/43	1/43	7.90E+00	40/43	3.32E-02	40/43	3.02E-02	40/43	1.51E-03	0.941 - 5
METAL	Barium	mg/kg	1.05E+01	2.69E+02	4.32E+01	43/43	1/43	1.70E+02	0/43	3.41E+02	0/43	3.11E+02	37/43	1.55E+01	0.753 - 4.45
METAL	Beryllium	mg/kg	2.06E-01	1.17E+00	6.04E-01	42/43	17/43	6.90E-01	0/43	4.29E+01	0/43	3.89E+01	0/43	1.95E+00	0.0941 - 0.5
METAL	Boron	mg/kg	8.90E-01	2.44E+00	1.43E+00	16/41	N/A	N/A	0/41	2.82E+01	0/41	2.56E+01	7/41	1.28E+00	2.82 - 3.65
METAL	Cadmium	mg/kg	2.82E-02	6.38E-01	2.46E-01	3/43	1/43	2.10E-01	0/43	1.52E+00	0/43	1.39E+00	2/43	6.93E-02	0.188 - 0.5
METAL	Calcium	mg/kg	1.15E+03	1.25E+03	1.20E+03	2/2	0/2	6.10E+03	N/A	N/A	N/A	N/A	N/A	N/A	100 - 100
METAL	Chromium	mg/kg	3.57E+00	7.18E+01	1.47E+01	43/43	3/43	4.30E+01	0/43	3.96E+06	0/43	3.60E+06	0/43	1.80E+05	0.565 - 2.5
METAL	Cobalt	mg/kg	3.33E-01	2.27E+01	5.00E+00	41/43	3/43	1.30E+01	40/43	5.96E-01	40/43	5.43E-01	41/43	2.71E-02	0.188 - 5
METAL	Copper	mg/kg	1.65E+00	9.44E+00	4.95E+00	43/43	0/43	2.50E+01	0/43	6.18E+01	0/43	5.62E+01	33/43	2.81E+00	0.376 - 2.5
METAL	Iron	mg/kg	1.23E+03	4.80E+04	1.42E+04	43/43	4/43	2.80E+04	43/43	7.74E+02	43/43	7.04E+02	43/43	3.52E+01	18.8 - 237
METAL	Lead	mg/kg	1.45E+00	1.09E+01	4.64E+00	43/43	0/43	2.30E+01	0/43	2.97E+02	0/43	2.70E+02	0/43	1.35E+01	0.376 - 1
METAL	Magnesium	mg/kg	6.57E+02	9.23E+02	7.90E+02	2/2	0/2	2.10E+03	N/A	N/A	N/A	N/A	N/A	N/A	5 - 5
METAL	Manganese	mg/kg	4.50E+00	1.26E+03	1.26E+02	43/43	1/43	8.20E+02	19/43	6.23E+01	21/43	5.65E+01	43/43	2.83E+00	0.941 - 11.5
METAL	Mercury	mg/kg	8.82E-03	3.89E-02	1.96E-02	8/43	0/43	1.30E-01	0/43	6.49E-01	0/43	5.91E-01	1/43	2.95E-02	0.02 - 0.0309
METAL	Molybdenum	mg/kg	9.59E-02	7.39E-01	2.75E-01	39/41	N/A	N/A	0/41	4.44E+00	0/41	4.03E+00	24/41	2.02E-01	0.188 - 0.243
METAL	Nickel	mg/kg	1.39E+00	1.11E+01	5.60E+00	41/43	0/43	2.20E+01	0/43	5.63E+01	0/43	5.12E+01	36/43	2.56E+00	0.376 - 5
METAL	Potassium	mg/kg	1.26E+02	2.79E+02	2.03E+02	2/2	0/2	9.50E+02	N/A	N/A	N/A	N/A	N/A	N/A	100 - 100
METAL	Selenium	mg/kg	3.87E-01	4.74E+00	1.19E+00	38/43	28/43	7.00E-01	16/43	1.14E+00	20/43	1.04E+00	38/43	5.19E-02	0.941 - 1.22
METAL	Silver	mg/kg	1.48E-01	3.61E-01	2.28E-01	5/43	0/43	2.70E+00	0/43	1.76E+00	0/43	1.60E+00	5/43	7.99E-02	0.506 - 5.1
METAL	Sodium	mg/kg	2.03E+02	2.17E+02	2.10E+02	2/2	0/2	3.40E+02	N/A	N/A	N/A	N/A	N/A	N/A	100 - 200
METAL	Thallium	mg/kg	1.57E-01	3.02E-01	1.97E-01	7/43	0/43	3.40E-01	7/43	3.12E-02	7/43	2.84E-02	7/43	1.42E-03	0.376 - 2
METAL	Uranium	mg/kg	3.73E-01	1.78E+00	9.41E-01	41/43	0/43	4.60E+00	0/43	3.96E+00	0/43	3.60E+00	41/43	1.80E-01	0.0376 - 1
METAL	Vanadium	mg/kg	5.77E+00	6.02E+01	2.29E+01	43/43	7/43	3.70E+01	0/43	1.90E+02	0/43	1.73E+02	38/43	8.64E+00	2.5 - 4.87
METAL	Zinc	mg/kg	4.24E+00	4.32E+01	1.67E+01	41/43	0/43	6.00E+01	0/43	8.21E+02	0/43	7.46E+02	2/43	3.73E+01	3.76 - 20
ANION	Fluoride	mg/kg	5.61E-01	9.85E+00	2.53E+00	41/41	N/A	N/A	0/41	2.64E+02	0/41	2.40E+02	0/41	1.20E+01	1.03 - 1.27
PPCB	Total PCB	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.50E-01	0/99	1.36E-01	0/99	6.82E-03	0.0035 - 0.1
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.92E-02	0/42	1.74E-02	0/42	8.72E-04	0.353 - 0.433
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.84E+00	0/99	8.04E+00	0/99	4.02E-01	0.353 - 0.5
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.55E-02	0/99	2.32E-02	0/99	1.16E-03	0.353 - 0.5
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.97E-02	0/99	4.52E-02	0/99	2.26E-03	0.353 - 0.5
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	9.26E-01	0/99	8.42E-01	0/99	4.21E-02	0.353 - 0.5
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	9.59E-02	0/99	8.72E-02	0/99	4.36E-03	0.45 - 0.866
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.06E-03	0/99	6.42E-03	0/99	3.21E-04	0.353 - 0.5
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.47E-03	0/99	1.33E-03	0/99	6.67E-05	0.353 - 0.5
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.47E+00	0/99	7.70E+00	0/99	3.85E-01	0.0353 - 0.5
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.96E-01	0/99	1.78E-01	0/99	8.91E-03	0.353 - 0.5
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.68E-03	0/99	5.16E-03	0/99	2.58E-04	0.353 - 0.5
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.07E-01	0/99	3.70E-01	0/99	1.85E-02	0.0353 - 0.5
SVOA	2-Methylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.66E+00	0/99	1.51E+00	0/99	7.53E-02	0.353 - 0.5
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.76E-01	0/99	1.60E-01	0/99	8.01E-03	0.353 - 0.5
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	9.59E-02	0/99	8.72E-02	0/99	4.36E-03	0.353 - 0.5
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.81E-02	0/99	1.65E-02	0/99	8.24E-04	0.353 - 0.5
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.39E-03	0/99	4.90E-03	0/99	2.45E-04	0.353 - 0.5
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.52E-03	0/99	6.84E-03	0/99	3.42E-04	0.353 - 0.5
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.76E+00	0/99	3.42E+00	0/99	1.71E-01	0.353 - 0.5
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.41E-03	0/99	3.10E-03	0/99	1.55E-04	0.353 - 0.5
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.52E-03	0/99	6.84E-03	0/99	3.42E-04	0.353 - 0.5
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	9.59E-02	0/99	8.72E-02	0/99	4.36E-03	0.353 - 0.5
SVOA	Acenaphthene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.21E+01	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5
SVOA	Acenaphthylene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.21E+01	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5

Table C1.36. Sector 5 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Acetophenone	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.28E+00	0/42	1.17E+00	0/42	5.84E-02	0.353 - 0.433
SVOA	Anthracene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.28E+02	0/99	1.16E+02	0/99	5.81E+00	0.0353 - 0.5
SVOA	Atrazine	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.31E-03	0/42	3.92E-03	0/42	1.96E-04	0.353 - 0.433
SVOA	Benzaldehyde	mg/kg	--	--	--	0/42	N/A	N/A	0/42	9.13E-02	0/42	8.30E-02	0/42	4.15E-03	0.353 - 0.433
SVOA	Benzenemethanol	mg/kg	--	--	--	0/57	N/A	N/A	0/57	1.05E+00	0/57	9.52E-01	0/57	4.76E-02	0.45 - 0.5
SVOA	Benzo(ghi)perylene	mg/kg	1.31E-02	1.39E-02	1.35E-02	2/99	N/A	N/A	0/99	2.90E+01	0/99	2.63E+01	0/99	1.32E+00	0.0353 - 0.5
SVOA	Benzoic acid	mg/kg	--	--	--	0/52	N/A	N/A	0/52	3.32E+01	0/52	3.02E+01	0/52	1.51E+00	0.45 - 0.5
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.97E-02	0/99	2.70E-02	0/99	1.35E-03	0.353 - 0.5
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.94E-05	0/99	7.22E-05	0/99	3.61E-06	0.353 - 0.5
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.88E-03	0/99	2.62E-03	0/99	1.31E-04	0.353 - 0.5
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.43E-02	2.59E-02	1.92E-02	4/99	N/A	N/A	0/99	2.93E+01	0/99	2.66E+01	0/99	1.33E+00	0.0353 - 0.5
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.19E+00	0/99	4.72E+00	0/99	2.36E-01	0.0353 - 0.5
SVOA	Caprolactam	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.43E+00	0/42	4.94E+00	0/42	2.47E-01	0.353 - 0.433
SVOA	Carbazole	mg/kg	--	--	--	0/42	N/A	N/A	0/42	8.27E-01	0/42	7.51E-01	0/42	3.76E-02	0.0353 - 0.0433
SVOA	Dibenzofuran	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.21E-01	0/99	2.92E-01	0/99	1.46E-02	0.353 - 0.5
SVOA	Diethyl phthalate	mg/kg	1.53E-02	1.67E-02	1.60E-02	2/99	N/A	N/A	0/99	1.34E+01	0/99	1.22E+01	0/99	6.08E-01	0.0353 - 0.5
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.34E+01	0/99	1.22E+01	0/99	6.08E-01	0.0353 - 0.5
SVOA	Di-n-butyl phthalate	mg/kg	1.15E-02	1.20E+00	1.73E-01	15/99	N/A	N/A	0/99	4.99E+00	0/99	4.54E+00	3/99	2.27E-01	0.0353 - 0.5
SVOA	Di-n-octylphthalate	mg/kg	3.55E-02	3.55E-02	3.55E-02	1/99	N/A	N/A	0/99	1.24E+02	0/99	1.13E+02	0/99	5.65E+00	0.0353 - 0.5
SVOA	Diphenylamine	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.13E+00	0/42	4.66E+00	0/42	2.33E-01	0.353 - 0.433
SVOA	Fluoranthene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.96E+02	0/99	1.78E+02	0/99	8.91E+00	0.0353 - 0.5
SVOA	Fluorene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.20E+01	0/99	1.09E+01	0/99	5.45E-01	0.0353 - 0.5
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.71E-03	0/99	2.46E-03	0/99	1.23E-04	0.353 - 0.5
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.87E-03	0/99	5.34E-03	0/99	2.67E-04	0.353 - 0.5
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.82E-03	0/99	2.56E-03	0/99	1.28E-04	0.353 - 0.5
SVOA	Hexachloroethane	mg/kg	--	--	--	0/99	N/A	N/A	0/99	4.40E-03	0/99	4.00E-03	0/99	2.00E-04	0.353 - 0.5
SVOA	Isophorone	mg/kg	--	--	--	0/99	N/A	N/A	0/99	5.68E-01	0/99	5.16E-01	0/99	2.58E-02	0.353 - 0.5
SVOA	m,p-Cresol	mg/kg	--	--	--	0/57	N/A	N/A	0/57	6.53E-01	0/57	5.94E-01	0/57	2.97E-02	0.45 - 0.5
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.53E-01	0/42	5.94E-01	0/42	2.97E-02	0.353 - 0.433
SVOA	Naphthalene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	8.47E-03	0/99	7.70E-03	0/99	3.85E-04	0.0353 - 0.5
SVOA	Nitrobenzene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.02E-03	0/99	1.83E-03	0/99	9.17E-05	0.353 - 0.5
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.78E-04	0/99	1.62E-04	0/99	8.10E-06	0.353 - 0.5
SVOA	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/57	N/A	N/A	0/57	1.47E+00	0/57	1.33E+00	0/57	6.66E-02	0.45 - 0.5
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.26E-03	0/99	1.14E-03	0/99	5.71E-05	0.353 - 0.5
SVOA	Phenanthrene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	1.21E+01	0/99	1.10E+01	0/99	5.49E-01	0.0353 - 0.5
SVOA	Phenol	mg/kg	--	--	--	0/99	N/A	N/A	0/99	7.28E+00	0/99	6.62E+00	0/99	3.31E-01	0.353 - 0.5
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/99	N/A	N/A	0/99	3.48E-02	0/99	3.16E-02	0/99	1.58E-03	0.353 - 0.5
SVOA	Pyrene	mg/kg	--	--	--	0/99	N/A	N/A	0/99	2.90E+01	0/99	2.63E+01	0/99	1.32E+00	0.0353 - 0.5
SVOA	Total PAH	mg/kg	--	--	--	0/99	N/A	N/A	0/99	6.47E-01	0/99	5.89E-01	0/99	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/41	N/A	N/A	0/41	2.11E+01	0/41	1.92E+01	0/41	9.58E-01	0.243 - 1.02
RADS	Cesium-137	pCi/g	--	--	--	0/41	0/41	2.80E-01	0/41	1.05E+01	0/41	9.58E+00	0/41	4.79E-01	0.024 - 0.0752
RADS	Neptunium-237	pCi/g	--	--	--	0/43	N/A	N/A	0/43	1.18E+00	0/43	1.07E+00	0/43	5.36E-02	0.0263 - 0.972
RADS	Plutonium-238	pCi/g	--	--	--	0/41	N/A	N/A	0/41	4.82E+00	0/41	4.38E+00	0/41	2.19E-01	0.191 - 0.871
RADS	Plutonium-239/240	pCi/g	--	--	--	0/43	N/A	N/A	0/43	4.69E+00	0/43	4.26E+00	0/43	2.13E-01	0.0204 - 1.03
RADS	Technetium-99	pCi/g	--	--	--	0/43	0/43	2.80E+00	0/43	1.67E-01	0/43	1.52E-01	0/43	7.60E-03	1.86 - 4.15
RADS	Thorium-230	pCi/g	6.37E-01	2.31E+00	1.06E+00	31/41	7/41	1.40E+00	0/41	4.03E-01	0/41	3.66E-01	2/41	1.83E+00	0.274 - 1.29
RADS	Uranium-233/234	pCi/g	5.22E-01	2.12E+00	9.15E-01	27/41	3/41	1.20E+00	5/41	1.09E+00	8/41	9.90E-01	27/41	4.95E-02	0.276 - 0.731
RADS	Uranium-234	pCi/g	--	--	--	0/2	0/2	1.20E+00	0/2	1.09E+00	0/2	9.90E-01	0/2	4.95E-02	0.743 - 1.24
RADS	Uranium-235	pCi/g	--	--	--	0/2	0/2	6.00E-02	0/2	1.07E+00	0/2	9.76E-01	0/2	4.88E-02	0.0506 - 0.231
RADS	Uranium-235/236	pCi/g	2.37E-01	3.50E-01	2.78E-01	3/41	3/41	6.00E-02	0/41	1.07E+00	0/41	9.76E-01	3/41	4.88E-02	0.193 - 0.656
RADS	Uranium-238	pCi/g	3.68E-01	1.94E+00	9.29E-01	32/43	8/43	1.20E+00	12/43	8.87E-01	16/43	8.05E-01	32/43	4.03E-02	0.192 - 0.717
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.18E+00	0/44	5.62E+00	0/44	2.81E-01	0.00087 - 0.002

Table C1.36. Sector 5 Deep Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.51E-04	0/44	5.92E-04	0/44	2.96E-05	0.00087 - 0.002
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	5.63E+01	0/42	5.13E+01	0/42	2.56E+00	0.00435 - 0.00597
VOA	1,1,2-Trichloroethane	mg/kg	7.49E-04	9.33E-04	8.41E-04	2/44	N/A	N/A	2/44	2.97E-04	2/44	2.69E-04	2/44	1.35E-05	0.00087 - 0.002
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.72E-02	0/44	1.56E-02	0/44	7.82E-04	0.00087 - 0.002
VOA	1,1-Dichloroethene	mg/kg	3.54E-04	4.42E-04	3.98E-04	2/105	N/A	N/A	0/105	2.24E-01	0/105	2.04E-01	0/105	1.02E-02	0.00087 - 0.00504
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.60E-02	0/42	4.18E-02	0/42	2.09E-03	0.00087 - 0.00119
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.55E-02	0/42	2.32E-02	0/42	1.16E-03	0.00087 - 0.00119
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.17E-06	0/42	2.88E-06	0/42	1.44E-07	0.00087 - 0.00119
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.62E-05	0/42	4.20E-05	0/42	2.10E-06	0.00087 - 0.00119
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.49E-01	0/42	5.90E-01	0/42	2.95E-02	0.00087 - 0.00119
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.06E-03	0/44	9.69E-04	0/44	4.84E-05	0.00087 - 0.002
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.03E-03	0/44	5.48E-03	0/44	2.74E-04	0.00087 - 0.002
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.18E-01	0/44	3.81E-01	0/44	1.90E-02	0.00087 - 0.002
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.49E-01	0/42	5.90E-01	0/42	2.95E-02	0.00087 - 0.00119
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.02E-02	0/42	9.24E-03	0/42	4.62E-04	0.00087 - 0.00119
VOA	1,4-Dioxane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.07E-03	0/42	1.88E-03	0/42	9.42E-05	0.0435 - 0.0597
VOA	2-Butanone	mg/kg	4.66E-03	4.66E-03	4.66E-03	1/44	N/A	N/A	0/44	2.55E+00	0/44	2.32E+00	0/44	1.16E-01	0.001 - 0.05
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.04E-05	0/42	2.76E-05	0/42	1.38E-06	0.00435 - 0.00597
VOA	2-Hexanone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.93E-02	0/44	1.75E-02	0/44	8.75E-04	0.001 - 0.0099
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	7.08E-02	0/42	6.44E-02	0/42	3.22E-03	0.00087 - 0.00119
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/44	N/A	N/A	0/44	6.18E-01	0/44	5.62E-01	0/44	2.81E-02	0.001 - 0.05
VOA	Acetone	mg/kg	2.09E-03	1.08E-02	4.09E-03	16/44	N/A	N/A	0/44	8.10E+00	0/44	7.36E+00	0/44	3.68E-01	0.001 - 0.05
VOA	Acrolein	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.85E-05	0/42	1.68E-05	0/42	8.41E-07	0.00435 - 0.00597
VOA	Acrylonitrile	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.51E-04	0/42	2.28E-04	0/42	1.14E-05	0.00435 - 0.00597
VOA	Benzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.13E-03	0/44	4.66E-03	0/44	2.33E-04	0.00087 - 0.002
VOA	Bromochloromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.58E-02	0/42	4.16E-02	0/42	2.08E-03	0.00087 - 0.00119
VOA	Bromodichloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	8.03E-04	0/44	7.30E-04	0/44	3.65E-05	0.00087 - 0.002
VOA	Bromoform	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.92E-02	0/44	1.75E-02	0/44	8.73E-04	0.00087 - 0.002
VOA	Bromomethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.20E-03	0/44	3.82E-03	0/44	1.91E-04	0.00087 - 0.004
VOA	Carbon disulfide	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.28E-01	0/44	4.80E-01	0/44	2.40E-02	0.001 - 0.00597
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.89E-03	0/44	3.54E-03	0/44	1.77E-04	0.00087 - 0.002
VOA	Chlorobenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.16E-01	0/44	1.06E-01	0/44	5.28E-03	0.00087 - 0.002
VOA	Chloroethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.21E+00	0/44	4.74E+00	0/44	2.37E-01	0.00087 - 0.004
VOA	Chloroform	mg/kg	3.54E-04	1.79E-03	7.46E-04	6/44	N/A	N/A	1/44	1.35E-03	1/44	1.22E-03	6/44	6.12E-05	0.00087 - 0.002
VOA	Chloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	1.16E-02	0/44	1.05E-02	0/44	5.26E-04	0.00087 - 0.004
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.62E-04	3.87E-01	2.57E-02	30/105	N/A	N/A	5/105	2.33E-02	5/105	2.12E-02	24/105	1.06E-03	0.00087 - 0.101
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.70E-03	0/44	3.36E-03	0/44	1.68E-04	0.00087 - 0.002
VOA	Cumene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.62E+00	0/42	1.48E+00	0/42	7.38E-02	0.00087 - 0.00119
VOA	Cyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	2.86E+01	0/42	2.60E+01	0/42	1.30E+00	0.00087 - 0.00119
VOA	Dibromochloromethane	mg/kg	--	--	--	0/44	N/A	N/A	0/44	5.10E-03	0/44	4.64E-03	0/44	2.32E-04	0.00087 - 0.002
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	6.69E-01	0/42	6.08E-01	0/42	3.04E-02	0.00087 - 0.00119
VOA	Ethylbenzene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.70E-02	0/44	3.36E-02	0/44	1.68E-03	0.00087 - 0.002
VOA	m,p-Xylene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.20E-01	0/44	3.82E-01	0/44	1.91E-02	0.00174 - 0.00239
VOA	Methyl acetate	mg/kg	--	--	--	0/42	N/A	N/A	0/42	9.04E+00	0/42	8.22E+00	0/42	4.11E-01	0.00435 - 0.00597
VOA	Methylcyclohexane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	3.08E+01	0/42	2.80E+01	0/42	1.40E+00	0.00087 - 0.00119
VOA	Methylene chloride	mg/kg	3.29E-03	4.79E-03	4.15E-03	4/44	N/A	N/A	0/44	5.98E-02	0/44	5.44E-02	4/44	2.72E-03	0.001 - 0.00597
VOA	Styrene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	2.93E+00	0/44	2.66E+00	0/44	1.33E-01	0.00087 - 0.002
VOA	Tetrachloroethene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	4.05E-02	0/44	3.69E-02	0/44	1.84E-03	0.00087 - 0.002
VOA	Toluene	mg/kg	5.56E-04	5.58E-04	5.57E-04	2/44	N/A	N/A	0/44	1.68E+00	0/44	1.52E+00	0/44	7.62E-02	0.00087 - 0.002
VOA	Total Xylene	mg/kg	--	--	--	0/42	N/A	N/A	0/42	4.20E-01	0/42	3.82E-01	0/42	1.91E-02	0.00261 - 0.00358
VOA	*trans* -1,2-Dichloroethene	mg/kg	4.96E-04	4.96E-04	4.96E-04	1/105	N/A	N/A	0/105	6.40E-02	0/105	5.83E-02	0/105	2.91E-03	0.00087 - 0.00504
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/44	N/A	N/A	0/44	3.70E-03	0/44	3.36E-03	0/44	1.68E-04	0.00087 - 0.002

Table C1.36. Sector 5 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Trichloroethene	mg/kg	4.11E-04	8.67E+00	2.36E-01	48/107	N/A	N/A	42/107	2.22E-03	42/107	2.02E-03	48/107	1.01E-04	0.00087 - 5
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/42	N/A	N/A	0/42	1.61E+00	0/42	1.46E+00	0/42	7.31E-02	0.00087 - 0.00119
VOA	Vinyl chloride	mg/kg	--	--	--	0/105	N/A	N/A	0/105	1.42E-04	0/105	1.29E-04	0/105	6.47E-06	0.00087 - 0.00504

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.37. Sector 5 McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	8.24E+02	1.61E+04	6.73E+03	15/15	9/15	3.00E+03	11.3 - 129
METAL	Antimony	mg/kg	1.13E+00	1.13E+00	1.13E+00	1/15	1/15	3.52E-02	2.35 - 13.8
METAL	Arsenic	mg/kg	7.01E-01	2.32E+01	7.13E+00	15/15	15/15	1.51E-03	1.13 - 1.52
METAL	Barium	mg/kg	3.15E+00	1.26E+03	1.91E+02	15/15	7/15	1.55E+01	0.905 - 10.3
METAL	Beryllium	mg/kg	1.05E-01	3.34E+00	9.15E-01	15/15	3/15	1.95E+00	0.113 - 0.152
METAL	Boron	mg/kg	1.16E+00	7.29E+01	1.70E+01	13/15	12/15	1.28E+00	3.39 - 35.1
METAL	Cadmium	mg/kg	3.64E-02	2.56E-01	1.69E-01	4/15	3/15	6.93E-02	0.226 - 0.304
METAL	Chromium	mg/kg	2.67E+00	1.05E+02	3.43E+01	15/15	0/15	1.80E+05	0.679 - 0.912
METAL	Cobalt	mg/kg	8.68E-01	3.56E+01	8.39E+00	15/15	15/15	2.71E-02	0.226 - 0.304
METAL	Copper	mg/kg	7.13E-01	8.46E+00	2.62E+00	15/15	5/15	2.81E+00	0.452 - 0.608
METAL	Iron	mg/kg	2.76E+03	1.59E+05	3.28E+04	15/15	15/15	3.52E+01	22.6 - 1380
METAL	Lead	mg/kg	2.52E+00	1.91E+01	6.65E+00	15/15	3/15	1.35E+01	0.452 - 0.608
METAL	Manganese	mg/kg	6.39E+00	1.54E+03	2.16E+02	15/15	15/15	2.83E+00	1.13 - 15.2
METAL	Mercury	mg/kg	1.27E-02	2.73E-02	1.81E-02	3/15	0/15	2.95E-02	0.0259 - 0.0346
METAL	Molybdenum	mg/kg	1.24E-01	1.11E+00	3.44E-01	12/15	7/15	2.02E-01	0.226 - 0.304
METAL	Nickel	mg/kg	1.26E+00	3.37E+01	1.06E+01	15/15	11/15	2.56E+00	0.452 - 0.608
METAL	Selenium	mg/kg	4.75E-01	1.11E+01	2.58E+00	13/15	13/15	5.19E-02	1.13 - 1.52
METAL	Silver	mg/kg	2.70E-01	1.16E+00	7.15E-01	2/15	2/15	7.99E-02	0.587 - 6.52
METAL	Thallium	mg/kg	3.02E-01	3.02E-01	3.02E-01	1/15	1/15	1.42E-03	0.452 - 0.608
METAL	Uranium	mg/kg	1.83E-01	2.93E+00	9.94E-01	15/15	15/15	1.80E-01	0.0452 - 0.0608
METAL	Vanadium	mg/kg	5.24E+00	9.94E+01	3.10E+01	15/15	12/15	8.64E+00	4.52 - 6.08
METAL	Zinc	mg/kg	6.47E+00	9.59E+01	3.38E+01	15/15	7/15	3.73E+01	4.52 - 6.08
ANION	Fluoride	mg/kg	7.62E-01	9.98E+00	4.27E+00	14/15	0/15	1.20E+01	1.2 - 1.57
PPCB	Total PCB	mg/kg	2.78E-03	9.03E-03	4.90E-03	3/25	1/25	6.82E-03	0.00403 - 0.1
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/15	0/15	8.72E-04	0.405 - 0.591
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/25	0/25	4.02E-01	0.405 - 0.591
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/25	0/25	1.16E-03	0.405 - 0.591
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/25	0/25	2.26E-03	0.405 - 0.591
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/25	0/25	4.21E-02	0.405 - 0.591
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.46 - 1.18
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/25	0/25	3.21E-04	0.405 - 0.591
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/25	0/25	6.67E-05	0.405 - 0.591
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/25	0/25	3.85E-01	0.0405 - 0.5
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/25	0/25	8.91E-03	0.405 - 0.591
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/25	0/25	2.58E-04	0.405 - 0.591
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/25	0/25	1.85E-02	0.0405 - 0.5
SVOA	2-Methylphenol	mg/kg	--	--	--	0/25	0/25	7.53E-02	0.405 - 0.591
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/25	0/25	8.01E-03	0.405 - 0.591
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.405 - 0.591
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/25	0/25	8.24E-04	0.405 - 0.591
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/25	0/25	2.45E-04	0.405 - 0.591
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/25	0/25	3.42E-04	0.405 - 0.591

Table C1.37. Sector 5 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/25	0/25	1.71E-01	0.405 - 0.591
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/25	0/25	1.55E-04	0.405 - 0.591
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/25	0/25	3.42E-04	0.405 - 0.591
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/25	0/25	4.36E-03	0.405 - 0.591
SVOA	Acenaphthene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOA	Acenaphthylene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOA	Acetophenone	mg/kg	--	--	--	0/15	0/15	5.84E-02	0.405 - 0.591
SVOA	Anthracene	mg/kg	--	--	--	0/25	0/25	5.81E+00	0.0405 - 0.5
SVOA	Atrazine	mg/kg	--	--	--	0/15	0/15	1.96E-04	0.405 - 0.591
SVOA	Benzaldehyde	mg/kg	--	--	--	0/15	0/15	4.15E-03	0.405 - 0.591
SVOA	Benzenemethanol	mg/kg	--	--	--	0/10	0/10	4.76E-02	0.46 - 0.5
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/25	0/25	1.32E+00	0.0405 - 0.5
SVOA	Benzoic acid	mg/kg	--	--	--	0/10	0/10	1.51E+00	0.46 - 0.5
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/25	0/25	1.35E-03	0.405 - 0.591
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/25	0/25	3.61E-06	0.405 - 0.591
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/25	0/25	1.31E-04	0.405 - 0.591
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	2.63E-02	2.63E-02	2.63E-02	1/25	0/25	1.33E+00	0.0405 - 0.5
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/25	0/25	2.36E-01	0.0405 - 0.5
SVOA	Caprolactam	mg/kg	--	--	--	0/15	0/15	2.47E-01	0.405 - 0.591
SVOA	Carbazole	mg/kg	--	--	--	0/15	0/15	3.76E-02	0.0405 - 0.0591
SVOA	Dibenzofuran	mg/kg	--	--	--	0/25	0/25	1.46E-02	0.405 - 0.591
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/25	0/25	6.08E-01	0.0405 - 0.5
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/25	0/25	6.08E-01	0.0405 - 0.5
SVOA	Di-n-butyl phthalate	mg/kg	1.60E-02	4.36E-02	2.98E-02	2/25	0/25	2.27E-01	0.0405 - 0.5
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/25	0/25	5.65E+00	0.0405 - 0.5
SVOA	Diphenylamine	mg/kg	--	--	--	0/15	0/15	2.33E-01	0.405 - 0.591
SVOA	Fluoranthene	mg/kg	--	--	--	0/25	0/25	8.91E+00	0.0405 - 0.5
SVOA	Fluorene	mg/kg	--	--	--	0/25	0/25	5.45E-01	0.0405 - 0.5
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/25	0/25	1.23E-04	0.405 - 0.591
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/25	0/25	2.67E-04	0.405 - 0.591
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/25	0/25	1.28E-04	0.405 - 0.591
SVOA	Hexachloroethane	mg/kg	--	--	--	0/25	0/25	2.00E-04	0.405 - 0.591
SVOA	Isophorone	mg/kg	--	--	--	0/25	0/25	2.58E-02	0.405 - 0.591
SVOA	m,p-Cresol	mg/kg	--	--	--	0/10	0/10	2.97E-02	0.46 - 0.5
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/15	0/15	2.97E-02	0.405 - 0.591
SVOA	Naphthalene	mg/kg	--	--	--	0/25	0/25	3.85E-04	0.0405 - 0.5
SVOA	Nitrobenzene	mg/kg	--	--	--	0/25	0/25	9.17E-05	0.405 - 0.591
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/25	0/25	8.10E-06	0.405 - 0.591
SVOA	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/10	0/10	6.66E-02	0.46 - 0.5
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/25	0/25	5.71E-05	0.405 - 0.591
SVOA	Phenanthrene	mg/kg	--	--	--	0/25	0/25	5.49E-01	0.0405 - 0.5
SVOA	Phenol	mg/kg	--	--	--	0/25	0/25	3.31E-01	0.405 - 0.591

Table C1.37. Sector 5 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/25	0/25	1.58E-03	0.405 - 0.591
SVOA	Pyrene	mg/kg	--	--	--	0/25	0/25	1.32E+00	0.0405 - 0.5
SVOA	Total PAH	mg/kg	--	--	--	0/25	0/25	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/15	0/15	9.58E-01	0.228 - 0.852
RADS	Cesium-137	pCi/g	--	--	--	0/15	0/15	4.79E-01	0.0269 - 0.0535
RADS	Neptunium-237	pCi/g	--	--	--	0/15	0/15	5.36E-02	0.372 - 1.17
RADS	Plutonium-238	pCi/g	--	--	--	0/15	0/15	2.19E-01	0.172 - 0.662
RADS	Plutonium-239/240	pCi/g	--	--	--	0/15	0/15	2.13E-01	0.172 - 0.564
RADS	Technetium-99	pCi/g	--	--	--	0/15	0/15	7.60E-03	3.01 - 4.85
RADS	Thorium-230	pCi/g	7.03E-01	1.71E+00	1.12E+00	9/15	0/15	1.83E+00	0.488 - 0.884
RADS	Uranium-233/234	pCi/g	4.55E-01	1.55E+00	8.32E-01	8/15	8/15	4.95E-02	0.306 - 0.591
RADS	Uranium-235/236	pCi/g	--	--	--	0/15	0/15	4.88E-02	0.129 - 0.517
RADS	Uranium-238	pCi/g	3.70E-01	1.53E+00	7.49E-01	14/15	14/15	4.03E-02	0.114 - 0.544
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/15	0/15	2.81E-01	0.00116 - 0.0019
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/15	0/15	2.96E-05	0.00116 - 0.0019
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/15	0/15	2.56E+00	0.0058 - 0.00949
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/15	0/15	1.35E-05	0.00116 - 0.0019
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/15	0/15	7.82E-04	0.00116 - 0.0019
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/39	0/39	1.02E-02	0.00116 - 0.0493
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.09E-03	0.00116 - 0.0019
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/15	0/15	1.16E-03	0.00116 - 0.0019
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/15	0/15	1.44E-07	0.00116 - 0.0019
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/15	0/15	2.10E-06	0.00116 - 0.0019
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.95E-02	0.00116 - 0.0019
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/15	0/15	4.84E-05	0.00116 - 0.0019
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/15	0/15	2.74E-04	0.00116 - 0.0019
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/15	0/15	1.90E-02	0.00116 - 0.0019
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	2.95E-02	0.00116 - 0.0019
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/15	0/15	4.62E-04	0.00116 - 0.0019
VOA	1,4-Dioxane	mg/kg	--	--	--	0/15	0/15	9.42E-05	0.058 - 0.0949
VOA	2-Butanone	mg/kg	--	--	--	0/15	0/15	1.16E-01	0.0058 - 0.00949
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/15	0/15	1.38E-06	0.0058 - 0.00949
VOA	2-Hexanone	mg/kg	--	--	--	0/15	0/15	8.75E-04	0.0058 - 0.00949
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/15	0/15	3.22E-03	0.00116 - 0.0019
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/15	0/15	2.81E-02	0.0058 - 0.00949
VOA	Acetone	mg/kg	2.91E-03	1.01E-02	5.21E-03	9/15	0/15	3.68E-01	0.0058 - 0.00949
VOA	Acrolein	mg/kg	--	--	--	0/15	0/15	8.41E-07	0.0058 - 0.00949
VOA	Acrylonitrile	mg/kg	--	--	--	0/15	0/15	1.14E-05	0.0058 - 0.00949
VOA	Benzene	mg/kg	--	--	--	0/15	0/15	2.33E-04	0.00116 - 0.0019
VOA	Bromochloromethane	mg/kg	--	--	--	0/15	0/15	2.08E-03	0.00116 - 0.0019
VOA	Bromodichloromethane	mg/kg	--	--	--	0/15	0/15	3.65E-05	0.00116 - 0.0019
VOA	Bromoform	mg/kg	--	--	--	0/15	0/15	8.73E-04	0.00116 - 0.0019

Table C1.37. Sector 5 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
VOA	Bromomethane	mg/kg	--	--	--	0/15	0/15	1.91E-04	0.00116 - 0.0019
VOA	Carbon disulfide	mg/kg	--	--	--	0/15	0/15	2.40E-02	0.0058 - 0.00949
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/15	0/15	1.77E-04	0.00116 - 0.0019
VOA	Chlorobenzene	mg/kg	--	--	--	0/15	0/15	5.28E-03	0.00116 - 0.0019
VOA	Chloroethane	mg/kg	--	--	--	0/15	0/15	2.37E-01	0.00116 - 0.0019
VOA	Chloroform	mg/kg	--	--	--	0/15	0/15	6.12E-05	0.00116 - 0.0019
VOA	Chloromethane	mg/kg	--	--	--	0/15	0/15	5.26E-04	0.00116 - 0.0019
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.42E-03	1.99E-03	1.66E-03	3/39	3/39	1.06E-03	0.00116 - 0.0493
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/15	0/15	1.68E-04	0.00116 - 0.0019
VOA	Cumene	mg/kg	--	--	--	0/15	0/15	7.38E-02	0.00116 - 0.0019
VOA	Cyclohexane	mg/kg	--	--	--	0/15	0/15	1.30E+00	0.00116 - 0.0019
VOA	Dibromochloromethane	mg/kg	--	--	--	0/15	0/15	2.32E-04	0.00116 - 0.0019
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/15	0/15	3.04E-02	0.00116 - 0.0019
VOA	Ethylbenzene	mg/kg	--	--	--	0/15	0/15	1.68E-03	0.00116 - 0.0019
VOA	m,p-Xylene	mg/kg	--	--	--	0/15	0/15	1.91E-02	0.00232 - 0.0038
VOA	Methyl acetate	mg/kg	--	--	--	0/15	0/15	4.11E-01	0.0058 - 0.00949
VOA	Methylcyclohexane	mg/kg	--	--	--	0/15	0/15	1.40E+00	0.00116 - 0.0019
VOA	Methylene chloride	mg/kg	--	--	--	0/15	0/15	2.72E-03	0.0058 - 0.00949
VOA	Styrene	mg/kg	--	--	--	0/15	0/15	1.33E-01	0.00116 - 0.0019
VOA	Tetrachloroethene	mg/kg	--	--	--	0/15	0/15	1.84E-03	0.00116 - 0.0019
VOA	Toluene	mg/kg	8.66E-04	6.19E-03	3.53E-03	2/15	0/15	7.62E-02	0.00116 - 0.0019
VOA	Total Xylene	mg/kg	--	--	--	0/15	0/15	1.91E-02	0.00348 - 0.00569
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/39	0/39	2.91E-03	0.00116 - 0.0493
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/15	0/15	1.68E-04	0.00116 - 0.0019
VOA	Trichloroethene	mg/kg	6.57E-03	1.95E-01	3.20E-02	13/40	13/40	1.01E-04	0.00116 - 0.0493
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/15	0/15	7.31E-02	0.00116 - 0.0019
VOA	Vinyl chloride	mg/kg	--	--	--	0/39	0/39	6.47E-06	0.00116 - 0.0493

(shaded) One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.38. Sector 6 Surface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	4.67E+03	1.48E+04	8.84E+03	18/18	3/18	1.30E+04	0/18	6.60E+06	0/18	5.99E+04	18/18	3.00E+03	5 - 114
METAL	Antimony	mg/kg	6.30E-01	6.98E+01	7.98E+00	11/19	11/19	2.10E-01	10/19	7.04E-01	11/19	3.52E-02	10/19	7.74E-01	2.01 - 30
METAL	Arsenic	mg/kg	2.65E+00	2.24E+01	7.05E+00	19/19	2/19	1.20E+01	19/19	3.02E-02	19/19	1.51E-03	19/19	3.32E-02	0.971 - 11
METAL	Barium	mg/kg	1.38E+01	3.25E+02	1.03E+02	18/19	2/19	2.00E+02	2/19	3.11E+02	17/19	1.55E+01	0/19	3.41E+02	0.777 - 100
METAL	Beryllium	mg/kg	1.32E-01	7.00E-01	4.46E-01	18/18	1/18	6.70E-01	0/18	3.89E+01	0/18	1.95E+00	0/18	4.29E+01	0.0971 - 0.114
METAL	Boron	mg/kg	1.16E+00	4.05E+00	2.43E+00	17/17	N/A	N/A	0/17	2.56E+01	16/17	1.28E+00	0/17	2.82E+01	2.91 - 3.42
METAL	Cadmium	mg/kg	4.12E-02	1.60E+01	1.40E+00	18/19	13/19	2.10E-01	3/19	1.39E+00	16/19	6.93E-02	3/19	1.52E+00	0.05 - 12
METAL	Chromium	mg/kg	1.05E+01	7.61E+01	2.22E+01	18/19	10/19	1.60E+01	0/19	3.60E+06	0/19	1.80E+05	0/19	3.96E+06	0.583 - 85
METAL	Cobalt	mg/kg	1.57E+00	1.04E+02	1.16E+01	18/18	1/18	1.40E+01	18/18	5.43E-01	18/18	2.71E-02	18/18	5.96E-01	0.194 - 0.228
METAL	Copper	mg/kg	5.32E+00	3.05E+02	3.57E+01	18/19	6/19	1.90E+01	2/19	5.62E+01	18/19	2.81E+00	2/19	6.18E+01	0.389 - 35
METAL	Iron	mg/kg	4.66E+03	2.95E+04	1.66E+04	19/19	1/19	2.80E+04	19/19	7.04E+02	19/19	3.52E+01	19/19	7.74E+02	5 - 228
METAL	Lead	mg/kg	4.83E+00	5.99E+01	2.03E+01	19/19	2/19	3.60E+01	0/19	2.70E+02	10/19	1.35E+01	0/19	2.97E+02	0.389 - 13
METAL	Manganese	mg/kg	1.37E+02	3.84E+03	5.09E+02	19/19	1/19	1.50E+03	19/19	5.65E+01	19/19	2.83E+00	19/19	6.23E+01	1.05 - 105
METAL	Mercury	mg/kg	1.12E-02	1.57E-01	3.28E-02	16/19	0/19	2.00E-01	0/19	5.91E-01	5/19	2.95E-02	0/19	6.49E-01	0.0225 - 10
METAL	Molybdenum	mg/kg	3.41E-01	1.88E+00	7.48E-01	18/19	N/A	N/A	0/19	4.03E+00	18/19	2.02E-01	0/19	4.44E+00	0.194 - 15
METAL	Nickel	mg/kg	7.33E+00	1.35E+02	3.31E+01	18/19	6/19	2.10E+01	4/19	5.12E+01	18/19	2.56E+00	4/19	5.63E+01	0.389 - 65
METAL	Selenium	mg/kg	5.33E-01	1.57E+00	1.09E+00	15/19	13/19	8.00E-01	8/19	1.04E+00	15/19	5.19E-02	6/19	1.14E+00	0.5 - 20
METAL	Silver	mg/kg	1.39E-01	6.91E+00	2.24E+00	8/19	2/19	2.30E+00	2/19	1.60E+00	8/19	7.99E-02	2/19	1.76E+00	0.2 - 10
METAL	Thallium	mg/kg	1.40E-01	1.01E+00	2.88E-01	8/18	3/18	2.10E-01	8/18	2.84E-02	8/18	1.42E-03	8/18	3.12E-02	0.2 - 0.456
METAL	Uranium	mg/kg	1.59E+00	3.00E+02	5.09E+01	19/19	15/19	4.90E+00	17/19	3.60E+00	19/19	1.80E-01	17/19	3.96E+00	0.0401 - 20
METAL	Vanadium	mg/kg	5.65E+00	3.28E+01	2.28E+01	18/19	0/19	3.80E+01	0/19	1.73E+02	17/19	8.64E+00	0/19	1.90E+02	1 - 70
METAL	Zinc	mg/kg	1.51E+01	6.96E+02	1.21E+02	19/19	10/19	6.50E+01	0/19	7.46E+02	17/19	3.73E+01	0/19	8.21E+02	2 - 44.4
ANION	Fluoride	mg/kg	2.27E+00	3.12E+01	1.49E+01	17/17	N/A	N/A	0/17	2.40E+02	10/17	1.20E+01	0/17	2.64E+02	1.06 - 1.21
PPCB	Total PCB	mg/kg	1.66E-03	7.33E-01	1.53E-01	9/19	N/A	N/A	2/19	1.36E-01	7/19	6.82E-03	2/19	1.50E-01	0.00367 - 5
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.74E-02	0/17	8.72E-04	0/17	1.92E-02	0.361 - 14.5
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.04E+00	0/18	4.02E-01	0/18	8.84E+00	0.35 - 14.5
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.32E-02	0/18	1.16E-03	0/18	2.55E-02	0.35 - 14.5
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.52E-02	0/18	2.26E-03	0/18	4.97E-02	0.35 - 14.5
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.42E-01	0/18	4.21E-02	0/18	9.26E-01	0.35 - 14.5
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0/18	9.59E-02	0.722 - 29
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.42E-03	0/18	3.21E-04	0/18	7.06E-03	0.35 - 14.5
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.33E-03	0/18	6.67E-05	0/18	1.47E-03	0.35 - 14.5
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.70E+00	0/18	3.85E-01	0/18	8.47E+00	0.0361 - 1.45
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.78E-01	0/18	8.91E-03	0/18	1.96E-01	0.35 - 14.5
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.16E-03	0/18	2.58E-04	0/18	5.68E-03	0.361 - 14.5
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.70E-01	0/18	1.85E-02	0/18	4.07E-01	0.0361 - 1.45
SVOA	2-Methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.51E+00	0/18	7.53E-02	0/18	1.66E+00	0.35 - 14.5
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.60E-01	0/18	8.01E-03	0/18	1.76E-01	0.361 - 14.5
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0/18	9.59E-02	0.35 - 14.5
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.65E-02	0/18	8.24E-04	0/18	1.81E-02	0.361 - 14.5
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.90E-03	0/18	2.45E-04	0/18	5.39E-03	0.361 - 14.5
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.84E-03	0/18	3.42E-04	0/18	7.52E-03	0.35 - 14.5
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.42E+00	0/18	1.71E-01	0/18	3.76E+00	0.35 - 14.5
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.10E-03	0/18	1.55E-04	0/18	3.41E-03	0.35 - 14.5
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.84E-03	0/18	3.42E-04	0/18	7.52E-03	0.35 - 14.5
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.72E-02	0/18	4.36E-03	0/18	9.59E-02	0.361 - 14.5
SVOA	Acenaphthene	mg/kg	1.58E-02	3.81E-01	1.45E-01	6/18	N/A	N/A	0/18	1.10E+01	0/18	5.49E-01	0/18	1.21E+01	0.0361 - 1.45
SVOA	Acenaphthylene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.10E+01	0/18	5.49E-01	0/18	1.21E+01	0.0361 - 1.45
SVOA	Acetophenone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.17E+00	0/17	5.84E-02	0/17	1.28E+00	0.361 - 14.5

Table C1.38. Sector 6 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Anthracene	mg/kg	2.08E-02	1.06E+00	3.77E-01	6/18	N/A	N/A	0/18	1.16E+02	0/18	5.81E+00	0/18	1.28E+02	0.0361 - 1.45
SVOA	Atrazine	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.31E-03	0/17	3.92E-03	0/17	1.96E-04	0.361 - 14.5
SVOA	Benzaldehyde	mg/kg	--	--	--	0/17	N/A	N/A	0/17	8.30E-02	0/17	4.15E-03	0/17	9.13E-02	0.361 - 14.5
SVOA	Benzenemethanol	mg/kg	--	--	--	0/1	N/A	N/A	0/1	9.52E-01	0/1	4.76E-02	0/1	1.05E+00	0.35 - 0.35
SVOA	Benzo(ghi)perylene	mg/kg	2.22E-02	1.81E+00	4.64E-01	10/18	N/A	N/A	0/18	2.63E+01	2/18	1.32E+00	0/18	2.90E+01	0.0361 - 1.45
SVOA	Benzoic acid	mg/kg	--	--	--	0/1	N/A	N/A	0/1	3.02E+01	0/1	1.51E+00	0/1	3.32E+01	1.7 - 1.7
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.70E-02	0/18	1.35E-03	0/18	2.97E-02	0.35 - 14.5
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.22E-05	0/18	3.61E-06	0/18	7.94E-05	0.0069 - 14.5
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.62E-03	0/18	1.31E-04	0/18	2.88E-03	0.35 - 14.5
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	2.11E-02	7.00E+00	1.77E+00	4/18	N/A	N/A	0/18	2.66E+01	1/18	1.33E+00	0/18	2.93E+01	0.0361 - 1.45
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.72E+00	0/18	2.36E-01	0/18	5.19E+00	0.0361 - 1.45
SVOA	Caprolactam	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.94E+00	0/17	2.47E-01	0/17	5.43E+00	0.361 - 14.5
SVOA	Carbazole	mg/kg	1.58E-02	7.73E-01	2.12E-01	6/17	N/A	N/A	1/17	7.51E-01	3/17	3.76E-02	0/17	8.27E-01	0.0361 - 1.45
SVOA	Dibenzofuran	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.92E-01	0/18	1.46E-02	0/18	3.21E-01	0.35 - 14.5
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.22E+01	0/18	6.08E-01	0/18	1.34E+01	0.0361 - 1.45
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.22E+01	0/18	6.08E-01	0/18	1.34E+01	0.0361 - 1.45
SVOA	Di-n-butyl phthalate	mg/kg	1.15E-02	4.21E-02	2.15E-02	4/18	N/A	N/A	0/18	4.54E+00	0/18	2.27E-01	0/18	4.99E+00	0.0361 - 1.45
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.13E+02	0/18	5.65E+00	0/18	1.24E+02	0.0361 - 1.45
SVOA	Diphenylamine	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.66E+00	0/17	2.33E-01	0/17	5.13E+00	0.361 - 14.5
SVOA	Fluoranthene	mg/kg	4.62E-02	9.06E+00	1.39E+00	17/18	N/A	N/A	0/18	1.78E+02	1/18	8.91E+00	0/18	1.96E+02	0.0361 - 1.45
SVOA	Fluorene	mg/kg	1.44E-02	4.64E-01	1.86E-01	5/18	N/A	N/A	0/18	1.09E+01	0/18	5.45E-01	0/18	1.20E+01	0.0361 - 1.45
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.46E-03	0/18	1.23E-04	0/18	2.71E-03	0.35 - 14.5
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.34E-03	0/18	2.67E-04	0/18	5.87E-03	0.35 - 14.5
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.56E-03	0/18	1.28E-04	0/18	2.82E-03	0.361 - 14.5
SVOA	Hexachloroethane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.00E-03	0/18	2.00E-04	0/18	4.40E-03	0.35 - 14.5
SVOA	Isophorone	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.16E-01	0/18	2.58E-02	0/18	5.68E-01	0.35 - 14.5
SVOA	m,p-Cresol	mg/kg	--	--	--	0/1	N/A	N/A	0/1	5.94E-01	0/1	2.97E-02	0/1	6.53E-01	0.69 - 0.69
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.94E-01	0/17	2.97E-02	0/17	6.53E-01	0.361 - 14.5
SVOA	Naphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.70E-03	0/18	3.85E-04	0/18	8.47E-03	0.0361 - 1.45
SVOA	Nitrobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.83E-03	0/18	9.17E-05	0/18	2.02E-03	0.361 - 14.5
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.62E-04	0/18	8.10E-06	0/18	1.78E-04	0.0069 - 14.5
SVOA	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/1	N/A	N/A	0/1	1.33E+00	0/1	6.66E-02	0/1	1.47E+00	0.35 - 0.35
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.14E-03	0/18	5.71E-05	0/18	1.26E-03	0.361 - 14.5
SVOA	Phenanthrene	mg/kg	1.39E-02	5.27E+00	8.35E-01	15/18	N/A	N/A	0/18	1.10E+01	3/18	5.49E-01	0/18	1.21E+01	0.0361 - 1.45
SVOA	Phenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	6.62E+00	0/18	3.31E-01	0/18	7.28E+00	0.35 - 14.5
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.16E-02	0/18	1.58E-03	0/18	3.48E-02	0.361 - 14.5
SVOA	Pyrene	mg/kg	3.35E-02	5.85E+00	1.04E+00	17/18	N/A	N/A	0/18	2.63E+01	3/18	1.32E+00	0/18	2.90E+01	0.0361 - 1.45
SVOA	Pyridine	mg/kg	--	--	--	0/1	N/A	N/A	0/1	1.36E-02	0/1	6.80E-04	0/1	1.50E-02	0.69 - 0.69
SVOA	Total PAH	mg/kg	2.91E-02	4.92E+00	8.43E-01	17/18	N/A	N/A	4/18	5.89E-01	15/18	2.94E-02	4/18	6.47E-01	-
RADS	Americium-241	pCi/g	6.75E-01	3.93E+01	1.65E+01	5/19	N/A	N/A	2/19	1.92E+01	4/19	9.58E-01	2/19	2.11E+01	0.016 - 0.797
RADS	Cesium-137	pCi/g	5.08E-02	3.42E+00	7.66E-01	15/19	5/19	4.90E-01	0/19	9.58E+00	5/19	4.79E-01	0/19	1.05E+01	0.0295 - 0.287
RADS	Neptunium-237	pCi/g	1.15E-01	1.86E+01	4.47E+00	5/19	5/19	1.00E-01	3/19	1.07E+00	5/19	5.36E-02	3/19	1.18E+00	0.011 - 1
RADS	Plutonium-238	pCi/g	7.30E-02	3.51E+00	1.94E+00	3/19	2/19	7.30E-02	0/19	4.38E+00	2/19	2.19E-01	0/19	4.82E+00	0.015 - 1.37
RADS	Plutonium-239/240	pCi/g	1.23E+00	2.39E+02	5.56E+01	7/19	7/19	2.50E-02	4/19	4.26E+00	7/19	2.13E-01	4/19	4.69E+00	0.01 - 1.33
RADS	Technetium-99	pCi/g	4.68E+00	1.61E+03	1.75E+02	15/19	15/19	2.50E+00	15/19	1.52E-01	15/19	7.60E-03	15/19	1.67E-01	0.5 - 4.05
RADS	Thorium-228	pCi/g	7.70E-01	7.70E-01	7.70E-01	1/1	0/1	1.60E+00	1/1	1.96E-04	1/1	9.80E-06	1/1	2.16E-04	0.04 - 0.04
RADS	Thorium-230	pCi/g	6.85E-01	1.06E+04	7.50E+02	17/19	14/19	1.50E+00	5/19	3.66E+01	14/19	1.83E+00	5/19	4.03E+01	0.02 - 3.9
RADS	Thorium-232	pCi/g	8.60E-01	8.60E-01	8.60E-01	1/1	0/1	1.50E+00	1/1	1.96E-01	1/1	9.80E-03	1/1	2.16E-01	0.02 - 0.02
RADS	Uranium-233/234	pCi/g	1.36E+00	4.13E+02	4.72E+01	18/18	18/18	1.20E+00	18/18	9.90E-01	18/18	4.95E-02	18/18	1.09E+00	0.45 - 1.8

Table C1.38. Sector 6 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
RADS	Uranium-234	pCi/g	6.85E+00	6.85E+00	6.85E+00	1/1	1/1	1.20E+00	1/1	9.90E-01	1/1	4.95E-02	1/1	1.09E+00	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	5.00E-01	2.80E+01	7.08E+00	8/19	8/19	6.00E-02	5/19	9.76E-01	8/19	4.88E-02	4/19	1.07E+00	0.01 - 1.49
RADS	Uranium-238	pCi/g	1.33E+00	4.40E+02	4.93E+01	19/19	19/19	1.20E+00	19/19	8.05E-01	19/19	4.03E-02	19/19	8.87E-01	0.02 - 1.46
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.62E+00	0/17	2.81E-01	0/17	6.18E+00	0.000929 - 0.113
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.92E-04	0/17	2.96E-05	0/17	6.51E-04	0.000929 - 0.113
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.13E+01	0/17	2.56E+00	0/17	5.63E+01	0.00465 - 0.564
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.69E-04	0/17	1.35E-05	0/17	2.97E-04	0.000929 - 0.113
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.56E-02	0/17	7.82E-04	0/17	1.72E-02	0.000929 - 0.113
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.04E-01	0/17	1.02E-02	0/17	2.24E-01	0.000929 - 0.113
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.18E-02	0/17	2.09E-03	0/17	4.60E-02	0.000929 - 0.113
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.32E-02	0/17	1.16E-03	0/17	2.55E-02	0.000929 - 0.113
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.88E-06	0/17	1.44E-07	0/17	3.17E-06	0.000929 - 0.113
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.20E-05	0/17	2.10E-06	0/17	4.62E-05	0.000929 - 0.113
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.90E-01	0/17	2.95E-02	0/17	6.49E-01	0.000929 - 0.113
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.69E-04	0/17	4.84E-05	0/17	1.06E-03	0.000929 - 0.113
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.48E-03	0/17	2.74E-04	0/17	6.03E-03	0.000929 - 0.113
VOA	1,2-Dimethylbenzene	mg/kg	3.74E-04	3.74E-04	3.74E-04	1/17	N/A	N/A	0/17	3.81E-01	0/17	1.90E-02	0/17	4.18E-01	0.000929 - 0.113
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.90E-01	0/17	2.95E-02	0/17	6.49E-01	0.000929 - 0.113
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	9.24E-03	0/17	4.62E-04	0/17	1.02E-02	0.000929 - 0.113
VOA	1,4-Dioxane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.88E-03	0/17	9.42E-05	0/17	2.07E-03	0.0465 - 5.64
VOA	2-Butanone	mg/kg	2.65E-03	2.56E-01	8.79E-02	3/17	N/A	N/A	0/17	2.32E+00	1/17	1.16E-01	0/17	2.55E+00	0.00465 - 0.564
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.76E-05	0/17	1.38E-06	0/17	3.04E-05	0.00465 - 0.564
VOA	2-Hexanone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.75E-02	0/17	8.75E-04	0/17	1.93E-02	0.00465 - 0.564
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.44E-02	0/17	3.22E-03	0/17	7.08E-02	0.000929 - 0.113
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.62E-01	0/17	2.81E-02	0/17	6.18E-01	0.00465 - 0.564
VOA	Acetone	mg/kg	3.50E-03	3.20E-02	1.13E-02	5/17	N/A	N/A	0/17	7.36E+00	0/17	3.68E-01	0/17	8.10E+00	0.00465 - 0.564
VOA	Acrolein	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.68E-05	0/17	8.41E-07	0/17	1.85E-05	0.00465 - 0.564
VOA	Acrylonitrile	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.28E-04	0/17	1.14E-05	0/17	2.51E-04	0.00465 - 0.564
VOA	Benzene	mg/kg	5.30E-04	6.55E-04	5.93E-04	2/17	N/A	N/A	0/17	4.66E-03	2/17	2.33E-04	0/17	5.13E-03	0.000929 - 0.113
VOA	Bromochloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.16E-02	0/17	2.08E-03	0/17	4.58E-02	0.000929 - 0.113
VOA	Bromodichloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	7.30E-04	0/17	3.65E-05	0/17	8.03E-04	0.000929 - 0.113
VOA	Bromoform	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.75E-02	0/17	8.73E-04	0/17	1.92E-02	0.000929 - 0.113
VOA	Bromomethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.82E-03	0/17	1.91E-04	0/17	4.20E-03	0.000929 - 0.113
VOA	Carbon disulfide	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.80E-01	0/17	2.40E-02	0/17	5.28E-01	0.00465 - 0.564
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.54E-03	0/17	1.77E-04	0/17	3.89E-03	0.000929 - 0.113
VOA	Chlorobenzene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.06E-01	0/17	5.28E-03	0/17	1.16E-01	0.000929 - 0.113
VOA	Chloroethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.74E+00	0/17	2.37E-01	0/17	5.21E+00	0.000929 - 0.113
VOA	Chloroform	mg/kg	8.88E-04	8.88E-04	8.88E-04	1/17	N/A	N/A	0/17	1.22E-03	1/17	6.12E-05	0/17	1.35E-03	0.000929 - 0.113
VOA	Chloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.05E-02	0/17	5.26E-04	0/17	1.16E-02	0.000929 - 0.113
VOA	*cis* -1,2-Dichloroethene	mg/kg	9.29E-04	9.29E-04	9.29E-04	1/17	N/A	N/A	0/17	2.12E-02	0/17	1.06E-03	0/17	2.33E-02	0.000929 - 0.113
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.36E-03	0/17	1.68E-04	0/17	3.70E-03	0.000929 - 0.113
VOA	Cumene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.48E+00	0/17	7.38E-02	0/17	1.62E+00	0.000929 - 0.113
VOA	Cyclohexane	mg/kg	5.67E-04	1.65E-03	1.11E-03	2/17	N/A	N/A	0/17	2.60E+01	0/17	1.30E+00	0/17	2.86E+01	0.000929 - 0.113
VOA	Dibromochloromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	4.64E-03	0/17	2.32E-04	0/17	5.10E-03	0.000929 - 0.113
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	6.08E-01	0/17	3.04E-02	0/17	6.69E-01	0.000929 - 0.113
VOA	Ethylbenzene	mg/kg	3.83E-04	3.83E-04	3.83E-04	1/17	N/A	N/A	0/17	3.36E-02	0/17	1.68E-03	0/17	3.70E-02	0.000929 - 0.113
VOA	m,p-Xylene	mg/kg	6.41E-04	9.17E-04	7.79E-04	2/17	N/A	N/A	0/17	3.82E-01	0/17	1.91E-02	0/17	4.20E-01	0.00186 - 0.226
VOA	Methyl acetate	mg/kg	--	--	--	0/17	N/A	N/A	0/17	8.22E+00	0/17	4.11E-01	0/17	9.04E+00	0.00465 - 0.564
VOA	Methylcyclohexane	mg/kg	4.12E-04	2.40E-03	1.06E-03	4/17	N/A	N/A	0/17	2.80E+01	0/17	1.40E+00	0/17	3.08E+01	0.000929 - 0.113

Table C1.38. Sector 6 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Methylene chloride	mg/kg	2.41E-03	2.30E-01	4.82E-02	5/17	N/A	N/A	1/17	5.44E-02	2/17	2.72E-03	1/17	5.98E-02	0.00465 - 0.564
VOA	Styrene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	2.66E+00	0/17	1.33E-01	0/17	2.93E+00	0.000929 - 0.113
VOA	Tetrachloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.69E-02	0/17	1.84E-03	0/17	4.05E-02	0.000929 - 0.113
VOA	Toluene	mg/kg	3.41E-04	1.55E-03	8.27E-04	7/17	N/A	N/A	0/17	1.52E+00	0/17	7.62E-02	0/17	1.68E+00	0.000929 - 0.113
VOA	Total Xylene	mg/kg	1.29E-03	1.29E-03	1.29E-03	1/17	N/A	N/A	0/17	3.82E-01	0/17	1.91E-02	0/17	4.20E-01	0.00279 - 0.338
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	5.83E-02	0/17	2.91E-03	0/17	6.40E-02	0.000929 - 0.113
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/17	N/A	N/A	0/17	3.36E-03	0/17	1.68E-04	0/17	3.70E-03	0.000929 - 0.113
VOA	Trichloroethene	mg/kg	3.67E-04	1.02E-02	3.07E-03	4/17	N/A	N/A	1/17	2.02E-03	4/17	1.01E-04	1/17	2.22E-03	0.000929 - 0.121
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.46E+00	0/17	7.31E-02	0/17	1.61E+00	0.000929 - 0.113
VOA	Vinyl chloride	mg/kg	--	--	--	0/17	N/A	N/A	0/17	1.29E-04	0/17	6.47E-06	0/17	1.42E-04	0.000929 - 0.113

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.39. Sector 6 Subsurface Soil Data Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	4.63E+03	1.99E+04	1.05E+04	21/21	7/21	1.20E+04	0/21	6.60E+04	0/21	5.99E+04	21/21	3.00E+03	5 - 120
METAL	Antimony	mg/kg	2.60E-01	7.10E+01	2.05E+01	10/21	10/21	2.10E-01	7/21	7.74E-01	7/21	7.04E-01	10/21	3.52E-02	0.56 - 30
METAL	Arsenic	mg/kg	3.20E+00	1.01E+01	5.71E+00	21/21	1/21	7.90E+00	21/21	3.32E-02	21/21	3.02E-02	21/21	1.51E-03	1 - 11
METAL	Barium	mg/kg	2.05E+01	4.21E+02	1.32E+02	21/21	3/21	1.70E+02	3/21	3.41E+02	3/21	3.11E+02	21/21	1.55E+01	0.806 - 100
METAL	Beryllium	mg/kg	2.10E-01	8.90E-01	4.80E-01	21/21	2/21	6.90E-01	0/21	4.29E+01	0/21	3.89E+01	0/21	1.95E+00	0.1 - 0.12
METAL	Boron	mg/kg	9.76E-01	3.04E+00	1.95E+00	15/16	N/A	N/A	0/16	2.82E+01	0/16	2.56E+01	11/16	1.28E+00	3.02 - 3.6
METAL	Cadmium	mg/kg	1.30E-02	1.51E+01	9.45E-01	17/21	2/21	2.10E-01	1/21	1.52E+00	1/21	1.39E+00	4/21	6.93E-02	0.05 - 12
METAL	Calcium	mg/kg	5.37E+02	4.33E+03	1.46E+03	5/5	0/5	6.10E+03	N/A	N/A	N/A	N/A	N/A	N/A	50 - 57.9
METAL	Chromium	mg/kg	1.08E+01	4.12E+01	1.78E+01	20/21	0/21	4.30E+01	0/21	3.96E+06	0/21	3.60E+06	0/21	1.80E+05	0.605 - 85
METAL	Cobalt	mg/kg	3.26E+00	1.69E+01	7.65E+00	21/21	3/21	1.30E+01	21/21	5.96E-01	21/21	5.43E-01	21/21	2.71E-02	0.2 - 0.24
METAL	Copper	mg/kg	3.80E+00	1.93E+01	8.58E+00	21/21	0/21	2.50E+01	0/21	6.18E+01	0/21	5.62E+01	21/21	2.81E+00	0.403 - 35
METAL	Iron	mg/kg	1.11E+04	2.55E+04	1.66E+04	21/21	0/21	2.80E+04	21/21	7.74E+02	21/21	7.04E+02	21/21	3.52E+01	5 - 240
METAL	Lead	mg/kg	3.22E+00	1.78E+01	9.42E+00	21/21	0/21	2.30E+01	0/21	2.97E+02	0/21	2.70E+02	1/21	1.35E+01	0.3 - 0.48
METAL	Magnesium	mg/kg	3.14E+02	1.82E+03	1.03E+03	5/5	0/5	2.10E+03	N/A	N/A	N/A	N/A	N/A	N/A	50 - 57.9
METAL	Manganese	mg/kg	2.06E+02	1.69E+03	5.08E+02	21/21	3/21	8.20E+02	21/21	6.23E+01	21/21	5.65E+01	21/21	2.83E+00	0.2 - 11.9
METAL	Mercury	mg/kg	1.02E-02	3.41E-02	1.92E-02	12/21	0/21	1.30E-01	0/21	6.49E-01	0/21	5.91E-01	1/21	2.95E-02	0.0229 - 10
METAL	Molybdenum	mg/kg	1.46E-01	1.24E+00	5.12E-01	18/21	N/A	N/A	0/21	4.44E+00	0/21	4.03E+00	17/21	2.02E-01	0.202 - 15
METAL	Nickel	mg/kg	4.00E+00	2.28E+01	1.08E+01	21/21	2/21	2.20E+01	0/21	5.63E+01	0/21	5.12E+01	21/21	2.56E+00	0.403 - 0.58
METAL	Selenium	mg/kg	4.17E-01	2.04E+00	1.31E+00	19/21	16/21	7.00E-01	15/21	1.14E+00	15/21	1.04E+00	19/21	5.19E-02	0.5 - 1.2
METAL	Silver	mg/kg	2.20E-02	2.95E-01	9.90E-02	7/21	0/21	2.70E+00	0/21	1.76E+00	0/21	1.60E+00	2/21	7.99E-02	0.2 - 5.78
METAL	Sodium	mg/kg	2.92E+01	3.76E+02	1.89E+02	5/5	1/5	3.40E+02	N/A	N/A	N/A	N/A	N/A	N/A	20 - 23.2
METAL	Thallium	mg/kg	1.10E-01	3.50E-01	2.19E-01	10/21	1/21	3.40E-01	10/21	3.12E-02	10/21	2.84E-02	10/21	1.42E-03	0.2 - 0.48
METAL	Uranium	mg/kg	5.79E-01	2.01E+02	1.94E+01	21/21	7/21	4.60E+00	7/21	3.96E+00	7/21	3.60E+00	21/21	1.80E-01	0.03 - 0.473
METAL	Vanadium	mg/kg	1.36E+01	3.61E+01	2.56E+01	21/21	0/21	3.70E+01	0/21	1.90E+02	0/21	1.73E+02	21/21	8.64E+00	1 - 4.8
METAL	Zinc	mg/kg	9.80E+00	5.32E+01	2.72E+01	21/21	0/21	6.00E+01	0/21	8.21E+02	0/21	7.46E+02	4/21	3.73E+01	2 - 25
ANION	Fluoride	mg/kg	1.35E+00	2.69E+01	9.36E+00	16/16	N/A	N/A	0/16	2.64E+02	0/16	2.40E+02	3/16	1.20E+01	1.1 - 1.24
PPCB	Total PCB	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.50E-01	0/18	1.36E-01	0/18	6.82E-03	0.00371 - 5
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.92E-02	0/15	1.74E-02	0/15	8.72E-04	0.374 - 7.46
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.84E+00	0/18	8.04E+00	0/18	4.02E-01	0.37 - 7.46
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.55E-02	0/18	2.32E-02	0/18	1.16E-03	0.37 - 7.46
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.97E-02	0/18	4.52E-02	0/18	2.26E-03	0.37 - 7.46
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.26E-01	0/18	8.42E-01	0/18	4.21E-02	0.37 - 7.46
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.749 - 14.9
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.06E-03	0/18	6.42E-03	0/18	3.21E-04	0.37 - 7.46
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.47E-03	0/18	1.33E-03	0/18	6.67E-05	0.37 - 7.46
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	8.47E+00	0/18	7.70E+00	0/18	3.85E-01	0.0374 - 0.746
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.96E-01	0/18	1.78E-01	0/18	8.91E-03	0.37 - 7.46
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.68E-03	0/18	5.16E-03	0/18	2.58E-04	0.374 - 7.46
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.07E-01	0/18	3.70E-01	0/18	1.85E-02	0.0374 - 0.746
SVOA	2-Methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.66E+00	0/18	1.51E+00	0/18	7.53E-02	0.37 - 7.46
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.76E-01	0/18	1.60E-01	0/18	8.01E-03	0.374 - 7.46
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.37 - 7.46
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.81E-02	0/18	1.65E-02	0/18	8.24E-04	0.374 - 7.46
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.39E-03	0/18	4.90E-03	0/18	2.45E-04	0.374 - 7.46
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.52E-03	0/18	6.84E-03	0/18	3.42E-04	0.37 - 7.46
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.76E+00	0/18	3.42E+00	0/18	1.71E-01	0.37 - 7.46
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.41E-03	0/18	3.10E-03	0/18	1.55E-04	0.37 - 7.46
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.52E-03	0/18	6.84E-03	0/18	3.42E-04	0.37 - 7.46
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.374 - 7.46
SVOA	Acenaphthene	mg/kg	1.58E-02	2.20E-02	1.86E-02	3/18	N/A	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOA	Acenaphthylene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOA	Acetophenone	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.28E+00	0/15	1.17E+00	0/15	5.84E-02	0.374 - 7.46

Table C1.39. Sector 6 Subsurface Soil Data Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Anthracene	mg/kg	2.48E-02	2.96E-02	2.72E-02	2/18	N/A	N/A	0/18	1.28E+02	0/18	1.16E+02	0/18	5.81E+00	0.0374 - 0.746
SVOA	Atrazine	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.29E-02	0/15	3.90E-02	0/15	1.95E-03	0.374 - 7.46
SVOA	Benzaldehyde	mg/kg	--	--	--	0/15	N/A	N/A	0/15	9.13E-02	0/15	8.30E-02	0/15	4.15E-03	0.374 - 7.46
SVOA	Benzenemethanol	mg/kg	--	--	--	0/3	N/A	N/A	0/3	1.05E+00	0/3	9.52E-01	0/3	4.76E-02	0.37 - 0.4
SVOA	Benzo(ghi)perylene	mg/kg	2.64E-02	8.66E-02	5.65E-02	2/18	N/A	N/A	0/18	2.90E+01	0/18	2.63E+01	0/18	1.32E+00	0.0374 - 0.746
SVOA	Benzoic acid	mg/kg	--	--	--	0/3	N/A	N/A	0/3	3.32E+01	0/3	3.02E+01	0/3	1.51E+00	1.8 - 1.9
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.97E-02	0/18	2.70E-02	0/18	1.35E-03	0.37 - 7.46
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.94E-05	0/18	7.22E-05	0/18	3.61E-06	0.0073 - 7.46
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.88E-03	0/18	2.62E-03	0/18	1.31E-04	0.37 - 7.46
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.93E+01	0/18	2.66E+01	0/18	1.33E+00	0.0374 - 0.746
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.19E+00	0/18	4.72E+00	0/18	2.36E-01	0.0374 - 0.746
SVOA	Caprolactam	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.43E+00	0/15	4.94E+00	0/15	2.47E-01	0.374 - 7.46
SVOA	Carbazole	mg/kg	1.40E-02	1.66E-02	1.53E-02	2/15	N/A	N/A	0/15	8.27E-01	0/15	7.51E-01	0/15	3.76E-02	0.0374 - 0.746
SVOA	Dibenzofuran	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.21E-01	0/18	2.92E-01	0/18	1.46E-02	0.37 - 7.46
SVOA	Diethyl phthalate	mg/kg	1.46E-02	3.43E-02	2.45E-02	2/18	N/A	N/A	0/18	1.34E+01	0/18	1.22E+01	0/18	6.08E-01	0.0374 - 0.746
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.34E+01	0/18	1.22E+01	0/18	6.08E-01	0.0374 - 0.746
SVOA	Di-n-butyl phthalate	mg/kg	1.24E-02	2.79E-02	1.81E-02	3/18	N/A	N/A	0/18	4.99E+00	0/18	4.54E+00	0/18	2.27E-01	0.0374 - 0.746
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.24E+02	0/18	1.13E+02	0/18	5.65E+00	0.0374 - 0.746
SVOA	Diphenylamine	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.13E+00	0/15	4.66E+00	0/15	2.33E-01	0.374 - 7.46
SVOA	Fluoranthene	mg/kg	1.39E-02	7.24E-01	1.55E-01	9/18	N/A	N/A	0/18	1.96E+02	0/18	1.78E+02	0/18	8.91E+00	0.0374 - 0.746
SVOA	Fluorene	mg/kg	1.56E-02	1.56E-02	1.56E-02	1/18	N/A	N/A	0/18	1.20E+01	0/18	1.09E+01	0/18	5.45E-01	0.0374 - 0.746
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.71E-03	0/18	2.46E-03	0/18	1.23E-04	0.37 - 7.46
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.87E-03	0/18	5.34E-03	0/18	2.67E-04	0.37 - 7.46
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.82E-03	0/18	2.56E-03	0/18	1.28E-04	0.374 - 7.46
SVOA	Hexachloroethane	mg/kg	--	--	--	0/18	N/A	N/A	0/18	4.40E-03	0/18	4.00E-03	0/18	2.00E-04	0.37 - 7.46
SVOA	Isophorone	mg/kg	--	--	--	0/18	N/A	N/A	0/18	5.68E-01	0/18	5.16E-01	0/18	2.58E-02	0.37 - 7.46
SVOA	m,p-Cresol	mg/kg	--	--	--	0/3	N/A	N/A	0/3	6.53E-01	0/3	5.94E-01	0/3	2.97E-02	0.73 - 0.8
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/15	N/A	N/A	0/15	6.53E-01	0/15	5.94E-01	0/15	2.97E-02	0.374 - 7.46
SVOA	Naphthalene	mg/kg	1.48E-02	1.48E-02	1.48E-02	1/18	N/A	N/A	1/18	8.47E-03	1/18	7.70E-03	1/18	3.85E-04	0.0374 - 0.746
SVOA	Nitrobenzene	mg/kg	--	--	--	0/18	N/A	N/A	0/18	2.02E-03	0/18	1.83E-03	0/18	9.17E-05	0.374 - 7.46
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.78E-04	0/18	1.62E-04	0/18	8.10E-06	0.0073 - 7.46
SVOA	N-Nitrosodiphenylamine	mg/kg	--	--	--	0/3	N/A	N/A	0/3	1.47E+00	0/3	1.33E+00	0/3	6.66E-02	0.37 - 0.4
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	1.26E-03	0/18	1.14E-03	0/18	5.71E-05	0.374 - 7.46
SVOA	Phenanthrene	mg/kg	1.37E-02	1.39E-01	6.02E-02	6/18	N/A	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.0374 - 0.746
SVOA	Phenol	mg/kg	--	--	--	0/18	N/A	N/A	0/18	7.28E+00	0/18	6.62E+00	0/18	3.31E-01	0.37 - 7.46
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/18	N/A	N/A	0/18	3.48E-02	0/18	3.16E-02	0/18	1.58E-03	0.374 - 7.46
SVOA	Pyrene	mg/kg	1.16E-02	8.06E-01	1.52E-01	9/18	N/A	N/A	0/18	2.90E+01	0/18	2.63E+01	0/18	1.32E+00	0.0374 - 0.746
SVOA	Pyridine	mg/kg	--	--	--	0/3	N/A	N/A	0/3	1.50E-02	0/3	1.36E-02	0/3	6.80E-04	0.73 - 0.8
SVOA	Total PAH	mg/kg	1.54E-03	6.04E-01	1.43E-01	7/18	N/A	N/A	0/18	6.47E-01	1/18	5.89E-01	6/18	2.94E-02	-
RADS	Americium-241	pCi/g	1.00E-02	4.71E+00	1.83E+00	3/19	N/A	N/A	0/19	2.11E+01	0/19	1.92E+01	1/19	9.58E-01	0.009 - 0.973
RADS	Cesium-137	pCi/g	3.91E-01	3.91E-01	3.91E-01	1/19	1/19	2.80E-01	0/19	1.05E+01	0/19	9.58E+00	0/19	4.79E-01	0.0325 - 0.14
RADS	Neptunium-237	pCi/g	1.46E-01	2.67E+00	1.41E+00	2/19	N/A	N/A	1/19	1.18E+00	1/19	1.07E+00	2/19	5.36E-02	0.012 - 1.97
RADS	Plutonium-238	pCi/g	8.40E-02	8.40E-02	8.40E-02	1/19	N/A	N/A	0/19	4.82E+00	0/19	4.38E+00	0/19	2.19E-01	0.018 - 0.733
RADS	Plutonium-239/240	pCi/g	6.30E-03	2.17E+01	8.63E+00	3/19	N/A	N/A	1/19	4.69E+00	1/19	4.26E+00	2/19	2.13E-01	0.0043 - 0.89
RADS	Technetium-99	pCi/g	4.87E+00	5.05E+01	1.91E+01	8/19	8/19	2.80E+00	8/19	1.67E-01	8/19	1.52E-01	8/19	7.60E-03	0.49 - 4.57
RADS	Thorium-228	pCi/g	9.40E-01	1.11E+00	1.01E+00	3/3	0/3	1.60E+00	3/3	2.16E-04	3/3	1.96E-04	3/3	9.80E-06	0.02 - 0.04
RADS	Thorium-230	pCi/g	6.05E-01	2.85E+02	2.37E+01	15/19	6/19	1.40E+00	2/19	4.03E+01	2/19	3.66E+01	3/19	1.83E+00	0.007 - 0.839
RADS	Thorium-232	pCi/g	9.20E-01	1.16E+00	1.04E+00	3/3	0/3	1.50E+00	3/3	2.16E-01	3/3	1.96E-01	3/3	9.80E-03	0.007 - 0.02
RADS	Uranium-233/234	pCi/g	7.95E-01	1.59E+02	1.39E+01	15/16	9/16	1.20E+00	12/16	1.09E+00	13/16	9.90E-01	15/16	4.95E-02	0.422 - 1.41
RADS	Uranium-234	pCi/g	7.50E-01	8.10E+00	3.21E+00	3/3	1/3	1.20E+00	1/3	1.09E+00	1/3	9.90E-01	3/3	4.95E-02	0.02 - 0.02
RADS	Uranium-235/236	pCi/g	2.90E-02	8.66E+00	1.62E+00	7/19	5/19	6.00E-02	2/19	1.07E+00	2/19	9.76E-01	6/19	4.88E-02	0.01 - 0.594
RADS	Uranium-238	pCi/g	5.41E-01	1.79E+02	1.39E+01	18/19	13/19	1.20E+00	14/19	8.87E-01	15/19	8.05E-01	18/19	4.03E-02	0.009 - 0.951

Table C1.39. Sector 6 Subsurface Soil Data Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,1,1,2-Tetrachloroethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	4.82E-03	0/6	4.38E-03	0/6	2.19E-04	0.0054 - 0.0062
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.18E+00	0/21	5.62E+00	0/21	2.81E-01	0.000888 - 0.0062
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.51E-04	0/21	5.92E-04	0/21	2.96E-05	0.000888 - 0.0062
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	5.63E+01	0/15	5.13E+01	0/15	2.56E+00	0.00444 - 0.00653
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	2.97E-04	0/21	2.69E-04	0/21	1.35E-05	0.000888 - 0.0062
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.72E-02	0/21	1.56E-02	0/21	7.82E-04	0.000888 - 0.0062
VOA	1,1-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/21	N/A	N/A	0/21	2.24E-01	0/21	2.04E-01	0/21	1.02E-02	0.000888 - 0.0062
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.60E-02	0/15	4.18E-02	0/15	2.09E-03	0.000888 - 0.00131
VOA	1,2,3-Trichloropropane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	7.13E-06	0/6	6.48E-06	0/6	3.24E-07	0.0054 - 0.0062
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.55E-02	0/15	2.32E-02	0/15	1.16E-03	0.000888 - 0.00131
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	3.17E-06	0/15	2.88E-06	0/15	1.44E-07	0.000888 - 0.00131
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.62E-05	0/21	4.20E-05	0/21	2.10E-06	0.000888 - 0.0062
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	6.49E-01	0/15	5.90E-01	0/15	2.95E-02	0.000888 - 0.00131
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.06E-03	0/21	9.69E-04	0/21	4.84E-05	0.000888 - 0.0062
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.03E-03	0/21	5.48E-03	0/21	2.74E-04	0.000888 - 0.0062
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.18E-01	0/21	3.81E-01	0/21	1.90E-02	0.000888 - 0.0062
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	6.49E-01	0/15	5.90E-01	0/15	2.95E-02	0.000888 - 0.00131
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.02E-02	0/15	9.24E-03	0/15	4.62E-04	0.000888 - 0.00131
VOA	1,4-Dioxane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.07E-03	0/15	1.88E-03	0/15	9.42E-05	0.0444 - 0.0653
VOA	2-Butanone	mg/kg	3.53E-03	3.15E-02	1.86E-02	5/15	N/A	N/A	0/15	2.55E+00	0/15	2.32E+00	0/15	1.16E-01	0.00444 - 0.00653
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/15	N/A	N/A	0/15	3.04E-05	0/15	2.76E-05	0/15	1.38E-06	0.00444 - 0.00653
VOA	2-Hexanone	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.93E-02	0/21	1.75E-02	0/21	8.75E-04	0.00444 - 0.025
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	7.08E-02	0/15	6.44E-02	0/15	3.22E-03	0.000888 - 0.00131
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.18E-01	0/21	5.62E-01	0/21	2.81E-02	0.00444 - 0.025
VOA	Acetone	mg/kg	1.63E-03	1.95E-01	5.37E-02	16/19	N/A	N/A	0/19	8.10E+00	0/19	7.36E+00	0/19	3.68E-01	0.00444 - 0.025
VOA	Acrolein	mg/kg	2.44E-03	2.44E-03	2.44E-03	1/15	N/A	N/A	1/15	1.85E-05	1/15	1.68E-05	1/15	8.41E-07	0.00444 - 0.00653
VOA	Acrylonitrile	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.51E-04	0/15	2.28E-04	0/15	1.14E-05	0.00444 - 0.00653
VOA	Benzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.13E-03	0/21	4.66E-03	0/21	2.33E-04	0.000888 - 0.0062
VOA	Bromochloromethane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.58E-02	0/15	4.16E-02	0/15	2.08E-03	0.000888 - 0.00131
VOA	Bromodichloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	8.03E-04	0/21	7.30E-04	0/21	3.65E-05	0.000888 - 0.0062
VOA	Bromoform	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.92E-02	0/21	1.75E-02	0/21	8.73E-04	0.000888 - 0.0062
VOA	Bromomethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.20E-03	0/21	3.82E-03	0/21	1.91E-04	0.000888 - 0.012
VOA	Carbon disulfide	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.28E-01	0/21	4.80E-01	0/21	2.40E-02	0.00444 - 0.00653
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.89E-03	0/21	3.54E-03	0/21	1.77E-04	0.000888 - 0.0062
VOA	Chlorobenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.16E-01	0/21	1.06E-01	0/21	5.28E-03	0.000888 - 0.0062
VOA	Chloroethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.21E+00	0/21	4.74E+00	0/21	2.37E-01	0.000888 - 0.012
VOA	Chloroform	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.35E-03	0/21	1.22E-03	0/21	6.12E-05	0.000888 - 0.0062
VOA	Chloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.16E-02	0/21	1.05E-02	0/21	5.26E-04	0.000888 - 0.012
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.20E-03	1.77E-01	4.92E-02	4/21	N/A	N/A	1/21	2.33E-02	1/21	2.12E-02	4/21	1.06E-03	0.000888 - 0.112
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.70E-03	0/21	3.36E-03	0/21	1.68E-04	0.000888 - 0.0062
VOA	Cumene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	1.62E+00	0/15	1.48E+00	0/15	7.38E-02	0.000888 - 0.00131
VOA	Cyclohexane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	2.86E+01	0/15	2.60E+01	0/15	1.30E+00	0.000888 - 0.00131
VOA	Dibromochloromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	5.10E-03	0/21	4.64E-03	0/21	2.32E-04	0.000888 - 0.0062
VOA	Dibromomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	4.33E-03	0/6	3.94E-03	0/6	1.97E-04	0.0054 - 0.0062
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	6.69E-01	0/21	6.08E-01	0/21	3.04E-02	0.000888 - 0.012
VOA	Ethyl methacrylate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	2.35E-01	0/6	2.14E-01	0/6	1.07E-02	0.0054 - 0.0062
VOA	Ethylbenzene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.70E-02	0/21	3.36E-02	0/21	1.68E-03	0.000888 - 0.0062
VOA	Iodomethane	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.16E-02	0/6	1.05E-02	0/6	5.26E-04	0.0054 - 0.0062
VOA	m,p-Xylene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.20E-01	0/21	3.82E-01	0/21	1.91E-02	0.00178 - 0.0062
VOA	Methyl acetate	mg/kg	--	--	--	0/15	N/A	N/A	0/15	9.04E+00	0/15	8.22E+00	0/15	4.11E-01	0.00444 - 0.00653
VOA	Methylcyclohexane	mg/kg	--	--	--	0/15	N/A	N/A	0/15	3.08E+01	0/15	2.80E+01	0/15	1.40E+00	0.000888 - 0.00131
VOA	Methylene chloride	mg/kg	2.67E-03	1.40E-02	7.81E-03	10/21	N/A	N/A	0/21	5.98E-02	0/21	5.44E-02	9/21	2.72E-03	0.00444 - 0.00653

Table C1.39. Sector 6 Subsurface Soil Data Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Styrene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	2.93E+00	0/21	2.66E+00	0/21	1.33E-01	0.000888 - 0.0062
VOA	Tetrachloroethene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	4.05E-02	0/21	3.69E-02	0/21	1.84E-03	0.000888 - 0.0062
VOA	Toluene	mg/kg	5.00E-04	6.54E-03	2.69E-03	6/21	N/A	N/A	0/21	1.68E+00	0/21	1.52E+00	0/21	7.62E-02	0.000888 - 0.0062
VOA	Total Xylene	mg/kg	--	--	--	0/15	N/A	N/A	0/15	4.20E-01	0/15	3.82E-01	0/15	1.91E-02	0.00266 - 0.00392
VOA	*trans* -1,2-Dichloroethene	mg/kg	5.28E-03	5.28E-03	5.28E-03	1/21	N/A	N/A	0/21	6.40E-02	0/21	5.83E-02	1/21	2.91E-03	0.000888 - 0.0062
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/21	N/A	N/A	0/21	3.70E-03	0/21	3.36E-03	0/21	1.68E-04	0.000888 - 0.0062
VOA	*Trans* -1,4-Dichloro-2-butene	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.37E-05	0/6	1.24E-05	0/6	6.22E-07	0.011 - 0.012
VOA	Trichloroethene	mg/kg	2.14E-03	6.28E-02	2.44E-02	3/21	N/A	N/A	2/21	2.22E-03	3/21	2.02E-03	3/21	1.01E-04	0.000888 - 0.125
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/21	N/A	N/A	0/21	1.61E+00	0/21	1.46E+00	0/21	7.31E-02	0.000888 - 0.0062
VOA	Vinyl acetate	mg/kg	--	--	--	0/6	N/A	N/A	0/6	1.91E-01	0/6	1.74E-01	0/6	8.70E-03	0.0054 - 0.0062
VOA	Vinyl chloride	mg/kg	5.88E-03	5.88E-03	5.88E-03	1/21	N/A	N/A	1/21	1.42E-04	1/21	1.29E-04	1/21	6.47E-06	0.000888 - 0.0062

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20 SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.40. Sector 6 Deep Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	2.24E+03	1.43E+04	8.02E+03	27/27	3/27	1.20E+04	0/27	6.60E+04	0/27	5.99E+04	24/27	3.00E+03	9.88 - 119
METAL	Antimony	mg/kg	4.53E-01	7.31E-01	5.62E-01	4/27	4/27	2.10E-01	0/27	7.74E-01	1/27	7.04E-01	4/27	3.52E-02	2.06 - 22.6
METAL	Arsenic	mg/kg	6.03E-01	5.42E+01	4.65E+00	27/27	3/27	7.90E+00	27/27	3.32E-02	27/27	3.02E-02	27/27	1.51E-03	0.988 - 1.19
METAL	Barium	mg/kg	5.54E+00	6.67E+01	2.53E+01	27/27	0/27	1.70E+02	0/27	3.41E+02	0/27	3.11E+02	19/27	1.55E+01	0.79 - 0.955
METAL	Beryllium	mg/kg	1.46E-01	1.16E+00	5.92E-01	27/27	10/27	6.90E-01	0/27	4.29E+01	0/27	3.89E+01	0/27	1.95E+00	0.0988 - 0.119
METAL	Boron	mg/kg	9.86E-01	1.98E+00	1.33E+00	9/27	N/A	N/A	0/27	2.82E+01	0/27	2.56E+01	5/27	1.28E+00	2.96 - 3.58
METAL	Cadmium	mg/kg	2.08E-02	5.44E-02	3.19E-02	6/27	0/27	2.10E-01	0/27	1.52E+00	0/27	1.39E+00	0/27	6.93E-02	0.198 - 0.239
METAL	Chromium	mg/kg	4.44E+00	6.00E+01	1.57E+01	27/27	2/27	4.30E+01	0/27	3.96E+06	0/27	3.60E+06	0/27	1.80E+05	0.593 - 0.716
METAL	Cobalt	mg/kg	7.96E-01	2.53E+01	5.33E+00	27/27	2/27	1.30E+01	27/27	5.96E-01	27/27	5.43E-01	27/27	2.71E-02	0.198 - 0.239
METAL	Copper	mg/kg	1.20E+00	9.67E+00	3.90E+00	27/27	0/27	2.50E+01	0/27	6.18E+01	0/27	5.62E+01	19/27	2.81E+00	0.395 - 0.477
METAL	Iron	mg/kg	4.61E+03	5.95E+04	1.90E+04	27/27	7/27	2.80E+04	27/27	7.74E+02	27/27	7.04E+02	27/27	3.52E+01	19.8 - 238
METAL	Lead	mg/kg	1.29E+00	1.72E+01	4.49E+00	27/27	0/27	2.30E+01	0/27	2.97E+02	0/27	2.70E+02	1/27	1.35E+01	0.395 - 0.477
METAL	Manganese	mg/kg	1.00E+01	9.65E+02	1.17E+02	27/27	1/27	8.20E+02	12/27	6.23E+01	14/27	5.65E+01	27/27	2.83E+00	0.988 - 11.4
METAL	Mercury	mg/kg	9.78E-03	1.63E-02	1.30E-02	2/27	0/27	1.30E-01	0/27	6.49E-01	0/27	5.91E-01	0/27	2.95E-02	0.0227 - 0.0291
METAL	Molybdenum	mg/kg	9.21E-02	9.77E-01	3.02E-01	26/27	N/A	N/A	0/27	4.44E+00	0/27	4.03E+00	15/27	2.02E-01	0.198 - 0.239
METAL	Nickel	mg/kg	2.20E+00	1.19E+01	5.72E+00	27/27	0/27	2.20E+01	0/27	5.63E+01	0/27	5.12E+01	25/27	2.56E+00	0.395 - 0.477
METAL	Selenium	mg/kg	4.23E-01	2.40E+00	9.69E-01	21/27	11/27	7.00E-01	5/27	1.14E+00	6/27	1.04E+00	21/27	5.19E-02	0.988 - 1.19
METAL	Silver	mg/kg	1.43E-01	2.32E+00	6.59E-01	11/27	0/27	2.70E+00	1/27	1.76E+00	1/27	1.60E+00	11/27	7.99E-02	0.514 - 5.79
METAL	Thallium	mg/kg	1.71E-01	1.95E-01	1.83E-01	3/27	0/27	3.40E-01	3/27	3.12E-02	3/27	2.84E-02	3/27	1.42E-03	0.395 - 0.477
METAL	Uranium	mg/kg	3.24E-01	2.51E+00	9.79E-01	27/27	0/27	4.60E+00	0/27	3.96E+00	0/27	3.60E+00	27/27	1.80E-01	0.0395 - 0.0477
METAL	Vanadium	mg/kg	4.36E+00	6.33E+01	2.29E+01	27/27	5/27	3.70E+01	0/27	1.90E+02	0/27	1.73E+02	24/27	8.64E+00	3.95 - 4.77
METAL	Zinc	mg/kg	3.31E+00	3.35E+01	1.61E+01	27/27	0/27	6.00E+01	0/27	8.21E+02	0/27	7.46E+02	0/27	3.73E+01	3.95 - 4.77
ANION	Fluoride	mg/kg	7.17E-01	4.05E+00	2.18E+00	27/27	N/A	N/A	0/27	2.64E+02	0/27	2.40E+02	0/27	1.20E+01	1.02 - 1.22
PPCB	Total PCB	mg/kg	5.49E-03	5.49E-03	5.49E-03	1/28	N/A	N/A	0/28	1.50E-01	0/28	1.36E-01	0/28	6.82E-03	0.00355 - 0.0043
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.92E-02	0/28	1.74E-02	0/28	8.72E-04	0.352 - 0.43
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.84E+00	0/28	8.04E+00	0/28	4.02E-01	0.352 - 0.43
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.55E-02	0/28	2.32E-02	0/28	1.16E-03	0.352 - 0.43
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.97E-02	0/28	4.52E-02	0/28	2.26E-03	0.352 - 0.43
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.26E-01	0/28	8.42E-01	0/28	4.21E-02	0.352 - 0.43
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.59E-02	0/28	8.72E-02	0/28	4.36E-03	0.703 - 0.861
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.06E-03	0/28	6.42E-03	0/28	3.21E-04	0.352 - 0.43
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.47E-03	0/28	1.33E-03	0/28	6.67E-05	0.352 - 0.43
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.47E+00	0/28	7.70E+00	0/28	3.85E-01	0.0352 - 0.043
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.96E-01	0/28	1.78E-01	0/28	8.91E-03	0.352 - 0.43
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.68E-03	0/28	5.16E-03	0/28	2.58E-04	0.352 - 0.43
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.07E-01	0/28	3.70E-01	0/28	1.85E-02	0.0352 - 0.043
SVOA	2-Methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.66E+00	0/28	1.51E+00	0/28	7.53E-02	0.352 - 0.43
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.76E-01	0/28	1.60E-01	0/28	8.01E-03	0.352 - 0.43
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.59E-02	0/28	8.72E-02	0/28	4.36E-03	0.352 - 0.43
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.81E-02	0/28	1.65E-02	0/28	8.24E-04	0.352 - 0.43
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.39E-03	0/28	4.90E-03	0/28	2.45E-04	0.352 - 0.43
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.52E-03	0/28	6.84E-03	0/28	3.42E-04	0.352 - 0.43
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.76E+00	0/28	3.42E+00	0/28	1.71E-01	0.352 - 0.43
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.41E-03	0/28	3.10E-03	0/28	1.55E-04	0.352 - 0.43
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.52E-03	0/28	6.84E-03	0/28	3.42E-04	0.352 - 0.43
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.59E-02	0/28	8.72E-02	0/28	4.36E-03	0.352 - 0.43
SVOA	Acenaphthene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.21E+01	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOA	Acenaphthylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.21E+01	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOA	Acetophenone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.28E+00	0/28	1.17E+00	0/28	5.84E-02	0.352 - 0.43

Table C1.40. Sector 6 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
SVOA	Anthracene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.28E+02	0/28	1.16E+02	0/28	5.81E+00	0.0352 - 0.043
SVOA	Atrazine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.31E-03	0/28	3.92E-03	0/28	1.96E-04	0.352 - 0.43
SVOA	Benzaldehyde	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.13E-02	0/28	8.30E-02	0/28	4.15E-03	0.352 - 0.43
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.90E+01	0/28	2.63E+01	0/28	1.32E+00	0.0352 - 0.043
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.97E-02	0/28	2.70E-02	0/28	1.35E-03	0.352 - 0.43
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.94E-05	0/28	7.22E-05	0/28	3.61E-06	0.352 - 0.43
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.88E-03	0/28	2.62E-03	0/28	1.31E-04	0.352 - 0.43
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.30E-02	1.73E-02	1.52E-02	2/28	N/A	N/A	0/28	2.93E+01	0/28	2.66E+01	0/28	1.33E+00	0.0352 - 0.043
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.19E+00	0/28	4.72E+00	0/28	2.36E-01	0.0352 - 0.043
SVOA	Caprolactam	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.43E+00	0/28	4.94E+00	0/28	2.47E-01	0.352 - 0.43
SVOA	Carbazole	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.27E-01	0/28	7.51E-01	0/28	3.76E-02	0.0352 - 0.043
SVOA	Dibenzofuran	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.21E-01	0/28	2.92E-01	0/28	1.46E-02	0.352 - 0.43
SVOA	Diethyl phthalate	mg/kg	1.22E-02	1.65E-02	1.42E-02	3/28	N/A	N/A	0/28	1.34E+01	0/28	1.22E+01	0/28	6.08E-01	0.0352 - 0.043
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.34E+01	0/28	1.22E+01	0/28	6.08E-01	0.0352 - 0.043
SVOA	Di-n-butyl phthalate	mg/kg	1.40E-02	4.63E-02	2.28E-02	18/28	N/A	N/A	0/28	4.99E+00	0/28	4.54E+00	0/28	2.27E-01	0.0352 - 0.043
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.24E+02	0/28	1.13E+02	0/28	5.65E+00	0.0352 - 0.043
SVOA	Diphenylamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.13E+00	0/28	4.66E+00	0/28	2.33E-01	0.352 - 0.43
SVOA	Fluoranthene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.96E+02	0/28	1.78E+02	0/28	8.91E+00	0.0352 - 0.043
SVOA	Fluorene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.20E+01	0/28	1.09E+01	0/28	5.45E-01	0.0352 - 0.043
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.71E-03	0/28	2.46E-03	0/28	1.23E-04	0.352 - 0.43
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.87E-03	0/28	5.34E-03	0/28	2.67E-04	0.352 - 0.43
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.82E-03	0/28	2.56E-03	0/28	1.28E-04	0.352 - 0.43
SVOA	Hexachloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.40E-03	0/28	4.00E-03	0/28	2.00E-04	0.352 - 0.43
SVOA	Isophorone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.68E-01	0/28	5.16E-01	0/28	2.58E-02	0.352 - 0.43
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.53E-01	0/28	5.94E-01	0/28	2.97E-02	0.352 - 0.43
SVOA	Naphthalene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.47E-03	0/28	7.70E-03	0/28	3.85E-04	0.0352 - 0.043
SVOA	Nitrobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.02E-03	0/28	1.83E-03	0/28	9.17E-05	0.352 - 0.43
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.78E-04	0/28	1.62E-04	0/28	8.10E-06	0.352 - 0.43
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.26E-03	0/28	1.14E-03	0/28	5.71E-05	0.352 - 0.43
SVOA	Phenanthrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.21E+01	0/28	1.10E+01	0/28	5.49E-01	0.0352 - 0.043
SVOA	Phenol	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.28E+00	0/28	6.62E+00	0/28	3.31E-01	0.352 - 0.43
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.48E-02	0/28	3.16E-02	0/28	1.58E-03	0.352 - 0.43
SVOA	Pyrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.90E+01	0/28	2.63E+01	0/28	1.32E+00	0.0352 - 0.043
SVOA	Total PAH	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.47E-01	0/28	5.89E-01	0/28	2.94E-02	-
RADS	Americium-241	pCi/g	1.39E-01	1.39E-01	1.39E-01	1/27	N/A	N/A	0/27	2.11E+01	0/27	1.92E+01	0/27	9.58E-01	0.139 - 0.827
RADS	Cesium-137	pCi/g	--	--	--	0/27	0/27	2.80E-01	0/27	1.05E+01	0/27	9.58E+00	0/27	4.79E-01	0.0214 - 0.082
RADS	Neptunium-237	pCi/g	--	--	--	0/27	N/A	N/A	0/27	1.18E+00	0/27	1.07E+00	0/27	5.36E-02	0.328 - 0.786
RADS	Plutonium-238	pCi/g	--	--	--	0/27	N/A	N/A	0/27	4.82E+00	0/27	4.38E+00	0/27	2.19E-01	0.255 - 0.853
RADS	Plutonium-239/240	pCi/g	--	--	--	0/27	N/A	N/A	0/27	4.69E+00	0/27	4.26E+00	0/27	2.13E-01	0.272 - 1.1
RADS	Technetium-99	pCi/g	--	--	--	0/27	0/27	2.80E+00	0/27	1.67E-01	0/27	1.52E-01	0/27	7.60E-03	2.41 - 3.6
RADS	Thorium-230	pCi/g	4.59E-01	1.20E+00	8.24E-01	19/27	0/27	1.40E+00	0/27	4.03E+01	0/27	3.66E+01	0/27	1.83E+00	0.285 - 0.912
RADS	Uranium-233/234	pCi/g	4.54E-01	1.23E+00	8.95E-01	10/27	1/27	1.20E+00	1/27	1.09E+00	4/27	9.90E-01	10/27	4.95E-02	0.428 - 1.32
RADS	Uranium-235/236	pCi/g	--	--	--	0/27	0/27	6.00E-02	0/27	1.07E+00	0/27	9.76E-01	0/27	4.88E-02	0.256 - 0.901
RADS	Uranium-238	pCi/g	4.65E-01	1.26E+00	8.66E-01	19/27	2/27	1.20E+00	11/27	8.87E-01	12/27	8.05E-01	19/27	4.03E-02	0.244 - 1.21
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.18E+00	0/28	5.62E+00	0/28	2.81E-01	0.00091 - 0.00133
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.51E-04	0/28	5.92E-04	0/28	2.96E-05	0.00091 - 0.00133
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.63E+01	0/28	5.13E+01	0/28	2.56E+00	0.00455 - 0.00666
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.97E-04	0/28	2.69E-04	0/28	1.35E-05	0.00091 - 0.00133
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.72E-02	0/28	1.56E-02	0/28	7.82E-04	0.00091 - 0.00133

Table C1.40. Sector 6 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,1-Dichloroethene	mg/kg	7.98E-04	7.98E-04	7.98E-04	1/28	N/A	N/A	0/28	2.24E-01	0/28	2.04E-01	0/28	1.02E-02	0.00091 - 0.00133
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.60E-02	0/28	4.18E-02	0/28	2.09E-03	0.00091 - 0.00133
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.55E-02	0/28	2.32E-02	0/28	1.16E-03	0.00091 - 0.00133
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.17E-06	0/28	2.88E-06	0/28	1.44E-07	0.00091 - 0.00133
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.62E-05	0/28	4.20E-05	0/28	2.10E-06	0.00091 - 0.00133
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.49E-01	0/28	5.90E-01	0/28	2.95E-02	0.00091 - 0.00133
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.06E-03	0/28	9.69E-04	0/28	4.84E-05	0.00091 - 0.00133
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.03E-03	0/28	5.48E-03	0/28	2.74E-04	0.00091 - 0.00133
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.18E-01	0/28	3.81E-01	0/28	1.90E-02	0.00091 - 0.00133
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.49E-01	0/28	5.90E-01	0/28	2.95E-02	0.00091 - 0.00133
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.02E-02	0/28	9.24E-03	0/28	4.62E-04	0.00091 - 0.00133
VOA	1,4-Dioxane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.07E-03	0/28	1.88E-03	0/28	9.42E-05	0.0455 - 0.0666
VOA	2-Butanone	mg/kg	1.56E-03	1.19E-02	6.73E-03	2/28	N/A	N/A	0/28	2.55E+00	0/28	2.32E+00	0/28	1.16E-01	0.00455 - 0.00666
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.04E-05	0/28	2.76E-05	0/28	1.38E-06	0.00455 - 0.00666
VOA	2-Hexanone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.93E-02	0/28	1.75E-02	0/28	8.75E-04	0.00455 - 0.00666
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	7.08E-02	0/28	6.44E-02	0/28	3.22E-03	0.00091 - 0.00133
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.18E-01	0/28	5.62E-01	0/28	2.81E-02	0.00455 - 0.00666
VOA	Acetone	mg/kg	1.94E-03	6.46E-02	1.13E-02	9/28	N/A	N/A	0/28	8.10E+00	0/28	7.36E+00	0/28	3.68E-01	0.00455 - 0.00666
VOA	Acrolein	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.85E-05	0/28	1.68E-05	0/28	8.41E-07	0.00455 - 0.00666
VOA	Acrylonitrile	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.51E-04	0/28	2.28E-04	0/28	1.14E-05	0.00455 - 0.00666
VOA	Benzene	mg/kg	5.14E-04	5.14E-04	5.14E-04	1/28	N/A	N/A	0/28	5.13E-03	0/28	4.66E-03	1/28	2.33E-04	0.00091 - 0.00133
VOA	Bromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.58E-02	0/28	4.16E-02	0/28	2.08E-03	0.00091 - 0.00133
VOA	Bromodichloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	8.03E-04	0/28	7.30E-04	0/28	3.65E-05	0.00091 - 0.00133
VOA	Bromoform	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.92E-02	0/28	1.75E-02	0/28	8.73E-04	0.00091 - 0.00133
VOA	Bromomethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.20E-03	0/28	3.82E-03	0/28	1.91E-04	0.00091 - 0.00133
VOA	Carbon disulfide	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.28E-01	0/28	4.80E-01	0/28	2.40E-02	0.00455 - 0.00666
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.89E-03	0/28	3.54E-03	0/28	1.77E-04	0.00091 - 0.00133
VOA	Chlorobenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.16E-01	0/28	1.06E-01	0/28	5.28E-03	0.00091 - 0.00133
VOA	Chloroethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.21E+00	0/28	4.74E+00	0/28	2.37E-01	0.00091 - 0.00133
VOA	Chloroform	mg/kg	3.88E-04	1.68E-03	7.84E-04	4/28	N/A	N/A	1/28	1.35E-03	1/28	1.22E-03	4/28	6.12E-05	0.00091 - 0.00133
VOA	Chloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.16E-02	0/28	1.05E-02	0/28	5.26E-04	0.00091 - 0.00133
VOA	*cis* -1,2-Dichloroethene	mg/kg	4.30E-04	1.05E-01	1.79E-02	11/28	N/A	N/A	2/28	2.33E-02	2/28	2.12E-02	8/28	1.06E-03	0.00091 - 0.105
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.70E-03	0/28	3.36E-03	0/28	1.68E-04	0.00091 - 0.00133
VOA	Cumene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.62E+00	0/28	1.48E+00	0/28	7.38E-02	0.00091 - 0.00133
VOA	Cyclohexane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.86E+01	0/28	2.60E+01	0/28	1.30E+00	0.00091 - 0.00133
VOA	Dibromochloromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	5.10E-03	0/28	4.64E-03	0/28	2.32E-04	0.00091 - 0.00133
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	6.69E-01	0/28	6.08E-01	0/28	3.04E-02	0.00091 - 0.00133
VOA	Ethylbenzene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.70E-02	0/28	3.36E-02	0/28	1.68E-03	0.00091 - 0.00133
VOA	m,p-Xylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.20E-01	0/28	3.82E-01	0/28	1.91E-02	0.00182 - 0.00266
VOA	Methyl acetate	mg/kg	--	--	--	0/28	N/A	N/A	0/28	9.04E+00	0/28	8.22E+00	0/28	4.11E-01	0.00455 - 0.00666
VOA	Methylcyclohexane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.08E+01	0/28	2.80E+01	0/28	1.40E+00	0.00091 - 0.00133
VOA	Methylene chloride	mg/kg	2.23E-03	2.79E-03	2.47E-03	8/28	N/A	N/A	0/28	5.98E-02	0/28	5.44E-02	2/28	2.72E-03	0.00455 - 0.00666
VOA	Styrene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	2.93E+00	0/28	2.66E+00	0/28	1.33E-01	0.00091 - 0.00133
VOA	Tetrachloroethene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.05E-02	0/28	3.69E-02	0/28	1.84E-03	0.00091 - 0.00133
VOA	Toluene	mg/kg	5.86E-04	5.86E-04	5.86E-04	1/28	N/A	N/A	0/28	1.68E+00	0/28	1.52E+00	0/28	7.62E-02	0.00091 - 0.00133
VOA	Total Xylene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	4.20E-01	0/28	3.82E-01	0/28	1.91E-02	0.00273 - 0.00399
VOA	*trans* -1,2-Dichloroethene	mg/kg	7.98E-04	7.98E-04	7.98E-04	1/28	N/A	N/A	0/28	6.40E-02	0/28	5.83E-02	0/28	2.91E-03	0.00091 - 0.00133
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/28	N/A	N/A	0/28	3.70E-03	0/28	3.36E-03	0/28	1.68E-04	0.00091 - 0.00133
VOA	Trichloroethene	mg/kg	3.97E-04	1.24E-01	1.91E-02	10/28	N/A	N/A	6/28	2.22E-03	6/28	2.02E-03	10/28	1.01E-04	0.00091 - 0.105

Table C1.40. Sector 6 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.61E+00	0/28	1.46E+00	0/28	7.31E-02	0.00091 - 0.00133
VOA	Vinyl chloride	mg/kg	--	--	--	0/28	N/A	N/A	0/28	1.42E-04	0/28	1.29E-04	0/28	6.47E-06	0.00091 - 0.00133

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.41. Sector 6 McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.82E+03	1.39E+04	8.35E+03	6/6	0/6	5.99E+04	12.2 - 14.4
METAL	Antimony	mg/kg	--	--	--	0/6	0/6	7.04E-01	2.62 - 24.6
METAL	Arsenic	mg/kg	9.17E-01	2.97E+01	8.67E+00	6/6	6/6	3.02E-02	1.22 - 1.44
METAL	Barium	mg/kg	1.11E+01	3.07E+02	8.23E+01	6/6	0/6	3.11E+02	1.11 - 9.75
METAL	Beryllium	mg/kg	2.13E-01	3.03E+00	1.03E+00	6/6	0/6	3.89E+01	0.122 - 0.144
METAL	Boron	mg/kg	2.28E+00	3.33E+01	1.25E+01	6/6	1/6	2.56E+01	3.66 - 4.31
METAL	Cadmium	mg/kg	3.11E-02	7.74E-01	2.97E-01	3/6	0/6	1.39E+00	0.244 - 0.287
METAL	Chromium	mg/kg	7.95E+00	6.69E+01	4.33E+01	6/6	0/6	3.60E+06	0.731 - 0.862
METAL	Cobalt	mg/kg	1.05E+00	4.04E+01	1.50E+01	6/6	6/6	5.43E-01	0.244 - 0.287
METAL	Copper	mg/kg	2.08E+00	2.94E+01	9.10E+00	6/6	0/6	5.62E+01	0.487 - 0.574
METAL	Iron	mg/kg	6.60E+03	2.73E+05	6.19E+04	6/6	6/6	7.04E+02	27.8 - 2440
METAL	Lead	mg/kg	2.08E+00	2.41E+01	8.80E+00	6/6	0/6	2.70E+02	0.487 - 0.574
METAL	Manganese	mg/kg	1.92E+01	2.47E+03	4.36E+02	6/6	1/6	5.65E+01	1.38 - 122
METAL	Mercury	mg/kg	1.77E-02	1.77E-02	1.77E-02	1/6	0/6	5.91E-01	0.0275 - 0.0331
METAL	Molybdenum	mg/kg	1.22E-01	4.17E+00	1.24E+00	5/6	1/6	4.03E+00	0.244 - 0.287
METAL	Nickel	mg/kg	2.11E+00	4.91E+01	2.46E+01	6/6	0/6	5.12E+01	0.487 - 0.574
METAL	Selenium	mg/kg	1.01E+00	3.85E+00	2.26E+00	6/6	5/6	1.04E+00	1.22 - 1.44
METAL	Silver	mg/kg	2.60E+00	2.60E+00	2.60E+00	1/6	1/6	1.60E+00	0.654 - 6.15
METAL	Thallium	mg/kg	2.07E-01	7.73E-01	4.90E-01	2/6	2/6	2.84E-02	0.487 - 0.574
METAL	Uranium	mg/kg	6.85E-01	4.13E+00	2.18E+00	6/6	2/6	3.60E+00	0.0487 - 0.0574
METAL	Vanadium	mg/kg	1.15E+01	3.27E+01	1.99E+01	6/6	0/6	1.73E+02	4.87 - 5.74
METAL	Zinc	mg/kg	1.06E+01	1.24E+02	6.44E+01	6/6	0/6	7.46E+02	4.87 - 28.7
ANION	Fluoride	mg/kg	1.38E+00	5.67E+00	2.72E+00	6/6	0/6	2.40E+02	1.2 - 1.54
PPCB	Total PCB	mg/kg	--	--	--	0/6	0/6	1.36E-01	0.0049 - 0.00546
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/6	0/6	1.74E-02	0.487 - 0.544
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/6	0/6	8.04E+00	0.487 - 0.544
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/6	0/6	2.32E-02	0.487 - 0.544
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/6	0/6	4.52E-02	0.487 - 0.544
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/6	0/6	8.42E-01	0.487 - 0.544
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/6	0/6	8.72E-02	0.974 - 1.09
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/6	0/6	6.42E-03	0.487 - 0.544
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/6	0/6	1.33E-03	0.487 - 0.544
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/6	0/6	7.70E+00	0.0487 - 0.0544
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/6	0/6	1.78E-01	0.487 - 0.544
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/6	0/6	5.16E-03	0.487 - 0.544
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/6	0/6	3.70E-01	0.0487 - 0.0544
SVOA	2-Methylphenol	mg/kg	--	--	--	0/6	0/6	1.51E+00	0.487 - 0.544
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/6	0/6	1.60E-01	0.487 - 0.544
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/6	0/6	8.72E-02	0.487 - 0.544
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/6	0/6	1.65E-02	0.487 - 0.544
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/6	0/6	4.90E-03	0.487 - 0.544

Table C1.41. Sector 6 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/6	0/6	6.84E-03	0.487 - 0.544
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/6	0/6	3.42E+00	0.487 - 0.544
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/6	0/6	3.10E-03	0.487 - 0.544
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/6	0/6	6.84E-03	0.487 - 0.544
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/6	0/6	8.72E-02	0.487 - 0.544
SVOA	Acenaphthene	mg/kg	--	--	--	0/6	0/6	1.10E+01	0.0487 - 0.0544
SVOA	Acenaphthylene	mg/kg	--	--	--	0/6	0/6	1.10E+01	0.0487 - 0.0544
SVOA	Acetophenone	mg/kg	--	--	--	0/6	0/6	1.17E+00	0.487 - 0.544
SVOA	Anthracene	mg/kg	--	--	--	0/6	0/6	1.16E+02	0.0487 - 0.0544
SVOA	Atrazine	mg/kg	--	--	--	0/6	0/6	1.96E-04	0.487 - 0.544
SVOA	Benzaldehyde	mg/kg	--	--	--	0/6	0/6	8.30E-02	0.487 - 0.544
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/6	0/6	2.63E+01	0.0487 - 0.0544
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/6	0/6	2.70E-02	0.487 - 0.544
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/6	0/6	7.22E-05	0.487 - 0.544
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/6	0/6	2.62E-03	0.487 - 0.544
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.70E-02	1.70E-02	1.70E-02	1/6	0/6	2.66E+01	0.0487 - 0.0544
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/6	0/6	4.72E+00	0.0487 - 0.0544
SVOA	Caprolactam	mg/kg	--	--	--	0/6	0/6	4.94E+00	0.487 - 0.544
SVOA	Carbazole	mg/kg	--	--	--	0/6	0/6	7.51E-01	0.0487 - 0.0544
SVOA	Dibenzofuran	mg/kg	--	--	--	0/6	0/6	2.92E-01	0.487 - 0.544
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/6	0/6	1.22E+01	0.0487 - 0.0544
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/6	0/6	1.22E+01	0.0487 - 0.0544
SVOA	Di-n-butyl phthalate	mg/kg	2.73E-02	2.73E-02	2.73E-02	1/6	0/6	4.54E+00	0.0487 - 0.0544
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/6	0/6	1.13E+02	0.0487 - 0.0544
SVOA	Diphenylamine	mg/kg	--	--	--	0/6	0/6	4.66E+00	0.487 - 0.544
SVOA	Fluoranthene	mg/kg	--	--	--	0/6	0/6	1.78E+02	0.0487 - 0.0544
SVOA	Fluorene	mg/kg	--	--	--	0/6	0/6	1.09E+01	0.0487 - 0.0544
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/6	0/6	2.46E-03	0.487 - 0.544
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/6	0/6	5.34E-03	0.487 - 0.544
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/6	0/6	2.56E-03	0.487 - 0.544
SVOA	Hexachloroethane	mg/kg	--	--	--	0/6	0/6	4.00E-03	0.487 - 0.544
SVOA	Isophorone	mg/kg	--	--	--	0/6	0/6	5.16E-01	0.487 - 0.544
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/6	0/6	5.94E-01	0.487 - 0.544
SVOA	Naphthalene	mg/kg	--	--	--	0/6	0/6	7.70E-03	0.0487 - 0.0544
SVOA	Nitrobenzene	mg/kg	--	--	--	0/6	0/6	1.83E-03	0.487 - 0.544
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/6	0/6	1.62E-04	0.487 - 0.544
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/6	0/6	1.14E-03	0.487 - 0.544
SVOA	Phenanthrene	mg/kg	--	--	--	0/6	0/6	1.10E+01	0.0487 - 0.0544
SVOA	Phenol	mg/kg	--	--	--	0/6	0/6	6.62E+00	0.487 - 0.544
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/6	0/6	3.16E-02	0.487 - 0.544
SVOA	Pyrene	mg/kg	--	--	--	0/6	0/6	2.63E+01	0.0487 - 0.0544

Table C1.41. Sector 6 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	Total PAH	mg/kg	--	--	--	0/6	0/6	5.89E-01	-
RADS	Americium-241	pCi/g	--	--	--	0/6	0/6	1.92E+01	0.388 - 0.762
RADS	Cesium-137	pCi/g	--	--	--	0/6	0/6	9.58E+00	0.0424 - 0.0664
RADS	Neptunium-237	pCi/g	--	--	--	0/6	0/6	1.07E+00	0.47 - 1
RADS	Plutonium-238	pCi/g	--	--	--	0/6	0/6	4.38E+00	0.365 - 0.468
RADS	Plutonium-239/240	pCi/g	--	--	--	0/6	0/6	4.26E+00	0.445 - 0.623
RADS	Technetium-99	pCi/g	--	--	--	0/6	0/6	1.52E-01	2.76 - 4.59
RADS	Thorium-230	pCi/g	7.87E-01	1.79E+00	1.33E+00	3/6	0/6	3.66E+01	0.579 - 1.11
RADS	Uranium-233/234	pCi/g	7.22E-01	1.92E+00	1.13E+00	4/6	2/6	9.90E-01	0.534 - 1.15
RADS	Uranium-235/236	pCi/g	3.38E-01	3.38E-01	3.38E-01	1/6	0/6	9.76E-01	0.253 - 0.858
RADS	Uranium-238	pCi/g	4.62E-01	1.36E+00	8.63E-01	5/6	2/6	8.05E-01	0.327 - 1.25
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/6	0/6	5.62E+00	0.00148 - 0.00167
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/6	0/6	5.92E-04	0.00148 - 0.00167
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/6	0/6	5.13E+01	0.00741 - 0.00836
VOA	1,1,2-Trichloroethane	mg/kg	1.24E-03	1.24E-03	1.24E-03	1/6	1/6	2.69E-04	0.00148 - 0.00167
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/6	0/6	1.56E-02	0.00148 - 0.00167
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/6	0/6	2.04E-01	0.00148 - 0.00167
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/6	0/6	4.18E-02	0.00148 - 0.00167
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/6	0/6	2.32E-02	0.00148 - 0.00167
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/6	0/6	2.88E-06	0.00148 - 0.00167
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/6	0/6	4.20E-05	0.00148 - 0.00167
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	5.90E-01	0.00148 - 0.00167
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/6	0/6	9.69E-04	0.00148 - 0.00167
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/6	0/6	5.48E-03	0.00148 - 0.00167
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/6	0/6	3.81E-01	0.00148 - 0.00167
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	5.90E-01	0.00148 - 0.00167
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/6	0/6	9.24E-03	0.00148 - 0.00167
VOA	1,4-Dioxane	mg/kg	--	--	--	0/6	0/6	1.88E-03	0.0741 - 0.0836
VOA	2-Butanone	mg/kg	--	--	--	0/6	0/6	2.32E+00	0.00741 - 0.00836
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/6	0/6	2.76E-05	0.00741 - 0.00836
VOA	2-Hexanone	mg/kg	--	--	--	0/6	0/6	1.75E-02	0.00741 - 0.00836
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/6	0/6	6.44E-02	0.00148 - 0.00167
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/6	0/6	5.62E-01	0.00741 - 0.00836
VOA	Acetone	mg/kg	3.89E-03	5.68E-02	1.78E-02	5/6	0/6	7.36E+00	0.00741 - 0.00836
VOA	Acrolein	mg/kg	2.93E-03	2.93E-03	2.93E-03	1/6	1/6	1.68E-05	0.00741 - 0.00836
VOA	Acrylonitrile	mg/kg	--	--	--	0/6	0/6	2.28E-04	0.00741 - 0.00836
VOA	Benzene	mg/kg	--	--	--	0/6	0/6	4.66E-03	0.00148 - 0.00167
VOA	Bromochloromethane	mg/kg	--	--	--	0/6	0/6	4.16E-02	0.00148 - 0.00167
VOA	Bromodichloromethane	mg/kg	--	--	--	0/6	0/6	7.30E-04	0.00148 - 0.00167
VOA	Bromoform	mg/kg	--	--	--	0/6	0/6	1.75E-02	0.00148 - 0.00167
VOA	Bromomethane	mg/kg	--	--	--	0/6	0/6	3.82E-03	0.00148 - 0.00167

Table C1.41. Sector 6 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results Min	Detected Results Max	Detected Results Avg	FOD	GW Protection Screen DAF 1	GW Protection Screen DAF 1 SSL	DL Range
VOA	Carbon disulfide	mg/kg	6.62E-03	6.62E-03	6.62E-03	1/6	0/6	4.80E-01	0.00741 - 0.00836
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/6	0/6	3.54E-03	0.00148 - 0.00167
VOA	Chlorobenzene	mg/kg	--	--	--	0/6	0/6	1.06E-01	0.00148 - 0.00167
VOA	Chloroethane	mg/kg	--	--	--	0/6	0/6	4.74E+00	0.00148 - 0.00167
VOA	Chloroform	mg/kg	1.01E-03	1.01E-03	1.01E-03	1/6	0/6	1.22E-03	0.00148 - 0.00167
VOA	Chloromethane	mg/kg	--	--	--	0/6	0/6	1.05E-02	0.00148 - 0.00167
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.08E-02	1.08E-02	1.08E-02	1/6	0/6	2.12E-02	0.00148 - 0.00167
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/6	0/6	3.36E-03	0.00148 - 0.00167
VOA	Cumene	mg/kg	--	--	--	0/6	0/6	1.48E+00	0.00148 - 0.00167
VOA	Cyclohexane	mg/kg	--	--	--	0/6	0/6	2.60E+01	0.00148 - 0.00167
VOA	Dibromochloromethane	mg/kg	--	--	--	0/6	0/6	4.64E-03	0.00148 - 0.00167
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/6	0/6	6.08E-01	0.00148 - 0.00167
VOA	Ethylbenzene	mg/kg	--	--	--	0/6	0/6	3.36E-02	0.00148 - 0.00167
VOA	m,p-Xylene	mg/kg	--	--	--	0/6	0/6	3.82E-01	0.00296 - 0.00335
VOA	Methyl acetate	mg/kg	--	--	--	0/6	0/6	8.22E+00	0.00741 - 0.00836
VOA	Methylcyclohexane	mg/kg	--	--	--	0/6	0/6	2.80E+01	0.00148 - 0.00167
VOA	Methylene chloride	mg/kg	3.66E-03	3.66E-03	3.66E-03	1/6	0/6	5.44E-02	0.00741 - 0.00836
VOA	Styrene	mg/kg	--	--	--	0/6	0/6	2.66E+00	0.00148 - 0.00167
VOA	Tetrachloroethene	mg/kg	2.15E-03	2.15E-03	2.15E-03	1/6	0/6	3.69E-02	0.00148 - 0.00167
VOA	Toluene	mg/kg	--	--	--	0/6	0/6	1.52E+00	0.00148 - 0.00167
VOA	Total Xylene	mg/kg	--	--	--	0/6	0/6	3.82E-01	0.00445 - 0.00502
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/6	0/6	5.83E-02	0.00148 - 0.00167
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/6	0/6	3.36E-03	0.00148 - 0.00167
VOA	Trichloroethene	mg/kg	1.28E-02	4.16E+00	2.09E+00	2/6	2/6	2.02E-03	0.00148 - 0.15
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/6	0/6	1.46E+00	0.00148 - 0.00167
VOA	Vinyl chloride	mg/kg	--	--	--	0/6	0/6	1.29E-04	0.00148 - 0.00167

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.42. Section 7 Surface Soil Protection of Groundwater Screen

			Detected Results				Provisional Background		Industrial Worker		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	AL	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	3.16E+03	1.45E+04	9.27E+03	19/19	3/19	1.30E+04	0/19	1.00E+05	0/19	6.60E+04	0/19	5.99E+04	19/19	3.00E+03	9.87 - 114
METAL	Antimony	mg/kg	3.56E-01	1.27E+00	8.55E-01	14/19	14/19	2.10E-01	0/19	2.80E+03	8/19	7.74E-01	9/19	7.04E-01	14/19	3.52E-02	1.92 - 2.46
METAL	Arsenic	mg/kg	3.24E+00	9.00E+00	5.47E+00	19/19	0/19	1.20E+01	0/19	1.60E+02	19/19	3.32E-02	19/19	3.02E-02	19/19	1.51E-03	1.01 - 4.94
METAL	Barium	mg/kg	1.10E+01	1.06E+02	7.10E+01	19/19	0/19	2.00E+02	0/19	1.00E+05	0/19	3.41E+02	0/19	3.11E+02	18/19	1.55E+01	0.79 - 0.993
METAL	Beryllium	mg/kg	1.22E-01	7.44E-01	4.34E-01	19/19	2/19	6.70E-01	0/19	1.35E+04	0/19	4.29E+01	0/19	3.89E+01	0/19	1.95E+00	0.0987 - 0.124
METAL	Boron	mg/kg	1.12E+00	4.26E+00	1.97E+00	17/19	0/19	N/A	0/19	1.00E+05	0/19	2.82E+01	0/19	2.56E+01	14/19	1.28E+00	2.96 - 3.72
METAL	Cadmium	mg/kg	5.45E-02	1.70E+00	2.97E-01	16/19	6/19	2.10E-01	0/19	1.82E+03	1/19	1.52E+00	1/19	1.39E+00	13/19	6.93E-02	0.202 - 0.987
METAL	Chromium	mg/kg	9.08E+00	4.01E+01	1.82E+01	19/19	11/19	1.60E+01	0/19	1.23E+03	0/19	3.96E+06	0/19	3.60E+06	0/19	1.80E+05	0.592 - 0.745
METAL	Cobalt	mg/kg	1.88E+00	9.63E+00	6.53E+00	19/19	0/19	1.40E+01	0/19	2.06E+03	19/19	5.96E-01	19/19	5.43E-01	19/19	2.71E-02	0.197 - 0.248
METAL	Copper	mg/kg	2.84E+00	2.61E+02	2.41E+01	19/19	3/19	1.90E+01	0/19	1.00E+05	1/19	6.18E+01	1/19	5.62E+01	19/19	2.81E+00	0.395 - 4.23
METAL	Iron	mg/kg	3.88E+03	2.51E+04	1.58E+04	19/19	0/19	2.80E+04	0/19	1.00E+05	19/19	7.74E+02	19/19	7.04E+02	19/19	3.52E+01	19.7 - 248
METAL	Lead	mg/kg	3.58E+00	5.65E+01	1.24E+01	19/19	1/19	3.60E+01	0/19	8.00E+02	0/19	2.97E+02	0/19	2.70E+02	4/19	1.35E+01	0.395 - 0.496
METAL	Manganese	mg/kg	1.07E+02	5.81E+02	3.14E+02	19/19	0/19	1.50E+03	0/19	1.00E+05	19/19	6.23E+01	19/19	5.65E+01	19/19	2.83E+00	0.987 - 12.4
METAL	Mercury	mg/kg	1.19E-02	7.55E+00	6.02E-01	18/19	4/19	2.00E-01	0/19	2.10E+03	3/19	6.49E-01	3/19	5.91E-01	9/19	2.95E-02	0.0223 - 0.446
METAL	Molybdenum	mg/kg	2.52E-01	1.62E+00	5.34E-01	19/19	0/19	N/A	0/19	3.48E+04	0/19	4.44E+00	0/19	4.03E+00	19/19	2.02E-01	0.202 - 0.987
METAL	Nickel	mg/kg	4.85E+00	1.32E+02	1.98E+01	19/19	4/19	2.10E+01	0/19	1.00E+05	1/19	5.63E+01	1/19	5.12E+01	19/19	2.56E+00	0.395 - 0.496
METAL	Selenium	mg/kg	4.75E-01	1.67E+00	1.00E+00	17/19	13/19	8.00E-01	0/19	3.51E+04	6/19	1.14E+00	9/19	1.04E+00	17/19	5.19E-02	1.01 - 4.94
METAL	Silver	mg/kg	1.24E-01	1.25E+00	4.75E-01	10/19	0/19	2.30E+00	0/19	3.51E+04	0/19	1.76E+00	0/19	1.60E+00	10/19	7.99E-02	0.48 - 5.63
METAL	Thallium	mg/kg	1.45E-01	1.92E-01	1.67E-01	5/19	0/19	2.10E-01	0/19	7.02E+01	5/19	3.12E-02	5/19	2.84E-02	5/19	1.42E-03	0.395 - 0.496
METAL	Uranium	mg/kg	7.52E-01	8.39E+01	1.78E+01	19/19	13/19	4.90E+00	0/19	1.40E+03	13/19	3.96E+00	14/19	3.60E+00	19/19	1.80E-01	0.0395 - 0.0496
METAL	Vanadium	mg/kg	8.44E+00	3.76E+01	2.28E+01	19/19	0/19	3.80E+01	0/19	3.45E+04	0/19	1.90E+02	0/19	1.73E+02	18/19	8.64E+00	3.95 - 4.96
METAL	Zinc	mg/kg	1.25E+01	1.38E+02	4.74E+01	19/19	3/19	6.50E+01	0/19	1.00E+05	0/19	8.21E+02	0/19	7.46E+02	8/19	3.73E+01	4.05 - 21.4
ANION	Fluoride	mg/kg	4.81E-01	3.68E+01	1.39E+01	19/19	0/19	N/A	0/19	1.00E+05	0/19	2.64E+02	0/19	2.40E+02	12/19	1.20E+01	1.06 - 1.26
DI/FURA	Total Dioxin/Furans	mg/kg	5.80E-06	5.80E-06	5.80E-06	1/1	0/1	N/A	0/1	1.57E-03	1/1	1.30E-06	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB	mg/kg	4.23E-03	8.60E-03	7.03E-03	3/19	0/19	N/A	0/19	2.93E+01	0/19	1.50E-01	0/19	1.36E-01	2/19	6.82E-03	0.00351 - 0.733
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.00E+02	0/19	1.92E-02	0/19	1.74E-02	0/19	8.72E-04	0.346 - 4.15
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+04	0/19	8.84E+00	0/19	8.04E+00	0/19	4.02E-01	0.346 - 4.15
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+02	0/19	2.55E-02	0/19	2.32E-02	0/19	1.16E-03	0.346 - 4.15
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.61E+03	0/19	4.97E-02	0/19	4.52E-02	0/19	2.26E-03	0.346 - 4.15
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.74E+04	0/19	9.26E-01	0/19	8.42E-01	0/19	4.21E-02	0.346 - 4.15
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.74E+03	0/19	9.59E-02	0/19	8.72E-02	0/19	4.36E-03	0.693 - 8.29
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.57E+02	0/19	7.06E-03	0/19	6.42E-03	0/19	3.21E-04	0.346 - 4.15
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.46E+01	0/19	1.47E-03	0/19	1.33E-03	0/19	6.67E-05	0.346 - 4.15
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.52E+04	0/19	8.47E+00	0/19	7.70E+00	0/19	3.85E-01	0.0346 - 0.415
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.51E+04	0/19	1.96E-01	0/19	1.78E-01	0/19	8.91E-03	0.346 - 4.15
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.96E+01	0/19	5.68E-03	0/19	5.16E-03	0/19	2.58E-04	0.346 - 4.15
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.76E+03	0/19	4.07E-01	0/19	3.70E-01	0/19	1.85E-02	0.0346 - 0.415
SVOA	2-Methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.35E+04	0/19	1.66E+00	0/19	1.51E+00	0/19	7.53E-02	0.346 - 4.15
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.61E+03	0/19	1.76E-01	0/19	1.60E-01	0/19	8.01E-03	0.346 - 4.15
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.74E+03	0/19	9.59E-02	0/19	8.72E-02	0/19	4.36E-03	0.346 - 4.15
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.80E+02	0/19	1.81E-02	0/19	1.65E-02	0/19	8.24E-04	0.346 - 4.15
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.61E+02	0/19	5.39E-03	0/19	4.90E-03	0/19	2.45E-04	0.346 - 4.15
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.23E+02	0/19	7.52E-03	0/19	6.84E-03	0/19	3.42E-04	0.346 - 4.15
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+04	0/19	3.76E+00	0/19	3.42E+00	0/19	1.71E-01	0.346 - 4.15
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.06E+02	0/19	3.41E-03	0/19	3.10E-03	0/19	1.55E-04	0.346 - 4.15
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.23E+02	0/19	7.52E-03	0/19	6.84E-03	0/19	3.42E-04	0.346 - 4.15
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.74E+03	0/19	9.59E-02	0/19	8.72E-02	0/19	4.36E-03	0.346 - 4.15
SVOA	Acenaphthene	mg/kg	9.15E-02	6.32E-01	2.53E-01	5/19	0/19	N/A	0/19	4.14E+04	0/19	1.21E+01	0/19	1.10E+01	1/19	5.49E-01	0.0346 - 0.415
SVOA	Acenaphthylene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.14E+04	0/19	1.21E+01	0/19	1.10E+01	0/19	5.49E-01	0.0346 - 0.415

Table C1.42. Section 7 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		Industrial Worker		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	AL	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Acetophenone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.02E+05	0/19	1.28E+00	0/19	1.17E+00	0/19	5.84E-02	0.346 - 4.15
SVOA	Anthracene	mg/kg	1.40E-01	9.96E-01	4.23E-01	6/19	0/19	N/A	0/19	1.00E+05	0/19	1.28E+02	0/19	1.16E+02	0/19	5.81E+00	0.0346 - 0.415
SVOA	Atrazine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.53E+02	0/19	4.31E-03	0/19	3.92E-03	0/19	1.96E-04	0.346 - 4.15
SVOA	Benzaldehyde	mg/kg	--	--	--	0/18	0/18	N/A	0/18	1.64E+05	0/18	9.13E-02	0/18	8.30E-02	0/18	4.15E-03	0.346 - 4.15
SVOA	Benzo(ghi)perylene	mg/kg	3.15E-02	1.52E+00	7.26E-01	6/19	0/19	N/A	0/19	2.07E+04	0/19	2.90E+01	0/19	2.63E+01	1/19	1.32E+00	0.0346 - 0.415
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.61E+03	0/19	2.97E-02	0/19	2.70E-02	0/19	1.35E-03	0.346 - 4.15
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.25E+02	0/19	7.94E-05	0/19	7.22E-05	0/19	3.61E-06	0.346 - 4.15
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.32E+03	0/19	2.88E-03	0/19	2.62E-03	0/19	1.31E-04	0.346 - 4.15
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.15E-02	1.11E-01	3.97E-02	4/19	0/19	N/A	0/19	5.80E+03	0/19	2.93E+01	0/19	2.66E+01	0/19	1.33E+00	0.0346 - 0.415
SVOA	Butyl benzyl phthalate	mg/kg	2.13E-01	6.17E+00	3.19E+00	2/19	0/19	N/A	0/19	4.27E+04	1/19	5.19E+00	1/19	4.72E+00	1/19	2.36E-01	0.0346 - 0.415
SVOA	Caprolactam	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.29E+05	0/19	5.43E+00	0/19	4.94E+00	0/19	2.47E-01	0.346 - 4.15
SVOA	Carbazole	mg/kg	1.21E-01	5.72E-01	2.81E-01	3/19	0/19	N/A	0/19	4.06E+03	0/19	8.27E-01	0/19	7.51E-01	3/19	3.76E-02	0.0346 - 0.415
SVOA	Dibenzofuran	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.02E+03	0/19	3.21E-01	0/19	2.92E-01	0/19	1.46E-02	0.346 - 4.15
SVOA	Diethyl phthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.96E+05	0/19	1.34E+01	0/19	1.22E+01	0/19	6.08E-01	0.0346 - 0.415
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.96E+05	0/19	1.34E+01	0/19	1.22E+01	0/19	6.08E-01	0.0346 - 0.415
SVOA	Di-n-butyl phthalate	mg/kg	1.34E-02	2.84E-02	1.97E-02	3/19	0/19	N/A	0/19	8.70E+04	0/19	4.99E+00	0/19	4.54E+00	0/19	2.27E-01	0.0346 - 0.415
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+03	0/19	1.24E+02	0/19	1.13E+02	0/19	5.65E+00	0.0346 - 0.415
SVOA	Diphenylamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.70E+04	0/19	5.13E+00	0/19	4.66E+00	0/19	2.33E-01	0.346 - 4.15
SVOA	Fluoranthene	mg/kg	8.07E-02	6.37E+00	1.98E+00	10/19	0/19	N/A	0/19	2.76E+04	0/19	1.96E+02	0/19	1.78E+02	0/19	8.91E+00	0.0346 - 0.415
SVOA	Fluorene	mg/kg	6.50E-02	4.88E-01	2.19E-01	4/19	0/19	N/A	0/19	2.76E+04	0/19	1.20E+01	0/19	1.09E+01	0/19	5.45E-01	0.0346 - 0.415
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.26E+02	0/19	2.71E-03	0/19	2.46E-03	0/19	1.23E-04	0.346 - 4.15
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.61E+02	0/19	5.87E-03	0/19	5.34E-03	0/19	2.67E-04	0.346 - 4.15
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.24E+01	0/19	2.82E-03	0/19	2.56E-03	0/19	1.28E-04	0.346 - 4.15
SVOA	Hexachloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.46E+02	0/19	4.40E-03	0/19	4.00E-03	0/19	2.00E-04	0.346 - 4.15
SVOA	Isophorone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.55E+04	0/19	5.68E-01	0/19	5.16E-01	0/19	2.58E-02	0.346 - 4.15
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.74E+04	0/19	6.53E-01	0/19	5.94E-01	0/19	2.97E-02	0.346 - 4.15
SVOA	Naphthalene	mg/kg	1.40E-01	1.40E-01	1.40E-01	1/19	0/19	N/A	0/19	4.06E+02	1/19	8.47E-03	1/19	7.70E-03	1/19	3.85E-04	0.0346 - 0.415
SVOA	Nitrobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.24E+03	0/19	2.02E-03	0/19	1.83E-03	0/19	9.17E-05	0.346 - 4.15
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.16E+01	0/19	1.78E-04	0/19	1.62E-04	0/19	8.10E-06	0.346 - 4.15
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.77E+01	0/19	1.26E-03	0/19	1.14E-03	0/19	5.71E-05	0.346 - 4.15
SVOA	Phenanthrene	mg/kg	5.64E-02	5.33E+00	1.47E+00	9/19	0/19	N/A	0/19	4.14E+04	0/19	1.21E+01	0/19	1.10E+01	6/19	5.49E-01	0.0346 - 0.415
SVOA	Phenol	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.61E+05	0/19	7.28E+00	0/19	6.62E+00	0/19	3.31E-01	0.346 - 4.15
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.48E+03	0/19	3.48E-02	0/19	3.16E-02	0/19	1.58E-03	0.346 - 4.15
SVOA	Pyrene	mg/kg	6.46E-02	5.66E+00	1.55E+00	10/19	0/19	N/A	0/19	2.07E+04	0/19	2.90E+01	0/19	2.63E+01	3/19	1.32E+00	0.0346 - 0.415
SVOA	Total PAH	mg/kg	1.26E-02	3.39E+00	1.13E+00	10/19	0/19	N/A	0/19	6.43E+01	5/19	6.47E-01	5/19	5.89E-01	9/19	2.94E-02	-
RADS	Actinium-227	pCi/g	--	--	--	0/1	0/1	N/A	0/1	1.86E+03	0/1	9.72E+00	0/1	8.84E+00	0/1	4.42E-01	0.316 - 0.316
RADS	Americium-241	pCi/g	3.99E+00	3.99E+00	3.99E+00	1/20	0/20	N/A	0/20	6.01E+02	0/20	2.11E+01	0/20	1.92E+01	1/20	9.58E-01	0.373 - 1.07
RADS	Cesium-137	pCi/g	6.07E-02	2.93E+00	8.44E-01	14/20	7/20	4.90E-01	0/20	1.08E+01	0/20	1.05E+01	0/20	9.58E+00	7/20	4.79E-01	0.0292 - 0.117
RADS	Cobalt-60	pCi/g	--	--	--	0/1	0/1	N/A	0/1	5.67E+00	0/1	3.50E-02	0/1	3.19E-02	0/1	1.59E-03	0.0435 - 0.0435
RADS	Lead-210	pCi/g	--	--	--	0/1	0/1	N/A	0/1	7.33E+02	0/1	1.95E-01	0/1	1.78E-01	0/1	8.88E-03	7.71 - 7.71
RADS	Neptunium-237	pCi/g	9.74E-01	6.50E+00	3.60E+00	3/20	3/20	1.00E-01	0/20	2.49E+01	2/20	1.18E+00	2/20	1.07E+00	3/20	5.36E-02	0.337 - 1.03
RADS	Plutonium-238	pCi/g	4.56E-01	4.56E-01	4.56E-01	1/20	1/20	7.30E-02	0/20	2.65E+03	0/20	4.82E+00	0/20	4.38E+00	1/20	2.19E-01	0.178 - 1.34
RADS	Plutonium-239/240	pCi/g	1.39E+00	1.50E+01	3.84E+00	7/20	7/20	2.50E-02	0/20	2.27E+03	1/20	4.69E+00	1/20	4.26E+00	7/20	2.13E-01	0.302 - 0.849
RADS	Radium-226	pCi/g	1.33E+00	1.33E+00	1.33E+00	1/1	0/1	1.50E+00	0/1	2.48E+00	1/1	3.59E-03	1/1	3.26E-03	1/1	1.63E-04	0.76 - 0.76
RADS	Strontium-90	pCi/g	--	--	--	0/1	0/1	4.70E+00	0/1	1.03E+03	0/1	2.46E-02	0/1	2.24E-02	0/1	1.12E-03	1.67 - 1.67
RADS	Technetium-99	pCi/g	3.18E+00	1.63E+02	5.11E+01	14/20	14/20	2.50E+00	0/20	1.00E+05	14/20	1.67E-01	14/20	1.52E-01	14/20	7.60E-03	2.35 - 4.21
RADS	Thorium-228	pCi/g	--	--	--	0/1	0/1	1.60E+00	0/1	1.54E+04	0/1	2.16E-04	0/1	1.96E-04	0/1	9.80E-06	0.712 - 0.712
RADS	Thorium-230	pCi/g	7.01E-01	1.52E+02	1.14E+01	20/20	14/20	1.50E+00	0/20	3.13E+03	1/20	4.03E+01	1/20	3.66E+01	12/20	1.83E+00	0.394 - 1.13
RADS	Thorium-232	pCi/g	9.16E-01	9.16E-01	9.16E-01	1/1	0/1	1.50E+00	0/1	3.08E+03	1/1	2.16E-01	1/1	1.96E-01	1/1	9.80E-03	0.472 - 0.472

Table C1.42. Section 7 Surface Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		Industrial Worker		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	AL	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
RADS	Uranium-233/234	pCi/g	9.11E-01	2.79E+01	8.28E+00	10/12	9/12	1.20E+00	0/12	5.01E+03	9/12	1.09E+00	9/12	9.90E-01	10/12	4.95E-02	0.453 - 0.896
RADS	Uranium-234	pCi/g	2.24E+00	8.67E+00	6.16E+00	8/8	8/8	1.20E+00	0/8	5.01E+03	8/8	1.09E+00	8/8	9.90E-01	8/8	4.95E-02	0.659 - 0.863
RADS	Uranium-235	pCi/g	7.77E-01	8.25E-01	8.01E-01	2/8	2/8	6.00E-02	0/8	4.08E+01	0/8	1.07E+00	0/8	9.76E-01	2/8	4.88E-02	0.24 - 0.608
RADS	Uranium-235/236	pCi/g	5.63E-01	1.12E+00	8.48E-01	4/12	4/12	6.00E-02	0/12	4.08E+01	1/12	1.07E+00	2/12	9.76E-01	4/12	4.88E-02	0.296 - 0.663
RADS	Uranium-238	pCi/g	1.10E+00	3.36E+01	8.93E+00	19/20	18/20	1.20E+00	0/20	1.66E+02	19/20	8.87E-01	19/20	8.05E-01	19/20	4.03E-02	0.247 - 0.802
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.00E+05	0/19	6.18E+00	0/19	5.62E+00	0/19	2.81E-01	0.000887 - 0.00129
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.91E+02	0/19	6.51E-04	0/19	5.92E-04	0/19	2.96E-05	0.000887 - 0.00129
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.43E+04	0/19	5.63E+01	0/19	5.13E+01	0/19	2.56E+00	0.00444 - 0.00647
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.90E+01	0/19	2.97E-04	0/19	2.69E-04	0/19	1.35E-05	0.000887 - 0.00129
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.58E+03	0/19	1.72E-02	0/19	1.56E-02	0/19	7.82E-04	0.000887 - 0.00129
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.00E+03	0/19	2.24E-01	0/19	2.04E-01	0/19	1.02E-02	0.000887 - 0.00129
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.61E+03	0/19	4.60E-02	0/19	4.18E-02	0/19	2.09E-03	0.000887 - 0.00129
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.77E+02	0/19	2.55E-02	0/19	2.32E-02	0/19	1.16E-03	0.000887 - 0.00129
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.49E+00	0/19	3.17E-06	0/19	2.88E-06	0/19	1.44E-07	0.000887 - 0.00129
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.68E+01	0/19	4.62E-05	0/19	4.20E-05	0/19	2.10E-06	0.000887 - 0.00129
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.93E+04	0/19	6.49E-01	0/19	5.90E-01	0/19	2.95E-02	0.000887 - 0.00129
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.09E+02	0/19	1.06E-03	0/19	9.69E-04	0/19	4.84E-05	0.000887 - 0.00129
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.99E+02	0/19	6.03E-03	0/19	5.48E-03	0/19	2.74E-04	0.000887 - 0.00129
VOA	1,2-Dimethylbenzene	mg/kg	4.74E-03	4.74E-03	4.74E-03	1/19	0/19	N/A	0/19	8.43E+03	0/19	4.18E-01	0/19	3.81E-01	0/19	1.90E-02	0.000887 - 0.00129
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.93E+04	0/19	6.49E-01	0/19	5.90E-01	0/19	2.95E-02	0.000887 - 0.00129
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.15E+03	0/19	1.02E-02	0/19	9.24E-03	0/19	4.62E-04	0.000887 - 0.00129
VOA	1,4-Dioxane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.91E+03	0/19	2.07E-03	0/19	1.88E-03	0/19	9.42E-05	0.0444 - 0.0647
VOA	2-Butanone	mg/kg	1.89E-03	2.96E-03	2.43E-03	2/19	0/19	N/A	0/19	6.72E+05	0/19	2.55E+00	0/19	2.32E+00	0/19	1.16E-01	0.00444 - 0.00647
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.15E+00	0/19	3.04E-05	0/19	2.76E-05	0/19	1.38E-06	0.00444 - 0.00647
VOA	2-Hexanone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.56E+03	0/19	1.93E-02	0/19	1.75E-02	0/19	8.75E-04	0.00444 - 0.00647
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.17E+04	0/19	7.08E-02	0/19	6.44E-02	0/19	3.22E-03	0.000887 - 0.00129
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.39E+05	0/19	6.18E-01	0/19	5.62E-01	0/19	2.81E-02	0.00444 - 0.00647
VOA	Acetone	mg/kg	1.84E-03	2.02E-02	6.31E-03	12/19	0/19	N/A	0/19	6.30E+06	0/19	8.10E+00	0/19	7.36E+00	0/19	3.68E-01	0.00444 - 0.00647
VOA	Acrolein	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.82E+00	0/19	1.85E-05	0/19	1.68E-05	0/19	8.41E-07	0.00444 - 0.00647
VOA	Acrylonitrile	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.24E+02	0/19	2.51E-04	0/19	2.28E-04	0/19	1.14E-05	0.00444 - 0.00647
VOA	Benzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	5.31E+02	0/19	5.13E-03	0/19	4.66E-03	0/19	2.33E-04	0.000887 - 0.00129
VOA	Bromochloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.88E+03	0/19	4.58E-02	0/19	4.16E-02	0/19	2.08E-03	0.000887 - 0.00129
VOA	Bromodichloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.30E+02	0/19	8.03E-04	0/19	7.30E-04	0/19	3.65E-05	0.000887 - 0.00129
VOA	Bromoform	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.56E+03	0/19	1.92E-02	0/19	1.75E-02	0/19	8.73E-04	0.000887 - 0.00129
VOA	Bromomethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.09E+01	0/19	4.20E-03	0/19	3.82E-03	0/19	1.91E-04	0.000887 - 0.00129
VOA	Carbon disulfide	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.06E+04	0/19	5.28E-01	0/19	4.80E-01	0/19	2.40E-02	0.00444 - 0.00647
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.96E+02	0/19	3.89E-03	0/19	3.54E-03	0/19	1.77E-04	0.000887 - 0.00129
VOA	Chlorobenzene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	4.11E+03	0/19	1.16E-01	0/19	1.06E-01	0/19	5.28E-03	0.000887 - 0.00129
VOA	Chloroethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	6.81E+04	0/19	5.21E+00	0/19	4.74E+00	0/19	2.37E-01	0.000887 - 0.00129
VOA	Chloroform	mg/kg	3.94E-04	8.72E-04	6.17E-04	4/19	0/19	N/A	0/19	1.39E+02	0/19	1.35E-03	0/19	1.22E-03	4/19	6.12E-05	0.000887 - 0.00129
VOA	Chloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.39E+03	0/19	1.16E-02	0/19	1.05E-02	0/19	5.26E-04	0.000887 - 0.00129
VOA	*cis*-1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.40E+04	0/19	2.33E-02	0/19	2.12E-02	0/19	1.06E-03	0.000887 - 0.00129
VOA	*cis*-1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.30E+02	0/19	3.70E-03	0/19	3.36E-03	0/19	1.68E-04	0.000887 - 0.00129
VOA	Cumene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.12E+04	0/19	1.62E+00	0/19	1.48E+00	0/19	7.38E-02	0.000887 - 0.00129
VOA	Cyclohexane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	8.22E+04	0/19	2.86E+01	0/19	2.60E+01	0/19	1.30E+00	0.000887 - 0.00129
VOA	Dibromochloromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.79E+03	0/19	5.10E-03	0/19	4.64E-03	0/19	2.32E-04	0.000887 - 0.00129
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.10E+03	0/19	6.69E-01	0/19	6.08E-01	0/19	3.04E-02	0.000887 - 0.00129
VOA	Ethylbenzene	mg/kg	2.32E-03	2.32E-03	2.32E-03	1/19	0/19	N/A	0/19	2.66E+03	0/19	3.70E-02	0/19	3.36E-02	1/19	1.68E-03	0.000887 - 0.00129
VOA	m,p-Xylene	mg/kg	1.09E-02	1.09E-02	1.09E-02	1/19	0/19	N/A	0/19	7.50E+03	0/19	4.20E-01	0/19	3.82E-01	0/19	1.91E-02	0.00177 - 0.00259

Table C1.42. Section 7 Surface Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		Industrial Worker		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	FOE	AL	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	Methyl acetate	mg/kg	--	--	--	0/19	0/19	N/A	0/19	7.02E+06	0/19	9.04E+00	0/19	8.22E+00	0/19	4.11E-01	0.00444 - 0.00647
VOA	Methylcyclohexane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	3.90E+04	0/19	3.08E+01	0/19	2.80E+01	0/19	1.40E+00	0.000887 - 0.00129
VOA	Methylene chloride	mg/kg	2.46E-03	4.22E-03	3.01E-03	7/19	0/19	N/A	0/19	1.22E+04	0/19	5.98E-02	0/19	5.44E-02	2/19	2.72E-03	0.00444 - 0.00647
VOA	Styrene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.13E+05	0/19	2.93E+00	0/19	2.66E+00	0/19	1.33E-01	0.000887 - 0.00129
VOA	Tetrachloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.20E+03	0/19	4.05E-02	0/19	3.69E-02	0/19	1.84E-03	0.000887 - 0.00129
VOA	Toluene	mg/kg	5.00E-04	8.26E-03	3.16E-03	3/19	0/19	N/A	0/19	1.00E+05	0/19	1.68E+00	0/19	1.52E+00	0/19	7.62E-02	0.000887 - 0.00129
VOA	Total Xylene	mg/kg	1.56E-02	1.56E-02	1.56E-02	1/19	0/19	N/A	0/19	7.50E+03	0/19	4.20E-01	0/19	3.82E-01	0/19	1.91E-02	0.00266 - 0.00388
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	1.36E+03	0/19	6.40E-02	0/19	5.83E-02	0/19	2.91E-03	0.000887 - 0.00129
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.30E+02	0/19	3.70E-03	0/19	3.36E-03	0/19	1.68E-04	0.000887 - 0.00129
VOA	Trichloroethene	mg/kg	3.40E-03	3.40E-03	3.40E-03	1/19	0/19	N/A	0/19	5.70E+01	1/19	2.22E-03	1/19	2.02E-03	1/19	1.01E-04	0.000887 - 0.00129
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/19	0/19	N/A	0/19	9.48E+03	0/19	1.61E+00	0/19	1.46E+00	0/19	7.31E-02	0.000887 - 0.00129
VOA	Vinyl chloride	mg/kg	--	--	--	0/19	0/19	N/A	0/19	2.06E+02	0/19	1.42E-04	0/19	1.29E-04	0/19	6.47E-06	0.000887 - 0.00129

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Table C1.43. Section 7 Subsurface Soil Protection of Groundwater Screen

			Detected Results			J-qualified		Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
METAL	Aluminum	mg/kg	7.36E+03	1.57E+04	1.12E+04	0/20	20/20	8/20	1.20E+04	0/20	6.60E+04	0/20	5.99E+04	20/20	3.00E+03	9.98 - 120
METAL	Antimony	mg/kg	4.00E-01	2.34E+00	8.34E-01	7/20	7/20	7/20	2.10E-01	2/20	7.74E-01	2/20	7.04E-01	7/20	3.52E-02	2.08 - 2.44
METAL	Arsenic	mg/kg	2.28E+00	9.52E+00	5.71E+00	0/20	20/20	3/20	7.90E+00	20/20	3.32E-02	20/20	3.02E-02	20/20	1.51E-03	0.998 - 1.24
METAL	Barium	mg/kg	4.71E+01	2.81E+02	1.15E+02	0/20	20/20	3/20	1.70E+02	0/20	3.41E+02	0/20	3.11E+02	20/20	1.55E+01	0.798 - 9.51
METAL	Beryllium	mg/kg	3.29E-01	9.13E-01	5.21E-01	0/20	20/20	2/20	6.90E-01	0/20	4.29E+01	0/20	3.89E+01	0/20	1.95E+00	0.0998 - 0.124
METAL	Boron	mg/kg	9.68E-01	3.79E+00	1.70E+00	14/20	15/20	0/20	N/A	0/20	2.82E+01	0/20	2.56E+01	8/20	1.28E+00	2.99 - 3.71
METAL	Cadmium	mg/kg	2.88E-02	5.64E-01	9.69E-02	16/20	17/20	1/20	2.10E-01	0/20	1.52E+00	0/20	1.39E+00	7/20	6.93E-02	0.2 - 0.247
METAL	Chromium	mg/kg	1.12E+01	3.74E+01	1.87E+01	0/20	20/20	0/20	4.30E+01	0/20	3.96E+06	0/20	3.60E+06	0/20	1.80E+05	0.599 - 0.742
METAL	Cobalt	mg/kg	3.38E+00	1.42E+01	6.68E+00	0/20	20/20	2/20	1.30E+01	20/20	5.96E-01	20/20	5.43E-01	20/20	2.71E-02	0.2 - 0.247
METAL	Copper	mg/kg	5.94E+00	2.49E+01	9.84E+00	1/20	20/20	0/20	2.50E+01	0/20	6.18E+01	0/20	5.62E+01	20/20	2.81E+00	0.399 - 0.494
METAL	Iron	mg/kg	1.01E+04	2.69E+04	1.73E+04	0/20	20/20	0/20	2.80E+04	20/20	7.74E+02	20/20	7.04E+02	20/20	3.52E+01	21.1 - 240
METAL	Lead	mg/kg	6.99E+00	2.34E+01	1.13E+01	0/20	20/20	1/20	2.30E+01	0/20	2.97E+02	0/20	2.70E+02	4/20	1.35E+01	0.399 - 0.494
METAL	Manganese	mg/kg	1.73E+02	1.58E+03	4.16E+02	0/20	20/20	1/20	8.20E+02	20/20	6.23E+01	20/20	5.65E+01	20/20	2.83E+00	1.05 - 12
METAL	Mercury	mg/kg	1.22E-02	7.09E+00	4.81E-01	11/20	19/20	5/20	1.30E-01	2/20	6.49E-01	2/20	5.91E-01	8/20	2.95E-02	0.0239 - 0.521
METAL	Molybdenum	mg/kg	1.08E-01	1.18E+00	4.46E-01	3/20	20/20	0/20	N/A	0/20	4.44E+00	0/20	4.03E+00	17/20	2.02E-01	0.2 - 0.247
METAL	Nickel	mg/kg	5.92E+00	2.31E+02	2.25E+01	0/20	20/20	2/20	2.20E+01	1/20	5.63E+01	1/20	5.12E+01	20/20	2.56E+00	0.412 - 3.99
METAL	Selenium	mg/kg	8.81E-01	2.34E+00	1.41E+00	3/20	20/20	20/20	7.00E-01	15/20	1.14E+00	17/20	1.04E+00	20/20	5.19E-02	0.998 - 1.24
METAL	Silver	mg/kg	1.26E-01	1.93E+00	7.76E-01	3/20	4/20	0/20	2.70E+00	1/20	1.76E+00	1/20	1.60E+00	4/20	7.99E-02	0.521 - 6.11
METAL	Thallium	mg/kg	1.59E-01	2.05E-01	1.84E-01	7/20	7/20	0/20	3.40E-01	7/20	3.12E-02	7/20	2.84E-02	7/20	1.42E-03	0.399 - 0.494
METAL	Uranium	mg/kg	5.53E-01	4.90E+01	6.63E+00	0/20	20/20	8/20	4.60E+00	8/20	3.96E+00	8/20	3.60E+00	20/20	1.80E-01	0.0399 - 0.0494
METAL	Vanadium	mg/kg	1.94E+01	4.92E+01	2.81E+01	0/20	20/20	2/20	3.70E+01	0/20	1.90E+02	0/20	1.73E+02	20/20	8.64E+00	3.99 - 4.94
METAL	Zinc	mg/kg	1.90E+01	6.41E+01	3.33E+01	0/20	20/20	2/20	6.00E+01	0/20	8.21E+02	0/20	7.46E+02	5/20	3.73E+01	3.99 - 21.1
ANION	Fluoride	mg/kg	2.49E+00	1.72E+01	9.51E+00	0/20	20/20	0/20	N/A	0/20	2.64E+02	0/20	2.40E+02	6/20	1.20E+01	1.08 - 1.26
DI/FURA	Total Dioxin/Furans	mg/kg	6.40E-06	6.40E-06	6.40E-06	0/1	1/1	0/1	N/A	1/1	1.30E-06	1/1	1.18E-06	1/1	5.91E-08	-
PPCB	Total PCB	mg/kg	2.13E-03	1.27E-02	7.15E-03	4/18	7/18	0/18	N/A	0/18	1.50E-01	0/18	1.36E-01	4/18	6.82E-03	0.00388 - 0.0197
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.92E-02	0/18	1.74E-02	0/18	8.72E-04	0.38 - 2.12
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	8.84E+00	0/18	8.04E+00	0/18	4.02E-01	0.38 - 2.12
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.55E-02	0/18	2.32E-02	0/18	1.16E-03	0.38 - 2.12
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	4.97E-02	0/18	4.52E-02	0/18	2.26E-03	0.38 - 2.12
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	9.26E-01	0/18	8.42E-01	0/18	4.21E-02	0.38 - 2.12
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.761 - 4.25
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	7.06E-03	0/18	6.42E-03	0/18	3.21E-04	0.38 - 2.12
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.47E-03	0/18	1.33E-03	0/18	6.67E-05	0.38 - 2.12
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	8.47E+00	0/18	7.70E+00	0/18	3.85E-01	0.038 - 0.212
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.96E-01	0/18	1.78E-01	0/18	8.91E-03	0.38 - 2.12
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.68E-03	0/18	5.16E-03	0/18	2.58E-04	0.38 - 2.12
SVOA	2-Methylnaphthalene	mg/kg	2.26E-02	2.26E-02	2.26E-02	1/18	1/18	0/18	N/A	0/18	4.07E-01	0/18	3.70E-01	1/18	1.85E-02	0.038 - 0.212
SVOA	2-Methylphenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.66E+00	0/18	1.51E+00	0/18	7.53E-02	0.38 - 2.12
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.76E-01	0/18	1.60E-01	0/18	8.01E-03	0.38 - 2.12
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.38 - 2.12
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.81E-02	0/18	1.65E-02	0/18	8.24E-04	0.38 - 2.12
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.39E-03	0/18	4.90E-03	0/18	2.45E-04	0.38 - 2.12
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	7.52E-03	0/18	6.84E-03	0/18	3.42E-04	0.38 - 2.12
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	3.76E+00	0/18	3.42E+00	0/18	1.71E-01	0.38 - 2.12
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	3.41E-03	0/18	3.10E-03	0/18	1.55E-04	0.38 - 2.12
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	7.52E-03	0/18	6.84E-03	0/18	3.42E-04	0.38 - 2.12
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	9.59E-02	0/18	8.72E-02	0/18	4.36E-03	0.38 - 2.12
SVOA	Acenaphthene	mg/kg	1.90E-02	3.40E-02	2.74E-02	3/18	3/18	0/18	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212
SVOA	Acenaphthylene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212

Table C1.43. Section 7 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results			J-qualified		Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Acetophenone	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.28E+00	0/18	1.17E+00	0/18	5.84E-02	0.38 - 2.12
SVOA	Anthracene	mg/kg	1.91E-02	5.38E-02	4.18E-02	1/18	4/18	0/18	N/A	0/18	1.28E+02	0/18	1.16E+02	0/18	5.81E+00	0.038 - 0.212
SVOA	Atrazine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	4.31E-03	0/18	3.92E-03	0/18	1.96E-04	0.38 - 2.12
SVOA	Benzaldehyde	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	9.13E-02	0/18	8.30E-02	0/18	4.15E-03	0.38 - 2.12
SVOA	Benzo(ghi)perylene	mg/kg	3.29E-02	4.61E-02	3.94E-02	3/18	3/18	0/18	N/A	0/18	2.90E+01	0/18	2.63E+01	0/18	1.32E+00	0.038 - 0.212
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.97E-02	0/18	2.70E-02	0/18	1.35E-03	0.38 - 2.12
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	7.94E-05	0/18	7.22E-05	0/18	3.61E-06	0.38 - 2.12
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.88E-03	0/18	2.62E-03	0/18	1.31E-04	0.38 - 2.12
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.93E+01	0/18	2.66E+01	0/18	1.33E+00	0.038 - 0.212
SVOA	Butyl benzyl phthalate	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.19E+00	0/18	4.72E+00	0/18	2.36E-01	0.038 - 0.212
SVOA	Caprolactam	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.43E+00	0/18	4.94E+00	0/18	2.47E-01	0.38 - 2.12
SVOA	Carbazole	mg/kg	1.33E-02	1.84E-02	1.52E-02	4/18	4/18	0/18	N/A	0/18	8.27E-01	0/18	7.51E-01	0/18	3.76E-02	0.038 - 0.212
SVOA	Dibenzofuran	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	3.21E-01	0/18	2.92E-01	0/18	1.46E-02	0.38 - 2.12
SVOA	Diethyl phthalate	mg/kg	1.89E-02	1.92E-02	1.91E-02	2/18	2/18	0/18	N/A	0/18	1.34E+01	0/18	1.22E+01	0/18	6.08E-01	0.038 - 0.212
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.34E+01	0/18	1.22E+01	0/18	6.08E-01	0.038 - 0.212
SVOA	Di-n-butyl phthalate	mg/kg	1.28E-02	1.68E-02	1.49E-02	4/18	4/18	0/18	N/A	0/18	4.99E+00	0/18	4.54E+00	0/18	2.27E-01	0.038 - 0.212
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.24E+02	0/18	1.13E+02	0/18	5.65E+00	0.038 - 0.212
SVOA	Diphenylamine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.13E+00	0/18	4.66E+00	0/18	2.33E-01	0.38 - 2.12
SVOA	Fluoranthene	mg/kg	1.71E-02	3.83E-01	2.10E-01	3/18	6/18	0/18	N/A	0/18	1.96E+02	0/18	1.78E+02	0/18	8.91E+00	0.038 - 0.212
SVOA	Fluorene	mg/kg	1.49E-02	5.83E-02	3.50E-02	2/18	3/18	0/18	N/A	0/18	1.20E+01	0/18	1.09E+01	0/18	5.45E-01	0.038 - 0.212
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.71E-03	0/18	2.46E-03	0/18	1.23E-04	0.38 - 2.12
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.87E-03	0/18	5.34E-03	0/18	2.67E-04	0.38 - 2.12
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.82E-03	0/18	2.56E-03	0/18	1.28E-04	0.38 - 2.12
SVOA	Hexachloroethane	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	4.40E-03	0/18	4.00E-03	0/18	2.00E-04	0.38 - 2.12
SVOA	Isophorone	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	5.68E-01	0/18	5.16E-01	0/18	2.58E-02	0.38 - 2.12
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	6.53E-01	0/18	5.94E-01	0/18	2.97E-02	0.38 - 2.12
SVOA	Naphthalene	mg/kg	1.40E-02	2.38E-02	1.89E-02	2/18	2/18	0/18	N/A	2/18	8.47E-03	2/18	7.70E-03	2/18	3.85E-04	0.038 - 0.212
SVOA	Nitrobenzene	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	2.02E-03	0/18	1.83E-03	0/18	9.17E-05	0.38 - 2.12
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.78E-04	0/18	1.62E-04	0/18	8.10E-06	0.38 - 2.12
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	1.26E-03	0/18	1.14E-03	0/18	5.71E-05	0.38 - 2.12
SVOA	Phenanthrene	mg/kg	1.31E-01	3.57E-01	2.30E-01	1/18	4/18	0/18	N/A	0/18	1.21E+01	0/18	1.10E+01	0/18	5.49E-01	0.038 - 0.212
SVOA	Phenol	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	7.28E+00	0/18	6.62E+00	0/18	3.31E-01	0.38 - 2.12
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/18	0/18	0/18	N/A	0/18	3.48E-02	0/18	3.16E-02	0/18	1.58E-03	0.38 - 2.12
SVOA	Pyrene	mg/kg	1.40E-02	2.99E-01	1.51E-01	3/18	6/18	0/18	N/A	0/18	2.90E+01	0/18	2.63E+01	0/18	1.32E+00	0.038 - 0.212
SVOA	Total PAH	mg/kg	2.48E-03	1.62E-01	7.21E-02	0/18	6/18	0/18	N/A	0/18	6.47E-01	0/18	5.89E-01	3/18	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/20	0/20	0/20	N/A	0/20	2.11E+01	0/20	1.92E+01	0/20	9.58E-01	0.294 - 1.21
RADS	Cesium-137	pCi/g	5.04E-02	3.03E+00	1.09E+00	0/20	6/20	4/20	2.80E-01	0/20	1.05E+01	0/20	9.58E+00	4/20	4.79E-01	0.0369 - 0.0733
RADS	Neptunium-237	pCi/g	8.73E-01	8.73E-01	8.73E-01	0/20	1/20	0/20	N/A	0/20	1.18E+00	0/20	1.07E+00	1/20	5.36E-02	0.421 - 1
RADS	Plutonium-238	pCi/g	--	--	--	0/20	0/20	0/20	N/A	0/20	4.82E+00	0/20	4.38E+00	0/20	2.19E-01	0.345 - 1.14
RADS	Plutonium-239/240	pCi/g	9.49E-01	3.16E+00	1.72E+00	0/20	3/20	0/20	N/A	0/20	4.69E+00	0/20	4.26E+00	3/20	2.13E-01	0.362 - 1.14
RADS	Technetium-99	pCi/g	4.28E+00	1.29E+02	2.94E+01	0/22	8/22	8/22	2.80E+00	8/22	1.67E-01	8/22	1.52E-01	8/22	7.60E-03	2.51 - 4.41
RADS	Thorium-230	pCi/g	6.73E-01	1.32E+01	2.84E+00	0/20	18/20	6/20	1.40E+00	0/20	4.03E+01	0/20	3.66E+01	6/20	1.83E+00	0.373 - 0.91
RADS	Uranium-233/234	pCi/g	7.90E-01	1.44E+01	4.32E+00	0/11	8/11	3/11	1.20E+00	3/11	1.09E+00	3/11	9.90E-01	8/11	4.95E-02	0.496 - 1.2
RADS	Uranium-234	pCi/g	1.04E+00	5.79E+00	2.75E+00	0/9	9/9	8/9	1.20E+00	8/9	1.09E+00	9/9	9.90E-01	9/9	4.95E-02	0.482 - 1.09
RADS	Uranium-235	pCi/g	--	--	--	0/9	0/9	0/9	6.00E-02	0/9	1.07E+00	0/9	9.76E-01	0/9	4.88E-02	0.232 - 0.731
RADS	Uranium-235/236	pCi/g	7.48E-01	7.73E-01	7.61E-01	0/11	2/11	2/11	6.00E-02	0/11	1.07E+00	0/11	9.76E-01	2/11	4.88E-02	0.28 - 0.863
RADS	Uranium-238	pCi/g	8.89E-01	1.78E+01	4.75E+00	0/20	15/20	11/20	1.20E+00	15/20	8.87E-01	15/20	8.05E-01	15/20	4.03E-02	0.346 - 1.15
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.18E+00	0/20	5.62E+00	0/20	2.81E-01	0.000901 - 0.00163
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.51E-04	0/20	5.92E-04	0/20	2.96E-05	0.000901 - 0.00163

Table C1.43. Section 7 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results			J-qualified		Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	1,1,2-Trichloro-1,2,2-	mg/kg	3.24E-03	1.15E-02	7.37E-03	1/20	2/20	0/20	N/A	0/20	5.63E+01	0/20	5.13E+01	0/20	2.56E+00	0.00451 - 0.00817
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.97E-04	0/20	2.69E-04	0/20	1.35E-05	0.000901 - 0.00163
VOA	1,1-Dichloroethane	mg/kg	6.81E-04	6.81E-04	6.81E-04	1/20	1/20	0/20	N/A	0/20	1.72E-02	0/20	1.56E-02	0/20	7.82E-04	0.000901 - 0.00163
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.24E-01	0/20	2.04E-01	0/20	1.02E-02	0.000901 - 0.00163
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	4.60E-02	0/20	4.18E-02	0/20	2.09E-03	0.000901 - 0.00163
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.55E-02	0/20	2.32E-02	0/20	1.16E-03	0.000901 - 0.00163
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	3.17E-06	0/20	2.88E-06	0/20	1.44E-07	0.000901 - 0.00163
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	4.62E-05	0/20	4.20E-05	0/20	2.10E-06	0.000901 - 0.00163
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.49E-01	0/20	5.90E-01	0/20	2.95E-02	0.000901 - 0.00163
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.06E-03	0/20	9.69E-04	0/20	4.84E-05	0.000901 - 0.00163
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.03E-03	0/20	5.48E-03	0/20	2.74E-04	0.000901 - 0.00163
VOA	1,2-Dimethylbenzene	mg/kg	7.68E-04	7.68E-04	7.68E-04	1/20	1/20	0/20	N/A	0/20	4.18E-01	0/20	3.81E-01	0/20	1.90E-02	0.000901 - 0.00163
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.49E-01	0/20	5.90E-01	0/20	2.95E-02	0.000901 - 0.00163
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.02E-02	0/20	9.24E-03	0/20	4.62E-04	0.000901 - 0.00163
VOA	1,4-Dioxane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.07E-03	0/20	1.88E-03	0/20	9.42E-05	0.0451 - 0.0817
VOA	2-Butanone	mg/kg	1.99E-03	1.41E-02	7.06E-03	2/20	4/20	0/20	N/A	0/20	2.55E+00	0/20	2.32E+00	0/20	1.16E-01	0.00451 - 0.00817
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	3.04E-05	0/20	2.76E-05	0/20	1.38E-06	0.00451 - 0.00817
VOA	2-Hexanone	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.93E-02	0/20	1.75E-02	0/20	8.75E-04	0.00451 - 0.00817
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	7.08E-02	0/20	6.44E-02	0/20	3.22E-03	0.000901 - 0.00163
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.18E-01	0/20	5.62E-01	0/20	2.81E-02	0.00451 - 0.00817
VOA	Acetone	mg/kg	2.53E-03	6.54E-02	1.85E-02	3/20	12/20	0/20	N/A	0/20	8.10E+00	0/20	7.36E+00	0/20	3.68E-01	0.00451 - 0.00817
VOA	Acrolein	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.85E-05	0/20	1.68E-05	0/20	8.41E-07	0.00451 - 0.00817
VOA	Acrylonitrile	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.51E-04	0/20	2.28E-04	0/20	1.14E-05	0.00451 - 0.00817
VOA	Benzene	mg/kg	5.41E-04	5.41E-04	5.41E-04	1/20	1/20	0/20	N/A	0/20	5.13E-03	0/20	4.66E-03	1/20	2.33E-04	0.000901 - 0.00163
VOA	Bromochloromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	4.58E-02	0/20	4.16E-02	0/20	2.08E-03	0.000901 - 0.00163
VOA	Bromodichloromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	8.03E-04	0/20	7.30E-04	0/20	3.65E-05	0.000901 - 0.00163
VOA	Bromoform	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.92E-02	0/20	1.75E-02	0/20	8.73E-04	0.000901 - 0.00163
VOA	Bromomethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	4.20E-03	0/20	3.82E-03	0/20	1.91E-04	0.000901 - 0.00163
VOA	Carbon disulfide	mg/kg	5.44E-03	5.44E-03	5.44E-03	1/20	1/20	0/20	N/A	0/20	5.28E-01	0/20	4.80E-01	0/20	2.40E-02	0.00451 - 0.00817
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	3.89E-03	0/20	3.54E-03	0/20	1.77E-04	0.000901 - 0.00163
VOA	Chlorobenzene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.16E-01	0/20	1.06E-01	0/20	5.28E-03	0.000901 - 0.00163
VOA	Chloroethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	5.21E+00	0/20	4.74E+00	0/20	2.37E-01	0.000901 - 0.00163
VOA	Chloroform	mg/kg	1.08E-03	1.08E-03	1.08E-03	1/20	1/20	0/20	N/A	0/20	1.35E-03	0/20	1.22E-03	1/20	6.12E-05	0.000901 - 0.00163
VOA	Chloromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.16E-02	0/20	1.05E-02	0/20	5.26E-04	0.000901 - 0.00163
VOA	*cis* -1,2-Dichloroethene	mg/kg	3.09E-03	3.09E-03	3.09E-03	0/20	1/20	0/20	N/A	0/20	2.33E-02	0/20	2.12E-02	1/20	1.06E-03	0.000901 - 0.00163
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	3.70E-03	0/20	3.36E-03	0/20	1.68E-04	0.000901 - 0.00163
VOA	Cumene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.62E+00	0/20	1.48E+00	0/20	7.38E-02	0.000901 - 0.00163
VOA	Cyclohexane	mg/kg	7.93E-04	7.93E-04	7.93E-04	1/20	1/20	0/20	N/A	0/20	2.86E+01	0/20	2.60E+01	0/20	1.30E+00	0.000901 - 0.00163
VOA	Dibromochloromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	5.10E-03	0/20	4.64E-03	0/20	2.32E-04	0.000901 - 0.00163
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.69E-01	0/20	6.08E-01	0/20	3.04E-02	0.000901 - 0.00163
VOA	Ethylbenzene	mg/kg	4.66E-04	4.66E-04	4.66E-04	1/20	1/20	0/20	N/A	0/20	3.70E-02	0/20	3.36E-02	0/20	1.68E-03	0.000901 - 0.00163
VOA	m,p-Xylene	mg/kg	1.85E-03	1.85E-03	1.85E-03	1/20	1/20	0/20	N/A	0/20	4.20E-01	0/20	3.82E-01	0/20	1.91E-02	0.0018 - 0.00327
VOA	Methyl acetate	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	9.04E+00	0/20	8.22E+00	0/20	4.11E-01	0.00451 - 0.00817
VOA	Methylcyclohexane	mg/kg	1.33E-03	1.33E-03	1.33E-03	0/20	1/20	0/20	N/A	0/20	3.08E+01	0/20	2.80E+01	0/20	1.40E+00	0.000901 - 0.00163
VOA	Methylene chloride	mg/kg	2.20E-03	8.15E-03	3.83E-03	9/20	11/20	0/20	N/A	0/20	5.98E-02	0/20	5.44E-02	8/20	2.72E-03	0.00451 - 0.00817
VOA	Styrene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	2.93E+00	0/20	2.66E+00	0/20	1.33E-01	0.000901 - 0.00163
VOA	Tetrachloroethene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	4.05E-02	0/20	3.69E-02	0/20	1.84E-03	0.000901 - 0.00163
VOA	Toluene	mg/kg	5.05E-04	2.00E-03	1.14E-03	3/20	5/20	0/20	N/A	0/20	1.68E+00	0/20	1.52E+00	0/20	7.62E-02	0.000901 - 0.00163
VOA	Total Xylene	mg/kg	2.62E-03	2.62E-03	2.62E-03	1/20	1/20	0/20	N/A	0/20	4.20E-01	0/20	3.82E-01	0/20	1.91E-02	0.0027 - 0.0049

Table C1.43. Section 7 Subsurface Soil Protection of Groundwater Screen (Continued)

			Detected Results			J-qualified		Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	6.40E-02	0/20	5.83E-02	0/20	2.91E-03	0.000901 - 0.00163
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	3.70E-03	0/20	3.36E-03	0/20	1.68E-04	0.000901 - 0.00163
VOA	Trichloroethene	mg/kg	4.66E-04	1.38E-03	8.80E-04	5/20	5/20	0/20	N/A	0/20	2.22E-03	0/20	2.02E-03	5/20	1.01E-04	0.000901 - 0.00163
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.61E+00	0/20	1.46E+00	0/20	7.31E-02	0.000901 - 0.00163
VOA	Vinyl chloride	mg/kg	--	--	--	0/20	0/20	0/20	N/A	0/20	1.42E-04	0/20	1.29E-04	0/20	6.47E-06	0.000901 - 0.00163

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Table C1.44. Sector 7 Deep Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	2.25E+03	2.67E+04	1.09E+04	37/37	16/37	1.20E+04	0/37	6.60E+04	0/37	5.99E+04	36/37	3.00E+03	10.1 - 125
METAL	Antimony	mg/kg	3.95E-01	2.23E+00	1.17E+00	5/37	5/37	2.10E-01	3/37	7.74E-01	4/37	7.04E-01	5/37	3.52E-02	1.97 - 22.5
METAL	Arsenic	mg/kg	5.79E-01	2.23E+01	4.32E+00	36/37	6/37	7.90E+00	36/37	3.32E-02	36/37	3.02E-02	36/37	1.51E-03	1.01 - 1.26
METAL	Barium	mg/kg	8.05E+00	1.33E+03	9.16E+01	37/37	2/37	1.70E+02	1/37	3.41E+02	1/37	3.11E+02	31/37	1.55E+01	0.81 - 9.48
METAL	Beryllium	mg/kg	1.37E-01	2.13E+00	8.90E-01	37/37	21/37	6.90E-01	0/37	4.29E+01	0/37	3.89E+01	2/37	1.95E+00	0.101 - 0.126
METAL	Boron	mg/kg	9.63E-01	2.53E+00	1.42E+00	14/37	0/37	N/A	0/37	2.82E+01	0/37	2.56E+01	8/37	1.28E+00	3.04 - 3.77
METAL	Cadmium	mg/kg	2.52E-02	2.84E-01	6.80E-02	20/37	2/37	2.10E-01	0/37	1.52E+00	0/37	1.39E+00	2/37	6.93E-02	0.203 - 0.251
METAL	Chromium	mg/kg	3.89E+00	5.36E+01	1.50E+01	37/37	1/37	4.30E+01	0/37	3.96E+06	0/37	3.60E+06	0/37	1.80E+05	0.608 - 0.753
METAL	Cobalt	mg/kg	7.94E-01	5.20E+01	9.51E+00	37/37	8/37	1.30E+01	37/37	5.96E-01	37/37	5.43E-01	37/37	2.71E-02	0.203 - 0.251
METAL	Copper	mg/kg	1.57E+00	1.44E+01	6.39E+00	37/37	0/37	2.50E+01	0/37	6.18E+01	0/37	5.62E+01	31/37	2.81E+00	0.405 - 0.502
METAL	Iron	mg/kg	2.99E+03	7.12E+04	2.43E+04	37/37	15/37	2.80E+04	37/37	7.74E+02	37/37	7.04E+02	37/37	3.52E+01	21.1 - 250
METAL	Lead	mg/kg	1.18E+00	2.80E+01	6.50E+00	37/37	1/37	2.30E+01	0/37	2.97E+02	0/37	2.70E+02	3/37	1.35E+01	0.405 - 0.499
METAL	Manganese	mg/kg	2.04E+01	7.23E+03	3.92E+02	37/37	3/37	8.20E+02	22/37	6.23E+01	24/37	5.65E+01	37/37	2.83E+00	1.01 - 109
METAL	Mercury	mg/kg	9.74E-03	4.50E-02	2.11E-02	13/37	0/37	1.30E-01	0/37	6.49E-01	0/37	5.91E-01	3/37	2.95E-02	0.0229 - 0.0291
METAL	Molybdenum	mg/kg	1.27E-01	1.89E+00	4.91E-01	30/37	0/37	N/A	0/37	4.44E+00	0/37	4.03E+00	26/37	2.02E-01	0.203 - 0.25
METAL	Nickel	mg/kg	1.46E+00	2.11E+01	9.39E+00	37/37	0/37	2.20E+01	0/37	5.63E+01	0/37	5.12E+01	34/37	2.56E+00	0.405 - 0.502
METAL	Selenium	mg/kg	4.18E-01	4.22E+00	1.54E+00	33/37	25/37	7.00E-01	17/37	1.14E+00	18/37	1.04E+00	33/37	5.19E-02	1.01 - 1.26
METAL	Silver	mg/kg	1.79E-01	1.39E+00	4.31E-01	12/37	0/37	2.70E+00	0/37	1.76E+00	0/37	1.60E+00	12/37	7.99E-02	0.492 - 22.5
METAL	Thallium	mg/kg	1.64E-01	2.97E-01	2.23E-01	17/37	0/37	3.40E-01	17/37	3.12E-02	17/37	2.84E-02	17/37	1.42E-03	0.405 - 0.502
METAL	Uranium	mg/kg	2.64E-01	1.91E+00	9.06E-01	37/37	0/37	4.60E+00	0/37	3.96E+00	0/37	3.60E+00	37/37	1.80E-01	0.0405 - 0.0502
METAL	Vanadium	mg/kg	5.02E+00	3.78E+01	2.14E+01	37/37	1/37	3.70E+01	0/37	1.90E+02	0/37	1.73E+02	32/37	8.64E+00	4.05 - 5.02
METAL	Zinc	mg/kg	3.90E+00	7.88E+01	3.34E+01	37/37	6/37	6.00E+01	0/37	8.21E+02	0/37	7.46E+02	16/37	3.73E+01	4.05 - 24.2
ANION	Fluoride	mg/kg	1.05E+00	8.53E+00	2.47E+00	37/37	0/37	N/A	0/37	2.64E+02	0/37	2.40E+02	0/37	1.20E+01	0.946 - 2.19
PPCB	Total PCB	mg/kg	6.92E-03	6.92E-03	6.92E-03	1/39	0/39	N/A	0/39	1.50E-01	0/39	1.36E-01	1/39	6.82E-03	0.00357 - 0.00437
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.92E-02	0/39	1.74E-02	0/39	8.72E-04	0.361 - 0.432
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	8.84E+00	0/39	8.04E+00	0/39	4.02E-01	0.361 - 0.432
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.55E-02	0/39	2.32E-02	0/39	1.16E-03	0.361 - 0.432
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	4.97E-02	0/39	4.52E-02	0/39	2.26E-03	0.361 - 0.432
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	9.26E-01	0/39	8.42E-01	0/39	4.21E-02	0.361 - 0.432
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	9.59E-02	0/39	8.72E-02	0/39	4.36E-03	0.721 - 0.864
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	7.06E-03	0/39	6.42E-03	0/39	3.21E-04	0.361 - 0.432
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.47E-03	0/39	1.33E-03	0/39	6.67E-05	0.361 - 0.432
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	8.47E+00	0/39	7.70E+00	0/39	3.85E-01	0.0361 - 0.0432
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.96E-01	0/39	1.78E-01	0/39	8.91E-03	0.361 - 0.432
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.68E-03	0/39	5.16E-03	0/39	2.58E-04	0.361 - 0.432
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	4.07E-01	0/39	3.70E-01	0/39	1.85E-02	0.0361 - 0.0432
SVOA	2-Methylphenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.66E+00	0/39	1.51E+00	0/39	7.53E-02	0.361 - 0.432
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.76E-01	0/39	1.60E-01	0/39	8.01E-03	0.361 - 0.432
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	9.59E-02	0/39	8.72E-02	0/39	4.36E-03	0.361 - 0.432
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.81E-02	0/39	1.65E-02	0/39	8.24E-04	0.361 - 0.432
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.39E-03	0/39	4.90E-03	0/39	2.45E-04	0.361 - 0.432
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/39	0/39	N/A	0/39	7.52E-03	0/39	6.84E-03	0/39	3.42E-04	0.361 - 0.432
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	3.76E+00	0/39	3.42E+00	0/39	1.71E-01	0.361 - 0.432
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	3.41E-03	0/39	3.10E-03	0/39	1.55E-04	0.361 - 0.432
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/39	0/39	N/A	0/39	7.52E-03	0/39	6.84E-03	0/39	3.42E-04	0.361 - 0.432
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	9.59E-02	0/39	8.72E-02	0/39	4.36E-03	0.361 - 0.432
SVOA	Acenaphthene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.21E+01	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432
SVOA	Acenaphthylene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.21E+01	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432

Table C1.44. Sector 7 Deep Soil Protection of Groundwater Screen (Continued)

			Detected Results				Provisional Background		GW Protection Screen						
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	DL Range
SVOA	Acetophenone	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.28E+00	0/39	1.17E+00	0/39	5.84E-02	0.361 - 0.432
SVOA	Anthracene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.28E+02	0/39	1.16E+02	0/39	5.81E+00	0.0361 - 0.0432
SVOA	Atrazine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	4.31E-03	0/39	3.92E-03	0/39	1.96E-04	0.361 - 0.432
SVOA	Benzaldehyde	mg/kg	--	--	--	0/37	0/37	N/A	0/37	9.13E-02	0/37	8.30E-02	0/37	4.15E-03	0.361 - 0.432
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.90E+01	0/39	2.63E+01	0/39	1.32E+00	0.0361 - 0.0432
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.97E-02	0/39	2.70E-02	0/39	1.35E-03	0.361 - 0.432
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/39	0/39	N/A	0/39	7.94E-05	0/39	7.22E-05	0/39	3.61E-06	0.361 - 0.432
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.88E-03	0/39	2.62E-03	0/39	1.31E-04	0.361 - 0.432
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	1.51E-02	3.35E-02	2.09E-02	5/39	0/39	N/A	0/39	2.93E+01	0/39	2.66E+01	0/39	1.33E+00	0.0361 - 0.0432
SVOA	Butyl benzyl phthalate	mg/kg	2.67E-02	4.91E-01	2.59E-01	2/39	0/39	N/A	0/39	5.19E+00	0/39	4.72E+00	1/39	2.36E-01	0.0361 - 0.0432
SVOA	Caprolactam	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.43E+00	0/39	4.94E+00	0/39	2.47E-01	0.361 - 0.432
SVOA	Carbazole	mg/kg	--	--	--	0/39	0/39	N/A	0/39	8.27E-01	0/39	7.51E-01	0/39	3.76E-02	0.0361 - 0.0432
SVOA	Dibenzofuran	mg/kg	--	--	--	0/39	0/39	N/A	0/39	3.21E-01	0/39	2.92E-01	0/39	1.46E-02	0.361 - 0.432
SVOA	Diethyl phthalate	mg/kg	1.15E-02	5.36E-02	2.57E-02	4/39	0/39	N/A	0/39	1.34E+01	0/39	1.22E+01	0/39	6.08E-01	0.0361 - 0.0432
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.34E+01	0/39	1.22E+01	0/39	6.08E-01	0.0361 - 0.0432
SVOA	Di-n-butyl phthalate	mg/kg	1.22E-02	2.96E-02	1.86E-02	23/39	0/39	N/A	0/39	4.99E+00	0/39	4.54E+00	0/39	2.27E-01	0.0361 - 0.0429
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.24E+02	0/39	1.13E+02	0/39	5.65E+00	0.0361 - 0.0432
SVOA	Diphenylamine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.13E+00	0/39	4.66E+00	0/39	2.33E-01	0.361 - 0.432
SVOA	Fluoranthene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.96E+02	0/39	1.78E+02	0/39	8.91E+00	0.0361 - 0.0432
SVOA	Fluorene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.20E+01	0/39	1.09E+01	0/39	5.45E-01	0.0361 - 0.0432
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.71E-03	0/39	2.46E-03	0/39	1.23E-04	0.361 - 0.432
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.87E-03	0/39	5.34E-03	0/39	2.67E-04	0.361 - 0.432
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.82E-03	0/39	2.56E-03	0/39	1.28E-04	0.361 - 0.432
SVOA	Hexachloroethane	mg/kg	--	--	--	0/39	0/39	N/A	0/39	4.40E-03	0/39	4.00E-03	0/39	2.00E-04	0.361 - 0.432
SVOA	Isophorone	mg/kg	--	--	--	0/39	0/39	N/A	0/39	5.68E-01	0/39	5.16E-01	0/39	2.58E-02	0.361 - 0.432
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	6.53E-01	0/39	5.94E-01	0/39	2.97E-02	0.361 - 0.432
SVOA	Naphthalene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	8.47E-03	0/39	7.70E-03	0/39	3.85E-04	0.0361 - 0.0432
SVOA	Nitrobenzene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.02E-03	0/39	1.83E-03	0/39	9.17E-05	0.361 - 0.432
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.78E-04	0/39	1.62E-04	0/39	8.10E-06	0.361 - 0.432
SVOA	Pentachlorophenol	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.26E-03	0/39	1.14E-03	0/39	5.71E-05	0.361 - 0.432
SVOA	Phenanthrene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	1.21E+01	0/39	1.10E+01	0/39	5.49E-01	0.0361 - 0.0432
SVOA	Phenol	mg/kg	1.41E-01	1.41E-01	1.41E-01	1/39	0/39	N/A	0/39	7.28E+00	0/39	6.62E+00	0/39	3.31E-01	0.361 - 0.432
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/39	0/39	N/A	0/39	3.48E-02	0/39	3.16E-02	0/39	1.58E-03	0.361 - 0.432
SVOA	Pyrene	mg/kg	--	--	--	0/39	0/39	N/A	0/39	2.90E+01	0/39	2.63E+01	0/39	1.32E+00	0.0361 - 0.0432
SVOA	Total PAH	mg/kg	--	--	--	0/39	0/39	N/A	0/39	6.47E-01	0/39	5.89E-01	0/39	2.94E-02	-
RADS	Americium-241	pCi/g	--	--	--	0/37	0/37	N/A	0/37	2.11E+01	0/37	1.92E+01	0/37	9.58E-01	0.206 - 0.817
RADS	Cesium-137	pCi/g	--	--	--	0/37	0/37	2.80E-01	0/37	1.05E+01	0/37	9.58E+00	0/37	4.79E-01	0.0258 - 0.0652
RADS	Neptunium-237	pCi/g	--	--	--	0/37	0/37	N/A	0/37	1.18E+00	0/37	1.07E+00	0/37	5.36E-02	0.348 - 1.05
RADS	Plutonium-238	pCi/g	--	--	--	0/37	0/37	N/A	0/37	4.82E+00	0/37	4.38E+00	0/37	2.19E-01	0.312 - 0.945
RADS	Plutonium-239/240	pCi/g	--	--	--	0/37	0/37	N/A	0/37	4.69E+00	0/37	4.26E+00	0/37	2.13E-01	0.169 - 0.983
RADS	Technetium-99	pCi/g	5.26E+00	5.26E+00	5.26E+00	1/41	1/41	2.80E+00	1/41	1.67E-01	1/41	1.52E-01	1/41	7.60E-03	2.22 - 4.18
RADS	Thorium-230	pCi/g	5.19E-01	1.71E+00	1.09E+00	27/37	4/37	1.40E+00	0/37	4.03E+01	0/37	3.66E+01	0/37	1.83E+00	0.342 - 1.39
RADS	Uranium-233/234	pCi/g	7.79E-01	2.01E+00	1.20E+00	20/37	9/37	1.20E+00	11/37	1.09E+00	13/37	9.90E-01	20/37	4.95E-02	0.351 - 1.04
RADS	Uranium-235/236	pCi/g	--	--	--	0/37	0/37	6.00E-02	0/37	1.07E+00	0/37	9.76E-01	0/37	4.88E-02	0.245 - 0.864
RADS	Uranium-238	pCi/g	4.50E-01	1.55E+00	9.34E-01	25/37	5/37	1.20E+00	11/37	8.87E-01	15/37	8.05E-01	25/37	4.03E-02	0.225 - 0.914
VOA	1,1,1-Trichloroethane	mg/kg	1.04E-03	1.04E-03	1.04E-03	1/42	0/42	N/A	0/42	6.18E+00	0/42	5.62E+00	0/42	2.81E-01	0.000948 - 0.00179
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.51E-04	0/42	5.92E-04	0/42	2.96E-05	0.000948 - 0.00179
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	5.63E+01	0/42	5.13E+01	0/42	2.56E+00	0.00474 - 0.00894

Table C1.44. Sector 7 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	1,1,2-Trichloroethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.97E-04	0/42	2.69E-04	0/42	1.35E-05	0.000948 - 0.00179
VOA	1,1-Dichloroethane	mg/kg	5.30E-04	5.30E-04	5.30E-04	1/42	0/42	N/A	0/42	1.72E-02	0/42	1.56E-02	0/42	7.82E-04	0.000948 - 0.00179
VOA	1,1-Dichloroethene	mg/kg	6.96E-04	2.83E-03	1.50E-03	3/42	0/42	N/A	0/42	2.24E-01	0/42	2.04E-01	0/42	1.02E-02	0.000948 - 0.00179
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.60E-02	0/42	4.18E-02	0/42	2.09E-03	0.000948 - 0.00179
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.55E-02	0/42	2.32E-02	0/42	1.16E-03	0.000948 - 0.00179
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.17E-06	0/42	2.88E-06	0/42	1.44E-07	0.000948 - 0.00179
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.62E-05	0/42	4.20E-05	0/42	2.10E-06	0.000948 - 0.00179
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.49E-01	0/42	5.90E-01	0/42	2.95E-02	0.000948 - 0.00179
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.06E-03	0/42	9.69E-04	0/42	4.84E-05	0.000948 - 0.00179
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.03E-03	0/42	5.48E-03	0/42	2.74E-04	0.000948 - 0.00179
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.18E-01	0/42	3.81E-01	0/42	1.90E-02	0.000948 - 0.00179
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.49E-01	0/42	5.90E-01	0/42	2.95E-02	0.000948 - 0.00179
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.02E-02	0/42	9.24E-03	0/42	4.62E-04	0.000948 - 0.00179
VOA	1,4-Dioxane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.07E-03	0/42	1.88E-03	0/42	9.42E-05	0.0474 - 0.0894
VOA	2-Butanone	mg/kg	2.36E-03	2.36E-03	2.36E-03	1/42	0/42	N/A	0/42	2.55E+00	0/42	2.32E+00	0/42	1.16E-01	0.00474 - 0.00894
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.04E-05	0/42	2.76E-05	0/42	1.38E-06	0.00474 - 0.00894
VOA	2-Hexanone	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.93E-02	0/42	1.75E-02	0/42	8.75E-04	0.00474 - 0.00894
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	7.08E-02	0/42	6.44E-02	0/42	3.22E-03	0.000948 - 0.00179
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.18E-01	0/42	5.62E-01	0/42	2.81E-02	0.00474 - 0.00894
VOA	Acetone	mg/kg	1.87E-03	1.74E-02	4.87E-03	18/42	0/42	N/A	0/42	8.10E+00	0/42	7.36E+00	0/42	3.68E-01	0.00474 - 0.00894
VOA	Acrolein	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.85E-05	0/42	1.68E-05	0/42	8.41E-07	0.00474 - 0.00894
VOA	Acrylonitrile	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.51E-04	0/42	2.28E-04	0/42	1.14E-05	0.00474 - 0.00894
VOA	Benzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	5.13E-03	0/42	4.66E-03	0/42	2.33E-04	0.000948 - 0.00179
VOA	Bromochloromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.58E-02	0/42	4.16E-02	0/42	2.08E-03	0.000948 - 0.00179
VOA	Bromodichloromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	8.03E-04	0/42	7.30E-04	0/42	3.65E-05	0.000948 - 0.00179
VOA	Bromoform	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.92E-02	0/42	1.75E-02	0/42	8.73E-04	0.000948 - 0.00179
VOA	Bromomethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.20E-03	0/42	3.82E-03	0/42	1.91E-04	0.000948 - 0.00179
VOA	Carbon disulfide	mg/kg	--	--	--	0/42	0/42	N/A	0/42	5.28E-01	0/42	4.80E-01	0/42	2.40E-02	0.00474 - 0.00894
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.89E-03	0/42	3.54E-03	0/42	1.77E-04	0.000948 - 0.00179
VOA	Chlorobenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.16E-01	0/42	1.06E-01	0/42	5.28E-03	0.000948 - 0.00179
VOA	Chloroethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	5.21E+00	0/42	4.74E+00	0/42	2.37E-01	0.000948 - 0.00179
VOA	Chloroform	mg/kg	4.42E-04	4.99E-04	4.71E-04	2/42	0/42	N/A	0/42	1.35E-03	0/42	1.22E-03	2/42	6.12E-05	0.000948 - 0.00179
VOA	Chloromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.16E-02	0/42	1.05E-02	0/42	5.26E-04	0.000948 - 0.00179
VOA	*cis* -1,2-Dichloroethene	mg/kg	5.37E-04	7.69E-04	6.55E-04	5/42	0/42	N/A	0/42	2.33E-02	0/42	2.12E-02	0/42	1.06E-03	0.000948 - 0.00179
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.70E-03	0/42	3.36E-03	0/42	1.68E-04	0.000948 - 0.00179
VOA	Cumene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.62E+00	0/42	1.48E+00	0/42	7.38E-02	0.000948 - 0.00179
VOA	Cyclohexane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.86E+01	0/42	2.60E+01	0/42	1.30E+00	0.000948 - 0.00179
VOA	Dibromochloromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	5.10E-03	0/42	4.64E-03	0/42	2.32E-04	0.000948 - 0.00179
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.69E-01	0/42	6.08E-01	0/42	3.04E-02	0.000948 - 0.00179
VOA	Ethylbenzene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.70E-02	0/42	3.36E-02	0/42	1.68E-03	0.000948 - 0.00179
VOA	m,p-Xylene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.20E-01	0/42	3.82E-01	0/42	1.91E-02	0.0019 - 0.00358
VOA	Methyl acetate	mg/kg	--	--	--	0/42	0/42	N/A	0/42	9.04E+00	0/42	8.22E+00	0/42	4.11E-01	0.00474 - 0.00894
VOA	Methylcyclohexane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.08E+01	0/42	2.80E+01	0/42	1.40E+00	0.000948 - 0.00179
VOA	Methylene chloride	mg/kg	2.58E-03	1.01E-02	5.20E-03	4/42	0/42	N/A	0/42	5.98E-02	0/42	5.44E-02	3/42	2.72E-03	0.00474 - 0.00894
VOA	Styrene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	2.93E+00	0/42	2.66E+00	0/42	1.33E-01	0.000948 - 0.00179
VOA	Tetrachloroethene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.05E-02	0/42	3.69E-02	0/42	1.84E-03	0.000948 - 0.00179
VOA	Toluene	mg/kg	7.33E-04	1.60E-03	1.24E-03	3/42	0/42	N/A	0/42	1.68E+00	0/42	1.52E+00	0/42	7.62E-02	0.000948 - 0.00179
VOA	Total Xylene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	4.20E-01	0/42	3.82E-01	0/42	1.91E-02	0.00284 - 0.00536

Table C1.44. Sector 7 Deep Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		GW Protection Screen						DL Range
			Min	Max	Avg		FOE	Bkgd	DAF 22	DAF 22 SSL	DAF 20	DAF 20 SSL	DAF 1	DAF 1 SSL	
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	6.40E-02	0/42	5.83E-02	0/42	2.91E-03	0.000948 - 0.00179
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/42	0/42	N/A	0/42	3.70E-03	0/42	3.36E-03	0/42	1.68E-04	0.000948 - 0.00179
VOA	Trichloroethene	mg/kg	4.74E-04	4.40E-01	3.31E-02	24/42	0/42	N/A	15/42	2.22E-03	15/42	2.02E-03	24/42	1.01E-04	0.000948 - 0.112
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.61E+00	0/42	1.46E+00	0/42	7.31E-02	0.000948 - 0.00179
VOA	Vinyl chloride	mg/kg	--	--	--	0/42	0/42	N/A	0/42	1.42E-04	0/42	1.29E-04	0/42	6.47E-06	0.000948 - 0.00179

One or more samples exceed background value

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

DAF 20/RGA SSL provided to understand dilution of groundwater contaminant levels as contamination moves to the receptor location.

Table C1.45. Section 7 McNairy Soil Protection of Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
METAL	Aluminum	mg/kg	7.80E+02	1.77E+04	5.77E+03	16/16	11/16	3.00E+03	10.5 - 130
METAL	Antimony	mg/kg	2.98E+00	2.98E+00	2.98E+00	1/16	1/16	3.52E-02	2.16 - 27.5
METAL	Arsenic	mg/kg	1.10E+00	4.02E+01	9.36E+00	16/16	16/16	1.51E-03	1.05 - 1.46
METAL	Barium	mg/kg	2.43E+00	2.44E+02	4.28E+01	16/16	8/16	1.55E+01	0.841 - 9.16
METAL	Beryllium	mg/kg	1.26E-01	2.11E+00	6.74E-01	16/16	1/16	1.95E+00	0.105 - 0.146
METAL	Boron	mg/kg	1.26E+00	4.45E+01	8.50E+00	16/16	14/16	1.28E+00	3.15 - 4.37
METAL	Cadmium	mg/kg	2.97E-02	2.81E-01	1.33E-01	9/16	7/16	6.93E-02	0.21 - 0.291
METAL	Chromium	mg/kg	2.86E+00	1.00E+02	3.04E+01	16/16	0/16	1.80E+05	0.631 - 0.874
METAL	Cobalt	mg/kg	6.54E-01	1.86E+01	6.89E+00	16/16	16/16	2.71E-02	0.21 - 0.291
METAL	Copper	mg/kg	2.83E-01	7.75E+00	4.00E+00	16/16	10/16	2.81E+00	0.42 - 0.583
METAL	Iron	mg/kg	2.29E+03	2.18E+05	3.85E+04	16/16	16/16	3.52E+01	21 - 2910
METAL	Lead	mg/kg	8.83E-01	2.54E+01	7.35E+00	16/16	2/16	1.35E+01	0.42 - 0.583
METAL	Manganese	mg/kg	8.89E+00	2.60E+03	3.19E+02	16/16	16/16	2.83E+00	1.05 - 57.2
METAL	Mercury	mg/kg	8.80E-03	3.49E-02	1.70E-02	8/16	1/16	2.95E-02	0.0247 - 0.0344
METAL	Molybdenum	mg/kg	1.43E-01	2.22E+00	6.90E-01	13/16	10/16	2.02E-01	0.21 - 0.291
METAL	Nickel	mg/kg	8.03E-01	2.34E+01	9.74E+00	16/16	13/16	2.56E+00	0.42 - 0.583
METAL	Selenium	mg/kg	6.51E-01	3.31E+00	1.71E+00	13/16	13/16	5.19E-02	1.05 - 1.46
METAL	Silver	mg/kg	1.59E-01	1.82E+00	9.90E-01	2/16	2/16	7.99E-02	0.54 - 6.87
METAL	Thallium	mg/kg	1.71E-01	1.71E-01	1.71E-01	1/16	1/16	1.42E-03	0.42 - 0.583
METAL	Uranium	mg/kg	7.53E-02	3.38E+00	1.15E+00	16/16	15/16	1.80E-01	0.042 - 0.0583
METAL	Vanadium	mg/kg	6.34E+00	7.52E+01	2.47E+01	16/16	15/16	8.64E+00	4.2 - 5.83
METAL	Zinc	mg/kg	3.68E+00	8.84E+01	3.54E+01	16/16	6/16	3.73E+01	4.2 - 5.83
ANION	Fluoride	mg/kg	6.88E-01	6.13E+00	2.29E+00	14/16	0/16	1.20E+01	1.09 - 1.51
PPCB	Total PCB	mg/kg	--	--	--	0/16	0/16	6.82E-03	0.0039 - 0.00574
SVOA	1,1-biphenyl	mg/kg	--	--	--	0/16	0/16	8.72E-04	0.385 - 0.568
SVOA	2,4,5-Trichlorophenol	mg/kg	--	--	--	0/16	0/16	4.02E-01	0.385 - 0.568
SVOA	2,4,6-Trichlorophenol	mg/kg	--	--	--	0/16	0/16	1.16E-03	0.385 - 0.568
SVOA	2,4-Dichlorophenol	mg/kg	--	--	--	0/16	0/16	2.26E-03	0.385 - 0.568
SVOA	2,4-Dimethylphenol	mg/kg	--	--	--	0/16	0/16	4.21E-02	0.385 - 0.568
SVOA	2,4-Dinitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.77 - 1.14
SVOA	2,4-Dinitrotoluene	mg/kg	--	--	--	0/16	0/16	3.21E-04	0.385 - 0.568
SVOA	2,6-Dinitrotoluene	mg/kg	--	--	--	0/16	0/16	6.67E-05	0.385 - 0.568
SVOA	2-Chloronaphthalene	mg/kg	--	--	--	0/16	0/16	3.85E-01	0.0385 - 0.0568
SVOA	2-Chlorophenol	mg/kg	--	--	--	0/16	0/16	8.91E-03	0.385 - 0.568
SVOA	2-Methyl-4,6-dinitrophenol	mg/kg	--	--	--	0/16	0/16	2.58E-04	0.385 - 0.568
SVOA	2-Methylnaphthalene	mg/kg	--	--	--	0/16	0/16	1.85E-02	0.0385 - 0.0568
SVOA	2-Methylphenol	mg/kg	--	--	--	0/16	0/16	7.53E-02	0.385 - 0.568
SVOA	2-Nitrobenzenamine	mg/kg	--	--	--	0/16	0/16	8.01E-03	0.385 - 0.568
SVOA	2-Nitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.385 - 0.568
SVOA	3,3'-Dichlorobenzidine	mg/kg	--	--	--	0/16	0/16	8.24E-04	0.385 - 0.568
SVOA	3-Nitrobenzenamine	mg/kg	--	--	--	0/16	0/16	2.45E-04	0.385 - 0.568
SVOA	4-Bromophenyl phenyl ether	mg/kg	--	--	--	0/16	0/16	3.42E-04	0.385 - 0.568
SVOA	4-Chloro-3-methylphenol	mg/kg	--	--	--	0/16	0/16	1.71E-01	0.385 - 0.568
SVOA	4-Chlorobenzenamine	mg/kg	--	--	--	0/16	0/16	1.55E-04	0.385 - 0.568
SVOA	4-Chlorophenyl phenyl ether	mg/kg	--	--	--	0/16	0/16	3.42E-04	0.385 - 0.568
SVOA	4-Nitrophenol	mg/kg	--	--	--	0/16	0/16	4.36E-03	0.385 - 0.568
SVOA	Acenaphthene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOA	Acenaphthylene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOA	Acetophenone	mg/kg	--	--	--	0/16	0/16	5.84E-02	0.385 - 0.568

Table C1.45. Section 7 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
SVOA	Anthracene	mg/kg	--	--	--	0/16	0/16	5.81E+00	0.0385 - 0.0568
SVOA	Atrazine	mg/kg	--	--	--	0/16	0/16	1.96E-04	0.385 - 0.568
SVOA	Benzaldehyde	mg/kg	--	--	--	0/16	0/16	4.15E-03	0.385 - 0.568
SVOA	Benzo(ghi)perylene	mg/kg	--	--	--	0/16	0/16	1.32E+00	0.0385 - 0.0568
SVOA	Bis(2-chloroethoxy)methane	mg/kg	--	--	--	0/16	0/16	1.35E-03	0.385 - 0.568
SVOA	Bis(2-chloroethyl) ether	mg/kg	--	--	--	0/16	0/16	3.61E-06	0.385 - 0.568
SVOA	Bis(2-chloroisopropyl) ether	mg/kg	--	--	--	0/16	0/16	1.31E-04	0.385 - 0.568
SVOA	Bis(2-ethylhexyl)phthalate	mg/kg	2.15E-02	2.15E-02	2.15E-02	1/16	0/16	1.33E+00	0.0385 - 0.0568
SVOA	Butyl benzyl phthalate	mg/kg	2.22E-02	2.22E-02	2.22E-02	1/16	0/16	2.36E-01	0.0385 - 0.0568
SVOA	Caprolactam	mg/kg	--	--	--	0/16	0/16	2.47E-01	0.385 - 0.568
SVOA	Carbazole	mg/kg	--	--	--	0/16	0/16	3.76E-02	0.0385 - 0.0568
SVOA	Dibenzofuran	mg/kg	--	--	--	0/16	0/16	1.46E-02	0.385 - 0.568
SVOA	Diethyl phthalate	mg/kg	1.51E-02	6.05E-02	3.78E-02	2/16	0/16	6.08E-01	0.0385 - 0.0568
SVOA	Dimethyl phthalate	mg/kg	--	--	--	0/16	0/16	6.08E-01	0.0385 - 0.0568
SVOA	Di-n-butyl phthalate	mg/kg	1.45E-02	4.10E-02	2.74E-02	12/16	0/16	2.27E-01	0.0385 - 0.0568
SVOA	Di-n-octylphthalate	mg/kg	--	--	--	0/16	0/16	5.65E+00	0.0385 - 0.0568
SVOA	Diphenylamine	mg/kg	--	--	--	0/16	0/16	2.33E-01	0.385 - 0.568
SVOA	Fluoranthene	mg/kg	2.60E-02	2.60E-02	2.60E-02	1/16	0/16	8.91E+00	0.0385 - 0.0568
SVOA	Fluorene	mg/kg	--	--	--	0/16	0/16	5.45E-01	0.0385 - 0.0568
SVOA	Hexachlorobenzene	mg/kg	--	--	--	0/16	0/16	1.23E-04	0.385 - 0.568
SVOA	Hexachlorobutadiene	mg/kg	--	--	--	0/16	0/16	2.67E-04	0.385 - 0.568
SVOA	Hexachlorocyclopentadiene	mg/kg	--	--	--	0/16	0/16	1.28E-04	0.385 - 0.568
SVOA	Hexachloroethane	mg/kg	--	--	--	0/16	0/16	2.00E-04	0.385 - 0.568
SVOA	Isophorone	mg/kg	--	--	--	0/16	0/16	2.58E-02	0.385 - 0.568
SVOA	m+p Methylphenol	mg/kg	--	--	--	0/16	0/16	2.97E-02	0.385 - 0.568
SVOA	Naphthalene	mg/kg	--	--	--	0/16	0/16	3.85E-04	0.0385 - 0.0568
SVOA	Nitrobenzene	mg/kg	--	--	--	0/16	0/16	9.17E-05	0.385 - 0.568
SVOA	N-Nitroso-di-n-propylamine	mg/kg	--	--	--	0/16	0/16	8.10E-06	0.385 - 0.568
SVOA	Pentachlorophenol	mg/kg	3.13E-01	3.13E-01	3.13E-01	1/16	1/16	5.71E-05	0.385 - 0.568
SVOA	Phenanthrene	mg/kg	--	--	--	0/16	0/16	5.49E-01	0.0385 - 0.0568
SVOA	Phenol	mg/kg	--	--	--	0/16	0/16	3.31E-01	0.385 - 0.568
SVOA	p-Nitroaniline	mg/kg	--	--	--	0/16	0/16	1.58E-03	0.385 - 0.568
SVOA	Pyrene	mg/kg	--	--	--	0/16	0/16	1.32E+00	0.0385 - 0.0568
SVOA	Total PAH	mg/kg	--	--	--	0/16	0/16	2.94E-02	-
RADS	Americium-241	pCi/g	7.89E-01	7.89E-01	7.89E-01	1/16	0/16	9.58E-01	0.212 - 0.861
RADS	Cesium-137	pCi/g	--	--	--	0/16	0/16	4.79E-01	0.0256 - 0.0664
RADS	Neptunium-237	pCi/g	--	--	--	0/16	0/16	5.36E-02	0.252 - 1.02
RADS	Plutonium-238	pCi/g	--	--	--	0/16	0/16	2.19E-01	0.373 - 1.23
RADS	Plutonium-239/240	pCi/g	--	--	--	0/16	0/16	2.13E-01	0.38 - 1.05
RADS	Technetium-99	pCi/g	--	--	--	0/19	0/19	7.60E-03	2.56 - 4.3
RADS	Thorium-230	pCi/g	6.76E-01	1.79E+00	1.12E+00	15/16	0/16	1.83E+00	0.493 - 1.26
RADS	Uranium-233/234	pCi/g	5.77E-01	1.89E+00	1.08E+00	9/16	9/16	4.95E-02	0.357 - 1.09
RADS	Uranium-235/236	pCi/g	1.54E-01	2.91E-01	2.23E-01	2/16	2/16	4.88E-02	0.116 - 0.733
RADS	Uranium-238	pCi/g	4.21E-01	1.39E+00	8.69E-01	14/16	14/16	4.03E-02	0.294 - 0.825
VOA	1,1,1-Trichloroethane	mg/kg	--	--	--	0/19	0/19	2.81E-01	0.00105 - 0.165
VOA	1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0/19	0/19	2.96E-05	0.00105 - 0.165
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	4.43E-03	4.43E-03	4.43E-03	1/19	0/19	2.56E+00	0.00523 - 0.823
VOA	1,1,2-Trichloroethane	mg/kg	7.95E-04	7.95E-04	7.95E-04	1/19	1/19	1.35E-05	0.00105 - 0.165
VOA	1,1-Dichloroethane	mg/kg	--	--	--	0/19	0/19	7.82E-04	0.00105 - 0.165

Table C1.45. Section 7 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
VOA	1,1-Dichloroethene	mg/kg	--	--	--	0/19	0/19	1.02E-02	0.00105 - 0.165
VOA	1,2,3-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.09E-03	0.00105 - 0.165
VOA	1,2,4-Trichlorobenzene	mg/kg	--	--	--	0/19	0/19	1.16E-03	0.00105 - 0.165
VOA	1,2-Dibromo-3-chloropropane	mg/kg	--	--	--	0/19	0/19	1.44E-07	0.00105 - 0.165
VOA	1,2-Dibromoethane	mg/kg	--	--	--	0/19	0/19	2.10E-06	0.00105 - 0.165
VOA	1,2-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.95E-02	0.00105 - 0.165
VOA	1,2-Dichloroethane	mg/kg	--	--	--	0/19	0/19	4.84E-05	0.00105 - 0.165
VOA	1,2-Dichloropropane	mg/kg	--	--	--	0/19	0/19	2.74E-04	0.00105 - 0.165
VOA	1,2-Dimethylbenzene	mg/kg	--	--	--	0/19	0/19	1.90E-02	0.00105 - 0.165
VOA	1,3-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	2.95E-02	0.00105 - 0.165
VOA	1,4-Dichlorobenzene	mg/kg	--	--	--	0/19	0/19	4.62E-04	0.00105 - 0.165
VOA	1,4-Dioxane	mg/kg	--	--	--	0/13	0/13	9.42E-05	0.0523 - 8.23
VOA	2-Butanone	mg/kg	--	--	--	0/19	0/19	1.16E-01	0.00523 - 0.823
VOA	2-Chloroethyl vinyl ether	mg/kg	--	--	--	0/19	0/19	1.38E-06	0.00523 - 0.823
VOA	2-Hexanone	mg/kg	--	--	--	0/19	0/19	8.75E-04	0.00523 - 0.823
VOA	2-Methoxy-2-methylpropane	mg/kg	--	--	--	0/19	0/19	3.22E-03	0.00105 - 0.165
VOA	4-Methyl-2-pentanone	mg/kg	--	--	--	0/19	0/19	2.81E-02	0.00523 - 0.823
VOA	Acetone	mg/kg	3.57E-03	5.21E-02	1.43E-02	8/19	0/19	3.68E-01	0.00523 - 0.823
VOA	Acrolein	mg/kg	--	--	--	0/19	0/19	8.41E-07	0.00523 - 0.823
VOA	Acrylonitrile	mg/kg	--	--	--	0/19	0/19	1.14E-05	0.00523 - 0.823
VOA	Benzene	mg/kg	--	--	--	0/19	0/19	2.33E-04	0.00105 - 0.165
VOA	Bromochloromethane	mg/kg	--	--	--	0/19	0/19	2.08E-03	0.00105 - 0.165
VOA	Bromodichloromethane	mg/kg	--	--	--	0/19	0/19	3.65E-05	0.00105 - 0.165
VOA	Bromoform	mg/kg	--	--	--	0/19	0/19	8.73E-04	0.00105 - 0.165
VOA	Bromomethane	mg/kg	--	--	--	0/19	0/19	1.91E-04	0.00105 - 0.165
VOA	Carbon disulfide	mg/kg	--	--	--	0/19	0/19	2.40E-02	0.00523 - 0.823
VOA	Carbon tetrachloride	mg/kg	--	--	--	0/19	0/19	1.77E-04	0.00105 - 0.165
VOA	Chlorobenzene	mg/kg	--	--	--	0/19	0/19	5.28E-03	0.00105 - 0.165
VOA	Chloroethane	mg/kg	--	--	--	0/19	0/19	2.37E-01	0.00105 - 0.165
VOA	Chloroform	mg/kg	7.95E-04	7.95E-04	7.95E-04	1/19	1/19	6.12E-05	0.00105 - 0.165
VOA	Chloromethane	mg/kg	--	--	--	0/19	0/19	5.26E-04	0.00105 - 0.165
VOA	*cis* -1,2-Dichloroethene	mg/kg	1.38E-02	1.38E-02	1.38E-02	1/19	1/19	1.06E-03	0.00105 - 0.208
VOA	*cis* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	1.68E-04	0.00105 - 0.165
VOA	Cumene	mg/kg	--	--	--	0/19	0/19	7.38E-02	0.00105 - 0.165
VOA	Cyclohexane	mg/kg	--	--	--	0/19	0/19	1.30E+00	0.00105 - 0.165
VOA	Dibromochloromethane	mg/kg	--	--	--	0/19	0/19	2.32E-04	0.00105 - 0.165
VOA	Dichlorodifluoromethane	mg/kg	--	--	--	0/19	0/19	3.04E-02	0.00105 - 0.165
VOA	Ethylbenzene	mg/kg	--	--	--	0/19	0/19	1.68E-03	0.00105 - 0.165
VOA	m,p-Xylene	mg/kg	--	--	--	0/19	0/19	1.91E-02	0.00209 - 0.329
VOA	Methyl acetate	mg/kg	--	--	--	0/19	0/19	4.11E-01	0.00523 - 0.823
VOA	Methylcyclohexane	mg/kg	--	--	--	0/19	0/19	1.40E+00	0.00105 - 0.165
VOA	Methylene chloride	mg/kg	2.28E-03	3.13E-03	2.71E-03	2/19	1/19	2.72E-03	0.00523 - 0.823
VOA	Styrene	mg/kg	--	--	--	0/19	0/19	1.33E-01	0.00105 - 0.165
VOA	Tetrachloroethene	mg/kg	3.10E-03	3.10E-03	3.10E-03	1/19	1/19	1.84E-03	0.00105 - 0.165
VOA	Toluene	mg/kg	--	--	--	0/19	0/19	7.62E-02	0.00105 - 0.165
VOA	Total Xylene	mg/kg	--	--	--	0/19	0/19	1.91E-02	0.00314 - 0.494
VOA	*trans* -1,2-Dichloroethene	mg/kg	--	--	--	0/19	0/19	2.91E-03	0.00105 - 0.165
VOA	*trans* -1,3-Dichloropropene	mg/kg	--	--	--	0/19	0/19	1.68E-04	0.00105 - 0.165
VOA	Trichloroethene	mg/kg	5.36E-04	6.22E+00	1.56E+00	7/19	7/19	1.01E-04	0.00105 - 0.208

Table C1.45. Section 7 McNairy Soil Protection of Groundwater Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	GW Protection Screen		DL Range
			Min	Max	Avg		DAF 1	DAF 1 SSL	
VOA	Trichlorofluoromethane	mg/kg	--	--	--	0/19	0/19	7.31E-02	0.00105 - 0.165
VOA	Vinyl chloride	mg/kg	--	--	--	0/19	0/19	6.47E-06	0.00105 - 0.165

One or more samples exceed groundwater protection screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different laboratories, only the maximum value is counted).

Field replicates, or separate samples, are counted independently.

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Table C1.46. Regional Gravel Aquifer Groundwater COPC Screen

			Detected Results				Provisional Background		Resident		Resident		MCL		
Type	Analysis	Unit	Min	Max	Avg	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
METAL	Aluminum	mg/L	1.94E-02	4.17E+00	4.46E-01	130/258	6/258	2.19E+00	7/258	2.00E+00	0/258	6.00E+01	0/258	N/A	0.05 - 0.2
METAL	Antimony	mg/L	1.02E-03	1.47E-03	1.14E-03	24/258	0/258	6.00E-02	24/258	7.79E-04	0/258	2.34E-02	0/258	6.00E-03	0.003 - 0.005
METAL	Arsenic	mg/L	1.47E-03	8.97E-03	3.06E-03	89/258	6/258	5.00E-03	89/258	5.17E-05	5/258	5.17E-03	0/258	1.00E-02	0.001 - 0.005
METAL	Barium	mg/L	3.62E-02	9.11E-01	2.61E-01	258/258	141/258	2.35E-01	45/258	3.77E-01	0/258	1.13E+01	0/258	2.00E+00	0.002 - 0.005
METAL	Beryllium	mg/L	2.00E-04	8.91E-04	3.54E-04	21/258	0/258	4.00E-03	0/258	2.46E-03	0/258	7.38E-02	0/258	4.00E-03	0.0005 - 0.001
METAL	Boron	mg/L	7.11E-03	5.61E-02	1.80E-02	256/256	N/A	N/A	0/256	3.99E-01	0/256	1.20E+01	0/256	N/A	0.015 - 0.015
METAL	Cadmium	mg/L	3.06E-04	6.84E-04	3.81E-04	11/258	0/258	1.00E-02	0/258	9.22E-04	0/258	2.77E-02	0/258	5.00E-03	0.001 - 0.001
METAL	Chromium	mg/L	3.10E-03	2.72E+00	1.11E-01	160/258	34/258	1.44E-01	160/258	3.50E-05	152/258	3.50E-03	44/258	1.00E-01	0.01 - 0.1
METAL	Cobalt	mg/L	3.17E-04	2.68E-02	3.07E-03	181/258	0/258	4.50E-02	164/258	6.01E-04	2/258	1.80E-02	0/258	N/A	0.001 - 0.001
METAL	Copper	mg/L	3.29E-04	3.30E-02	3.76E-03	246/258	0/258	3.60E-02	0/258	7.99E-02	0/258	2.40E+00	0/258	1.30E+00	0.001 - 0.02
METAL	Iron	mg/L	3.34E-02	2.76E+01	2.07E+00	237/258	28/258	5.03E+00	73/258	1.40E+00	0/258	4.20E+01	0/258	N/A	0.1 - 1
METAL	Lead	mg/L	5.15E-04	1.80E-02	1.98E-03	63/258	0/258	1.29E-01	1/258	1.50E-02	0/258	3.00E-02	1/258	1.50E-02	0.0013 - 0.002
METAL	Manganese	mg/L	1.19E-03	7.29E+00	2.73E-01	251/258	89/258	1.19E-01	131/258	4.34E-02	11/258	1.30E+00	0/258	N/A	0.005 - 0.1
METAL	Mercury	mg/L	7.00E-05	2.59E-04	1.31E-04	22/256	6/256	2.00E-04	0/256	5.66E-04	0/256	1.70E-02	0/256	2.00E-03	0.0002 - 0.0002
METAL	Molybdenum	mg/L	2.06E-04	6.04E-02	5.46E-03	169/258	2/258	5.00E-02	29/258	9.98E-03	0/258	2.99E-01	0/258	N/A	0.0005 - 0.001
METAL	Nickel	mg/L	7.13E-04	4.30E-01	4.82E-02	258/258	0/258	6.82E-01	96/258	3.92E-02	0/258	1.18E+00	0/258	N/A	0.002 - 0.005
METAL	Selenium	mg/L	1.61E-03	5.28E-03	2.39E-03	25/258	1/258	5.00E-03	0/258	9.98E-03	0/258	2.99E-01	0/258	5.00E-02	0.005 - 0.005
METAL	Silver	mg/L	3.26E-04	5.34E-03	1.20E-03	14/258	0/258	1.10E-02	0/258	9.41E-03	0/258	2.82E-01	0/258	N/A	0.001 - 0.001
METAL	Thallium	mg/L	6.01E-04	6.99E-04	6.45E-04	4/256	0/256	5.60E-02	4/256	2.00E-05	4/256	6.00E-04	0/256	2.00E-03	0.002 - 0.002
METAL	Uranium	mg/L	6.90E-05	3.12E-02	1.37E-03	107/303	16/303	2.00E-03	49/303	3.99E-04	2/303	1.20E-02	1/303	3.00E-02	0.0002 - 0.005
METAL	Vanadium	mg/L	3.30E-03	2.97E-02	7.79E-03	54/256	0/256	1.34E-01	20/256	8.64E-03	0/256	2.59E-01	0/256	N/A	0.02 - 0.02
METAL	Zinc	mg/L	3.30E-03	2.02E-01	1.56E-02	213/258	11/258	5.40E-02	0/258	6.00E-01	0/258	1.80E+01	0/258	N/A	0.01 - 0.02
ANION	Fluoride	mg/L	3.45E-02	2.49E+00	2.20E-01	256/258	22/258	2.70E-01	238/258	7.99E-02	1/258	2.40E+00	0/258	4.00E+00	0.1 - 0.2
ANION	Nitrate as Nitrogen	mg/L	5.02E-02	8.35E+01	1.04E+01	59/64	9/64	1.56E+01	20/64	3.19E+00	0/64	9.57E+01	12/64	1.00E+01	0.1 - 5
PPCB	Total PCB	mg/L	6.08E-05	4.73E-04	2.03E-04	5/256	N/A	N/A	5/256	4.36E-05	0/256	4.36E-03	0/256	5.00E-04	0.0000938 - 0.000497
RADS	Neptunium-237	pCi/L	9.23E-01	3.85E+00	1.91E+00	8/256	8/256	8.00E-01	8/256	7.63E-01	0/256	7.63E+01	0/256	1.50E+01	0.253 - 1.42
RADS	Technetium-99	pCi/L	3.12E+00	3.17E+04	2.05E+03	697/805	651/805	2.23E+01	661/805	1.90E+01	146/805	1.90E+03	192/805	9.00E+02	1.82 - 46.9
RADS	Thorium-230	pCi/L	6.58E-01	6.58E-01	6.58E-01	1/256	0/256	1.10E+00	1/256	5.72E-01	0/256	5.72E+01	0/256	1.50E+01	0.315 - 1.44
RADS	Uranium-233/234	pCi/L	4.29E-01	8.10E+01	1.74E+01	5/256	4/256	7.00E-01	4/256	7.39E-01	1/256	7.39E+01	0/256	N/A	0.222 - 1.42
RADS	Uranium-235/236	pCi/L	3.88E-01	4.68E+00	2.53E+00	2/256	2/256	3.00E-01	1/256	7.28E-01	0/256	7.28E+01	1/256	4.66E-01	0.127 - 1.26
RADS	Uranium-238	pCi/L	2.09E-01	8.51E+01	5.43E+00	22/256	12/256	7.00E-01	16/256	6.01E-01	1/256	6.01E+01	2/256	9.99E+00	0.102 - 1.25
SVOA	Benzo(ghi)perylene	mg/L	4.52E-04	9.26E-04	7.34E-04	3/256	N/A	N/A	0/256	1.21E-02	0/256	3.63E-01	0/256	N/A	0.000909 - 0.00129
SVOA	Bis(2-ethylhexyl)phthalate	mg/L	3.08E-04	7.01E-02	2.53E-03	41/256	N/A	N/A	1/256	5.56E-03	0/256	5.56E-01	1/256	6.00E-03	0.000909 - 0.00129
SVOA	Butyl benzyl phthalate	mg/L	3.51E-04	5.85E-04	5.11E-04	5/256	N/A	N/A	0/256	1.63E-02	0/256	1.63E+00	0/256	N/A	0.00909 - 0.0129
SVOA	Diethyl phthalate	mg/L	4.17E-04	4.50E-04	4.34E-04	2/256	N/A	N/A	0/256	1.48E+00	0/256	4.44E+01	0/256	N/A	0.00909 - 0.0129
SVOA	Dimethyl phthalate	mg/L	3.51E-04	3.51E-04	3.51E-04	1/256	N/A	N/A	0/256	1.48E+00	0/256	4.44E+01	0/256	N/A	0.00909 - 0.0129
SVOA	Di-n-butyl phthalate	mg/L	3.20E-04	2.71E-03	6.87E-04	12/256	N/A	N/A	0/256	9.02E-02	0/256	2.71E+00	0/256	N/A	0.00909 - 0.0129
SVOA	Di-n-octylphthalate	mg/L	3.23E-04	1.56E-03	7.95E-04	14/256	N/A	N/A	0/256	2.01E-02	0/256	6.03E-01	0/256	N/A	0.00909 - 0.0129
SVOA	Fluoranthene	mg/L	3.51E-04	5.54E-04	4.53E-04	2/256	N/A	N/A	0/256	8.02E-02	0/256	2.41E+00	0/256	N/A	0.000909 - 0.00129
SVOA	Hexachlorocyclopentadiene	mg/L	4.44E-03	4.74E-03	4.59E-03	2/256	N/A	N/A	2/256	4.12E-05	2/256	1.24E-03	0/256	5.00E-02	0.00909 - 0.0129
SVOA	Pentachlorophenol	mg/L	6.10E-03	6.41E-03	6.26E-03	2/256	N/A	N/A	2/256	4.13E-05	2/256	4.13E-03	2/256	1.00E-03	0.00909 - 0.0129
SVOA	Phenanthrene	mg/L	3.95E-04	3.95E-04	3.95E-04	1/256	N/A	N/A	0/256	5.35E-02	0/256	1.61E+00	0/256	N/A	0.000909 - 0.00129
SVOA	p-Nitroaniline	mg/L	3.69E-03	5.45E-03	4.64E-03	8/256	N/A	N/A	7/256	3.78E-03	0/256	2.34E-01	0/256	N/A	0.00909 - 0.0129
SVOA	Pyrene	mg/L	3.51E-04	4.13E-04	3.82E-04	2/256	N/A	N/A	0/256	1.21E-02	0/256	3.63E-01	0/256	N/A	0.000909 - 0.00129
SVOA	Total PAH	mg/L	4.54E-06	1.55E-03	6.92E-04	7/256	N/A	N/A	6/256	2.51E-05	0/256	2.51E-03	5/256	2.00E-04	-
VOA	1,1,1-Trichloroethane	mg/L	3.90E-04	2.61E-03	1.27E-03	11/271	N/A	N/A	0/271	8.01E-01	0/271	2.40E+01	0/271	2.00E-01	0.001 - 2
VOA	1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	3.02E-03	6.25E-02	1.35E-02	37/256	N/A	N/A	0/256	1.02E+00	0/256	3.06E+01	0/256	N/A	0.005 - 10
VOA	1,1,2-Trichloroethane	mg/L	3.40E-04	9.70E-03	1.66E-03	78/271	N/A	N/A	78/271	4.15E-05	29/271	1.25E-03	2/271	5.00E-03	0.001 - 2
VOA	1,1-Dichloroethane	mg/L	3.30E-04	3.02E-03	9.53E-04	19/271	N/A	N/A	1/271	2.75E-03	0/271	2.75E-01	0/271	N/A	0.001 - 2

Table C1.46. Regional Gravel Aquifer Groundwater COPC Screen (Continued)

Type	Analysis	Unit	Detected Results			FOD	Provisional Background		Resident		Resident		MCL		DL Range
			Min	Max	Avg		FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	
VOA	1,1-Dichloroethene	mg/L	1.80E-04	1.70E-01	1.74E-02	142/827	N/A	N/A	20/827	2.85E-02	0/827	8.55E-01	64/827	7.00E-03	0.001 - 20
VOA	1,2-Dichlorobenzene	mg/L	3.50E-04	4.40E-04	3.97E-04	3/256	N/A	N/A	0/256	3.04E-02	0/256	9.12E-01	0/256	6.00E-01	0.001 - 2
VOA	1,2-Dichloroethane	mg/L	3.50E-04	1.46E-03	7.86E-04	7/271	N/A	N/A	7/271	1.71E-04	0/271	1.71E-02	0/271	5.00E-03	0.001 - 2
VOA	1,4-Dioxane	mg/L	3.94E+00	3.94E+00	3.94E+00	1/191	N/A	N/A	1/191	4.59E-04	1/191	4.59E-02	0/191	N/A	0.05 - 50
VOA	2-Butanone	mg/L	1.10E-03	1.12E-01	1.28E-02	31/391	N/A	N/A	0/391	5.57E-01	0/391	1.67E+01	0/391	N/A	0.001 - 10
VOA	Acetone	mg/L	2.00E-03	6.41E-03	3.63E-03	3/256	N/A	N/A	0/256	1.80E+00	0/256	5.40E+01	0/256	N/A	0.005 - 10
VOA	Benzene	mg/L	4.70E-04	6.90E-04	5.34E-04	5/406	N/A	N/A	5/406	4.55E-04	0/406	4.55E-02	0/406	5.00E-03	0.001 - 10
VOA	Bromodichloromethane	mg/L	4.30E-04	1.79E-03	8.73E-04	10/271	N/A	N/A	10/271	1.34E-04	0/271	1.34E-02	0/271	8.00E-02	0.001 - 2
VOA	Carbon tetrachloride	mg/L	4.30E-04	8.80E-02	7.91E-03	56/406	N/A	N/A	55/406	4.55E-04	3/406	4.55E-02	8/406	5.00E-03	0.001 - 10
VOA	Chloroform	mg/L	3.40E-04	8.28E-03	2.78E-03	105/271	N/A	N/A	105/271	2.21E-04	0/271	2.21E-02	0/271	8.00E-02	0.001 - 2
VOA	*cis* -1,2-Dichloroethene	mg/L	3.80E-04	7.50E+01	1.94E+00	667/816	N/A	N/A	641/816	3.61E-03	316/816	1.08E-01	408/816	7.00E-02	0.001 - 10
VOA	Methylene chloride	mg/L	6.00E-04	2.60E-01	3.74E-02	43/256	N/A	N/A	17/256	1.07E-02	0/256	3.21E-01	20/256	5.00E-03	0.005 - 10
VOA	Tetrachloroethene	mg/L	3.00E-04	8.60E-02	4.47E-03	110/406	N/A	N/A	32/406	4.06E-03	0/406	1.22E-01	27/406	5.00E-03	0.001 - 10
VOA	Toluene	mg/L	3.50E-04	1.25E-03	7.37E-04	7/271	N/A	N/A	0/271	1.10E-01	0/271	3.30E+00	0/271	1.00E+00	0.001 - 2
VOA	*trans* -1,2-Dichloroethene	mg/L	1.20E-04	1.05E-02	1.31E-03	90/816	N/A	N/A	1/816	9.29E-03	0/816	2.79E-01	0/816	1.00E-01	0.001 - 10
VOA	Trichloroethene	mg/L	3.60E-04	1.40E+03	1.76E+01	825/827	N/A	N/A	825/827	2.83E-04	816/827	8.49E-03	821/827	5.00E-03	0.001 - 20
VOA	Trichlorofluoromethane	mg/L	4.20E-04	1.09E-03	7.70E-04	4/256	N/A	N/A	0/256	1.14E-01	0/256	3.42E+00	0/256	N/A	0.001 - 2
VOA	Vinyl chloride	mg/L	1.20E-04	1.80E-01	2.49E-02	28/816	N/A	N/A	28/816	1.88E-05	10/816	1.88E-03	10/816	2.00E-03	0.001 - 20

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed MCL screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against uranium (soluble salts).

Total PCBs calculated by laboratory.

Total PAHs calculated using TEF values in the 2021 RMD.

Uranium-233/234 was screened against uranium-234.

Uranium-235/236 was screened against uranium-235.

Table C1.47. McNairy Groundwater COPC Screen

Type	Analysis	Unit	Detected Results			J-qualified		Provisional Background		Resident		Resident		MCL		
			Min	Max	Avg	FOD	FOD	FOE	Bkgd	FOE	NAL	FOE	AL	FOE	MCL	DL Range
METAL	Aluminum	mg/L	4.08E-02	6.37E-01	3.20E-01	2/4	3/4	0/4	6.87E-01	0/4	2.00E+00	0/4	6.00E+01	0/4	N/A	0.05 - 0.05
METAL	Antimony	mg/L	1.22E-03	1.22E-03	1.22E-03	1/4	1/4	0/4	6.00E-02	1/4	7.79E-04	0/4	2.34E-02	0/4	6.00E-03	0.003 - 0.003
METAL	Arsenic	mg/L	2.52E-03	2.52E-03	2.52E-03	1/4	1/4	0/4	5.00E-03	1/4	5.17E-05	0/4	5.17E-03	0/4	1.00E-02	0.005 - 0.005
METAL	Barium	mg/L	9.04E-02	9.88E-02	9.31E-02	0/4	4/4	0/4	2.96E-01	0/4	3.77E-01	0/4	1.13E+01	0/4	2.00E+00	0.004 - 0.004
METAL	Boron	mg/L	1.39E-02	1.70E-02	1.56E-02	2/4	4/4	N/A	N/A	0/4	3.99E-01	0/4	1.20E+01	0/4	N/A	0.015 - 0.015
METAL	Chromium	mg/L	3.30E-03	2.00E-02	1.17E-02	1/4	2/4	0/4	6.00E-02	2/4	3.50E-05	1/4	3.50E-03	0/4	1.00E-01	0.01 - 0.01
METAL	Cobalt	mg/L	1.01E-03	5.95E-03	2.37E-03	1/4	4/4	0/4	9.60E-02	4/4	6.01E-04	0/4	1.80E-02	0/4	N/A	0.001 - 0.001
METAL	Copper	mg/L	5.75E-04	1.46E-03	9.78E-04	3/4	3/4	0/4	5.70E-02	0/4	7.99E-02	0/4	2.40E+00	0/4	1.30E+00	0.002 - 0.002
METAL	Iron	mg/L	6.12E-02	5.91E-01	3.35E-01	1/4	3/4	0/4	1.84E+01	0/4	1.40E+00	0/4	4.20E+01	0/4	N/A	0.1 - 0.1
METAL	Lead	mg/L	1.04E-03	1.04E-03	1.04E-03	1/4	1/4	0/4	5.00E-02	0/4	1.50E-02	0/4	3.00E-02	0/4	1.50E-02	0.002 - 0.002
METAL	Manganese	mg/L	1.76E-01	2.51E-01	2.01E-01	0/4	4/4	0/4	9.41E-01	4/4	4.34E-02	0/4	1.30E+00	0/4	N/A	0.005 - 0.005
METAL	Molybdenum	mg/L	3.41E-04	2.01E-03	1.18E-03	1/4	2/4	0/4	5.00E-02	0/4	9.98E-03	0/4	2.99E-01	0/4	N/A	0.001 - 0.001
METAL	Nickel	mg/L	1.36E-03	8.23E-03	3.53E-03	3/4	4/4	0/4	1.09E-01	0/4	3.92E-02	0/4	1.18E+00	0/4	N/A	0.002 - 0.002
METAL	Uranium	mg/L	8.10E-05	3.85E-04	2.72E-04	1/4	4/4	0/4	1.00E-03	0/4	3.99E-04	0/4	1.20E-02	0/4	3.00E-02	0.0002 - 0.0002
METAL	Vanadium	mg/L	4.25E-03	4.25E-03	4.25E-03	1/4	1/4	0/4	1.26E-01	0/4	8.64E-03	0/4	2.59E-01	0/4	N/A	0.02 - 0.02
METAL	Zinc	mg/L	5.17E-03	3.12E-02	1.44E-02	4/4	4/4	0/4	1.42E-01	0/4	6.00E-01	0/4	1.80E+01	0/4	N/A	0.02 - 0.02
ANION	Fluoride	mg/L	1.65E-01	2.23E-01	2.00E-01	0/4	4/4	0/4	3.30E-01	4/4	7.99E-02	0/4	2.40E+00	0/4	4.00E+00	0.1 - 0.1
RADS	Uranium-238	pCi/L	6.92E-01	6.92E-01	6.92E-01	0/4	1/4	1/4	3.00E-01	1/4	6.01E-01	0/4	6.01E+01	0/4	9.99E+00	0.354 - 0.555
SVOA	p-Nitroaniline	mg/L	6.03E-03	6.03E-03	6.03E-03	1/4	1/4	N/A	N/A	1/4	3.78E-03	0/4	2.34E-01	0/4	N/A	0.00997 - 0.0108
VOA	1,1,2-Trichloroethane	mg/L	5.10E-04	5.10E-04	5.10E-04	1/4	1/4	N/A	N/A	1/4	4.15E-05	0/4	1.25E-03	0/4	5.00E-03	0.001 - 0.05
VOA	1,1-Dichloroethene	mg/L	1.19E-03	1.19E-03	1.19E-03	0/4	1/4	N/A	N/A	0/4	2.85E-02	0/4	8.55E-01	0/4	7.00E-03	0.001 - 0.05
VOA	*cis* -1,2-Dichloroethene	mg/L	6.95E-02	2.76E-01	1.53E-01	1/4	4/4	N/A	N/A	4/4	3.61E-03	2/4	1.08E-01	3/4	7.00E-02	0.05 - 0.05
VOA	Tetrachloroethene	mg/L	1.96E-03	1.96E-03	1.96E-03	0/4	1/4	N/A	N/A	0/4	4.06E-03	0/4	1.22E-01	0/4	5.00E-03	0.001 - 0.05
VOA	*trans* -1,2-Dichloroethene	mg/L	8.40E-04	8.40E-04	8.40E-04	1/4	1/4	N/A	N/A	0/4	9.29E-03	0/4	2.79E-01	0/4	1.00E-01	0.001 - 0.05
VOA	Trichloroethene	mg/L	4.40E+00	6.80E+00	5.15E+00	1/4	4/4	N/A	N/A	4/4	2.83E-04	4/4	8.49E-03	4/4	5.00E-03	0.05 - 0.1

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed background value

One or more samples exceed MCL screening

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Note:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against uranium (soluble salts).

Table C1.48. Surface Soil Grid Concentration Assignment Results

Grid Name	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Trichloroethene (mg/kg)	Total PAH (mg/kg)	Total PCB (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Strontium-90 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
Sector 1																		
RA1-1	--	12.4	8.81	--	0.0342 U	0.111	43.1	19.6	0.0699	113	98.6	2.43	7.20	98.6	121	13.8	0.812	14.9
RA1-2	--	14.5	7.03	--	1.03	0.0186	6.67	0.375 U	0.0486 U	0.419 U	0.293 U	2.43	7.20	15.2	0.708	2.81	0.613	4.40
RA1-3	--	28.17	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-4	--	13.0	44.6	--	0.67 U	0.500	61.7	0.931 U	0.0321 U	0.632 U	0.61 U	2.43	7.20	18.6	1.71	11.4	0.346 U	27.2
RA1-5	--	23.9	4.08	--	0.171 U	0.0339	48.5	0.688 U	0.398	0.677 U	0.706 U	2.43	7.20	47.6	1.42	14.3	0.743	19.2
RA1-6	--	12.4	4.62	--	0.0012371	0.072	28.7	0.978 U	0.0516	0.587 U	1.37	2.43	7.20	20.4	1.96	10.6	0.735	13.6
RA1-7	--	28.17	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-8	--	13.9	10.2	--	0.0346 U	0.620	254	0.706 U	0.0251 U	0.622 U	0.453 U	0.585 U	0.835 U	102	5.01	20.2	1.48	62.4
RA1-9	--	194	8.66	--	0.167 U	0.271	691	2.63	0.840	6.02	18.1	2.43	7.20	5770	82.5	267	15.7	310
RA1-10	--	80.3	10.4	--	0.00558	0.417	481	1.00	8.05	4.65	4.67	2.43	7.20	923	28.1	266	16.4	295
RA1-11	--	8.84	2.17	--	0.0335 U	0.0156	41.1	0.578 U	0.0383 U	0.488 U	0.473 U	2.43	7.20	61.5	1.08 U	2.94	0.454 U	2.80
RA1-12	--	11.9	3.08	--	0.210	19.0	7.28	0.528 U	0.0552 U	0.373 U	0.568 U	2.43	7.20	15.3	1.09	0.620	0.409 U	1.91
RA1-13	--	37.1	5.66	--	0.304	0.303	78.0	0.807 U	0.0958	0.45 U	1.02 U	2.43	7.20	111	1.12	20.3	1.73	24.0
RA1-14	--	11.3	5.15	--	0.863 U	0.648	70.9	0.53 U	0.0358 U	0.629 U	0.483 U	2.43	7.20	25.2	0.537	6.60	0.567 U	18.4
RA1-15	--	9.67	6.33	--	0.0338 U	0.138	21.7	0.871 U	0.0297 U	0.549 U	0.25 U	2.43	7.20	491	0.993 U	3.24	0.449 U	5.97
RA1-16	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-17	--	35.6	4.73	--	0.629	0.838	523	1.51	18.9	3.26	8.45	2.43	7.20	416	0.625 U	331	17.5	355
RA1-18	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-19	--	10.8	4.69	--	0.166 U	0.0993	108	0.67 U	0.0457 U	0.525 U	0.759 U	2.43	7.20	270	1.45	19.8	2.76	54.1
RA1-20	--	72.4	4.83	--	0.00462	8.16	185	0.148 U	0.0392 U	1.36	0.322 U	2.43	7.20	97.6	2.51	16.3	2.11	27.3
RA1-21	--	14.4	4.39	--	0.535	0.328	830	0.372 U	8.38	3.440	2.75	2.43	7.20	426	16.4	238	12.9	264
RA1-22	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-23	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-24	--	32.0	5.53	--	0.0263	0.0898	67.2	0.281 U	0.03 U	0.337 U	0.259 U	2.43	7.20	45.8	2.50	6.05	0.759	10.4
RA1-25	--	78.1	4.28	--	9.35	0.359	1280	1.35	9.11	7.70	10.3	3.11	1.99	266	67.3	326	19.4	371
RA1-26	--	29.4	4.47	--	5.26	1.62	823	1.18	9.56	3.86	6.07	2.43	7.20	340	35.2	259	14.0	274
RA1-27	--	15.3	137	--	0.332 U	0.272	44.1	0.449 U	0.0356 U	0.373 U	0.267 U	2.43	7.20	1530	0.436 U	5.66	0.470	13.7
RA1-28	--	21.1	4.75	--	0.00290	8.16	185	0.506 U	0.0759 U	1.36	0.329 U	2.43	7.20	300	2.06	16.3	2.11	28.2
RA1-29	--	28.17	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-30	--	35.1	5.62	--	0.34 U	2.71	300	0.643	2.14	1.84	2.19	1.74	12.4	152	30.9	101	7.11	127
RA1-31	--	10.7	14.8	--	0.00301	0.115	6.02	0.678 U	0.0228 U	0.51 U	0.254 U	2.43	7.20	20.9	0.529 U	0.768	0.207 U	1.71
RA1-32	--	26.2	6.83	--	0.033 U	4.88	54.4	0.26 U	0.0438 U	0.534	0.513 U	2.43	7.20	25.0	0.657	3.41	0.759	6.14
RA1-33	--	14.2	5.04	--	0.34 U	1.67 U	102	0.611 U	0.241	0.527 U	0.473 U	2.43	7.20	47.9	3.28	39.8	2.18	50.2
RA1-34	--	28.17	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-35	--	7.10	20.4	--	0.0331 U	2.95	772	0.276 U	0.048 U	6.29	0.407	2.43	7.20	260	1.59	79.0	5.67	110
RA1-36	--	16.7	9.40	--	0.00513	0.747	322	0.258 U	0.0294 U	0.784	1.02	2.43	7.20	325	2.91	88.4	4.42	118
RA1-37	--	14.3	5.61	--	0.345 U	4.97	34.8	0.661 U	0.0661	0.573 U	0.431 U	2.43	7.20	28.4	1.51	15.5	0.61	19.5
RA1-38	--	11.4	5.28	--	0.169 U	0.103	90.6	0.602 U	0.0653	0.445 U	0.323 U	2.43	7.20	112	0.811 U	24.6	1.47	31.4
RA1-39	--	11.5	10.5	--	0.00544	0.498	8.44	0.762 U	0.023 U	0.514 U	0.308 U	2.43	7.20	466	0.694 U	2.30	0.312 U	2.46
RA1-40	--	10.8	10.6	--	0.00562	0.291	244	0.422 U	0.643	0.509 U	0.461 U	2.43	7.20	856	1.67	32.5	1.51	54.2
RA1-41	--	35.7	35.3	--	0.0329 U	0.130	66.8	0.375 U	0.0347 U	0.486 U	0.305	2.43	7.20	21.6	1.62	28.9	1.64	33.4
RA1-42	--	11.7	26.6	--	0.193	0.332	227	0.636 U	0.0278 U	0.468 U	0.505 U	2.43	7.20	52.4	2.19	47.2	3.08	63.8
RA1-43	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-44	--	28.2	13.3	--	1.03	0.0504	238	0.595 U	0.0625 U	0.836 U	0.42 U	2.43	7.20	20.9	0.688	2.40	0.524	2.52
RA1-45	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5
RA1-46	--	28.2	13.3	--	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5

Table C1.48. Surface Soil Grid Concentration Assignment Results (Continued)

Grid Name	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Trichloroethene (mg/kg)	Total PAH (mg/kg)	Total PCB (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Strontium-90 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
Sector 2																		
RA2-1	7.85	18.5	--	--	--	--	59.9	--	--	1.15	--	--	--	--	--	31.6	1.37	34.7
RA2-2	10.1	53.5	--	--	--	--	10.8	--	--	0.402 U	--	--	--	--	--	3.91	0.364 U	5.33
RA2-3	1.84	5.96	--	--	--	--	4.7	--	--	0.711 U	--	--	--	--	--	2.35	0.316	2.37
RA2-4	6.40	20.0	--	--	--	--	92.7	--	--	0.465 U	--	--	--	--	--	10.5	1.21	17.6
RA2-5	6.40	20.0	--	--	--	--	92.7	--	--	1.15	--	--	--	--	--	52.3	6.36	53.0
RA2-6	5.89	12.4	--	--	--	--	910	--	--	0.364 U	--	--	--	--	--	512	28.4	554
RA2-7	12.5	17.2	--	--	--	--	9.9	--	--	0.735 U	--	--	--	--	--	5.93	0.490	7.87
RA2-8	3.49	14.6	--	--	--	--	3.22	--	--	0.829 U	--	--	--	--	--	2.73	0.392 U	4.84
RA2-9	10.5	19.3	--	--	--	--	1.58	--	--	0.469 U	--	--	--	--	--	0.848	0.432 U	0.493
RA2-10	6.40	20.0	--	--	--	--	92.7	--	--	1.15	--	--	--	--	--	52.3	6.36	53.0
RA2-11	6.40	20.0	--	--	--	--	92.7	--	--	1.15	--	--	--	--	--	52.3	6.36	53.0
RA2-12	4.72	17.9	--	--	--	--	1.28	--	--	0.756 U	--	--	--	--	--	1.22	0.557 U	1.24
RA2-13	5.53	37.5	--	--	--	--	1.58	--	--	0.504 U	--	--	--	--	--	0.871	0.514 U	0.667
RA2-14	6.40	20.0	--	--	--	--	92.7	--	--	1.15	--	--	--	--	--	52.3	6.36	53.0
RA2-15	6.40	20.0	--	--	--	--	92.7	--	--	1.15	--	--	--	--	--	52.3	6.36	53.0
RA2-16	4.47	13.9	--	--	--	--	11.6	--	--	0.833 U	--	--	--	--	--	2.97	0.526 U	4.46
RA2-17	3.52	9.54	--	--	--	--	5.08	--	--	0.707 U	--	--	--	--	--	0.728 U	0.435 U	2.46
Sector 3																		
RA3-1	3.77	10.5	--	0.000671	0.0360	--	--	--	--	--	--	--	--	--	--	--	0.457 U	9.11
RA3-2	5.73	17.4	--	0.000712	0.768	--	--	--	--	--	--	--	--	--	--	--	0.45 U	8.19
RA3-3	13.1	20.8	--	0.107 U	0.0313	--	--	--	--	--	--	--	--	--	--	--	1.57	38.60
RA3-4	6.01	17.7	--	3.01	0.317	--	--	--	--	--	--	--	--	--	--	--	0.348 U	5.22
RA3-5	5.47	15.7	--	0.000958 U	1.09	--	--	--	--	--	--	--	--	--	--	--	0.553 U	5.28
RA3-6	9.71	19.9	--	0.00436	0.0756	--	--	--	--	--	--	--	--	--	--	--	1.06	11.9
RA3-7	6.88	17.1	--	0.00119 U	0.0289	--	--	--	--	--	--	--	--	--	--	--	0.404 U	2.90
RA3-8	6.84	16.6	--	0.604	0.297	--	--	--	--	--	--	--	--	--	--	--	1.32	10.4
RA3-9	6.84	16.6	--	0.604	0.297	--	--	--	--	--	--	--	--	--	--	--	1.32	10.4
RA3-10	4.02	13.9	--	0.00515	0.0254	--	--	--	--	--	--	--	--	--	--	--	0.458 U	2.08
Sector 4																		
RA4-1	--	12.8	--	--	--	0.354	3.23	--	--	0.424 U	--	--	--	--	1.01	2.35	0.473 U	2.66
RA4-2	--	18.5	--	--	--	0.999	28.4	--	--	0.631 U	--	--	--	--	1.38	6.17	0.405	8.17
RA4-3	--	45.0	--	--	--	0.109	7.04	--	--	0.0467 U	--	--	--	--	1.97	1.75	0.283 U	2.63
RA4-4	--	14.1	--	--	--	0.0433	4.61	--	--	0.0323 U	--	--	--	--	1.25	1.29	0.434	1.73
RA4-5	--	44.1	--	--	--	0.213	238	--	--	0.219	--	--	--	--	1.85	25.5	4.32	4.37
RA4-6	--	28.1	--	--	--	0.140	20.3	--	--	0.437 U	--	--	--	--	2.60	6.82	0.434 U	11.4
RA4-7	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2
RA4-8	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2
RA4-9	--	13.9	--	--	--	0.00355 U	1.77	--	--	0.754 U	--	--	--	--	0.974 U	0.688 U	0.344 U	0.534
RA4-10	--	10.1	--	--	--	0.00392	5.78	--	--	8.10	--	--	--	--	77.8	227	16.1	330
RA4-11	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2
RA4-12	--	15.0	--	--	--	0.0390	1.01	--	--	0.812 U	--	--	--	--	0.59 U	2.37	0.376 U	2.17
RA4-13	--	21.8	--	--	--	0.00386 U	9.79	--	--	0.65 U	--	--	--	--	1.05	0.537	0.316 U	1.22
RA4-14	--	19.4	--	--	--	0.00382 U	1.11	--	--	0.601 U	--	--	--	--	0.822	0.587	0.227 U	0.535
RA4-15	--	20.6	--	--	--	0.0162	23.5	--	--	0.901 U	--	--	--	--	2.28	6.60	0.342	8.43
RA4-16	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2
RA4-17	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2
RA4-18	--	22.0	--	--	--	0.213	28.7	--	--	4.16	--	--	--	--	9.20	25.5	4.32	31.2

Table C1.48. Surface Soil Grid Concentration Assignment Results (Continued)

Grid Name	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Trichloroethene (mg/kg)	Total PAH (mg/kg)	Total PCB (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Strontium-90 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
Sector 4 RR																		
RA4-RR1	--	12.3	--	--	--	0.0398	11.4	--	--	0.768 U	--	--	--	--	0.973 U	2.30	0.404 U	2.37
RA4-RR2	--	8.05	--	--	--	0.0215	15.1	--	--	0.932	--	--	--	--	1.99	6.74	0.436	7.52
RA4-RR3	--	12.4	--	--	--	0.00408 U	0.732	--	--	0.697 U	--	--	--	--	1.28	1.10	0.413 U	0.926
RA4-RR4	--	12.7	--	--	--	0.0132	30.8	--	--	0.832 U	--	--	--	--	1.36	6.87	0.58 U	9.17
RA4-RR5	--	11.6	--	--	--	0.0411	4.15	--	--	0.405 U	--	--	--	--	1.74	1.44	0.222 U	2.25
RA4-RR6	--	33.0	--	--	--	0.0121	11.8	--	--	0.687 U	--	--	--	--	1.08	2.13	0.32 U	3.02
RA4-RR7	--	9.15	--	--	--	0.00351	18.9	--	--	0.659 U	--	--	--	--	2.33	4.35	0.238 U	6.39
RA4-RR8	--	40.7	--	--	--	0.00436	154	--	--	0.538 U	--	--	--	--	1.86	6.76	0.529 U	15.4
Sector 5																		
RA5-1	5.20	21.1	--	3.31	0.373	--	6.21	--	0.0568 U	0.569 U	--	--	--	--	2.08	1.62	0.303 U	2.62
RA5-2	4.0	12.2	--	0.000996 U	0.311	--	6.84	--	0.0411 U	0.928 U	--	--	--	--	1.52	2.14	0.488 U	3.14
RA5-3	5.09	18.0	--	0.00102 U	6.90	--	27.4	--	0.0916	0.615 U	--	--	--	--	1.61	10.8	0.860	19.6
RA5-4	5.19	13.8	--	0.00101 U	0.184	--	8.99	--	0.0539 U	0.433 U	--	--	--	--	1.40	4.32	0.336 U	7.75
RA5-5	4.27	13.3	--	0.000958 U	0.748	--	4.66	--	0.0765 U	0.993 U	--	--	--	--	0.679 U	7.87	0.47 U	7.03
RA5-6	4.84	15.8	--	0.00109 U	0.429	--	5.38	--	0.0325 U	0.576 U	--	--	--	--	1.64	1.72	0.287 U	2.34
RA5-7	4.3	16.3	--	0.00104 U	0.405	--	4.56	--	0.153	0.502 U	--	--	--	--	1.19	3.36	0.457 U	4.27
RA5-8	3.21	42.4	--	0.000927 U	0.322 U	--	89.8	--	0.213	0.545 U	--	--	--	--	2.76	14.2	1.31 U	21.8
RA5-9	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-10	5.33	12.6	--	0.00181 U	0.0193 U	--	7.77	--	8.09	3.54	--	--	--	--	54.0	2900	177	3000
RA5-11	3.88	24.4	--	0.00121 U	0.199 U	--	73.0	--	4.17	0.349 U	--	--	--	--	1.97	10.1	0.557 U	11.4
RA5-12	17.4	23.1	--	0.00117 U	0.0392 U	--	8.38	--	0.0478 U	0.646 U	--	--	--	--	1.13	1.85	0.476 U	1.59
RA5-13	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-14	3.65	12.5	--	23.6	0.0384 U	--	0.914	--	0.0286 U	0.373 U	--	--	--	--	0.537	0.793	0.21 U	0.453
RA5-15	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-16	2.96	4.8	--	0.00439	0.0355 U	--	3.18	--	0.0326 U	0.532 U	--	--	--	--	0.989 U	2.09	0.489 U	1.53
RA5-17	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-18	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-19	4.93 U	7.9	--	0.000554	0.0341 U	--	0.927	--	0.0628 U	0.707 U	--	--	--	--	0.929 U	0.579	0.213	0.552
RA5-20	20.00	27.9	--	0.916	0.0108 U	--	1.49	--	0.0403 U	0.238 U	--	--	--	--	1.04	1.00	0.32 U	1.10
RA5-21	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-22	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-23	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
RA5-24	5.66	20.4	--	0.000884 U	0.0345 U	--	1.06	--	0.035 U	0.571 U	--	--	--	--	0.727	1.84	0.467 U	1.23
RA5-25	6.33	17.9	--	5.57	1.34	--	15.7	--	2.54	3.54	--	--	--	--	5.51	185	59.4	193
Sector 5 RR																		
RA5-RR-1	3.62	18.6	--	0.000623	0.0456	--	1.95	--	0.0471 U	0.657 U	--	--	--	--	1.98	5.40	0.401	6.45
RA5-RR-2	5.11	27.9	--	0.000711	0.0228	--	13.4	--	0.0796 U	0.527 U	--	--	--	--	1.57	3.28	0.424	4.94
RA5-RR-3	7.41	15.4	--	0.00466	0.0231	--	56.7	--	0.0526 U	0.707 U	--	--	--	--	1.50	6.80	0.617	8.09
RA5-RR-4	5.40	12.8	--	0.0613	0.0396 U	--	0.940	--	0.0452 U	0.755 U	--	--	--	--	1.42	0.838	0.376 U	0.620
RA5-RR-5	7.15	13.8	--	0.0823	0.114	--	1.04	--	0.0372 U	0.725 U	--	--	--	--	0.849	1.59	0.399 U	1.25
RA5-RR-6	3.89	11.2	--	0.000372	0.00156	--	1.52	--	0.0544 U	0.872 U	--	--	--	--	1.37	9.03	0.774	15.1
RA5-RR-7	4.02	15.6	--	0.00115 U	0.396 U	--	6.49	--	0.0513 U	0.562 U	--	--	--	--	1.24	4.10	0.266 U	6.34
RA5-RR-8	7.62	10.2	--	0.00109 U	0.0408 U	--	21.5	--	0.0558 U	0.476 U	--	--	--	--	1.43	2.27	0.345	2.65
RA5-RR-9	4.17	10.5	--	0.000976 U	0.0494	--	0.816	--	0.0575 U	0.651 U	--	--	--	--	1.31	1.15	0.453 U	1.44
RA5-RR-10	7.01	16.3	--	0.00106 U	0.0386 U	--	0.968	--	0.0508 U	0.896 U	--	--	--	--	0.967	1.43	0.358 U	1.28

Table C1.48. Surface Soil Grid Concentration Assignment Results (Continued)

Grid Name	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Trichloroethene (mg/kg)	Total PAH (mg/kg)	Total PCB (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Strontium-90 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
Sector 6																		
RA6-1	7.71	14.2	5.51	--	0.0973	0.0177	161	1.88	0.451	0.705 U	7.51	--	--	14.4	41.9	84.4	5.26	91.9
RA6-2	6.18	17.2	6.51	--	0.275	0.00166	43.0	0.439 U	0.778	0.719 U	1.23	--	--	12.2	16.0	10.6	1.02	11.7
RA6-3	7.87	76.1	8.20	--	0.907	0.0111	21.7	0.539 U	1.20	0.568 U	0.471 U	--	--	25.8	7.58	6.86	0.406 U	6.69
RA6-4	9.43	17.4	7.53	--	0.173	0.0759 U	33.9	0.674 U	0.874	0.594	1.81	--	--	5.49	24.0	10.8	0.804	11.3
RA6-5	5.43	17.8	5.03	--	0.574	0.00367 U	12.6	0.571 U	0.238	0.609 U	0.36 U	--	--	173	2.71	7.81	0.5 U	9.43
RA6-6	4.81	14.3	6.01	--	0.0292	0.0353 U	19.9	0.372 U	0.288	1 U	0.611 U	--	--	7.01	4.53	4.51	0.505 U	5.15
RA6-7	5.19	14.1	6.66	--	0.852	0.0359 U	8.59	0.696 U	0.0508 U	0.852 U	0.608 U	--	--	3.46 U	0.956 U	3.20	0.323 U	2.11
RA6-8	6.40	18.2	104	--	0.0987	0.0371	12.3	0.381 U	0.339	0.713 U	0.558 U	--	--	59.00	2.95	3.19	0.622	4.99
RA6-9	4.34	32.6	5.62	--	4.92	0.0101	161	1.51	0.378	1.43	4.84	--	--	405	68.4	54.8	2.56	66.4
RA6-10	4.69	16.4	7.56	--	4.81	0.0179	72.8	0.407 U	0.364	0.658 U	0.443 U	--	--	4.68	3.93	15.1	0.619 U	18.8
RA6-11	2.65	13.3	1.57	--	0.0426	0.733	300	39.3	3.42	18.6	239	--	--	1610	10600	413	28.0	440
Sector 7																		
RA7-1	--	19.0	--	--	0.358 U	--	25.5	--	0.573	0.777 U	--	--	--	--	4.29	0.777	0.774	8.91
RA7-2	--	17.1	--	--	0.184 U	--	24.7	--	1.21	0.647 U	--	--	--	--	4.62	0.521 U	0.638	9.12
RA7-3	--	17.1	--	--	0.280	--	20.7	--	1.48	0.685 U	--	--	--	--	5.78	0.825	0.774	13.2
RA7-4	--	25.3	--	--	0.189 U	--	49.9	--	2.93	0.655 U	--	--	--	--	5.34	0.486 U	0.774	9.07
RA7-5	--	40.1	--	--	0.0126	--	5.75	--	0.105	0.511 U	--	--	--	--	1.71	0.587 U	0.355 U	2.77
RA7-6	--	16.6	--	--	0.550	--	2.33	--	0.195	0.408 U	--	--	--	--	2.03	0.305 U	0.349 U	3.79
RA7-7	--	24.2	--	--	0.154	--	20.8	--	0.176	0.489 U	--	--	--	--	3.03	0.376 U	0.563	8.35
RA7-8	--	14.1	--	--	3.36	--	22.8	--	1.46	0.687 U	--	--	--	--	7.82	0.24 U	0.63 U	10.1
RA7-9	--	9.08	--	--	0.0346 U	--	3.92	--	0.0292 U	1.03 U	--	--	--	--	0.705	0.801	0.296 U	1.10
RA7-10	--	20.8	--	--	1.25	--	22.7	--	0.921	6.50	--	--	--	--	15.8	0.801	0.774	9.19
RA7-11	--	20.8	--	--	1.25	--	22.7	--	0.921	6.50	--	--	--	--	15.8	0.801	0.774	9.19
RA7-12	--	24.8	--	--	0.692	--	83.9	--	1.86	6.50	--	--	--	--	152	0.801	1.12	33.6
RA7-13	--	21.8	--	--	1.57	--	8.92	--	0.0607	0.734 U	--	--	--	--	1.77	0.801	0.663 U	8.19
RA7-14	--	20.1	--	--	3.39	--	3.55	--	0.0810	0.337 U	--	--	--	--	1.09	0.801	0.459 U	2.06

Table C1.49. Surface and Subsurface Soil Grid Concentration Assignment Results

Grid Name	Antimony (mg/kg)	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Iron (mg/kg)	Manganese (mg/kg)	Total Dioxin/Furans (mg/kg)	Nickel (mg/kg)	Thallium (mg/kg)	Trichloroethene (mg/kg)	Total PCB (mg/kg)	Total PAH (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
Sector 1																							
RA1-1	--	3.57	12.4	8.81	8020	291	--	--	0.383 U	--	0.111	0.0342 U	43.1	19.6	0.0699	113	98.6	2.35	98.6	121	13.8	0.812	14.9
RA1-2	--	5.83	17.9	7.03	14700	1340	--	--	0.366 U	--	0.0186	0.0428 U	6.67	0.375 U	0.0389 U	0.419 U	0.293 U	2.35	15.2	1.49	2.81	0.613	4.40
RA1-3	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.988	3.907	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-4	--	7.63	18.4	44.6	21100	543	--	--	0.176	--	0.500	0.67 U	61.7	0.449 U	0.0321 U	0.482 U	0.57 U	2.35	18.6	1.71	11.4	0.269	27.2
RA1-5	--	11.6	23.9	12.7	24800	1060	--	--	0.252	--	0.0339	0.171 U	48.5	0.367 U	0.398	0.431 U	0.706 U	2.35	47.6	1.52	14.3	0.743	19.2
RA1-6	--	3.87	12.4	4.62	7600	264	--	--	0.408 U	--	0.0720	0.00124	28.7	0.978 U	0.0516	0.587 U	1.37	2.35	20.4	1.96	10.6	0.735	13.6
RA1-7	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.988	3.907	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-8	--	5.89	18.5	10.2	21900	586	--	--	0.153	--	0.620	0.0346 U	254	0.301 U	0.0251 U	0.383 U	0.453 U	0.585 U	102	5.01	20.2	1.48	62.4
RA1-9	--	3.88	194	8.66	8350	413	--	--	0.4 U	--	0.271	0.0395 U	691	2.63	0.840	6.02	18.1	2.35	5770	82.5	267	15.7	310
RA1-10	--	9.35	80.3	10.4	25900	614	--	--	0.172	--	0.417	0.00558	481	1.00	8.05	4.65	4.67	2.35	923	28.1	266	16.4	295
RA1-11	--	12.4	30.3	17.3	26800	2100	--	--	0.223	--	0.0156	0.0335 U	41.1	0.486 U	0.0383 U	0.445 U	0.473 U	2.35	61.5	1.13	2.94	0.454 U	2.80
RA1-12	--	4.07	27.5	9.32	22300	453	--	--	0.374 U	--	19.0	0.210	7.28	0.337 U	0.0389 U	0.292 U	0.568 U	2.35	15.3	1.74	2.22	0.550	2.42
RA1-13	--	7.34	37.1	8.03	20900	453	--	--	0.373 U	--	0.303	0.304	78.0	0.577 U	0.0958	0.45 U	0.394 U	2.35	111	2.29	20.3	1.73	24.0
RA1-14	--	8.62	19.0	13.5	23200	808	--	--	0.160	--	0.648	0.105 U	70.9	0.53 U	0.0358 U	0.314 U	0.242 U	2.35	25.2	1.90	6.60	0.456 U	18.4
RA1-15	--	5.83	18.2	6.89	19100	398	--	--	0.168	--	0.138	0.0338 U	21.7	0.556 U	0.0297 U	0.549 U	0.25 U	2.35	491	1.60	3.24	0.449 U	5.97
RA1-16	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.663	1.03	224	3.988	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-17	--	3.63	35.6	4.73	12900	390	--	--	0.37 U	--	0.838	0.629	523	1.51	18.9	3.26	8.45	2.35	416	0.625 U	331	17.5	355
RA1-18	--	18.1	73.8	6.52	37800	438	--	--	0.268	--	0.00414 U	0.0405 U	1.72	0.787 U	0.0422 U	0.684 U	0.58 U	2.35	7.81	1.71	0.838 U	0.512 U	0.935
RA1-19	--	11.8	23.8	8.88	28000	492	--	--	0.189	--	0.0993	0.166 U	108	0.45 U	0.0457 U	0.407 U	0.363 U	2.35	270	1.45	19.8	2.76	54.1
RA1-20	--	9.76	72.4	4.83	10900	595	--	--	0.365 U	--	8.16	0.00462	185	0.148 U	0.0392 U	1.36	0.322 U	2.35	97.6	2.51	16.3	2.11	27.3
RA1-21	--	3.34	14.4	4.39	7410	414	--	--	0.393 U	--	0.328	0.535	830	0.372 U	8.38	3.44	2.75	2.35	426	16.4	238	12.9	264
RA1-22	--	7.29	26.2	7.30	29500	498	--	--	0.213	--	0.0117	0.0379 U	53.5	0.452 U	0.0601 U	0.493 U	0.399 U	2.35	1390	1.13	3.14	0.523 U	3.87
RA1-23	--	6.14	19.4	8.11	17600	367	--	--	0.407 U	--	0.00354 U	0.0348 U	1.2	0.416 U	0.0318 U	0.534 U	0.193 U	2.35	14.6	1.10	0.971	0.395 U	0.965
RA1-24	--	6.69	32.0	5.53	17800	460	--	--	0.391 U	--	0.0898	0.0263	67.2	0.281 U	0.03 U	0.337 U	0.259 U	2.35	45.8	2.5	6.05	0.759	10.4
RA1-25	--	3.8	78.1	4.28	9850	425	--	--	0.387 U	--	0.359	9.35	1280	1.35	9.11	7.70	10.3	3.11	266	67.3	326	19.4	371
RA1-26	--	3.9	29.4	125	16100	3010	--	--	0.520	--	1.62	5.26	823	1.18	9.56	5.09	6.07	2.35	340	35.2	259	14.5	274
RA1-27	--	6.38	15.3	137	15400	622	--	--	0.366 U	--	0.272	0.332 U	44.1	0.366 U	0.0356 U	0.359 U	0.267 U	2.35	1530	0.436 U	5.66	0.470	13.7
RA1-28	--	5.21	21.1	4.75	9980	595	--	--	0.384 U	--	8.16	0.00290	185	0.506 U	0.0759 U	1.36	0.329 U	2.35	300.00	2.06	16.3	2.11	28.2
RA1-29	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-30	--	5.45	35.1	7.51	16900	393	--	--	0.39 U	--	2.71	0.042 U	300	0.643	2.14	2.97	2.19	1.74	152	30.9	101	7.11	127
RA1-31	--	5.42	19.2	14.8	15000	459	--	--	0.396 U	--	0.115	0.00301	6.02	0.678 U	0.0228 U	0.51 U	0.254 U	2.35	20.9	1.41	0.768	0.207 U	1.71
RA1-32	--	11.5	45.0	20.3	30200	1280	--	--	0.234	--	4.88	0.033 U	54.4	0.26 U	0.0374 U	0.534	0.383 U	2.21	25	2.76	3.41	0.759	6.14
RA1-33	--	3.40	18.3	5.04	12100	235	--	--	0.401 U	--	0.0035 U	0.0347 U	102	0.36 U	0.241	0.378 U	0.473 U	2.35	47.9	3.28	39.8	2.18	50.2
RA1-34	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	0.0233	0.0425 U	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-35	--	4.65	16.9	20.4	15400	274	--	--	0.38 U	--	2.95	0.0331 U	772	0.276 U	0.0352 U	6.29	0.407	2.35	260	1.59	79.0	5.67	110
RA1-36	--	8.17	107	9.4	31900	494	--	--	0.164	--	0.747	0.00513	322	0.258 U	0.0294 U	0.784	1.02	2.35	325	2.91	88.4	4.42	118
RA1-37	--	5.28	27.3	9.06	22400	442	--	--	0.199	--	4.97	0.04 U	34.8	0.344 U	0.0661	0.398 U	0.248 U	2.35	28.4	1.51	15.5	0.610	19.5
RA1-38	--	5.55	18.1	5.73	12900	324	--	--	0.403 U	--	0.103	0.0399 U	90.6	0.346 U	0.0653	0.445 U	0.323 U	2.35	112	1.11	24.6	1.47	31.4
RA1-39	--	3.78	15.3	10.5	13800	346	--	--	0.404 U	--	0.498	0.00544	8.44	0.521 U	0.023 U	0.514 U	0.308 U	2.35	466	1.36	2.30	0.312 U	2.46
RA1-40	--	4.37	10.9	10.6	11600	415	--	--	0.372 U	--	0.291	0.00562	377	0.422 U	0.643	0.488 U	0.461 U	2.35	856	1.67	42.1	5.09	139
RA1-41	--	7.36	35.7	35.3	34300	588	--	--	0.375 U	--	0.1296	0.0329 U	66.8	0.252 U	0.0347 U	0.486 U	0.305	2.35	21.6	1.62	28.9	1.64	33.4
RA1-42	--	5.03	18.5	26.6	19400	459	--	--	0.373 U	--	0.332	0.193	227	0.636 U	0.0278 U	0.387 U	0.349 U	2.35	52.4	2.19	47.2	3.08	63.8
RA1-43	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-44	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	0.0504	1.03	224	0.595 U	0.0625 U	0.836 U	0.42 U	2.35	20.9	0.688	2.40	0.524	2.52
RA1-45	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
RA1-46	--	6.65	35.6	17.8	18752	631	--	--	0.221	--	1.66	1.03	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5
Sector 2																							
RA2-1	--	9.89	56.9	--	27500	713	--	41.1	--	--	--	--	281	--	--	1.15	--	--	--	--	38.2	2.45	50.6
RA2-2	--	10.1	53.5	--	24200	1050	--	25.5	--	--	--	--	10.8	--	--	0.402 U	--	--	--	--	3.91	0.244 U	5.33
RA2-3	--	1.84	5.96	--	2720	82.4	--	5.92	--	--	--	--	4.68	--	--	0.711 U	--	--	--	--	2.35	0.316	2.37
RA2-4	--	6.83	26.1	--	19410	547	--	134	--	--	--	--	106.0	--	--	0.465 U	--	--	--	--	10.5	1.21	17.6
RA2-5	--	5.72	24.3	--	30300	292	--	12.4	--	--	--	--	10.2	--	--	0.575 U	--	--	--	--	24.5	1.56	37.2
RA2-6	--	6.90	19.8	--	17200	299	--	1430	--	--	--	--	910	--	--	0.364 U	--	--	--	--	512	28.4	554
RA2-7	--	12.50	17.2	--	18200	1350	--	25.5	--	--	--	--	30.7	--	--	0.49 U	--	--	--	--	8.06	0.675	11.7
RA2-8	--	6.29	15.7	--	18100	418	--	14.9	--	--	--	--	3.22	--	--	0.511 U	--	--	--	--	2.73	0.392 U	4.84
RA2-9	--	10.5	19.3	--	21200	845	--	22.5	--	--	--	--	1.58	--	--	0.469 U	--	--	--	--	1.01	0.412 U	1.45
RA2-10	--	6.83	26.1	--	19410	547	--	134	--	--	--	--	106.0	--	--	1.15	--	--	--	--	50.7	5.77	53.4
RA2-11	--	6.83	26.1	--	19410	547	--	134	--	--	--	--	106.0	--	--	1.15	--	--	--	--	50.7	5.77	53.4
RA2-12	--	4.72	17.9	--	16300	353	--	6.13	--	--	--	--	1.28	--	--	0.756 U	--	--	--	--	1.22	0.557 U	1.24
RA2-13	--	5.53	37.5	--	26800	416	--	12.4	--	--	--	--	1.58	--	--	0.504 U	--	--	--	--	0.871	0.514 U	0.667
RA2-14	--	6.83	26.1	--	19410	547	--	134	--	--	--	--	106.0	--	--	1.15	--	--	--	--	50.7	5.77	53.4

Grid Name	Antimony (mg/kg)	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Iron (mg/kg)	Manganese (mg/kg)	Total Dioxin/Furans (mg/kg)	Nickel (mg/kg)	Thallium (mg/kg)	Trichloroethene (mg/kg)	Total PCB (mg/kg)	Total PAH (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
RA2-15	--	6.83	26.1	--	19410	547	--	134	--	--	--	--	106.0	--	--	1.15	--	--	--	--	50.7	5.77	53.4
RA2-16	--	4.47	13.9	--	14800	326	--	9.76	--	--	--	--	11.6	--	--	0.833 U	--	--	--	--	2.97	0.405 U	4.46
RA2-17	--	3.52	30.7	--	15600	421	--	5.69	--	--	--	--	5.08	--	--	0.707 U	--	--	--	--	0.655 U	0.435 U	2.46
Sector 3																							
RA3-1	--	7.95	17.3	4.30	--	336	--	--	0.184	0.000671	--	--	3.58	--	--	--	--	--	--	--	--	--	9.11
RA3-2	--	5.73	17.4	6.36	--	434	--	--	0.170	0.00178	--	--	29.7	--	--	--	--	--	--	--	--	--	8.19
RA3-3	--	13.1	20.8	22.3	--	1020	--	--	0.254	0.00108 U	--	--	10.7	--	--	--	--	--	--	--	--	--	38.6
RA3-4	--	6.01	20.2	6.77	--	428	--	--	0.182	3.01	--	--	7.43	--	--	--	--	--	--	--	--	--	5.22
RA3-5	--	7.49	17.4	12.9	--	1070	--	--	0.209	0.000958 U	--	--	9.93	--	--	--	--	--	--	--	--	--	5.28
RA3-6	--	9.71	24.6	8.99	--	597	--	--	0.269	0.0478	--	--	12.4	--	--	--	--	--	--	--	--	--	11.9
RA3-7	--	6.88	19.1	25.1	--	1330	--	--	0.215	0.00119 U	--	--	9.69	--	--	--	--	--	--	--	--	--	2.90
RA3-8	--	8.82	18.4	6.77	--	605	--	--	0.204	0.073	--	--	0.931	--	--	--	--	--	--	--	--	--	1.08
RA3-9	--	8.26	19.8	13.4	--	992	--	--	0.232	0.523	--	--	9.73	--	--	--	--	--	--	--	--	--	9.37
RA3-10	--	8.69	22.6	27.1	--	3110	--	--	0.400	0.00515	--	--	3.20	--	--	--	--	--	--	--	--	--	2.08
Sector 4																							
RA4-1	--	7.20	22.4	--	27900	639	--	--	--	0.224	--	0.0556	3.23	--	0.0396 U	0.346 U	0.341 U	--	--	1.23	2.35	0.362 U	2.66
RA4-2	--	4.38	18.5	--	16500	255	--	--	--	0.456	--	0.569	28.4	--	0.168	0.581 U	0.283 U	--	--	1.38	6.17	0.405	8.17
RA4-3	--	11.0	117	--	27700	2440	--	--	--	0.290	--	0.208	1000	--	0.0752	0.0309 U	0.0545 U	--	--	1.97	1.75	0.283 U	2.63
RA4-4	--	7.82	24.4	--	27300	3050	--	--	--	1.73	--	0.0507	8.95	--	0.0250	0.0309 U	0.0549 U	--	--	1.43	2.54	0.434	3.04
RA4-5	--	22.9	44.1	--	55100	2670	--	--	--	113	--	0.038 U	340	--	0.101	0.219	0.249	--	--	1.85	25.8	4.32	4.37
RA4-6	--	7.18	28.1	--	24300	593	--	--	--	0.00184	--	0.0249	20.3	--	0.106	0.371 U	0.238 U	--	--	2.60	6.82	0.434 U	11.4
RA4-7	--	8.51	30.2	--	23358	1043	--	--	--	0.93 U	--	0.0382 U	111	--	0.526	4.16	9.97	--	--	7.44	25.8	4.32	29.0
RA4-8	--	8.51	30.2	--	23358	1043	--	--	--	0.0853	--	0.0982	111	--	0.526	4.16	9.97	--	--	7.44	25.8	4.32	29.0
RA4-9	--	4.22	15.9	--	13100	332	--	--	--	0.0108	--	0.0355 U	1.77	--	0.0321 U	0.553 U	0.506 U	--	--	1.14	0.67 U	0.344 U	0.534
RA4-10	--	7.46	10.1	--	9260	234	--	--	--	0.00918	--	0.0332 U	5.78	--	2.82	8.10	19.7	--	--	77.8	227	16.1	330
RA4-11	--	8.51	30.2	--	23358	1043	--	--	--	8.32	--	0.177	111	--	0.526	4.16	9.97	--	--	7.44	25.8	4.32	29.0
RA4-12	--	8.43	22.1	--	29600	384	--	--	--	0.00129	--	0.177	1.20	--	0.0327 U	0.78 U	0.496 U	--	--	1.34	2.37	0.376 U	2.17
RA4-13	--	12.2	21.8	--	20400	705	--	--	--	0.00111 U	--	0.0388 U	9.79	--	0.04 U	0.575 U	0.51 U	--	--	1.23	1.42	0.316 U	1.40
RA4-14	--	7.39	19.4	--	18200	691	--	--	--	0.00111	--	0.039 U	1.22	--	0.0496 U	0.587 U	0.317 U	--	--	1.28	0.606	0.227 U	1.81
RA4-15	--	6.71	32.3	--	21500	1260	--	--	--	0.953	--	0.367	23.5	--	0.388	0.741 U	0.4 U	--	--	2.28	6.60	0.342	8.43
RA4-16	--	8.51	30.2	--	23358	1043	--	--	--	0.158	--	0.0422	111	--	0.526	4.16	9.97	--	--	7.44	25.8	4.32	29.0
RA4-17	--	8.51	30.2	--	23358	1043	--	--	--	8.32	--	0.177	111	--	0.526	4.16	9.97	--	--	7.44	25.8	4.32	29.0
RA4-18	--	3.69	16.4	--	12800	309	--	--	--	0.00463	--	0.0395 U	0.567	--	0.0728 U	1.41 U	0.385 U	--	--	1.22	1.04 U	0.471 U	0.902
Sector 4 RR																							
RA4-RR1	--	4.29	15.4	--	13500	412	8.51E-06	--	--	0.0141	--	0.286	11.4	--	0.0655 U	0.555 U	0.38 U	--	--	1.52	2.30	0.368 U	2.37
RA4-RR2	--	10.4	18.3	--	23900	449	8.74E-06	--	--	0.0274	--	0.00170	15.1	--	0.0705 U	0.932	1.88	--	--	1.99	6.74	0.436	7.52
RA4-RR3	--	4.58	12.4	--	11500	339	5.12E-06	--	--	0.00376	--	0.0407 U	6.81	--	0.0868	2.090	3.00	--	--	2.24	1.63	0.364 U	3.51
RA4-RR4	--	3.82	15.1	--	16500	560	5.71E-06	--	--	0.000935	--	0.0406 U	30.8	--	0.0389 U	0.465 U	0.559 U	--	--	1.36	6.87	0.494 U	9.17
RA4-RR5	--	8.32	14.0	--	16600	214	4.75E-06	--	--	0.0316	--	3.55	4.15	--	0.0443 U	0.405 U	0.327 U	--	--	1.74	1.44	0.222 U	2.25
RA4-RR6	--	6.55	33.0	--	20900	337	5.39E-05	--	--	0.00260	--	0.0201	11.8	--	0.0362 U	0.582 U	0.526 U	--	--	1.08	2.13	0.32 U	3.02
RA4-RR7	--	12.1	15.4	--	24900	619	4.70E-05	--	--	0.0244	--	0.0630	18.9	--	0.0402 U	0.481 U	0.527 U	--	--	2.33	4.35	0.610	6.39
RA4-RR8	--	6.08	40.7	--	21900	686	5.01E-06	--	--	0.000468	--	0.0389 U	154	--	0.0393 U	0.471 U	0.47 U	--	--	1.86	6.76	0.266 U	15.4
Sector 5																							
RA5-1	--	5.20	45.0	15.5	21400	928	--	--	--	3.31	--	0.373	6.21	--	0.0568 U	0.51 U	--	--	--	2.08	1.62	0.241 U	2.62
RA5-2	--	3.95	12.3	7.82	11600	508	--	--	--	0.000996 U	--	0.311	6.84	--	0.0373 U	0.828 U	--	--	--	1.52	2.14	0.488 U	3.14
RA5-3	--	5.09	18.4	8.49	17500	452	--	--	--	0.00102 U	--	6.90	27.4	--	0.0916	0.609 U	--	--	--	1.61	10.8	0.860	19.6
RA5-4	--	6.03	20.7	5.67	24300	306	--	--	--	0.00101 U	--	0.184	8.99	--	0.0322 U	0.433 U	--	--	--	1.40	4.32	0.336 U	7.75
RA5-5	--	5.29	14.9	7.36	16500	698	--	--	--	0.000958 U	--	0.748	4.66	--	0.0413 U	0.797 U	--	--	--	0.840	7.87	0.402 U	7.03
RA5-6	--	16.9	37.1	25.3	27700	721	--	--	--	0.000802	--	0.429	5.38	--	0.0303 U	0.455 U	--	--	--	1.64	1.72	0.287 U	2.34
RA5-7	--	4.89	16.9	6.39	16700	465	--	--	--	0.00104 U	--	0.405	4.56	--	0.153	0.502 U	--	--	--	1.43	3.36	0.353 U	4.27
RA5-8	--	7.71	42.4	11.7	21900	548	--	--	--	0.000927 U	--	0.0412 U	89.8	--	0.213	0.497 U	--	--	--	2.76	14.2	0.54 U	21.8
RA5-9	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-10	--	5.33	12.6	5.77	8990	583	--	--	--	0.00166 U	--	0.0193 U	7.77	--	8.09	3.54	--	--	--	54.0	2900	177	3000
RA5-11	--	5.87	24.4	4.10	17800	196	--	--	--	0.00121 U	--	0.0126 U	73.0	--	4.17	0.349 U	--	--	--	1.97	10.1	0.525 U	11.4
RA5-12	--	17.4	23.1	18.0	33400	2650	--	--	--	0.00101 U	--	0.0392 U	8.38	--	0.0478 U	0.646 U	--	--	--	1.13	1.85	0.476 U	1.59
RA5-13	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-14	--	9.93	14.1	12.2	20800	911	--	--	--	144	--	0.0384 U	0.940	--	0.0286 U	0.373 U	--	--	--	1.29	0.793	0.21 U	1.11
RA5-15	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-16	--	4.74	33.9	3.13	21500	298	--	--	--	0.00439	--	0.0355 U	3.18	--	0.0326 U	0.532 U	--	--	--	0.738	2.09	0.39 U	1.53
RA5-17	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-18	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-19	--	5.14	18.0	5.56	14800	362	--	--	--	0.000554	--	0.0341 U	0.927	--	0.0517 U	0.591 U	--	--	--	0.993	0.579	0.213	1.35

Table C1.49. Surface and Subsurface Soil Grid Concentration Assignment Results (Continued)

Grid Name	Antimony (mg/kg)	Arsenic (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Iron (mg/kg)	Manganese (mg/kg)	Total Dioxin/Furans (mg/kg)	Nickel (mg/kg)	Thallium (mg/kg)	Trichloroethene (mg/kg)	Total PCB (mg/kg)	Total PAH (mg/kg)	Uranium (mg/kg)	Americium-241 (pCi/g)	Cesium-137 (pCi/g)	Neptunium-237 (pCi/g)	Plutonium-239/240 (pCi/g)	Radium-226 (pCi/g)	Technetium-99 (pCi/g)	Thorium-230 (pCi/g)	Uranium-233/234 (pCi/g)	Uranium-235/236 (pCi/g)	Uranium-238 (pCi/g)
RA5-20	--	20.0	27.9	10.3	34500	793	--	--	--	1.27	--	0.0108 U	1.49	--	0.0403 U	0.238 U	--	--	--	1.04	1.00	0.214 U	1.10
RA5-21	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-22	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-23	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
RA5-24	--	9.49	20.4	11.1	24300	1370	--	--	--	0.000884 U	--	0.0345 U	1.25	--	0.035 U	0.499 U	--	--	--	0.727	1.84	0.199	1.23
RA5-25	--	8.31	23.9	9.90	20856	737	--	--	--	24.8	--	1.34	15.7	--	2.54	3.54	--	--	--	4.70	185	44.6	193
Sector 5 RR																							
RA5-RR-1	--	4.53	18.6	8.70	17100	286	--	--	--	0.000623	--	0.0456	1.99	--	0.0348 U	0.588 U	--	--	--	2.44	5.40	0.401	6.45
RA5-RR-2	--	5.11	51.4	9.58	29200	533	--	--	--	0.00253	--	1.61	13.4	--	0.0464 U	0.463 U	--	--	--	1.75	3.28	0.424	4.94
RA5-RR-3	--	7.41	22.6	8.33	22100	593	--	--	--	0.00466	--	0.0231	56.7	--	0.0395 U	0.616 U	--	--	--	1.50	6.80	0.617	8.09
RA5-RR-4	--	5.40	17.3	16.8	18700	723	--	--	--	0.554	--	0.0382 U	0.971	--	0.042 U	0.373 U	--	--	--	1.42	0.929	0.336 U	0.771
RA5-RR-5	--	7.15	18.0	9.12	19600	1230	--	--	--	1.71	--	0.114	1.04	--	0.0372 U	0.645 U	--	--	--	1.17	1.59	0.420	1.25
RA5-RR-6	--	9.36	15.6	6.13	18100	587	--	--	--	0.000372	--	0.00156	1.52	--	0.039 U	0.5 U	--	--	--	1.63	9.03	0.774	15.1
RA5-RR-7	--	6.03	15.7	8.16	20200	1460	--	--	--	0.00111 U	--	0.0411 U	6.49	--	0.0445 U	0.499 U	--	--	--	1.38	4.10	0.266 U	6.34
RA5-RR-8	--	9.21	18.4	14.0	21200	1810	--	--	--	0.000525	--	0.0327	21.5	--	0.0558 U	0.476 U	--	--	--	1.48	2.27	0.345	2.65
RA5-RR-9	--	7.00	16.2	6.57	18600	976	--	--	--	0.000976 U	--	0.0494	1.11	--	0.0435 U	0.649 U	--	--	--	1.31	1.19	0.345 U	1.54
RA5-RR-10	--	7.67	18.0	8.88	21800	2860	--	--	--	0.00107	--	0.0230	1.06	--	0.0437 U	0.565 U	--	--	--	1.35	1.43	0.358 U	1.28
Sector 6																							
RA6-1	1.69	7.71	14.2	5.51	14900	579	--	--	0.389 U	--	--	0.0973	161	1.88	0.451	0.705 U	7.51	--	20.1	41.9	84.4	5.26	91.9
RA6-2	2.07 U	7.62	27.3	14.2	25500	855	--	--	0.219	--	--	0.275	43.0	0.439 U	0.778	0.454 U	1.23	--	12.2	16.0	10.6	1.02	11.7
RA6-3	1.60	7.87	76.1	16.9	26100	1690	--	--	0.412 U	--	--	0.907	21.7	0.499 U	1.20	0.469 U	0.321 U	--	25.8	7.58	6.86	0.283 U	6.69
RA6-4	2.52	9.43	17.4	7.53	16500	486	--	--	0.215	--	--	0.173	33.9	0.629 U	0.874	0.6	1.81	--	5.49	24.0	10.8	0.804	11.3
RA6-5	2.08	6.53	18.0	8.27	18600	705	--	--	0.184	--	--	0.574	12.6	0.452 U	0.238	0.609 U	0.36 U	--	173	2.71	7.81	0.5 U	9.43
RA6-6	1.82	5.71	14.3	8.12	13300	743	--	--	0.152	--	--	0.029	19.9	0.372 U	0.288	1 U	0.606 U	--	7.01	4.53	4.51	0.441 U	5.15
RA6-7	1.48	6.44	15.6	6.66	16700	317	--	--	0.188	--	--	0.852	8.59	0.3 U	0.0378 U	0.852 U	0.608 U	--	4.87	0.821	3.20	0.323 U	2.11
RA6-8	1.24	6.40	18.2	104	19100	3840	--	--	1.01	--	--	0.0987	12.3	0.381 U	0.339	0.437 U	0.526 U	--	59.0	2.95	3.19	0.622	4.99
RA6-9	3.93	6.62	41.2	10.9	24500	348	--	--	0.422 U	--	--	4.92	161	1.51	0.378	1.4	4.84	--	405	68.4	54.8	2.56	66.4
RA6-10	63.5	11.0	16.4	11.1	18100	535	--	--	0.330	--	--	4.81	79.1	0.0100	0.364	0.012 U	0.00630	--	10.8	3.93	22.8	1.36	24.4
RA6-11	0.36	22.4	13.3	7.30	29500	272	--	--	0.140	--	--	0.0426	300	39.3	3.42	19	239	--	1610	10600	413	28.0	440
Sector 7																							
RA7-1	--	6.58	19.0	7.31	--	808	--	--	--	--	--	0.193 U	25.5	--	0.573	0.777 U	--	--	--	4.29	--	--	8.91
RA7-2	--	5.95	27.9	7.09	--	595	--	--	--	--	--	0.00299	24.7	--	3.03	0.873	--	--	--	4.62	--	--	17.8
RA7-3	--	6.42	22.8	7.19	--	336	--	--	--	--	--	0.280	20.7	--	1.480	0.499 U	--	--	--	13.0	--	--	13.2
RA7-4	--	8.89	25.3	6.12	--	566	--	--	--	--	--	0.038 U	49.9	--	2.93	0.655 U	--	--	--	5.34	--	--	9.07
RA7-5	--	7.62	40.1	9.50	--	381	--	--	--	--	--	0.0227	7.27	--	0.105	0.511 U	--	--	--	3.02	--	--	2.77
RA7-6	--	5.50	19.7	7.17	--	435	--	--	--	--	--	0.550	2.33	--	0.195	0.408 U	--	--	--	2.03	--	--	3.79
RA7-7	--	9.00	24.2	9.63	--	581	--	--	--	--	--	0.154	20.8	--	0.176	0.456 U	--	--	--	3.03	--	--	8.35
RA7-8	--	8.65	27.2	6.74	--	348	--	--	--	--	--	3.36	22.8	--	1.46	0.475 U	--	--	--	7.82	--	--	10.1
RA7-9	--	3.24	9.08	1.88	--	116	--	--	--	--	--	0.0346 U	3.920	--	0.0292 U	1.03 U	--	--	--	0.705	--	--	1.10
RA7-10	--	7.19	24.7	8.27	--	555	--	--	--	--	--	1.11	22.1	--	1.09	3.69	--	--	--	15.4	--	--	9.65
RA7-11	--	7.00	21.5	8.02	--	258	--	--	--	--	--	0.204 U	12.9	--	0.0459 U	0.606 U	--	--	--	0.852	--	--	6.55
RA7-12	--	7.01	24.8	14.2	--	433	--	--	--	--	--	0.692	83.9	--	1.86	6.50	--	--	--	152	--	--	33.6
RA7-13	--	8.14	21.8	8.89	--	776	--	--	--	--	--	1.57	8.92	--	0.0607	0.734 U	--	--	--	1.77	--	--	8.19
RA7-14	--	9.52	37.4	13.8	--	1580	--	--	--	--	--	3.39	3.55	--	0.0810	0.337 U	--	--	--	1.09	--	--	2.06

Table C1.50. Sector 1 Surface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 1	Surface Soil (0 to 1 ft bgs)	Chromium	34 / 34	100%	46 / 46	100%	mg/kg	194	54.34	95% Chebyshev (Mean, Sd) UCL	54.34	UCL	47.43	95% Chebyshev (Mean, Sd) UCL	47.43	UCL
		Cobalt	34 / 34	100%	46 / 46	100%	mg/kg	137	31.01	95% Chebyshev (Mean, Sd) UCL	31.01	UCL	26.33	95% Chebyshev (Mean, Sd) UCL	26.33	UCL
		Total PAH	16 / 33	48%	29 / 46	48%	mg/kg	9.35	2.539	97.5% KM (Chebyshev) UCL	2.539	UCL	2.109	97.5% KM (Chebyshev) UCL	2.109	UCL
		Total PCB	34 / 35	97%	45 / 46	97%	mg/kg	19	4.356	95% KM (Chebyshev) UCL	4.356	UCL	3.788	95% KM (Chebyshev) UCL	3.788	UCL
		Uranium	34 / 34	100%	46 / 46	100%	mg/kg	1280	358.5	95% Adjusted Gamma UCL	358.5	UCL	408.6	95% Chebyshev (Mean, Sd) UCL	408.6	UCL
		Americium-241	7 / 35	20%	18 / 46	20%	pCi/g	19.6	0.776	95% KM H-UCL	0.776	UCL	3.719	95% KM (Chebyshev) UCL	3.719	UCL
		Cesium-137	15 / 35	43%	26 / 46	43%	pCi/g	18.9	3.956	95% Adjusted Gamma UCL	3.956	UCL	4.613	95% KM (Chebyshev) UCL	4.613	UCL
		Neptunium-237	13 / 35	37%	24 / 46	37%	pCi/g	113	4.062	95% KM H-UCL	4.062	UCL	17.24	95% KM (Chebyshev) UCL	17.24	UCL
		Plutonium-239/240	12 / 35	34%	23 / 46	34%	pCi/g	98.6	17.27	95% Adjusted Gamma UCL	17.27	UCL	16.32	95% KM (Chebyshev) UCL	16.32	UCL
		Radium-226	2 / 3	67%	45 / 46	67%	pCi/g	3.11	--	--	3.11	Maximum	2.544	95% KM H-UCL	2.544	UCL
		Strontium-90	2 / 3	67%	45 / 46	67%	pCi/g	12.4	--	--	12.4	Maximum	8.006	95% KM H-UCL	8.006	UCL
		Technetium-99	35 / 35	100%	46 / 46	100%	pCi/g	5770	794.1	95% H-UCL	794.1	UCL	945.9	95% Chebyshev (Mean, Sd) UCL	945.9	UCL
		Thorium-230	28 / 35	80%	39 / 46	80%	pCi/g	121	31.82	95% KM (Chebyshev) UCL	31.82	UCL	27.74	95% Chebyshev (Mean, Sd) UCL	27.74	UCL
		Uranium-233/234	35 / 35	100%	46 / 46	100%	pCi/g	331	142.3	95% Chebyshev (Mean, Sd) UCL	142.3	UCL	123.9	95% Chebyshev (Mean, Sd) UCL	123.9	UCL
		Uranium-235/236	28 / 35	80%	39 / 46	80%	pCi/g	19.4	9.023	95% KM H-UCL	9.023	UCL	7.506	95% KM (Chebyshev) UCL	7.506	UCL
		Uranium-238	35 / 35	100%	46 / 46	100%	pCi/g	371	124.4	95% Adjusted Gamma UCL	124.4	UCL	111	95% Adjusted Gamma UCL	111	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 1.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentrations

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.51. Sector 1 Surface and Subsurface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 1	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	37 / 37	100%	46 / 46	100%	mg/kg	18.1	7.569	95% Adjusted Gamma UCL	7.569	UCL	7.377	95% Modified-t UCL	7.377	UCL
		Chromium	37 / 37	100%	46 / 46	100%	mg/kg	194	60.67	95% Chebyshev (Mean, Sd) UCL	60.67	UCL	55.72	95% Chebyshev (Mean, Sd) UCL	55.72	UCL
		Cobalt	37 / 37	100%	46 / 46	100%	mg/kg	137	38.43	95% Chebyshev (Mean, Sd) UCL	38.43	UCL	34.35	95% Chebyshev (Mean, Sd) UCL	34.35	UCL
		Iron	37 / 37	100%	46 / 46	100%	mg/kg	37800	20959	95% Student's-t UCL	20959	UCL	20513	95% Student's-t UCL	20513	UCL
		Manganese	37 / 37	100%	46 / 46	100%	mg/kg	3010	1016	95% Chebyshev (Mean, Sd) UCL	1016	UCL	755.9	95% Modified-t UCL	755.9	UCL
		Thallium	14 / 37	38%	23 / 46	50%	mg/kg	0.52	0.226	95% KM Adjusted Gamma UCL	0.226	UCL	0.229	95% KM (BCA) UCL	0.229	UCL
		Total PCB	36 / 39	92%	43 / 46	93%	mg/kg	19	4.001	95% KM (Chebyshev) UCL	4.001	UCL	3.64	95% KM (Chebyshev) UCL	3.64	UCL
		Total PAH	16 / 38	42%	24 / 46	52%	mg/kg	9.35	2.21	97.5% KM (Chebyshev) UCL	2.21	UCL	2.005	97.5% KM (Chebyshev) UCL	2.005	UCL
		Uranium	37 / 37	100%	46 / 46	100%	mg/kg	1280	341.3	95% Adjusted Gamma UCL	341.3	UCL	312.1	95% Adjusted Gamma UCL	312.1	UCL
		Americium-241	7 / 38	18%	15 / 46	33%	pCi/g	19.6	0.661	95% KM H-UCL	0.661	UCL	3.448	95% KM (Chebyshev) UCL	3.448	UCL
		Cesium-137	15 / 38	39%	23 / 46	50%	pCi/g	18.9	3.635	95% Gamma Adjusted KM-UCL	3.635	UCL	4.372	95% KM (Chebyshev) UCL	4.372	UCL
		Neptunium-237	13 / 38	34%	21 / 46	46%	pCi/g	113	3.681	95% KM H-UCL	3.681	UCL	10.2	95% KM H-UCL	10.2	UCL
		Plutonium-239/240	12 / 38	32%	20 / 46	43%	pCi/g	98.6	15.8	95% Adjusted Gamma UCL	15.8	UCL	15.49	95% KM (Chebyshev) UCL	15.49	UCL
		Radium-226	3 / 4	75%	45 / 46	98%	pCi/g	3.11	--	--	3.11	Maximum	2.465	95% KM H-UCL	2.465	UCL
		Technetium-99	38 / 38	100%	46 / 46	100%	pCi/g	5770	1083	95% Chebyshev (Mean, Sd) UCL	1083	UCL	962.6	95% Chebyshev (Mean, Sd) UCL	962.6	UCL
		Thorium-230	36 / 38	95%	44 / 46	96%	pCi/g	121	29.65	95% KM (Chebyshev) UCL	29.65	UCL	26.56	95% KM (Chebyshev) UCL	26.56	UCL
		Uranium-233/234	37 / 38	97%	45 / 46	98%	pCi/g	331	132.5	95% KM (Chebyshev) UCL	132.5	UCL	93.5	95% Gamma Adjusted KM-UCL	93.5	UCL
		Uranium-235/236	30 / 38	79%	38 / 46	83%	pCi/g	19.4	7.952	95% KM H-UCL	7.952	UCL	5.733	95% Gamma Adjusted KM-UCL	5.733	UCL
		Uranium-238	38 / 38	100%	46 / 46	100%	pCi/g	371	154.6	95% Chebyshev (Mean, Sd) UCL	154.6	UCL	109.3	95% Adjusted Gamma UCL	109.3	UCL

Notes:
COPCs were identified based on surface and subsurface soil from 0 to 16 ft bgs for Sector 1.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentrations

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.52. Sector 2 Surface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avg)	Percent Detected (without avg)	Detection Frequency (with avg)	Percent Detected (with avg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 2	Surface Soil (0 to 1 ft bgs)	Arsenic	11 / 11	100%	17 / 17	100%	mg/kg	12.5	8.254	95% Student's-t UCL	8.254	UCL	7.536	95% Student's-t UCL	7.536	UCL
		Chromium	11 / 11	100%	17 / 17	100%	mg/kg	53.5	30.55	95% Adjusted Gamma UCL	30.55	UCL	24.84	95% Modified-t UCL	24.84	UCL
		Uranium	11 / 11	100%	17 / 17	100%	mg/kg	910	907.5	99% Chebyshev (Mean, Sd) UCL	908	UCL	610.8	99% Chebyshev (Mean, Sd) UCL	611	UCL
		Neptunium-237	1 / 12	8%	6 / 17	35%	pCi/g	1.15	--	--	1.15	Maximum	--	only one distinct data value	1.15	Maximum
		Uranium-233/234	11 / 12	92%	16 / 17	94%	pCi/g	512	470.2	99% KM (Chebyshev) UCL	470.2	UCL	342.8	99% KM (Chebyshev) UCL	342.8	UCL
		Uranium-235/236	5 / 12	42%	10 / 17	59%	pCi/g	28.4	27.61	99% KM (Chebyshev) UCL	27.61	UCL	10.41	Gamma Adjusted KM-UCL	10.41	UCL
		Uranium-238	12 / 12	100%	17 / 17	100%	pCi/g	554	507	99% Chebyshev (Mean, Sd) UCL	507	UCL	369	99% Chebyshev (Mean, Sd) UCL	369	UCL

Notes:
COPCs were identified based on soil from 0 to 1 ft bgs for Sector 2.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.53. Sector 2 Surface and Subsurface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avg)	Percent Detected (without avg)	Detection Frequency (with avg)	Percent Detected (with avg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 2	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	12 / 12	100%	17 / 17	100%	mg/kg	12.5	8.506	95% Student's-t UCL	8.506	UCL	7.966	95% Student's-t UCL	7.966	UCL
		Chromium	12 / 12	100%	17 / 17	100%	mg/kg	56.9	34.25	95% Adjusted Gamma UCL	34.25	UCL	33.32	95% Adjusted Gamma UCL	33.32	UCL
		Iron	12 / 12	100%	17 / 17	100%	mg/kg	30300	23229	95% Student's-t UCL	23229	UCL	21996	95% Student's-t UCL	21996	UCL
		Manganese	12 / 12	100%	17 / 17	100%	mg/kg	1350	738.1	95% Student's-t UCL	738.1	UCL	725.2	95% Adjusted Gamma UCL	725.2	UCL
		Nickel	12 / 12	100%	17 / 17	100%	mg/kg	1430	647.9	95% Chebyshev (Mean, Sd) UCL	648	UCL	951	99% Chebyshev (Mean, Sd) UCL	951	UCL
		Uranium	12 / 12	100%	17 / 17	100%	mg/kg	910	867.7	99% Chebyshev (Mean, Sd) UCL	867.7	UCL	258.3	95% Adjusted Gamma UCL	258.3	UCL
		Neptunium-237	1 / 13	8%	5 / 17	29%	pCi/g	1.15	--	--	1.15	Maximum	--	only one distinct data value	1.15	Maximum
		Uranium-233/234	12 / 13	92%	16 / 17	94%	pCi/g	512	435.1	99% KM (Chebyshev) UCL	435.1	UCL	341.4	99% KM (Chebyshev) UCL	341.4	UCL
		Uranium-235/236	6 / 13	46%	10 / 17	59%	pCi/g	28.4	25.23	99% KM (Chebyshev) UCL	25.23	UCL	10.43	Gamma Adjusted KM-UCL	10.43	UCL
		Uranium-238	13 / 13	100%	17 / 17	100%	pCi/g	554	470.6	99% Chebyshev (Mean, Sd) UCL	470.6	UCL	369.4	99% Chebyshev (Mean, Sd) UCL	369.4	UCL

Notes:
COPCs were identified based on surface and subsurface soil from 0 to 16 ft bgs for Sector 2.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.54. Sector 3 Surface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 3	Surface Soil (0 to 1 ft bgs)	Arsenic	8 / 8	100%	10 / 10	100%	mg/kg	13.1	--	--	13.1	Maximum	8.437	95% Student's-t UCL	8.437	UCL
		Chromium	8 / 8	100%	10 / 10	100%	mg/kg	20.8	--	--	20.8	Maximum	18.31	95% Student's-t UCL	18.31	UCL
		Total PAH	8 / 8	100%	10 / 10	100%	mg/kg	1.09	--	--	1.09	Maximum	0.813	95% Adjusted Gamma UCL	0.813	UCL
		Trichloroethene	5 / 8	63%	7 / 10	70%	mg/kg	3.01	--	--	3.01	Maximum	2.811	95% Gamma Adjusted KM-UCL	2.811	UCL
		Uranium-235/236	2 / 8	25%	4 / 10	40%	pCi/g	1.57	--	--	1.57	Maximum	1.061	95% KM (t) UCL	1.061	UCL
		Uranium-238	8 / 8	100%	10 / 10	100%	pCi/g	38.6	--	--	38.6	Maximum	19.54	95% Adjusted Gamma UCL	19.54	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 3.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.55. Sector 3 Surface and Subsurface EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 3	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	9 / 9	100%	10 / 10	100%	mg/kg	13.1	--	--	13.1	Maximum	9.488	95% Student's-t UCL	9.488	UCL
		Chromium	9 / 9	100%	10 / 10	100%	mg/kg	24.6	--	--	24.6	Maximum	21.15	95% Student's-t UCL	21.15	UCL
		Cobalt	9 / 9	100%	10 / 10	100%	mg/kg	27.1	--	--	27.1	Maximum	18.3	95% Student's-t UCL	18.3	UCL
		Manganese	9 / 9	100%	10 / 10	100%	mg/kg	3110	--	--	3110	Maximum	1674	95% Adjusted Gamma UCL	1674	UCL
		Thallium	9 / 9	100%	10 / 10	100%	mg/kg	0.4	--	--	0.4	Maximum	0.271	95% Student's-t UCL	0.271	UCL
		Trichloroethene	6 / 9	67%	7 / 10	70%	mg/kg	3.01	--	--	3.01	Maximum	3.18	95% KM Bootstrap t UCL	3.18	UCL
		Uranium	9 / 9	100%	10 / 10	100%	mg/kg	29.7	--	--	29.7	Maximum	18.39	95% Adjusted Gamma UCL	18.39	UCL
		Uranium-238	9 / 9	100%	10 / 10	100%	pCi/g	38.6	--	--	38.6	Maximum	19.84	95% Adjusted Gamma UCL	19.84	UCL

Notes:
COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 3.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.56. Sector 4 Surface Soil Non-Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 4	Surface Soil (0 to 1 ft bgs)	Chromium	12 / 12	100%	18 / 18	100%	mg/kg	45	29.92	95% Adjusted Gamma UCL	29.92	UCL	26.2	95% H-UCL	26.2	UCL
		Total PCB	8 / 11	73%	15 / 18	83%	mg/kg	0.999	0.91	95% KM Bootstrap t UCL	0.91	UCL	0.417	95% KM (Chebyshev) UCL	0.417	UCL
		Uranium	12 / 12	100%	18 / 18	100%	mg/kg	238	84.92	95% Student's-t UCL	84.92	UCL	83.72	95% Chebyshev (Mean, Sd) UCL	83.72	UCL
		Neptunium-237	2 / 12	17%	8 / 18	44%	pCi/g	8.1	--	--	8.1	Maximum	4.55	95% KM (Chebyshev) UCL	4.55	UCL
		Thorium-230	10 / 12	83%	16 / 18	89%	pCi/g	77.8	35.79	95% KM (Chebyshev) UCL	35.79	UCL	26.56	95% KM (Chebyshev) UCL	26.56	UCL
		Uranium-233/234	10 / 11	91%	17 / 18	94%	pCi/g	227	151.2	97.5% KM (Chebyshev) UCL	151.2	UCL	146	99% KM (Chebyshev) UCL	146	UCL
		Uranium-235/236	4 / 11	36%	11 / 18	61%	pCi/g	16.1	11.61	97.5% KM (Chebyshev) UCL	11.61	UCL	6.801	95% KM (Chebyshev) UCL	6.801	UCL
		Uranium-238	12 / 12	100%	18 / 18	100%	pCi/g	330	301.7	99% Chebyshev (Mean, Sd) UCL	301.7	UCL	208.8	99% Chebyshev (Mean, Sd) UCL	208.8	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 4.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.57. Sector 4 Surface Soil Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 4 Rail Road	Surface Soil (0 to 1 ft bgs)	Chromium	8 / 8	100%	8 / 8	100%	mg/kg	40.7	--	--	40.7	Maximum	--	--	40.7	Maximum
		Total PCB	7 / 8	88%	7 / 8	88%	mg/kg	0.0411	--	--	0.0411	Maximum	--	--	0.0411	Maximum
		Uranium	8 / 8	100%	8 / 8	100%	mg/kg	154	--	--	154	Maximum	--	--	154	Maximum
		Neptunium-237	1 / 8	13%	1 / 8	13%	pCi/g	0.932	--	--	0.932	Maximum	--	--	0.932	Maximum
		Thorium-230	7 / 8	88%	7 / 8	88%	pCi/g	2.33	--	--	2.33	Maximum	--	--	2.33	Maximum
		Uranium-233/234	8 / 8	100%	8 / 8	100%	pCi/g	6.87	--	--	6.87	Maximum	--	--	6.87	Maximum
		Uranium-235/236	1 / 8	13%	1 / 8	13%	pCi/g	0.436	--	--	0.436	Maximum	--	--	0.436	Maximum
		Uranium-238	8 / 8	100%	8 / 8	100%	pCi/g	15.4	--	--	15.4	Maximum	--	--	15.4	Maximum

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 4.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.58. Sector 4 Surface and Subsurface Soil Non-Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 4	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	13 / 13	100%	18 / 18	100%	mg/kg	22.9	11.52	95% Adjusted Gamma UCL	11.52	UCL	10.31	95% Modified-t UCL	10.31	UCL
		Chromium	13 / 13	100%	18 / 18	100%	mg/kg	117	45.28	95% Adjusted Gamma UCL	45.28	UCL	53.86	95% Chebyshev (Mean, Sd) UCL	53.86	UCL
		Iron	13 / 13	100%	18 / 18	100%	mg/kg	55100	29073	95% Student's-t UCL	29073	UCL	28009	95% Adjusted Gamma UCL	28009	UCL
		Manganese	13 / 13	100%	18 / 18	100%	mg/kg	3050	2120	95% H-UCL	2120	UCL	1501	95% Adjusted Gamma UCL	1501	UCL
		Total PAH	8 / 15	53%	11 / 18	61%	mg/kg	0.568934	0.181	95% KM (t) UCL	0.181	UCL	0.179	95% KM (t) UCL	0.179	UCL
		Trichloroethene	14 / 16	88%	16 / 18	89%	mg/kg	112.5	77.42	99% KM (Chebyshev) UCL	77.42	UCL	51.87	95% Gamma Adjusted KM-UCL	51.87	UCL
		Uranium	13 / 13	100%	18 / 18	100%	mg/kg	1000	890.5	99% Chebyshev (Mean, Sd) UCL	890.5	UCL	267.8	95% Adjusted Gamma UCL	267.8	UCL
		Cesium-137	7 / 13	54%	12 / 18	67%	pCi/g	2.82	1.809	95% Gamma Adjusted KM-UCL	1.809	UCL	0.946	95% Gamma Adjusted KM-UCL	0.946	UCL
		Neptunium-237	2 / 13	15%	7 / 18	39%	pCi/g	8.1	--	--	8.1	Maximum	4.316	95% KM (Chebyshev) UCL	4.316	UCL
		Plutonium-239/240	2 / 13	15%	7 / 18	39%	pCi/g	19.7	--	--	19.7	Maximum	10.38	95% KM (Chebyshev) UCL	10.38	UCL
		Thorium-230	13 / 13	100%	18 / 18	100%	pCi/g	77.8	33.01	95% Chebyshev (Mean, Sd) UCL	33.01	UCL	25.69	95% Chebyshev (Mean, Sd) UCL	25.69	UCL
		Uranium-233/234	10 / 12	83%	16 / 18	89%	pCi/g	227	139.3	97.5% KM (Chebyshev) UCL	139.3	UCL	145.6	99% KM (Chebyshev) UCL	145.6	UCL
		Uranium-235/236	4 / 12	33%	10 / 18	56%	pCi/g	16.1	10.71	97.5% KM (Chebyshev) UCL	10.71	UCL	6.617	95% KM (Chebyshev) UCL	6.617	UCL
		Uranium-238	13 / 13	100%	18 / 18	100%	pCi/g	330	278.8	99% Chebyshev (Mean, Sd) UCL	278.8	UCL	207.3	99% Chebyshev (Mean, Sd) UCL	207.3	UCL

Notes:

COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 4.

Maximum detected concentration

The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:

- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:

mg/kg = milligram(s) per kilogram

"--" = value not calculated

ft bgs = feet below ground surface

pCi/g = picoCurie per gram

Table C1.59. Sector 4 Surface and Subsurface Soil Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 4 Rail Road	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	8 / 8	100%	8 / 8	100%	mg/kg	12.1	--	--	12.1	Maximum	--	--	12.1	Maximum
		Chromium	8 / 8	100%	8 / 8	100%	mg/kg	40.7	--	--	40.7	Maximum	--	--	40.7	Maximum
		Iron	8 / 8	100%	8 / 8	100%	mg/kg	24900	--	--	24900	Maximum	--	--	24900	Maximum
		Manganese	8 / 8	100%	8 / 8	100%	mg/kg	686	--	--	686	Maximum	--	--	686	Maximum
		Total Dioxin/Furans	8 / 8	100%	8 / 8	100%	mg/kg	5.39E-05	--	--	5.39E-05	Maximum	--	--	5.39E-05	Maximum
		Total PAH	5 / 8	63%	5 / 8	63%	mg/kg	3.55266	--	--	3.55266	Maximum	--	--	3.55266	Maximum
		Trichloroethene	8 / 8	100%	8 / 8	100%	mg/kg	0.0316	--	--	0.0316	Maximum	--	--	0.0316	Maximum
		Uranium	8 / 8	100%	8 / 8	100%	mg/kg	154	--	--	154	Maximum	--	--	154	Maximum
		Cesium-137	1 / 8	13%	1 / 8	13%	pCi/g	0.0868	--	--	0.0868	Maximum	--	--	0.0868	Maximum
		Neptunium-237	2 / 8	25%	2 / 8	25%	pCi/g	2.09	--	--	2.09	Maximum	--	--	2.09	Maximum
		Plutonium-239/240	2 / 8	25%	2 / 8	25%	pCi/g	3	--	--	3	Maximum	--	--	3	Maximum
		Thorium-230	8 / 8	100%	8 / 8	100%	pCi/g	2.33	--	--	2.33	Maximum	--	--	2.33	Maximum
		Uranium-233/234	8 / 8	100%	8 / 8	100%	pCi/g	6.87	--	--	6.87	Maximum	--	--	6.87	Maximum
		Uranium-235/236	2 / 8	25%	2 / 8	25%	pCi/g	0.61	--	--	0.61	Maximum	--	--	0.61	Maximum
		Uranium-238	8 / 8	100%	8 / 8	100%	pCi/g	15.4	--	--	15.4	Maximum	--	--	15.4	Maximum

Notes:
COPCs were identified based on surface and subsurface soil from 0 to 16 ft bgs for Sector 4.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.60. Sector 5 Surface Soil Non-Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 5	Surface Soil (0 to 1 ft bgs)	Arsenic	15 / 16	94%	24 / 25	96%	mg/kg	20	11.61	95% KM (Chebyshev) UCL	12	UCL	7.654	95% KM (BCA) UCL	7.654	UCL
		Chromium	16 / 16	100%	25 / 25	100%	mg/kg	42.4	21.81	95% Student's-t UCL	22	UCL	20.39	95% Modified-t UCL	20.39	UCL
		Total PAH	7 / 16	44%	16 / 25	64%	mg/kg	6.90	2.527	95% KM (Chebyshev) UCL	2.5	UCL	2.086	95% KM (Chebyshev) UCL	2.086	UCL
		Trichloroethene	5 / 16	31%	14 / 25	56%	mg/kg	23.6	13.01	95% Gamma Adjusted KM-UCL	13	UCL	13.27	99% KM (Chebyshev) UCL	13.27	UCL
		Uranium	16 / 16	100%	25 / 25	100%	mg/kg	89.8	44.63	95% Chebyshev (Mean, Sd) UCL	45	UCL	33.48	95% H-UCL	33.48	UCL
		Cesium-137	5 / 16	31%	14 / 25	56%	pCi/g	8.09	1.856	95% KM (t) UCL	1.9	UCL	3.149	95% KM (Chebyshev) UCL	3.149	UCL
		Neptunium-237	1 / 16	6%	10 / 25	40%	pCi/g	3.54	--	--	3.5	Maximum	--	--	3.54	Maximum
		Thorium-230	13 / 16	81%	22 / 25	88%	pCi/g	54	19.07	95% KM (Chebyshev) UCL	19.1	UCL	14.04	95% KM (Chebyshev) UCL	14.04	UCL
		Uranium-233/234	16 / 16	100%	25 / 25	100%	pCi/g	2900	1986	99% Chebyshev (Mean, Sd) UCL	1986	UCL	900.1	97.5% Chebyshev (Mean, Sd) UCL	900.1	UCL
		Uranium-235/236	3 / 16	19%	12 / 25	48%	pCi/g	177	--	--	177	Maximum	82.45	97.5% KM (Chebyshev) UCL	82.45	UCL
		Uranium-238	16 / 16	100%	25 / 25	100%	pCi/g	3000	2055	99% Chebyshev (Mean, Sd) UCL	2055	UCL	932.1	97.5% Chebyshev (Mean, Sd) UCL	932.1	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 5.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.61. Sector 5 Surface Soil Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 5 Rail Road	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	10 / 10	100%	10 / 10	100%	mg/kg	9.36	7.836	95% Student's-t UCL	7.836	UCL	7.836	95% Student's-t UCL	7.836	UCL
		Chromium	10 / 10	100%	10 / 10	100%	mg/kg	51.4	27.98	95% Modified-t UCL	27.98	UCL	27.98	95% Modified-t UCL	27.98	UCL
		Cobalt	10 / 10	100%	10 / 10	100%	mg/kg	16.8	12.12	95% Adjusted Gamma UCL	12.12	UCL	12.12	95% Adjusted Gamma UCL	12.12	UCL
		Iron	10 / 10	100%	10 / 10	100%	mg/kg	29200	22642	95% Student's-t UCL	22642	UCL	22642	95% Student's-t UCL	22642	UCL
		Manganese	10 / 10	100%	10 / 10	100%	mg/kg	2860	1555	95% Student's-t UCL	1555	UCL	1555	95% Student's-t UCL	1555	UCL
		Total PAH	8 / 10	80%	8 / 10	80%	mg/kg	1.61	1.193	97.5% KM (Chebyshev) UCL	1.193	UCL	1.193	97.5% KM (Chebyshev) UCL	1.193	UCL
		Trichloroethene	8 / 10	80%	8 / 10	80%	mg/kg	1.71	0.08764	95% KM Bootstrap t UCL	0.08764	UCL	0.08764	95% KM Bootstrap t UCL	0.08764	UCL
		Uranium	10 / 10	100%	10 / 10	100%	mg/kg	56.7	34.85	95% Chebyshev (Mean, Sd) UCL	34.85	UCL	34.85	95% Chebyshev (Mean, Sd) UCL	34.85	UCL
		Cesium-137	0 / 10	0%	0 / 10	0%	pCi/g	--	--	--	--	Not Detected	--	--	--	Not Detected
		Neptunium-237	0 / 10	0%	0 / 10	0%	pCi/g	--	--	--	--	Not Detected	--	--	--	Not Detected
		Thorium-230	10 / 10	100%	10 / 10	100%	pCi/g	2.44	1.749	95% Student's-t UCL	1.749	UCL	1.749	95% Student's-t UCL	1.749	UCL
		Uranium-233/234	10 / 10	100%	10 / 10	100%	pCi/g	9.03	5.181	95% Student's-t UCL	5.181	UCL	5.181	95% Student's-t UCL	5.181	UCL
		Uranium-235/236	6 / 10	60%	6 / 10	60%	pCi/g	0.774	0.509	95% KM (t) UCL	0.509	UCL	0.509	95% KM (t) UCL	0.509	UCL
		Uranium-238	10 / 10	100%	10 / 10	100%	pCi/g	15.1	7.423	95% Student's-t UCL	7.423	UCL	7.423	95% Student's-t UCL	7.423	UCL

Notes:
COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 5.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.62. Sector 5 Surface and Subsurface Soil Non-Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 5	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	16 / 16	100%	25 / 25	100%	mg/kg	20	13.94	95% Chebyshev (Mean, Sd) UCL	14	UCL	9.755	95% Modified-t UCL	9.755	UCL
		Chromium	16 / 16	100%	25 / 25	100%	mg/kg	45	28.48	95% Student's-t UCL	28	UCL	27.09	95% H-UCL	27.09	UCL
		Cobalt	16 / 16	100%	25 / 25	100%	mg/kg	25.3	12.44	95% Student's-t UCL	12	UCL	11.83	95% H-UCL	11.83	UCL
		Iron	16 / 16	100%	25 / 25	100%	mg/kg	34500	23925	95% Student's-t UCL	23925	UCL	22770	95% Modified-t UCL	22770	UCL
		Manganese	16 / 16	100%	25 / 25	100%	mg/kg	2650	1039	95% Adjusted Gamma UCL	1039	UCL	1143	95% Chebyshev (Mean, Sd) UCL	1143	UCL
		Total PAH	7 / 16	44%	16 / 25	64%	mg/kg	6.9	2.524	95% KM (Chebyshev) UCL	2.5	UCL	2.085	95% KM (Chebyshev) UCL	2.085	UCL
		Trichloroethene	6 / 16	38%	15 / 25	60%	mg/kg	144	87.69	95% Gamma Adjusted KM-UCL	88	UCL	74.2	99% KM (Chebyshev) UCL	74.2	UCL
		Uranium	16 / 16	100%	25 / 25	100%	mg/kg	89.8	44.64	95% Chebyshev (Mean, Sd) UCL	45	UCL	32.82	95% H-UCL	32.82	UCL
		Cesium-137	5 / 16	31%	14 / 25	56%	pCi/g	8.09	1.856	95% KM (t) UCL	1.9	UCL	3.149	95% KM (Chebyshev) UCL	3.149	UCL
		Neptunium-237	1 / 16	6%	10 / 25	40%	pCi/g	3.54	--	--	3.5	Maximum	--	--	3.54	Maximum
		Thorium-230	16 / 16	100%	25 / 25	100%	pCi/g	54	19.04	95% Chebyshev (Mean, Sd) UCL	19	UCL	13.77	95% Chebyshev (Mean, Sd) UCL	13.77	UCL
		Uranium-233/234	16 / 16	100%	25 / 25	100%	pCi/g	2900	1986	99% Chebyshev (Mean, Sd) UCL	1986	UCL	900.1	97.5% Chebyshev (Mean, Sd) UCL	900.1	UCL
		Uranium-235/236	4 / 16	25%	13 / 25	52%	pCi/g	177	108.7	95% Gamma Adjusted KM-UCL	109	UCL	72.38	97.5% KM (Chebyshev) UCL	72.38	UCL
		Uranium-238	16 / 16	100%	25 / 25	100%	pCi/g	3000	2055	99% Chebyshev (Mean, Sd) UCL	2055	UCL	932.1	97.5% Chebyshev (Mean, Sd) UCL	932.1	UCL

Notes:
COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 5.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
• Fewer than 10 samples
• Fewer than 4 detections
• < 2 distinct concentration
The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.63. Sector 5 Surface and Subsurface Soil Railroad Grids EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 5 Rail Road	Surface Soil (0 to 1 ft bgs)	Arsenic	10 / 10	100%	10 / 10	100%	mg/kg	7.62	6.474	95% Student's-t UCL	6.474	UCL	6.474	95% Student's-t UCL	6.474	UCL
		Chromium	10 / 10	100%	10 / 10	100%	mg/kg	27.9	18.25	95% Student's-t UCL	18.25	UCL	18.25	95% Student's-t UCL	18.25	UCL
		Total PAH	6 / 10	60%	6 / 10	60%	mg/kg	0.114	0.0562	95% KM (t) UCL	0.0562	UCL	0.0562	95% KM (t) UCL	0.0562	UCL
		Trichloroethene	6 / 10	60%	6 / 10	60%	mg/kg	0.0823	0.0825	95% Gamma Adjusted KM-UCL	0.0823	Maximum	0.0825	95% Gamma Adjusted KM-UCL	0.0825	UCL
		Uranium	10 / 10	100%	10 / 10	100%	mg/kg	56.7	66.02	99% Chebyshev (Mean, Sd) UCL	56.7	Maximum	66.02	99% Chebyshev (Mean, Sd) UCL	66.02	UCL
		Cesium-137	0 / 10	0%	0 / 10	0%	pCi/g	--	--	--	--	Not Detected	--	--	--	Not Detected
		Neptunium-237	0 / 10	0%	0 / 10	0%	pCi/g	--	--	--	--	Not Detected	--	--	--	Not Detected
		Thorium-230	10 / 10	100%	10 / 10	100%	pCi/g	1.98	1.546	95% Student's-t UCL	1.546	UCL	1.546	95% Student's-t UCL	1.546	UCL
		Uranium-233/234	10 / 10	100%	10 / 10	100%	pCi/g	9.03	5.176	95% Student's-t UCL	5.176	UCL	5.176	95% Student's-t UCL	5.176	UCL
		Uranium-235/236	5 / 10	50%	5 / 10	50%	pCi/g	0.774	0.514	95% KM (t) UCL	0.514	UCL	0.514	95% KM (t) UCL	0.514	UCL
		Uranium-238	10 / 10	100%	10 / 10	100%	pCi/g	15.1	7.411	95% Student's-t UCL	7.411	UCL	7.411	95% Student's-t UCL	7.411	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 5.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
"--" = value not calculated
ft bgs = feet below ground surface
mg/kg = milligram(s) per kilogram
pCi/g = picoCurie per gram

Table C1.64. Sector 6 Surface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics [1]						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration [2]	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 6	Surface Soil (0 to 1 ft bgs)	Arsenic	11 / 11	100%	11 / 11	100%	mg/kg	22.4	10.97	95% Adjusted Gamma UCL	10.97	UCL	10.97	95% Adjusted Gamma UCL	10.97	UCL
		Chromium	11 / 11	100%	11 / 11	100%	mg/kg	76.1	53.23	95% Chebyshev (Mean, Sd) UCL	53.23	UCL	53.23	95% Chebyshev (Mean, Sd) UCL	53.23	UCL
		Cobalt	11 / 11	100%	11 / 11	100%	mg/kg	104	54.07	95% Chebyshev (Mean, Sd) UCL	54.07	UCL	54.07	95% Chebyshev (Mean, Sd) UCL	54.07	UCL
		Total PAH	11 / 11	100%	11 / 11	100%	mg/kg	4.92426	3.435	95% Adjusted Gamma UCL	3.435	UCL	3.435	95% Adjusted Gamma UCL	3.435	UCL
		Total PCB	7 / 11	64%	7 / 11	64%	mg/kg	0.733	0.5	97.5% Chebyshev (Mean, Sd) UCL	0.5	UCL	0.5	97.5% Chebyshev (Mean, Sd) UCL	0.5	UCL
		Uranium	11 / 11	100%	11 / 11	100%	mg/kg	300	175.3	95% Adjusted Gamma UCL	175.3	UCL	175.3	95% Adjusted Gamma UCL	175.3	UCL
		Americium-241	3 / 11	27%	3 / 11	27%	pCi/g	39.3	--	--	39.3	Maximum	--	--	39.3	Maximum
		Cesium-137	10 / 11	91%	10 / 11	91%	pCi/g	3.42	1.941	95% KM Adjusted Gamma UCL	1.941	UCL	1.941	95% KM Adjusted Gamma UCL	1.941	UCL
		Neptunium-237	3 / 11	27%	3 / 11	27%	pCi/g	18.6	--	--	18.6	Maximum	--	--	18.6	Maximum
		Plutonium-239/240	5 / 11	45%	5 / 11	45%	pCi/g	239	252.2	99% KM (Chebyshev) UCL	239	Maximum	252.2	99% KM (Chebyshev) UCL	239	Maximum
		Technetium-99	10 / 11	91%	10 / 11	91%	pCi/g	1610	1276	95% Gamma Adjusted KM-UCL	1276	UCL	1276	95% Gamma Adjusted KM-UCL	1276	UCL
		Thorium-230	10 / 11	91%	10 / 11	91%	pCi/g	10600	10600	99% KM (Chebyshev) UCL	10600	UCL	10600	99% KM (Chebyshev) UCL	10600	UCL
		Uranium-233/234	11 / 11	100%	11 / 11	100%	pCi/g	413	419.6	99% Chebyshev (Mean, Sd) UCL	413	Maximum	419.6	99% Chebyshev (Mean, Sd) UCL	413	Maximum
		Uranium-235/236	6 / 11	55%	6 / 11	55%	pCi/g	28	21.83	95% Gamma Adjusted KM-UCL	21.83	UCL	21.83	95% Gamma Adjusted KM-UCL	21.83	UCL
		Uranium-238	11 / 11	100%	11 / 11	100%	pCi/g	440	448	99% Chebyshev (Mean, Sd) UCL	440	Maximum	448	99% Chebyshev (Mean, Sd) UCL	440	Maximum

Notes:

COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 6.

Maximum detected concentration

The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:

- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentrations

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:

mg/kg = milligram(s) per kilogram

"--" = value not calculated

ft bgs = feet below ground surface

pCi/g = picoCurie per gram

Table C1.65. Sector 6 Surface and Subsurface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics: Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration [2]	EPC without Avrg: UCL Concentration	UCL Statistic	Value	Basis	EPC with Avrg: UCL Concentration	UCL Statistic	Value	Basis
Sector 6	Surface and Subsurface Soil (0 to 16 ft bgs)	Antimony	10 / 11	91%	10 / 11	91%	mg/kg	71.02	63.95	97.5% KM (Chebyshev) UCL	63.95	UCL	63.95	97.5% KM (Chebyshev) UCL	63.95	UCL
		Arsenic	11 / 11	100%	11 / 11	100%	mg/kg	22.4	11.17	95% Modified-t UCL	11.17	UCL	11.17	95% Modified-t UCL	11.17	UCL
		Chromium	11 / 11	100%	11 / 11	100%	mg/kg	76.1	55.13	95% Chebyshev (Mean, Sd) UCL	55.13	UCL	55.13	95% Chebyshev (Mean, Sd) UCL	55.13	UCL
		Cobalt	11 / 11	100%	11 / 11	100%	mg/kg	104	30.86	95% H-UCL	30.86	UCL	30.86	95% H-UCL	30.86	UCL
		Iron	11 / 11	100%	11 / 11	100%	mg/kg	29500	23134	95% Student's-t UCL	23134	UCL	23134	95% Student's-t UCL	23134	UCL
		Manganese	11 / 11	100%	11 / 11	100%	mg/kg	3840	1659	95% H-UCL	1659	UCL	1659	95% H-UCL	1659	UCL
		Thallium	8 / 11	73%	8 / 11	73%	mg/kg	1.01	0.616	95% KM (Chebyshev) UCL	0.616	UCL	0.616	95% KM (Chebyshev) UCL	0.616	UCL
		Total PAH	11 / 11	100%	11 / 11	100%	mg/kg	4.92426	3.435	95% Adjusted Gamma UCL	3.435	UCL	3.435	95% Adjusted Gamma UCL	3.435	UCL
		Uranium	11 / 11	100%	11 / 11	100%	mg/kg	300	176.6	95% Adjusted Gamma UCL	176.6	UCL	176.6	95% Adjusted Gamma UCL	176.6	UCL
		Americium-241	4 / 11	36%	4 / 11	36%	pCi/g	39.3	39.54	95% Gamma Adjusted KM-UCL	39.3	Maximum	39.54	95% Gamma Adjusted KM-UCL	39.3	Maximum
		Cesium-137	10 / 11	91%	10 / 11	91%	pCi/g	3.42	1.943	95% KM Adjusted Gamma UCL	1.943	UCL	1.943	95% KM Adjusted Gamma UCL	1.943	UCL
		Neptunium-237	3 / 11	27%	3 / 11	27%	pCi/g	18.6	--	--	18.6	Maximum	--	--	18.6	Maximum
		Plutonium-239/240	6 / 11	55%	6 / 11	55%	pCi/g	239	1055	95% KM Bootstrap t UCL	239	Maximum	1055	95% KM Bootstrap t UCL	239	Maximum
		Technetium-99	11 / 11	100%	11 / 11	100%	pCi/g	1610	1650	99% Chebyshev (Mean, Sd) UCL	1610	Maximum	1650	99% Chebyshev (Mean, Sd) UCL	1610	Maximum
		Thorium-230	11 / 11	100%	11 / 11	100%	pCi/g	10600	10552	99% Chebyshev (Mean, Sd) UCL	10552	UCL	10552	99% Chebyshev (Mean, Sd) UCL	10552	UCL
		Uranium-233/234	11 / 11	100%	11 / 11	100%	pCi/g	413	419.6	99% Chebyshev (Mean, Sd) UCL	413	Maximum	419.6	99% Chebyshev (Mean, Sd) UCL	413	Maximum
		Uranium-235/236	7 / 11	64%	7 / 11	64%	pCi/g	28	21.33	95% Gamma Adjusted KM-UCL	21.33	UCL	21.33	95% Gamma Adjusted KM-UCL	21.33	UCL
		Uranium-238	11 / 11	100%	11 / 11	100%	pCi/g	440	448	99% Chebyshev (Mean, Sd) UCL	440	Maximum	448	99% Chebyshev (Mean, Sd) UCL	440	Maximum

Notes:

COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 6.

Maximum detected concentration

The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:

- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:

mg/kg = milligram(s) per kilogram

"--" = value not calculated

ft bgs = feet below ground surface

pCi/g = picoCurie per gram

Table C1.66. Sector 7 Surface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 7	Surface Soil (0 to 1 ft bgs)	Chromium	12 / 12	100%	14 / 14	100%	mg/kg	40.1	24.77	95% Student's-t UCL	24.77	UCL	24.13	95% Student's-t UCL	24.13	UCL
		Total PAH	8 / 12	67%	10 / 14	71%	mg/kg	3.39383	1.523	95% KM (t) UCL	1.523	UCL	1.473	95% KM (t) UCL	1.473	UCL
		Uranium	12 / 12	100%	14 / 14	100%	mg/kg	83.9	44.84	95% Adjusted Gamma UCL	44.84	UCL	39.53	95% Adjusted Gamma UCL	39.53	UCL
		Cesium-137	11 / 12	92%	13 / 14	93%	pCi/g	2.93	1.334	95% KM (t) UCL	1.334	UCL	1.266	95% KM (t) UCL	1.266	UCL
		Neptunium-237	1 / 12	8%	3 / 14	21%	pCi/g	6.5	--	--	6.5	Maximum	--	--	6.5	Maximum
		Thorium-230	12 / 12	100%	14 / 14	100%	pCi/g	152	69.87	95% Chebyshev (Mean, Sd) UCL	69.87	UCL	61.85	95% Chebyshev (Mean, Sd) UCL	61.85	UCL
		Uranium-235	2 / 8	25%	8 / 14	57%	pCi/g	0.825	--	--	0.825	Maximum	0.821	95% KM H-UCL	0.821	UCL
		Uranium-235/236	3 / 9	33%	8 14	57%	pCi/g	1.12	--	--	1.12	Maximum	0.76	95% KM H-UCL	0.76	UCL
		Uranium-238	12 / 12	100%	14 14	100%	pCi/g	33.6	16.16	95% Adjusted Gamma UCL	16.16	UCL	18.05	95% H-UCL	18.05	UCL

Notes:
COPCs were identified based on surface soil from 0 to 1 ft bgs for Sector 7.
Maximum detected concentration
The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:
- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:
mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.67. Sector 7 Surface and Subsurface Soil EPC Selection Results

Sector	Exposure Point	COPC	Summary Statistics						EPC without Avrg				EPC with Avrg			
			Detection Frequency (without avrg)	Percent Detected (without avrg)	Detection Frequency (with avrg)	Percent Detected (with avrg)	Concentration Units	Maximum Concentration	UCL Concentration	UCL Statistic	Value	Basis	UCL Concentration	UCL Statistic	Value	Basis
Sector 7	Surface and Subsurface Soil (0 to 16 ft bgs)	Arsenic	13 / 13	100%	14 / 14	100%	mg/kg	9.52	8.048	95% Student's-t UCL	8.048	UCL	7.98	95% Student's-t UCL	7.98	UCL
		Chromium	13 / 13	100%	14 / 14	100%	mg/kg	40.1	28.56	95% Student's-t UCL	28.56	UCL	28.24	95% Student's-t UCL	28.24	UCL
		Cobalt	13 / 13	100%	14 / 14	100%	mg/kg	14.2	9.849	95% Student's-t UCL	9.849	UCL	9.722	95% Student's-t UCL	9.722	UCL
		Manganese	13 / 13	100%	14 / 14	100%	mg/kg	1580	735.2	95% Student's-t UCL	735.2	UCL	776.9	95% Adjusted Gamma UCL	776.9	UCL
		Total PAH	9 / 13	69%	10 / 14	71%	mg/kg	3.39383	2.285	95% Gamma Adjusted KM-UCL	2.285	UCL	1.376	95% KM (t) UCL	1.376	UCL
		Uranium	13 / 13	100%	14 / 14	100%	mg/kg	83.9	40.59	95% Adjusted Gamma UCL	40.59	UCL	38.35	95% Adjusted Gamma UCL	38.35	UCL
		Cesium-137	11 / 13	85%	12 / 14	86%	pCi/g	3.03	1.478	95% KM (t) UCL	1.478	UCL	1.445	95% KM (t) UCL	1.445	UCL
		Neptunium-237	2 / 13	15%	3 / 14	21%	pCi/g	6.5	--	--	6.5	Maximum	--	--	6.5	Maximum
		Thorium-230	13 / 13	100%	14 / 14	100%	pCi/g	152	65.16	95% Chebyshev (Mean, Sd) UCL	65.16	UCL	61.46	95% Chebyshev (Mean, Sd) UCL	61.46	UCL
		Uranium-238	13 / 13	100%	14 / 14	100%	pCi/g	33.6	16.33	95% Adjusted Gamma UCL	16.33	UCL	15.55	95% Adjusted Gamma UCL	15.55	UCL

Notes:

COPCs were identified based on subsurface soil from 0 to 16 ft bgs for Sector 7.

Maximum detected concentration

The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:

- Fewer than 10 samples
- Fewer than 4 detections
- < 2 distinct concentration
- 95% UCL exceeds the maximum detected concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

Definitions:

mg/kg = milligram(s) per kilogram
"--" = value not calculated
ft bgs = feet below ground surface
pCi/g = picoCurie per gram

Table C1.68. Regional Gravel Aquifer Groundwater EPC Selection Results

Exposure Point [1]	COPC	Detection Frequency	Percent Detected	Exceedance Frequency	Percent Exceed	Concentration Units	Maximum Concentration [2]	UCL Concentration [4]	UCL Statistic [4]	EPC [3]	Basis [3]
Regional Gravel Aquifer	Aluminum	130 / 258	50%	7 / 258	3%	mg/L	4.17	0.4	95% KM (Chebyshev) UCL	0.4	UCL
	Arsenic	89 / 258	34%	89 / 258	34%	mg/L	0.00897	0.00307	95% KM (t) UCL	0.00307	UCL
	Barium	258 / 258	100%	45 / 258	17%	mg/L	0.911	0.299	95% Chebyshev (Mean, Sd) UCL	0.299	UCL
	Chromium	160 / 258	62%	160 / 258	62%	mg/L	2.72	0.0667	95% KM H-UCL	0.0667	UCL
	Fluoride	256 / 258	99%	238 / 258	92%	mg/L	2.49	0.303	95% KM (Chebyshev) UCL	0.303	UCL
	Iron	237 / 258	92%	73 / 258	28%	mg/L	27.6	2.819	95% KM H-UCL	2.819	UCL
	Manganese	251 / 258	97%	131 / 258	51%	mg/L	7.29	0.452	95% KM (Chebyshev) UCL	0.452	UCL
	Molybdenum	169 / 258	66%	29 / 258	11%	mg/L	0.0604	0.006	95% KM (Chebyshev) UCL	0.006	UCL
	Nitrate as Nitrogen	59 / 64	92%	20 / 64	31%	mg/L	83.5	20.19	95% KM (Chebyshev) UCL	20.19	UCL
	Uranium	107 / 303	35%	49 / 303	16%	mg/L	0.0312	0.00115	95% KM (Chebyshev) UCL	0.00115	UCL
	Bis(2-ethylhexyl)phthalate	41 / 256	16%	1 / 256	0.4%	mg/L	0.0701	0.002	95% KM (Chebyshev) UCL	0.002	UCL
	Hexachlorocyclopentadiene	2 / 256	1%	2 / 256	1%	mg/L	0.00474	--	--	0.00474	Maximum
	Pentachlorophenol	2 / 256	1%	2 / 256	1%	mg/L	0.00641	--	--	0.00641	Maximum
	p-Nitroaniline	8 / 256	3%	7 / 256	3%	mg/L	0.00545	0.005	95% KM (t) UCL	0.005	UCL
	Total PAH	7 / 256	3%	6 / 256	2%	mg/L	0.00155	0.00076	95% KM (t) UCL	0.00076	UCL
	Total PCB	5 / 256	2%	5 / 256	2%	mg/L	0.000473	0.000067	95% KM (t) UCL	0.000067	UCL
	1,1,2-Trichloroethane	78 / 271	29%	78 / 271	29%	mg/L	0.0097	0.00177	95% KM (Chebyshev) UCL	0.00177	UCL
	1,1-Dichloroethane	19 / 271	7%	1 / 271	0.4%	mg/L	0.00302	0.00983	95% GROS Approximate Gamma UCL	0.00983	UCL
	1,1-Dichloroethene	142 / 827	17%	20 / 827	2%	mg/L	0.17	0.00655	95% KM H-UCL	0.00655	UCL
	1,2-Dichloroethane	7 / 271	3%	7 / 271	3%	mg/L	0.00146	0.00072	95% KM (t) UCL	0.00072	UCL
	1,4-Dioxane	1 / 191	1%	1 / 191	1%	mg/L	3.94	--	--	3.94	Maximum
	Benzene	5 / 406	1%	5 / 406	1%	mg/L	0.00069	0.00015	95% KM (t) UCL	0.00015	UCL
	Bromodichloromethane	10 / 271	4%	10 / 271	4%	mg/L	0.00179	0.01000	95% KM Approximate Gamma UCL	0.01000	UCL
	Carbon tetrachloride	56 / 406	14%	55 / 406	14%	mg/L	0.088	0.0037	95% KM (Chebyshev) UCL	0.0037	UCL
	Chloroform	105 / 271	39%	105 / 271	39%	mg/L	0.00828	0.003	95% KM (Chebyshev) UCL	0.003	UCL
	cis -1,2-Dichloroethene	667 / 816	82%	641 / 816	79%	mg/L	75	2.71	95% KM (Chebyshev) UCL	2.71	UCL
	Methylene chloride	43 / 256	17%	17 / 256	7%	mg/L	0.26	0.0204	95% KM (Chebyshev) UCL	0.0204	UCL
	Tetrachloroethene	110 / 406	27%	32 / 406	8%	mg/L	0.086	0.00381	95% KM (Chebyshev) UCL	0.00381	UCL
	trans -1,2-Dichloroethene	90 / 816	11%	1 / 816	0.1%	mg/L	0.0105	0.00093	95% KM (Chebyshev) UCL	0.00093	UCL
	Trichloroethene	825 / 827	100%	825 / 827	100%	mg/L	1400	28.32	95% KM (Chebyshev) UCL	28.32	UCL
	Vinyl chloride	28 / 816	3%	28 / 816	3%	mg/L	0.18	0.00344	95% KM (Chebyshev) UCL	0.00344	UCL
	Neptunium-237	8 / 256	3%	8 / 256	3%	pCi/L	3.85	0.105	95% KM (t) UCL	0.105	UCL
	Technetium-99	697 / 805	87%	661 / 805	82%	pCi/L	31700	2482	95% KM (Chebyshev) UCL	2482	UCL
	Uranium-233/234	5 / 256	2%	4 / 256	2%	pCi/L	81	0.00422	95% KM H-UCL	0.00422	UCL
	Uranium-235/236	2 / 256	1%	1 / 256	0.4%	pCi/L	4.68	--	--	4.68	Maximum
	Uranium-238	22 / 256	9%	16 / 256	6%	pCi/L	85.1	0.0337	95% KM H-UCL	0.0337	UCL

Notes:

COPCs were identified based on groundwater collected from Regional Gravel Aquifer formation.

Maximum detected concentration

The exposure point concentration (EPC) for use in the HHRA is the 95% UCL or, in the following cases, the maximum detected concentration:

- Fewer than 10 samples
- Fewer than 4 detections
- less than 2 distinct concentration
- 95% UCL exceeds the maximum detected concentration

The upper confidence limit on the mean (UCL) was calculated using ProUCL. The 95% UCL of the ProUCL-recommended method was selected as the representative UCL.

mg/L = milligram(s) per liter

"--" = value not calculated

pCi/L = picoCurie per liter

Table C1.69. Sector 1 Surface Soil Risk Characterization Results

Grid	COPC	Chromium	Cobalt	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Radium-226	Strontium-90	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk / HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	16	14	N/A	N/A	4.9	N/A	0.49	0.1	0.025	1.5	4.7	2.5	1.5	1.2	0.06	1.2	N/A
	Industrial NAL - Cancer	12.3	1850	0.643	0.293	--	6.01	0.108	0.249	22.7	0.0248	10.3	1270	31.3	50.1	0.408	1.66	N/A
	Industrial NAL - Noncancer	693	68.7	6.85	--	46.6	--	--	--	--	--	--	--	--	--	--	--	N/A
RA1-1	Concentration	12.4	8.81	0.0342 U	0.111	43.1	19.6	0.070	113	98.6	2.43	7.20	98.6	121	13.8	0.81	14.9	N/A
	ELCR	1.0E-06	4.8E-09	ND	3.8E-07	--	3.3E-06	6.5E-07	4.5E-04	4.3E-06	9.8E-05	7.0E-07	7.8E-08	3.9E-06	2.8E-07	2.0E-06	9.0E-06	5.7E-04
	HQ	0.0018	0.013	ND	--	0.092	--	--	--	--	--	--	--	--	--	--	--	0.11
RA1-2	Concentration	14.5	7.03	1.03	0.0186	6.67	0.375 U	0.0486 U	0.419 U	0.293 U	2.43	7.20	15.2	0.71	2.81	0.61	4.4	N/A
	ELCR	1.2E-06	3.8E-09	1.6E-06	6.3E-08	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.2E-08	2.3E-08	5.6E-08	1.5E-06	2.7E-06	1.1E-04
	HQ	0.0021	0.01	0.015	--	0.014	--	--	--	--	--	--	--	--	--	--	--	0.04
RA1-3	Concentration	28.2	13.27764706	1.03	1.760	238	3.99	3.91	11.9	12.9	2.43	7.20	394	14.99	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-4	Concentration	13	44.6	0.67 U	0.5	61.7	0.931 U	0.0321 U	0.632 U	0.61 U	2.43	7.20	18.6	1.71	11.4	0.346 U	27.2	N/A
	ELCR	1.1E-06	2.4E-08	ND	1.7E-06	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.5E-08	5.5E-08	2.3E-07	ND	1.6E-05	1.2E-04
	HQ	0.0019	0.065	ND	--	0.13	--	--	--	--	--	--	--	--	--	--	--	0.20
RA1-5	Concentration	23.9	4.08	0.171 U	0.0339	48.5	0.688 U	0.398	0.677 U	0.706 U	2.43	7.20	47.6	1.42	14.3	0.74	19.2	N/A
	ELCR	1.9E-06	2.2E-09	ND	1.2E-07	--	ND	3.7E-06	ND	ND	9.8E-05	7.0E-07	3.7E-08	4.5E-08	2.9E-07	1.8E-06	1.2E-05	1.2E-04
	HQ	0.0034	0.0059	ND	--	0.1	--	--	--	--	--	--	--	--	--	--	--	0.110
RA1-6	Concentration	12.4	4.62	0.00124	0.0720	28.7	0.978 U	0.0516	0.587 U	1.37	2.43	7.20	20.4	1.96	10.6	0.74	13.6	N/A
	ELCR	1.0E-06	2.5E-09	1.9E-09	2.5E-07	--	ND	4.8E-07	ND	6.0E-08	9.8E-05	7.0E-07	1.6E-08	6.3E-08	2.1E-07	1.8E-06	8.2E-06	1.1E-04
	HQ	0.0018	0.0067	0.000018	--	0.062	--	--	--	--	--	--	--	--	--	--	--	0.071
RA1-7	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.85	12.85	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.550
RA1-8	Concentration	13.9	10.2	0.0346 U	0.62	254	0.706 U	0.0251 U	0.622 U	0.453 U	0.585 U	0.835 U	102	5.01	20.2	1.48	62.4	N/A
	ELCR	1.1E-06	5.5E-09	ND	2.1E-06	--	ND	ND	ND	ND	ND	ND	8.0E-08	1.6E-07	4.0E-07	3.6E-06	3.8E-05	4.5E-05
	HQ	0.002	0.015	ND	--	0.55	--	--	--	--	--	--	--	--	--	--	--	0.57
RA1-9	Concentration	194	8.66	0.167 U	0.271	691	2.63	0.84	6.02	18.1	2.43	7.20	5770	82.5	267	15.7	310	N/A
	ELCR	1.6E-05	4.7E-09	ND	9.2E-07	--	4.4E-07	7.8E-06	2.4E-05	8.0E-07	9.8E-05	7.0E-07	4.5E-06	2.6E-06	5.3E-06	3.8E-05	1.9E-04	3.9E-04
	HQ	0.028	0.013	ND	--	1.5	--	--	--	--	--	--	--	--	--	--	--	1.5
RA1-10	Concentration	80.3	10.4	0.00558	0.417	481	1	8.05	4.65	4.67	2.43	7.20	923	28.1	266	16.4	295	N/A
	ELCR	6.5E-06	5.6E-09	8.7E-09	1.4E-06	--	1.7E-07	7.5E-05	1.9E-05	2.1E-07	9.8E-05	7.0E-07	7.3E-07	9.0E-07	5.3E-06	4.0E-05	1.8E-04	4.3E-04
	HQ	0.012	0.015	0.000081	--	1	--	--	--	--	--	--	--	--	--	--	--	1.00
RA1-11	Concentration	8.84	2.17	0.0335 U	0.0156	41.1	0.578 U	0.0383 U	0.488 U	0.473 U	2.43	7.20	61.5	1.08 U	2.94	0.454 U	2.8	N/A
	ELCR	7.2E-07	1.2E-09	ND	5.3E-08	--	ND	ND	ND	ND	9.8E-05	7.0E-07	4.8E-08	ND	5.9E-08	ND	1.7E-06	1.0E-04
	HQ	0.0013	0.0032	ND	--	0.088	--	--	--	--	--	--	--	--	--	--	--	0.093
RA1-12	Concentration	11.9	3.08	0.210	19.0000	7.28	0.528 U	0.0552 U	0.373 U	0.568 U	2.43	7.20	15.3	1.09	0.62	0.409 U	1.91	N/A
	ELCR	9.7E-07	1.7E-09	3.3E-07	6.5E-05	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.2E-08	3.5E-08	1.2E-08	ND	1.2E-06	1.7E-04
	HQ	0.0017	0.0045	0.0031	--	0.016	--	--	--	--	--	--	--	--	--	--	--	0.025
RA1-13	Concentration	37.1	5.66	0.304	0.303	78	0.807 U	0.0958	0.45 U	1.02 U	2.43	7.20	111	1.12	20.3	1.73	24	N/A
	ELCR	3.0E-06	3.1E-09	4.7E-07	1.0E-06	--	ND	8.9E-07	ND	ND	9.8E-05	7.0E-07	8.7E-08	3.6E-08	4.1E-07	4.2E-06	1.4E-05	1.2E-04
	HQ	0.0054	0.0082	0.0044	--	0.17	--	--	--	--	--	--	--	--	--	--	--	0.19
RA1-14	Concentration	11.3	5.15	0.863 U	0.648	70.9	0.53 U	0.0358 U	0.629 U	0.483 U	2.43	7.20	25.2	0.54	6.6	0.567 U	18.4	N/A
	ELCR	9.2E-07	2.8E-09	ND	2.2E-06	--	ND	ND	ND	ND	9.8E-05	7.0E-07	2.0E-08	1.7E-08	1.3E-07	ND	1.1E-05	1.1E-04
	HQ	0.0016	0.0075	ND	--	0.15	--	--	--	--	--	--	--	--	--	--	--	0.16
RA1-15	Concentration	9.67	6.33	0.0338 U	0.138	21.7	0.871 U	0.0297 U	0.549 U	0.25 U	2.43	7.20	491	0.993 U	3.24	0.449 U	5.97	N/A
	ELCR	7.9E-07	3.4E-09	ND	4.7E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	3.9E-07	ND	6.5E-08	ND	3.6E-06	1.0E-04
	HQ	0.0014	0.0092	ND	--	0.047	--	--	--	--	--	--	--	--	--	--	--	0.058
RA1-16	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-17	Concentration	35.6	4.73	0.629	0.838	523	1.51	18.9	3.26	8.45	2.43	7.20	416	0.625 U	331	17.5	355	N/A
	ELCR	2.9E-06	2.6E-09	9.8E-07	2.9E-06	--	2.5E-07	1.8E-04	1.3E-05	3.7E-07	9.8E-05	7.0E-07	3.3E-07	ND	6.6E-06	4.3E-05	2.1E-04	5.6E-04
	HQ	0.0051	0.0069	0.0092	--	1.1	--	--	--	--	--	--	--	--	--	--	--	1.1
RA1-18	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-19	Concentration	10.8	4.69	0.166 U	0.0993	108	0.67 U	0.0457 U	0.525 U	0.759 U	2.43	7.20	270	1.45	19.8	2.76	54.1	N/A
	ELCR	8.8E-07	2.5E-09	ND	3.4E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	2.1E-07	4.6E-08	4.0E-07	6.8E-06	3.3E-05	1.4E-04
	HQ	0.0016	0.0068	ND	--	0.23	--	--	--	--	--	--	--	--	--	--	--	0.24
RA1-20	Concentration	72.4	4.83	0.00462	8.16	185	0.148 U	0.0392 U	1.36	0.322 U	2.43	7.20	97.6	2.51	16.3	2.11	27.3	N/A
	ELCR	5.9E-06	2.6E-09	7.2E-09	2.8E-05	--	ND	ND	5.5E-06	ND	9.8E-05	7.0E-07	7.7E-08	8.0E-08	3.3E-07	5.2E-06	1.6E-05	1.6E-04
	HQ	0.01	0.007	0.000067	--	0.4	--	--	--	--	--	--	--	--	--	--	--	0.42
RA1-21	Concentration	14.4	4.39	0.535	0.328	830	0.372 U	8.38	3.44	2.75	2.43	7.20	426	16.4	238	12.9	264	N/A
	ELCR	1.2E-06	2.4E-09	8.3E-07	1.1E-06	--	ND	7.8E-05	1.4E-05	1.2E-07	9.8E-05	7.0E-07	3.4E-07	5.2E-07	4.8E-06	3.2E-05	1.6E-04	3.9E-04
	HQ	0.0021	0.0064	0.0078	--	1.8	--	--	--	--	--	--	--	--	--	--	--	1.8
RA1-22	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-23	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55

Table C1.69. Sector 1 Surface Soil Risk Characterization Results (Continued)

Grid	COPC	Chromium	Cobalt	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Radium-226	Strontium-90	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk / HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	16	14	N/A	N/A	4.9	N/A	0.49	0.1	0.025	1.5	4.7	2.5	1.5	1.2	0.06	1.2	N/A
	Industrial NAL - Cancer	12.3	1850	0.643	0.293	--	6.01	0.108	0.249	22.7	0.0248	10.3	1270	31.3	50.1	0.408	1.66	N/A
	Industrial NAL - Noncancer	693	68.7	6.85	--	46.6	--	--	--	--	--	--	--	--	--	--	--	N/A
RA1-24	Concentration	32	5.53	0.0263	0.0898	67.2	0.281 U	0.03 U	0.337 U	0.259 U	2.43	7.20	45.8	2.50	6.05	0.76	10.4	N/A
	ELCR	2.6E-06	3.0E-09	4.1E-08	3.1E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	3.6E-08	8.0E-08	1.2E-07	1.9E-06	6.3E-06	1.1E-04
	HQ	0.0046	0.008	0.00038	--	0.14	--	--	--	--	--	--	--	--	--	--	--	0.15
RA1-25	Concentration	78.1	4.28	9.35	0.3590	1280	1.35	9.11	7.7	10.3	3.11	1.99	266	67.30	326	19.4	371	N/A
	ELCR	6.3E-06	2.3E-09	1.5E-05	1.2E-06	--	2.2E-07	8.4E-05	3.1E-05	4.5E-07	1.3E-04	1.9E-07	2.1E-07	2.2E-06	6.5E-06	4.8E-05	2.2E-04	5.5E-04
	HQ	0.011	0.0062	0.14	--	2.7	--	--	--	--	--	--	--	--	--	--	--	2.9
RA1-26	Concentration	29.4	4.47	5.26	1.6200	823	1.18	9.56	3.86	6.07	2.43	7.20	340	35.2	259	14.0	274	N/A
	ELCR	2.4E-06	2.4E-09	8.2E-06	5.5E-06	--	2.0E-07	8.9E-05	1.6E-05	2.7E-07	9.8E-05	7.0E-07	2.7E-07	1.1E-06	5.2E-06	3.4E-05	1.7E-04	4.3E-04
	HQ	0.0042	0.0065	0.077	--	1.8	--	--	--	--	--	--	--	--	--	--	--	1.9
RA1-27	Concentration	15.3	137	0.332 U	0.272	44.1	0.449 U	0.0356 U	0.373 U	0.267 U	2.43	7.20	1530	0.436 U	5.66	0.47	13.7	N/A
	ELCR	1.2E-06	7.4E-08	ND	9.3E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.2E-06	ND	1.1E-07	1.2E-06	8.3E-06	1.1E-04
	HQ	0.0022	0.2	ND	--	0.095	--	--	--	--	--	--	--	--	--	--	--	0.3
RA1-28	Concentration	21.1	4.75	0.0029	8.16	185	0.506 U	0.0759 U	1.36	0.329 U	2.43	7.20	300	2.06	16.3	2.11	28.2	N/A
	ELCR	1.7E-06	2.6E-09	4.5E-09	2.8E-05	--	ND	ND	5.5E-06	ND	9.8E-05	7.0E-07	2.4E-07	6.6E-08	3.3E-07	5.2E-06	1.7E-05	1.6E-04
	HQ	0.003	0.0069	0.000042	--	0.4	--	--	--	--	--	--	--	--	--	--	--	0.41
RA1-29	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-30	Concentration	35.1	5.62	0.34 U	2.71	300	0.643	2.14	1.84	2.19	1.74	12.4	152	30.9	101	7.11	127	N/A
	ELCR	2.9E-06	3.0E-09	ND	9.2E-06	--	1.1E-07	2.0E-05	7.4E-06	9.6E-08	7.0E-05	1.2E-06	1.2E-07	9.9E-07	2.0E-06	1.7E-05	7.7E-05	2.1E-04
	HQ	0.0051	0.0082	ND	--	0.64	--	--	--	--	--	--	--	--	--	--	--	0.65
RA1-31	Concentration	10.7	14.8	0.00301	0.115	6.02	0.678 U	0.0228 U	0.51 U	0.254 U	2.43	7.20	20.9	0.529 U	0.768	0.207 U	1.71	N/A
	ELCR	8.7E-07	8.0E-09	4.7E-09	3.9E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.6E-08	ND	1.5E-08	ND	1.0E-06	1.0E-04
	HQ	0.0015	0.022	0.000044	--	0.013	--	--	--	--	--	--	--	--	--	--	--	0.037
RA1-32	Concentration	26.2	6.83	0.033 U	4.88	54.4	0.26 U	0.0438 U	0.534	0.513 U	2.43	7.20	25	0.66	3.41	0.76	6.14	N/A
	ELCR	2.1E-06	3.7E-09	ND	1.7E-05	--	ND	ND	2.1E-06	ND	9.8E-05	7.0E-07	2.0E-08	2.1E-08	6.8E-08	1.9E-06	3.7E-06	1.3E-04
	HQ	0.0038	0.0099	ND	--	0.12	--	--	--	--	--	--	--	--	--	--	--	0.13
RA1-33	Concentration	14.2	5.04	0.34 U	1.67 U	102	0.611 U	0.241	0.527 U	0.473 U	2.43	7.20	47.9	3.28	39.8	2.18	50.2	N/A
	ELCR	1.2E-06	2.7E-09	ND	ND	--	ND	2.2E-06	ND	ND	9.8E-05	7.0E-07	3.8E-08	1.0E-07	7.9E-07	5.3E-06	3.0E-05	1.4E-04
	HQ	0.002	0.0073	ND	--	0.22	--	--	--	--	--	--	--	--	--	--	--	0.23
RA1-34	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-35	Concentration	7.1	20.4	0.0331 U	2.95	772	0.276 U	0.048 U	6.29	0.407	2.43	7.20	260	1.59	79	5.67	110	N/A
	ELCR	5.8E-07	1.1E-08	ND	1.0E-05	--	ND	ND	2.5E-05	1.8E-08	9.8E-05	7.0E-07	2.0E-07	5.1E-08	1.6E-06	1.4E-05	6.6E-05	2.2E-04
	HQ	0.001	0.03	ND	--	1.7	--	--	--	--	--	--	--	--	--	--	--	1.7
RA1-36	Concentration	16.7	9.4	0.00513	0.747	322	0.258 U	0.0294 U	0.784	1.02	2.43	7.20	325	2.91	88.4	4.42	118	N/A
	ELCR	1.4E-06	5.1E-09	8.0E-09	2.5E-06	--	ND	ND	3.1E-06	4.5E-08	9.8E-05	7.0E-07	2.6E-07	9.3E-08	1.8E-06	1.1E-05	7.1E-05	1.9E-04
	HQ	0.0024	0.014	0.000075	--	0.69	--	--	--	--	--	--	--	--	--	--	--	0.71
RA1-37	Concentration	14.3	5.61	0.345 U	4.97	34.8	0.661 U	0.0661	0.573 U	0.431 U	2.43	7.20	28.4	1.51	15.5	0.61	19.5	N/A
	ELCR	1.2E-06	3.0E-09	ND	1.7E-05	--	ND	6.1E-07	ND	ND	9.8E-05	7.0E-07	2.2E-08	4.8E-08	3.1E-07	1.5E-06	1.2E-05	1.3E-04
	HQ	0.0021	0.0082	ND	--	0.075	--	--	--	--	--	--	--	--	--	--	--	0.085
RA1-38	Concentration	11.4	5.28	0.169 U	0.103	90.6	0.602 U	0.0653	0.445 U	0.323 U	2.43	7.20	112	0.811 U	24.6	1.47	31.4	N/A
	ELCR	9.3E-07	2.9E-09	ND	3.5E-07	--	ND	6.0E-07	ND	ND	9.8E-05	7.0E-07	8.8E-08	ND	4.9E-07	3.6E-06	1.9E-05	1.2E-04
	HQ	0.0016	0.0077	ND	--	0.19	--	--	--	--	--	--	--	--	--	--	--	0.2
RA1-39	Concentration	11.5	10.5	0.00544	0.498	8.44	0.762 U	0.023 U	0.514 U	0.308 U	2.43	7.20	466	0.694 U	2.3	0.312 U	2.46	N/A
	ELCR	9.3E-07	5.7E-09	8.5E-09	1.7E-06	--	ND	ND	ND	ND	9.8E-05	7.0E-07	3.7E-07	ND	4.6E-08	ND	1.5E-06	1.0E-04
	HQ	0.0017	0.015	0.000079	--	0.018	--	--	--	--	--	--	--	--	--	--	--	0.035
RA1-40	Concentration	10.8	10.6	0.00562	0.291	244	0.422 U	0.643	0.509 U	0.461 U	2.43	7.20	856	1.67	32.5	1.51	54.2	N/A
	ELCR	8.8E-07	5.7E-09	8.7E-09	9.9E-07	--	ND	6.0E-06	ND	ND	9.8E-05	7.0E-07	6.7E-07	5.3E-08	6.5E-07	3.7E-06	3.3E-05	1.4E-04
	HQ	0.0016	0.015	0.000082	--	0.52	--	--	--	--	--	--	--	--	--	--	--	0.54
RA1-41	Concentration	35.7	35.3	0.0329 U	0.1296	66.8	0.375 U	0.0347 U	0.486 U	0.305	2.43	7.20	21.6	1.62	28.9	1.64	33.4	N/A
	ELCR	2.9E-06	1.9E-08	ND	4.4E-07	--	ND	ND	ND	1.3E-08	9.8E-05	7.0E-07	1.7E-08	5.2E-08	5.8E-07	4.0E-06	2.0E-05	1.3E-04
	HQ	0.0052	0.051	ND	--	0.14	--	--	--	--	--	--	--	--	--	--	--	0.2
RA1-42	Concentration	11.7	26.6	0.193	0.3320	227	0.636 U	0.0278 U	0.468 U	0.505 U	2.43	7.20	52.4	2.19	47.2	3.08	63.8	N/A
	ELCR	9.5E-07	1.4E-08	3.0E-07	1.1E-06	--	ND	ND	ND	ND	9.8E-05	7.0E-07	4.1E-08	7.0E-08	9.4E-07	7.5E-06	3.8E-05	1.5E-04
	HQ	0.0017	0.039	0.0028	--	0.49	--	--	--	--	--	--	--	--	--	--	--	0.53
RA1-43	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.39	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-44	Concentration	28.2	13.3	1.03	0.0504	238	0.595 U	0.0625 U	0.836 U	0.42 U	2.43	7.20	20.9	0.69	2.4	0.52	2.52	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	1.7E-07	--	ND	ND	ND	ND	9.8E-05	7.0E-07	1.6E-08	2.2E-08	4.8E-08	1.3E-06	1.5E-06	1.1E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-45	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55
RA1-46	Concentration	28.2	13.3	1.03	1.76	238	3.99	3.91	11.9	12.9	2.43	7.20	394	15.0	66.4	4.97	80.5	N/A
	ELCR	2.3E-06	7.2E-09	1.6E-06	6.0E-06	--	6.6E-07	3.6E-05	4.8E-05	5.7E-07	9.8E-05	7.0E-07	3.1E-07	4.8E-07	1.3E-06	1.2E-05	4.8E-05	2.6E-04
	HQ	0.0041	0.019	0.015	--	0.51	--	--	--	--	--	--	--	--	--	--	--	0.55

Table C1.69. Sector 1 Surface Soil Risk Characterization Results (Continued)

Grid	COPC	Chromium	Cobalt	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Radium-226	Strontium-90	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk / HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
	Provisional Background	**16**	**14**	**N/A**	**N/A**	**4.9**	**N/A**	**0.49**	**0.1**	**0.025**	**1.5**	**4.7**	**2.5**	**1.5**	**1.2**	**0.06**	**1.2**	**N/A**
	Industrial NAL - Cancer	**12.3**	**1850**	**0.643**	**0.293**	**--**	**6.01**	**0.108**	**0.249**	**22.7**	**0.0248**	**10.3**	**1270**	**31.3**	**50.1**	**0.408**	**1.66**	**N/A**
	Industrial NAL - Noncancer	**693**	**68.7**	**6.85**	**--**	**46.6**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**N/A**
Sector 1 Surface Soil	Concentration	47.4	26.3	2.109	3.788	409	3.72	4.61	17.2	16.3	2.54	8.01	946	27.7	124	7.51	111	N/A
	ELCR	3.9E-06	1.4E-08	3.3E-06	1.3E-05	--	6.2E-07	4.3E-05	6.9E-05	7.2E-07	1.0E-04	7.8E-07	7.4E-07	8.9E-07	2.5E-06	1.8E-05	6.7E-05	**3.2E-04**
	HQ	0.0068	0.038	0.031	--	0.88	--	--	--	--	--	--	--	--	--	--	--	**1.00**
	COC (Y/N?):	**Yes**	No	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	**Yes**	No	No	No	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	<NAL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	<NAL	>NAL	<NAL	<NAL	<NAL	>NAL	>NAL	>NAL	
	% Total ELCR	1.21%	0.00%	1.02%	4.02%	--	0.19%	13.29%	21.33%	0.22%	30.92%	0.24%	0.23%	0.28%	0.77%	5.56%	20.71%	
	% Total HI	0.68%	3.80%	3.10%	--	88.00%	--	--	--	--	--	--	--	--	--	--	--	
		No Priority COCs																

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
AL = Action Level
BG = Provisional Background Value
NAL = No Action Level

Table C1.70. Sector 1 Surface and Subsurface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Iron	Manganese	Thallium	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Radium-226	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk / HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	13	28000	820	0.21	N/A	N/A	4.6	N/A	0.28	0.1	0.025	1.5	2.5	1.4	1.2	0.06	1.2	N/A
	Excavation NAL - Cancer	3.74	9.14	12500	--	--	--	2.35	1.12	--	16.4	0.582	1.63	18.3	0.164	1550	28.2	43	2.62	8.98	N/A
	Excavation NAL - Noncancer	12	98.5	9.84	23000	774	0.329	5.03	--	6.58	--	--	--	--	--	--	--	--	--	--	N/A
RA1-1	Concentration	3.57	12.4	8.81	8020	291	0.383 U	0.0342 U	0.111	43.1	19.6	0.07	113	98.6	2.35	98.6	121	13.8	0.81	14.9	N/A
	ELCR	9.5E-07	1.4E-06	7.0E-10	--	--	--	ND	9.9E-08	--	1.2E-06	1.2E-07	6.9E-05	5.4E-06	1.4E-05	6.4E-08	4.3E-06	3.2E-07	3.1E-07	1.7E-06	1E-04
	HQ	0.03	0.013	0.09	0.035	0.038	ND	ND	--	0.66	--	--	--	--	--	--	--	--	--	--	0.84
RA1-2	Concentration	5.83	17.9	7.03	14700	1340	0.366 U	0.0428 U	0.0186	6.67	0.375 U	0.0389 U	0.419 U	0.293 U	2.35	15.2	1.49	2.81	0.61	4.4	N/A
	ELCR	1.6E-06	2.0E-06	5.6E-10	--	--	--	ND	1.7E-08	--	ND	ND	ND	ND	1.4E-05	9.8E-09	5.3E-08	6.5E-08	2.3E-07	4.9E-07	1.6E-05
	HQ	0.049	0.018	0.071	0.064	0.17	ND	ND	--	0.1	--	--	--	--	--	--	--	--	--	--	0.42
RA1-3	Concentration	6.6	35.6	17.8	18752	631	0.2	1.03	1.66	224	4.0	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-4	Concentration	7.63	18.4	44.6	21100	543	0.176	0.67 U	0.5	61.7	0.449 U	0.0321 U	0.482 U	0.57 U	2.35	18.6	1.71	11.4	0.27	27.2	N/A
	ELCR	2.0E-06	2.0E-06	3.6E-09	--	--	--	ND	4.5E-07	--	ND	ND	ND	ND	1.4E-05	1.2E-08	6.1E-08	2.7E-07	1.0E-07	3.0E-06	1.7E-05
	HQ	0.064	0.019	0.45	0.092	0.07	0.053	ND	--	0.94	--	--	--	--	--	--	--	--	--	--	1.6
RA1-5	Concentration	11.6	23.9	12.7	24800	1060	0.252	0.171 U	0.0339	48.5	0.367 U	0.40	0.431 U	0.706 U	2.35	47.6	1.52	14.3	0.74	19.2	N/A
	ELCR	3.1E-06	2.6E-06	1.0E-09	--	--	--	ND	3.0E-08	--	ND	6.8E-07	ND	ND	1.4E-05	3.1E-08	5.4E-08	3.3E-07	2.8E-07	2.1E-06	1.7E-05
	HQ	0.097	0.024	0.13	0.11	0.14	0.077	ND	--	0.74	--	--	--	--	--	--	--	--	--	--	1.2
RA1-6	Concentration	3.87	12.4	4.62	7600	264	0.408 U	0.00124	0.072	28.7	0.978 U	0.05	0.587 U	1.37	2.35	20.4	1.96	10.6	0.74	13.6	N/A
	ELCR	1.0E-06	1.4E-06	3.7E-10	--	--	--	5.3E-10	6.4E-08	--	ND	8.9E-08	ND	7.5E-08	1.4E-05	1.3E-08	7.0E-08	2.5E-07	2.8E-07	1.5E-06	1.6E-05
	HQ	0.032	0.013	0.047	0.033	0.034	ND	0.000025	--	0.44	--	--	--	--	--	--	--	--	--	--	0.570
RA1-7	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-8	Concentration	5.89	18.5	10.2	21900	586	0.153	0.0346 U	0.62	254	0.301 U	0.0251 U	0.383 U	0.453 U	0.585 U	102	5.01	20.2	1.48	62.4	N/A
	ELCR	1.6E-06	2.0E-06	8.2E-10	--	--	--	ND	5.5E-07	--	ND	ND	ND	ND	ND	6.6E-08	1.8E-07	4.7E-07	5.6E-07	6.9E-06	2.8E-06
	HQ	0.049	0.019	0.1	0.095	0.076	0.047	ND	--	3.9	--	--	--	--	--	--	--	--	--	--	4.2
RA1-9	Concentration	3.88	194	8.66	8350	413	0.4 U	0.0395 U	0.271	691	2.63	0.84	6.02	18.1	2.35	5770	82.5	267	15.7	310	N/A
	ELCR	1.0E-06	2.1E-05	6.9E-10	--	--	--	ND	2.4E-07	--	1.6E-07	1.4E-06	3.7E-06	9.9E-07	1.4E-05	3.7E-06	2.9E-06	6.2E-06	6.0E-06	3.5E-05	4.8E-05
	HQ	0.032	0.2	0.088	0.036	0.053	ND	ND	--	11	--	--	--	--	--	--	--	--	--	--	11
RA1-10	Concentration	9.35	80.3	10.4	25900	614	0.172	0.00558	0.417	481	1	8.05	4.65	4.67	2.35	923	28.1	266	16.4	295	N/A
	ELCR	2.5E-06	8.8E-06	8.3E-10	--	--	--	2.4E-09	3.7E-07	--	6.1E-08	1.4E-05	2.9E-06	2.6E-07	1.4E-05	6.0E-07	1.0E-06	6.2E-06	6.3E-06	3.3E-05	4.2E-05
	HQ	0.078	0.082	0.11	0.11	0.079	0.052	0.00011	--	7.3	--	--	--	--	--	--	--	--	--	--	7.7
RA1-11	Concentration	12.4	30.3	17.3	26800	2100	0.223	0.0335 U	0.0156	41.1	0.486 U	0.0383 U	0.445 U	0.473 U	2.35	61.5	1.13	2.94	0.454 U	2.8	N/A
	ELCR	3.3E-06	3.3E-06	1.4E-09	--	--	--	ND	1.4E-08	--	ND	ND	ND	ND	1.4E-05	4.0E-08	4.0E-08	6.8E-08	ND	3.1E-07	1.7E-05
	HQ	0.1	0.031	0.18	0.12	0.27	0.068	ND	--	0.62	--	--	--	--	--	--	--	--	--	--	1.3
RA1-12	Concentration	4.07	27.5	9.32	22300	453	0.374 U	0.210	19	7.28	0.337 U	0.0389 U	0.292 U	0.568 U	2.35	15.3	1.74	2.22	0.55	2.42	N/A
	ELCR	1.1E-06	3.0E-06	7.5E-10	--	--	--	8.9E-08	1.7E-05	--	ND	ND	ND	ND	1.4E-05	9.9E-09	6.2E-08	5.2E-08	2.1E-07	2.7E-07	3.4E-05
	HQ	0.034	0.028	0.095	0.097	0.059	ND	0.0042	--	0.11	--	--	--	--	--	--	--	--	--	--	0.39
RA1-13	Concentration	7.34	37.1	8.03	20900	453	0.373 U	0.304	0.303	78	0.577 U	0.10	0.45 U	0.394 U	2.35	111	2.29	20.3	1.73	24	N/A
	ELCR	2.0E-06	4.1E-06	6.4E-10	--	--	--	1.3E-07	2.7E-07	--	ND	1.6E-07	ND	ND	1.4E-05	7.2E-08	8.1E-08	4.7E-07	6.6E-07	2.7E-06	1.9E-05
	HQ	0.061	0.038	0.082	0.091	0.059	ND	0.006	--	1.2	--	--	--	--	--	--	--	--	--	--	1.5
RA1-14	Concentration	8.62	19	13.5	23200	808	0.16	0.105 U	0.648	70.9	0.53 U	0.0358 U	0.314 U	0.242 U	2.35	25.2	1.9	6.6	0.456 U	18.4	N/A
	ELCR	2.3E-06	2.1E-06	1.1E-09	--	--	--	ND	5.8E-07	--	ND	ND	ND	ND	1.4E-05	1.6E-08	6.7E-08	1.5E-07	ND	2.0E-06	1.7E-05
	HQ	0.072	0.019	0.14	0.1	0.1	0.049	ND	--	1.1	--	--	--	--	--	--	--	--	--	--	1.5
RA1-15	Concentration	5.83	18.2	6.89	19100	398	0.168	0.0338 U	0.138	21.7	0.556 U	0.0297 U	0.549 U	0.25 U	2.35	491	1.6	3.24	0.449 U	5.97	N/A
	ELCR	1.6E-06	2.0E-06	5.5E-10	--	--	--	ND	1.2E-07	--	ND	ND	ND	ND	1.4E-05	3.2E-07	5.7E-08	7.5E-08	ND	6.6E-07	1.6E-05
	HQ	0.049	0.018	0.07	0.083	0.051	0.051	ND	--	0.33	--	--	--	--	--	--	--	--	--	--	0.60
RA1-16	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-17	Concentration	3.63	35.6	4.73	12900	390	0.37 U	0.629	0.838	523	1.51	18.9	3.26	8.45	2.35	416	0.625 U	331	17.5	355	N/A
	ELCR	9.7E-07	3.9E-06	3.8E-10	--	--	--	2.7E-07	7.5E-07	--	9.2E-08	3.2E-05	2.0E-06	4.6E-07	1.4E-05	2.7E-07	ND	7.7E-06	6.7E-06	4.0E-05	5.4E-05
	HQ	0.03	0.036	0.048	0.056	0.05	ND	0.012	--	7.9	--	--	--	--	--	--	--	--	--	--	8.1
RA1-18	Concentration	18.1	73.8	6.52	37800	438	0.268	0.0405 U	0.00414 U	1.72	0.787 U	0.0422 U	0.684 U	0.58 U	2.35	7.81	1.71	0.838 U	0.512 U	0.935	N/A
	ELCR	4.8E-06	8.1E-06	5.2E-10	--	--	--	ND	ND	--	ND	ND	ND	ND	1.4E-05	5.0E-09	6.1E-08	ND	ND	1.0E-07	2.2E-05
	HQ	0.15	0.075	0.066	0.16	0.057	0.081	ND	--	0.026	--	--	--	--	--	--	--	--	--	--	0.47
RA1-19	Concentration	11.8	23.8	8.88	28000	492	0.189	0.166 U	0.0993	108	0.45 U	0.0457 U	0.407 U	0.363 U	2.35	270	1.45	19.8	2.76	54.1	N/A
	ELCR	3.2E-06	2.6E-06	7.1E-10	--	--	--	ND	8.9E-08	--	ND	ND	ND	ND	1.4E-05	1.7E-07	5.1E-08	4.6E-07	1.1E-06	6.0E-06	1.7E-05
	HQ	0.098	0.024	0.09	0.12	0.064	0.057	ND	--	1.6	--	--	--	--	--	--	--	--	--	--	2.0
RA1-20	Concentration	9.76	72.4	4.83	10900	595	0.365 U	0.00462	8.16	185	0.148 U	0.0392 U	1.36	0.322 U	2.35	97.6	2.51	16.3	2.11	27.3	N/A
	ELCR	2.6E-06	7.9E-06	3.9E-10	--	--	--	2.0E-09	7.3E-06	--	ND	ND	8.3E-07	ND	1.4E-05	6.3E-08	8.9E-08	3.8E-07	8.1E-07	3.0E-06	3.0E-05
	HQ	0.081	0.074	0.049	0.047	0.077	ND	0.000092	--	2.8	--	--	--	--	--	--	--	--	--	--	3.0
RA1-21	Concentration	3.34	14.4	4.39	7410	414	0.393 U	0.535	0.328	830	0.372 U	8.38	3.44	2.75	2.35	426	16.4	238	12.9	264	N/A
	ELCR	8.9E-07	1.6E-06	3.5E-10	--	--	--	2.3E-07	2.9E-07	--	ND	1.4E-05	2.1E-06	1.5E-07	1.4E-05	2.7E-07	5.8E-07	5.5E-06	4.9E-06	2.9E-05	3.3E-05
	HQ	0.028	0.015	0.045	0.032	0.053	ND	0.011	--	13	--	--	--	--	--	--	--	--	--	--	13
RA1-22	Concentration	7.29	26.2	7.3	29500	498	0.213	0.0379 U	0.0117	53.5	0.452 U	0.0601 U	0.493 U	0.399 U	2.35	1390	1.13	3.14	0.523 U	3.87	N/A
	ELCR	1.9E-06	2.9E-06	5.8E-10	--	--	--	ND	1.0E-08	--	ND	ND	ND	ND	1.4E-05	9.0E-07	4.0E-08	7.3E-08	ND	4.3E-07	1.8E-05
	HQ	0.061	0.027	0.074	0.13	0.064	0.065	ND	--	0.81	--	--	--	--	--	--	--	--	--	--	1.2
RA1-23	Concentration	6.14	19.4	8.11	17600	367	0.407 U	0.0348 U	0.00354 U	1.2	0.416 U	0.0318 U	0.534 U	0.193 U	2.35	14.6	1.1	0.971	0.395 U	0.965	N/A
	ELCR	1.6E-06	2.1E-06	6.5E-10	--	--	--	ND	ND	--	ND	ND	ND	ND	1.4E-05	9.4E-09	3.9E-08	2.3E-08	ND	1.1E-07	1.6E-05
	HQ	0.051	0.02	0.082	0.077	0.047	ND	ND	--	0.018	--	--	--	--	--	--	--	--	--	--	0.24
RA1-24	Concentration	6.69	32	5.53	17800	460	0.391 U	0.0263	0.0898	67.2	0.281 U	0.03 U	0.337 U	0.259 U	2.35	45.8	2.5	6.05	0.76	10.4	N/A
	ELCR	1.8E-06	3.5E-06	4.4E-10	--	--	--	1.1E-08	8.0E-08	--	ND	ND	ND	ND	1.4E-05	3.0E-08	8.9E-08	1.4E-07	2.9E-07	1.2E-06	1.8E-05
	HQ	0.056	0.032	0.056	0.077	0.059	ND	0.00052	--	1	--	--	--	--	--	--	--	--	--	--	1.2
RA1-25	Concentration	3.8	78.1	4.28	9850	425	0.387 U	9.35	0.359	1280	1.35	9.11	7.7	10.3	3.11	266	67.3	326	19.4	371	N/A
	ELCR	1.0E-06	8.5E-06	3.4E-10	--	--	--	4.0E-06	3.2E-07	--	8.2E-08	1.6E-05	4.7E-06	5.6E-07	1.9E-05	1.7E-07	2.4E-06	7.6E-06	7.4E-06	4.1E-05	5.6E-05
	HQ	0.032	0.079	0.043	0.043	0.055	ND	0.19	--	19	--	--	--	--	--	--	--	--	--	--	19
RA1-26	Concentration	3.9	29.4	125	16100	3010	0.52	5.26	1.62	823	1.18	9.56	5.09	6.07	2.35	340	35.2	259	14.5	274	N/A
	ELCR	1.0E-06	3.2E-06	1.0E-08	--	--	--	2.2E-06	1.4E-06	--	7.2E-08	1.6E-05	3.1E-06	3.3E-07	1.4E-05	2.2E-07	1.2E-06	6.0E-06	5.5E-06	3.1E-05	4.2E-05
	HQ	0.033	0.03	1.3	0.07	0.39	0.16	0.1	--	13	--	--	--	--	--	--	--	--	--	--	15
RA1-27	Concentration	6.38	15.3	137	15400	622	0.366 U	0.332 U	0.272	44.1	0.366 U	0.0356 U	0.359 U	0.267 U	2.35	1530	0.436 U	5.66	0.47	13.7	N/A
	ELCR	1.7E-06	1.7E-06	1.1E-08	--	--	--	ND	2.4E-07	--	ND	ND	ND	ND	1.4E-05	9.9E-07	ND	1.3E-07	1.8E-07	1.5E-06	1.7E-05
	HQ	0.053	0.016	1.4	0.067	0.08	ND	ND	--	0.67	--	--	--	--	--	--	--	--	--	--	2.2

Table C1.70. Sector 1 Surface and Subsurface Soil Risk Characterization Results (Continued)

Grid	COPC	Arsenic	Chromium	Cobalt	Iron	Manganese	Thallium	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Radium-226	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk / HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
Grid	**Provisional Background**	**7.9**	**16**	**13**	**28000**	**820**	**0.21**	**N/A**	**N/A**	**4.6**	**N/A**	**0.28**	**0.1**	**0.025**	**1.5**	**2.5**	**1.4**	**1.2**	**0.06**	**1.2**	**N/A**
	Excavation NAL - Cancer	**3.74**	**9.14**	**12500**	**--**	**--**	**--**	**2.35**	**1.12**	**--**	**16.4**	**0.582**	**1.63**	**18.3**	**0.164**	**1550**	**28.2**	**43**	**2.62**	**8.98**	**N/A**
	Excavation NAL - Noncancer	**12**	**98.5**	**9.84**	**23000**	**774**	**0.329**	**5.03**	**--**	**6.58**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**N/A**
RA1-28	Concentration	5.21	21.1	4.75	9980	595	0.384 U	0.00290	8.16	185	0.506 U	0.0759 U	1.36	0.329 U	2.35	300	2.06	16.3	2.11	28.2	N/A
	ELCR	1.4E-06	2.3E-06	3.8E-10	--	--	--	1.2E-09	7.3E-06	--	ND	ND	8.3E-07	ND	1.4E-05	1.9E-07	7.3E-08	3.8E-07	8.1E-07	3.1E-06	2.5E-05
	HQ	0.043	0.021	0.048	0.043	0.077	ND	0.000058	--	2.8	--	--	--	--	--	--	--	--	--	--	3
RA1-29	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-30	Concentration	5.45	35.1	7.51	16900	393	0.39 U	0.042 U	2.71	300	0.643	2.14	2.97	2.19	1.74	152	30.9	101	7.11	127	N/A
	ELCR	1.5E-06	3.8E-06	6.0E-10	--	--	--	ND	2.4E-06	--	3.9E-08	3.7E-06	1.8E-06	1.2E-07	1.1E-05	9.8E-08	1.1E-06	2.3E-06	2.7E-06	1.4E-05	2.4E-05
	HQ	0.045	0.036	0.076	0.073	0.051	ND	ND	--	4.6	--	--	--	--	--	--	--	--	--	--	4.8
RA1-31	Concentration	5.42	19.2	14.8	15000	459	0.396 U	0.00301	0.115	6.02	0.678 U	0.0228 U	0.51 U	0.254 U	2.35	20.9	1.41	0.768	0.207 U	1.71	N/A
	ELCR	1.4E-06	2.1E-06	1.2E-09	--	--	--	1.3E-09	1.0E-07	--	ND	ND	ND	ND	1.4E-05	1.3E-08	5.0E-08	1.8E-08	ND	1.9E-07	1.6E-05
	HQ	0.045	0.019	0.15	0.065	0.059	ND	0.00006	--	0.091	--	--	--	--	--	--	--	--	--	--	0.38
RA1-32	Concentration	11.5	45	20.3	30200	1280	0.234	0.033 U	4.88	54.4	0.26 U	0.0374 U	0.534	0.383 U	2.21	25	2.76	3.41	0.76	6.14	N/A
	ELCR	3.1E-06	4.9E-06	1.6E-09	--	--	--	ND	4.4E-06	--	ND	ND	3.3E-07	ND	1.3E-05	1.6E-08	9.8E-08	7.9E-08	2.9E-07	6.8E-07	2.3E-05
	HQ	0.096	0.046	0.21	0.13	0.17	0.071	ND	--	0.83	--	--	--	--	--	--	--	--	--	--	1.5
RA1-33	Concentration	3.4	18.3	5.04	12100	235	0.401 U	0.0347 U	0.0035 U	102	0.36 U	0.24	0.378 U	0.473 U	2.35	47.9	3.28	39.8	2.18	50.2	N/A
	ELCR	9.1E-07	2.0E-06	4.0E-10	--	--	--	ND	ND	--	ND	4.1E-07	ND	ND	1.4E-05	3.1E-08	1.2E-07	9.3E-07	8.3E-07	5.6E-06	1.7E-05
	HQ	0.028	0.019	0.051	0.053	0.03	ND	ND	--	1.6	--	--	--	--	--	--	--	--	--	--	1.8
RA1-34	Concentration	6.65	35.6	17.8	18752	631	0.221	0.0425 U	0.0233	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	ND	2.1E-08	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.4E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	ND	--	3.4	--	--	--	--	--	--	--	--	--	--	3.8
RA1-35	Concentration	4.65	16.9	20.4	15400	274	0.38 U	0.0331 U	2.95	772	0.276 U	0.0352 U	6.29	0.407	2.35	260	1.59	79	5.67	110	N/A
	ELCR	1.2E-06	1.8E-06	1.6E-09	--	--	--	ND	2.6E-06	--	ND	ND	3.9E-06	2.2E-08	1.4E-05	1.7E-07	5.6E-08	1.8E-06	2.2E-06	1.2E-05	2.3E-05
	HQ	0.039	0.017	0.21	0.067	0.035	ND	ND	--	12	--	--	--	--	--	--	--	--	--	--	12.0
RA1-36	Concentration	8.17	107	9.4	31900	494	0.164	0.00513	0.747	322	0.258 U	0.0294 U	0.784	1.02	2.35	325	2.91	88.4	4.42	118	N/A
	ELCR	2.2E-06	1.2E-05	7.5E-10	--	--	--	2.2E-09	6.7E-07	--	ND	ND	4.8E-07	5.6E-08	1.4E-05	2.1E-07	1.0E-07	2.1E-06	1.7E-06	1.3E-05	2.8E-05
	HQ	0.068	0.11	0.096	0.14	0.064	0.05	0.0001	--	4.9	--	--	--	--	--	--	--	--	--	--	5.4
RA1-37	Concentration	5.28	27.3	9.06	22400	442	0.199	0.04 U	4.97	34.8	0.344 U	0.07	0.398 U	0.248 U	2.35	28.4	1.51	15.5	0.61	19.5	N/A
	ELCR	1.4E-06	3.0E-06	7.2E-10	--	--	--	ND	4.4E-06	--	ND	1.1E-07	ND	ND	1.4E-05	1.8E-08	5.4E-08	3.6E-07	2.3E-07	2.2E-06	2.2E-05
	HQ	0.044	0.028	0.092	0.097	0.057	0.06	ND	--	0.53	--	--	--	--	--	--	--	--	--	--	0.86
RA1-38	Concentration	5.55	18.1	5.73	12900	324	0.403 U	0.0399 U	0.103	90.6	0.346 U	0.07	0.445 U	0.323 U	2.35	112	1.11	24.6	1.47	31.4	N/A
	ELCR	1.5E-06	2.0E-06	4.6E-10	--	--	--	ND	9.2E-08	--	ND	1.1E-07	ND	ND	1.4E-05	7.2E-08	3.9E-08	5.7E-07	5.6E-07	3.5E-06	1.6E-05
	HQ	0.046	0.018	0.058	0.056	0.042	ND	ND	--	1.4	--	--	--	--	--	--	--	--	--	--	1.6
RA1-39	Concentration	3.78	15.3	10.5	13800	346	0.404 U	0.00544	0.498	8.44	0.521 U	0.023 U	0.514 U	0.308 U	2.35	466	1.36	2.3	0.312 U	2.46	N/A
	ELCR	1.0E-06	1.7E-06	8.4E-10	--	--	--	2.3E-09	4.4E-07	--	ND	ND	ND	ND	1.4E-05	3.0E-07	4.8E-08	5.3E-08	ND	2.7E-07	1.6E-05
	HQ	0.032	0.016	0.11	0.06	0.045	ND	0.00011	--	0.13	--	--	--	--	--	--	--	--	--	--	0.36
RA1-40	Concentration	4.37	10.9	10.6	11600	415	0.372 U	0.00562	0.291	377	0.422 U	0.64	0.488 U	0.461 U	2.35	856	1.67	42.1	5.09	139	N/A
	ELCR	1.2E-06	1.2E-06	8.5E-10	--	--	--	2.4E-09	2.6E-07	--	ND	1.1E-06	ND	ND	1.4E-05	5.5E-07	5.9E-08	9.8E-07	1.9E-06	1.5E-05	1.7E-05
	HQ	0.036	0.011	0.11	0.05	0.054	ND	0.00011	--	5.7	--	--	--	--	--	--	--	--	--	--	5.9
RA1-41	Concentration	7.36	35.7	35.3	34300	588	0.375 U	0.0329 U	0.1296	66.8	0.252 U	0.0347 U	0.486 U	0.305	2.35	21.6	1.62	28.9	1.64	33.4	N/A
	ELCR	2.0E-06	3.9E-06	2.8E-09	--	--	--	ND	1.2E-07	--	ND	ND	ND	1.7E-08	1.4E-05	1.4E-08	5.7E-08	6.7E-07	6.3E-07	3.7E-06	1.8E-05
	HQ	0.061	0.036	0.36	0.15	0.076	ND	ND	--	1	--	--	--	--	--	--	--	--	--	--	1.6
RA1-42	Concentration	5.03	18.5	26.6	19400	459	0.373 U	0.193	0.332	227	0.636 U	0.0278 U	0.387 U	0.349 U	2.35	52.4	2.19	47.2	3.08	63.8	N/A
	ELCR	1.3E-06	2.0E-06	2.1E-09	--	--	--	8.2E-08	3.0E-07	--	ND	ND	ND	ND	1.4E-05	3.4E-08	7.8E-08	1.1E-06	1.2E-06	7.1E-06	1.6E-05
	HQ	0.042	0.019	0.27	0.084	0.059	ND	0.0038	--	3.4	--	--	--	--	--	--	--	--	--	--	3.8
RA1-43	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-44	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	0.050	224	0.595 U	0.0625 U	0.836 U	0.42 U	2.35	20.9	0.688	2.4	0.52	2.52	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	4.5E-08	--	ND	ND	ND	ND	1.4E-05	1.3E-08	2.4E-08	5.6E-08	2.0E-07	2.8E-07	1.8E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-45	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
RA1-46	Concentration	6.65	35.6	17.8	18752	631	0.221	1.03	1.66	224	3.99	3.91	12.0	12.9	2.35	400	12.1	63.2	4.80	76.5	N/A
	ELCR	1.8E-06	3.9E-06	1.4E-09	--	--	--	4.4E-07	1.5E-06	--	2.4E-07	6.7E-06	7.4E-06	7.0E-07	1.4E-05	2.6E-07	4.3E-07	1.5E-06	1.8E-06	8.5E-06	3.6E-05
	HQ	0.055	0.036	0.18	0.082	0.081	0.067	0.021	--	3.4	--	--	--	--	--	--	--	--	--	--	3.9
Sector 1 Surface Soil	Concentration	7.38	55.7	34.2	20513	756	0.232	2.005	3.565	293	3.45	4.37	10.2	15.5	2.47	963	26.6	93.5	5.73	109	N/A
	ELCR	2.0E-06	6.1E-06	2.7E-09	--	--	--	8.5E-07	3.2E-06	--	2.1E-07	7.5E-06	6.3E-06	8.5E-07	1.5E-05	6.2E-07	9.4E-07	2.2E-06	2.2E-06	1.2E-05	**4.2E-05**
	HQ	0.061	0.057	0.35	0.089	0.098	0.071	0.04	--	4.5	--	--	--	--	--	--	--	--	--	--	**5.0**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	No	No	No	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No	**Yes**	No	No	**Yes**	**Yes**	**Yes**	
	Reason:	<BG	>NAL	>NAL	<NAL	<NAL	<NAL	<NAL	>NAL	>AL	<NAL	>NAL	>NAL	<NAL	>NAL	<NAL	<NAL	>NAL	>NAL	>NAL	
	% Total ELCR	4.81%	14.67%	0.01%	--	--	--	2.04%	7.70%	--	0.51%	18.04%	15.15%	2.04%	36.08%	1.49%	2.26%	5.29%	5.29%	28.87%	
	% Total HI	1.22%	1.14%	7.00%	1.78%	1.96%	1.42%	0.80%	--	90.00%	--	--	--	--	--	--	--	--	--	--	
		Uranium is a Priority COC																			

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
AL = Action Level
BG = Provisional Background Value
NAL = No Action Level

Table C1.71. Sector 2 Surface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Uranium	Neptunium-237	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Units	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	
	Provisional Background	12	16	4.9	0.1	1.2	0.06	1.2	N/A
	Industrial NAL—Cancer	1.6	12.3	--	0.249	50.1	0.408	1.66	N/A
	Industrial NAL—Noncancer	25.7	693	46.6	--	--	--	--	N/A
RA2-1	Concentration	7.85	18.5	59.9	1.15	31.6	1.37	34.7	N/A
	ELCR	5E-06	2E-06	--	5E-06	6E-07	3E-06	2E-05	3.6E-05
	HQ	0.031	0.0027	0.13	--	--	--	--	0.16
RA2-2	Concentration	10.1	53.5	10.8	0.402 U	3.91	0.364 U	5.33	N/A
	ELCR	6E-06	4E-06	--	ND	8E-08	ND	3E-06	1.4E-05
	HQ	0.039	0.0077	0.023	--	--	--	--	0.070
RA2-3	Concentration	1.84	5.96	4.68	0.711 U	2.35	0.316	2.37	N/A
	ELCR	1E-06	5E-07	--	ND	5E-08	8E-07	1E-06	3.9E-06
	HQ	0.0072	0.00086	0.01	--	--	--	--	0.018
RA2-4	Concentration	6.40	20.0	92.7	0.465 U	10.5	1.21	17.6	N/A
	ELCR	4E-06	2E-06	--	ND	2E-07	3E-06	1E-05	2.0E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-5	Concentration	6.40	20.0	92.7	1.15	52.3	6.36	53.0	N/A
	ELCR	4.0E-06	1.6E-06	--	4.6E-06	1.0E-06	1.6E-05	3.2E-05	5.9E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-6	Concentration	5.89	12.4	910	0.364 U	512	28.4	554	N/A
	ELCR	3.7E-06	1.0E-06	--	ND	1.0E-05	7.0E-05	3.3E-04	4.1E-04
	HQ	0.023	0.0018	2	--	--	--	--	2.0
RA2-7	Concentration	12.5	17.2	9.89	0.735 U	5.93	0.49	7.87	N/A
	ELCR	7.8E-06	1.4E-06	--	ND	1.2E-07	1.2E-06	4.7E-06	1.5E-05
	HQ	0.049	0.0025	0.021	--	--	--	--	0.07
RA2-8	Concentration	3.49	14.6	3.22	0.829 U	2.73	0.392 U	4.84	N/A
	ELCR	2.2E-06	1.2E-06	--	ND	5.4E-08	ND	2.9E-06	6.4E-06
	HQ	0.014	0.0021	0.0069	--	--	--	--	0.023
RA2-9	Concentration	10.5	19.3	1.58	0.469 U	0.848	0.432 U	0.493	N/A
	ELCR	6.6E-06	1.6E-06	--	ND	1.7E-08	ND	3.0E-07	8.5E-06
	HQ	0.041	0.0028	0.0034	--	--	--	--	0.047
RA2-10	Concentration	6.40	20.0	92.7	1.15	52.3	6.36	53.0	N/A
	ELCR	4E-06	2E-06	--	5E-06	1E-06	2E-05	3E-05	5.9E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-11	Concentration	6.40	20.0	92.7	1.15	52.3	6.36	53.0	N/A
	ELCR	4E-06	2E-06	--	5E-06	1E-06	2E-05	3E-05	5.9E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-12	Concentration	4.72	17.9	1.28	0.756 U	1.22	0.557 U	1.24	N/A
	ELCR	3E-06	2E-06	--	ND	2E-08	ND	8E-07	5.3E-06
	HQ	0.018	0.0026	0.0027	--	--	--	--	0.023
RA2-13	Concentration	5.53	37.5	1.58	0.504 U	0.871	0.514 U	0.667	N/A
	ELCR	4E-06	3E-06	--	ND	2E-08	ND	4E-07	6.9E-06
	HQ	0.022	0.0054	0.0034	--	--	--	--	0.031
RA2-14	Concentration	6.40	20.0	92.7	1.15	52.3	6.36	53.0	N/A
	ELCR	4E-06	2E-06	--	5E-06	1E-06	2E-05	3E-05	5.9E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-15	Concentration	6.40	20.0	92.7	1.15	52.3	6.36	53.0	N/A
	ELCR	4E-06	2E-06	--	5E-06	1E-06	2E-05	3E-05	5.9E-05
	HQ	0.025	0.0029	0.2	--	--	--	--	0.23
RA2-16	Concentration	4.47	13.9	11.6	0.833 U	2.97	0.526 U	4.46	N/A
	ELCR	3E-06	1E-06	--	ND	6E-08	ND	3E-06	6.7E-06
	HQ	0.017	0.002	0.025	--	--	--	--	0.044
RA2-17	Concentration	3.52	9.54	5.08	0.707 U	0.728 U	0.435 U	2.46	N/A
	ELCR	2E-06	8E-07	--	ND	ND	ND	2E-06	4.5E-06
	HQ	0.014	0.0014	0.011	--	--	--	--	0.026

Table C1.71. Sector 2 Surface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Uranium	Neptunium-237	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Units	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	
	Provisional Background	12	16	4.9	0.1	1.2	0.06	1.2	N/A
	Industrial NAL—Cancer	1.6	12.3	--	0.249	50.1	0.408	1.66	N/A
	Industrial NAL—Noncancer	25.7	693	46.6	--	--	--	--	N/A
Sector 2 Surface Soil	**Concentration**	7.54	24.8	611	1.15	343	10.4	369	N/A
	ELCR	5E-06	2E-06	--	5E-06	7E-06	3E-05	2E-04	**2.6E-04**
	HQ	0.029	0.0036	1.3	--	--	--	--	**1.3**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	<BG; >NAL	>NAL	>AL	>NAL	>NAL	>NAL	>AL	
	% Total ELCR	1.78%	0.76%	--	1.74%	2.57%	9.84%	83.30%	
	% Total HI	2.18%	0.27%	97.55%	--	--	--	--	
		Uranium and Uranium-238 are Priority COCs							

Notes:

Orange Shading = The EPC concentration is above the provisional background value

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

BG = Provisional Background Value

NAL = No Action Level

Table C1.72. Sector 2 Surface and Subsurface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Iron	Manganese	Nickel	Uranium	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	28000	820	21	4.6	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	--	--	100000	--	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	23000	774	652	6.58	--	--	--	N/A
RA2-1	Concentration	9.89	56.9	27500	713	41.1	281	38.2	2.45	50.6	N/A
	ELCR	3E-06	6E-06	--	--	4E-10	--	9E-07	9E-07	6E-06	1.6E-05
	HQ	0.082	0.058	0.12	0.092	0.0063	4.3	--	--	--	4.7
RA2-2	Concentration	10.1	53.5	24200	1050	25.5	10.8	3.91	0.244 U	5.33	N/A
	ELCR	3E-06	6E-06	--	--	3E-10	--	9E-08	ND	6E-07	9.3E-06
	HQ	0.084	0.054	0.11	0.14	0.0039	0.16	--	--	--	0.55
RA2-3	Concentration	1.84	5.96	2720	82.4	5.92	4.68	2.35	0.316	2.37	N/A
	ELCR	5E-07	7E-07	--	--	6E-11	--	6E-08	1E-07	3E-07	1.6E-06
	HQ	0.015	0.0061	0.012	0.011	0.00091	0.071	--	--	--	0.12
RA2-4	Concentration	6.83	26.1	19410	547	134	106	10.5	1.21	17.6	N/A
	ELCR	2E-06	3E-06	--	--	1E-09	--	2E-07	5E-07	2E-06	7.4E-06
	HQ	0.057	0.026	0.084	0.071	0.021	1.6	--	--	--	1.9
RA2-5	Concentration	5.72	24.3	30300	292	12.4	10.2	24.5	1.56	37.2	N/A
	ELCR	2E-06	3E-06	--	--	1E-10	--	6E-07	6E-07	4E-06	9.5E-06
	HQ	0.048	0.025	0.13	0.038	0.0019	0.16	--	--	--	0.40
RA2-6	Concentration	6.9	19.8	17200	299	1430	910	512	28.4	554	N/A
	ELCR	2E-06	2E-06	--	--	1E-08	--	1E-05	1E-05	6E-05	8.9E-05
	HQ	0.058	0.02	0.075	0.039	0.22	14	--	--	--	14
RA2-7	Concentration	12.5	17.2	18200	1350	25.5	30.7	8.06	0.675	11.7	N/A
	ELCR	3E-06	2E-06	--	--	3E-10	--	2E-07	3E-07	1E-06	7.0E-06
	HQ	0.1	0.017	0.079	0.17	0.0039	0.47	--	--	--	0.84
RA2-8	Concentration	6.29	15.7	18100	418	14.9	3.22	2.73	0.392 U	4.84	N/A
	ELCR	2E-06	2E-06	--	--	2E-10	--	6E-08	ND	5E-07	4.0E-06
	HQ	0.052	0.016	0.079	0.054	0.0023	0.049	--	--	--	0.25
RA2-9	Concentration	10.5	19.3	21200	845	22.5	1.58	1.01	0.412 U	1.45	N/A
	ELCR	3E-06	2E-06	--	--	2E-10	--	2E-08	ND	2E-07	5.1E-06
	HQ	0.088	0.02	0.092	0.11	0.0035	0.024	--	--	--	0.34
RA2-10	Concentration	6.83	26.1	19410	547	134	106	50.7	5.77	53.4	N/A
	ELCR	2E-06	3E-06	--	--	1E-09	--	1E-06	2E-06	6E-06	1.4E-05
	HQ	0.057	0.026	0.084	0.071	0.021	1.6	--	--	--	1.9
RA2-11	Concentration	6.83	26.1	19410	547	134	106	50.7	5.77	53.4	N/A
	ELCR	2E-06	3E-06	--	--	1E-09	--	1E-06	2E-06	6E-06	1.4E-05
	HQ	0.057	0.026	0.084	0.071	0.021	1.6	--	--	--	1.9
RA2-12	Concentration	4.72	17.9	16300	353	6.13	1.28	1.22	0.557 U	1.24	N/A
	ELCR	1E-06	2E-06	--	--	6E-11	--	3E-08	ND	1E-07	3.5E-06
	HQ	0.039	0.018	0.071	0.046	0.00094	0.019	--	--	--	0.19
RA2-13	Concentration	5.53	37.5	26800	416	12.4	1.58	0.871	0.514 U	0.667	N/A
	ELCR	2E-06	4E-06	--	--	1E-10	--	2E-08	ND	7E-08	5.7E-06
	HQ	0.046	0.038	0.12	0.054	0.0019	0.024	--	--	--	0.28
RA2-14	Concentration	6.83	26.1	19410	547	134	106	50.7	5.77	53.4	N/A
	ELCR	2E-06	3E-06	--	--	1E-09	--	1E-06	2E-06	6E-06	1.4E-05
	HQ	0.057	0.026	0.084	0.071	0.021	1.6	--	--	--	1.9

Table C1.72. Sector 2 Surface and Subsurface Soil Risk Characterization Results (Continued)

Grid	COPC	Arsenic	Chromium	Iron	Manganese	Nickel	Uranium	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
Grid	Concentration Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	28000	820	21	4.6	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	--	--	100000	--	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	23000	774	652	6.58	--	--	--	N/A
RA2-15	Concentration	6.83	26.1	19410	547	134	106	50.7	5.77	53.4	N/A
	ELCR	2E-06	3E-06	--	--	1E-09	--	1E-06	2E-06	6E-06	1.4E-05
	HQ	0.057	0.026	0.084	0.071	0.021	1.6	--	--	--	1.9
RA2-16	Concentration	4.47	13.9	14800	326	9.76	11.6	2.97	0.405 U	4.46	N/A
	ELCR	1E-06	2E-06	--	--	1E-10	--	7E-08	ND	5E-07	3.3E-06
	HQ	0.037	0.014	0.064	0.042	0.0015	0.18	--	--	--	0.34
RA2-17	Concentration	3.52	30.7	15600	421	5.69	5.08	0.655 U	0.435 U	2.46	N/A
	ELCR	9E-07	3E-06	--	--	6E-11	--	ND	ND	3E-07	4.6E-06
	HQ	0.029	0.031	0.068	0.054	0.00087	0.077	--	--	--	0.26
Sector 2 Surface and Subsurface Soil	**Concentration**	7.966	33.32	21996	725.2	951	258.3	341.4	10.43	369.4	N/A
	ELCR	2E-06	4E-06	--	--	1E-08	--	8E-06	4E-06	4E-05	**5.9E-05**
	HQ	0.066	0.034	0.096	0.094	0.2	3.9	--	--	--	**4.3**
	COC (Y/N?):	**Yes**	**Yes**	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	<NAL	<NAL	>NAL	>AL	>NAL	>NAL	>NAL	
	% Total ELCR	3.58%	6.14%	--	--	0.02%	--	13.48%	6.82%	69.95%	
	% Total HI	1.52%	0.78%	2.21%	2.17%	3.46%	89.86%	--	--	--	
		Uranium is a Priority COC									

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

NAL = No Action Level

Table C1.73. Sector 3 Surface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Total PAH	Trichloroethene	Uranium-235/236	Uranium-238	Total Risk/HI
	CAS #							N/A
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	N/A
	Provisional Background	12	16	N/A	N/A	0.06	1.2	N/A
	Industrial NAL—Cancer	1.6	12.3	0.643	6.31	0.408	1.66	N/A
	Industrial NAL—Noncancer	25.7	693	6.85	1.9	--	--	N/A
RA3-1	Concentration	3.77	10.5	0.036	0.000671	0.457 U	9.11	N/A
	ELCR	2E-06	8.5E-07	5.6E-08	1.1E-10	ND	5.5E-06	9E-06
	HQ	0.015	0.0015	0.00053	0.000035	--	--	0.02
RA3-2	Concentration	5.73	17.4	0.768405	0.000712	0.45 U	8.19	N/A
	ELCR	4E-06	1.4E-06	1.2E-06	1.1E-10	ND	4.9E-06	1E-05
	HQ	0.022	0.0025	0.011	0.000037	--	--	0.04
RA3-3	Concentration	13.1	20.8	0.0313308	0.107 U	1.57	38.6	N/A
	ELCR	8E-06	2E-06	5E-08	ND	4E-06	2E-05	4E-05
	HQ	0.051	0.003	0.00046	ND	--	--	0.05
RA3-4	Concentration	6.01	17.7	0.3	3.01	0.348 U	5.22	N/A
	ELCR	4E-06	1.4E-06	4.9E-07	4.8E-07	ND	3.1E-06	9E-06
	HQ	0.023	0.0026	0.0046	0.16	--	--	0.2
RA3-5	Concentration	5.47	15.7	1.1	0.000958 U	0.553 U	5.3	N/A
	ELCR	3E-06	1.3E-06	1.7E-06	ND	ND	3.2E-06	1E-05
	HQ	0.021	0.0023	0.016	ND	--	--	0.04
RA3-6	Concentration	9.71	19.9	0.0756417	0.00436	1.06	11.9	N/A
	ELCR	6E-06	1.6E-06	1.2E-07	6.9E-10	2.6E-06	7.2E-06	2E-05
	HQ	0.038	0.0029	0.0011	0.00023	--	--	0.04
RA3-7	Concentration	6.88	17.1	0.028851	0.00119 U	0.404 U	2.9	N/A
	ELCR	4E-06	1.4E-06	4.5E-08	ND	ND	1.7E-06	7E-06
	HQ	0.027	0.0025	0.00042	ND	--	--	0.03
RA3-8	Concentration	6.84	16.6	0.30	0.60	1.32	10.4	N/A
	ELCR	4E-06	1.4E-06	4.6E-07	9.6E-08	3.2E-06	6.3E-06	2E-05
	HQ	0.027	0.0024	0.0043	0.032	--	--	0.07
RA3-9	Concentration	6.84	16.6	0.30	0.60	1.32	10.4	N/A
	ELCR	4E-06	1.4E-06	4.6E-07	9.6E-08	3.2E-06	6.3E-06	2E-05
	HQ	0.027	0.0024	0.0043	0.032	--	--	0.07
RA3-10	Concentration	4.02	13.9	0.0	0.01	0.458 U	2.1	N/A
	ELCR	3E-06	1.1E-06	4.0E-08	8.2E-10	ND	1.3E-06	5E-06
	HQ	0.016	0.002	0.00037	0.00027	--	--	0.02
Sector 3 Surface Soil	Concentration	8.437	18.31	0.81	2.81	1.06	19.5	N/A
	ELCR	5E-06	1.5E-06	1.3E-06	4.5E-07	2.6E-06	1.2E-05	**2E-05**
	HQ	0.033	0.0026	0.012	0.15	--	--	**0.2**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	<BG; >NAL	>NAL	>NAL	>NAL	>NAL	>NAL	
	% Total ELCR	22.89%	6.48%	5.62%	1.94%	11.23%	51.84%	
	% Total HI	16.50%	1.30%	6.00%	75.00%	--	--	
		No Priority COCs						

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
BG = Provisional Background Value
NAL = No Action Level
AL = Action Level

Table C1.74. Sector 3 Surface and Subsurface Soil Risk Characterization Results

Grid	COPC CAS #	Arsenic	Chromium	Cobalt	Manganese	Thallium	Trichloroethene	Uranium	Uranium-238	Total Risk/HI N/A
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	N/A
	Provisional Background	7.9	16	13	820	0.21	N/A	4.6	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	12500	--	--	30.9	--	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	9.84	774	0.329	2.26	6.58	--	N/A
RA3-1	Concentration	7.95	17.3	4.3	336	0.184	0.000671	3.58	9.11	N/A
	ELCR	2.1E-06	1.9E-06	3.4E-10	--	--	2.2E-11	--	1.0E-06	5.0E-06
	HQ	0.066	0.018	0.044	0.043	0.056	0.00003	0.054	--	0.28
RA3-2	Concentration	5.73	17.4	6.36	434	0.17	0.00178	29.7	8.19	N/A
	ELCR	1.5E-06	1.9E-06	5.1E-10	--	--	5.8E-11	--	9.1E-07	4.3E-06
	HQ	0.048	0.018	0.065	0.056	0.052	0.000079	0.45	--	0.69
RA3-3	Concentration	13.1	20.8	22.3	1020	0.254	0.00108 U	10.7	38.6	N/A
	ELCR	3.5E-06	2.3E-06	1.8E-09	--	--	ND	--	4.3E-06	1.0E-05
	HQ	0.11	0.021	0.23	0.13	0.077	ND	0.16	--	0.73
RA3-4	Concentration	6.01	20.2	6.77	428	0	3.01	7	5.22	N/A
	ELCR	1.6E-06	2.2E-06	5.4E-10	--	--	9.7E-08	--	5.8E-07	4.5E-06
	HQ	0.05	0.021	0.069	0.055	0.055	0.13	0.11	--	0.49
RA3-5	Concentration	7.49	17.4	12.9	1070	0.209	0.000958 U	9.93	5.28	N/A
	ELCR	2.0E-06	1.9E-06	1.0E-09	--	--	ND	--	5.9E-07	4.5E-06
	HQ	0.062	0.018	0.13	0.14	0.064	ND	0.15	--	0.56
RA3-6	Concentration	9.71	24.6	8.99	597	0.269	0.0478	12.4	11.9	N/A
	ELCR	2.6E-06	2.7E-06	7.2E-10	--	--	1.5E-09	--	1.3E-06	6.6E-06
	HQ	0.081	0.025	0.091	0.077	0.082	0.0021	0.19	--	0.55
RA3-7	Concentration	6.88	19.1	25.1	1330	0.215	0.00119 U	9.69	2.9	N/A
	ELCR	1.8E-06	2.1E-06	2.0E-09	--	--	ND	--	3.2E-07	4.2E-06
	HQ	0.057	0.019	0.26	0.17	0.065	ND	0.15	--	0.72
RA3-8	Concentration	8.82	18.4	6.77	605	0.204	0.0733	0.931	1.08	N/A
	ELCR	2.4E-06	2.0E-06	5.4E-10	--	--	2.4E-09	--	1.2E-07	4.5E-06
	HQ	0.074	0.019	0.069	0.078	0.062	0.0032	0.014	--	0.32
RA3-9	Concentration	8.26	19.8	13.4	992	0.23	0.52	9.73	9.37	N/A
	ELCR	2.2E-06	2.2E-06	1.1E-09	--	--	1.7E-08	--	1.0E-06	5.4E-06
	HQ	0.069	0.02	0.14	0.13	0.07	0.023	0.15	--	0.6
RA3-10	Concentration	8.69	22.6	27.1	3110	0.4	0.00515	3.2	2.08	N/A
	ELCR	2.3E-06	2.5E-06	2.2E-09	--	--	1.7E-10	--	2.3E-07	5.0E-06
	HQ	0.072	0.023	0.28	0.4	0.12	0.00023	0.049	--	0.94
Sector 3 Surface and Subsurface Soil	Concentration	9.49	21.2	18	1674	0.27	3.18	18.4	19.8	N/A
	ELCR	2.5E-06	2.3E-06	1.5E-09	--	--	1.0E-07	--	2.2E-06	**7.1E-06**
	HQ	0.079	0.021	0.19	0.22	0.082	0.14	0.28	--	**1**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	>NAL	
	% Total ELCR	35.20%	32.39%	0.02%	--	--	1.41%	--	30.98%	
	% Total HI	7.90%	2.10%	19.00%	22.00%	8.20%	14.00%	28.00%	--	
		No Priority COCs								

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
NAL = No Action Level

Table C1.75. Sector 4 Surface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Chromium	Total PCB	Uranium	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	16	N/A	4.9	0.1	1.5	1.2	0.06	1.2	N/A
	Industrial NAL - Cancer	12.3	0.293	--	0.249	31.3	50.1	0.408	1.66	N/A
	Industrial NAL - Noncancer	693	--	46.6	--	--	--	--	--	N/A
RA4-1	Concentration	12.8	0.354	3.23	0.424 U	1.01	2.35	0.473 U	2.66	N/A
	ELCR	1.0E-06	1.2E-06	--	ND	3.2E-08	4.7E-08	ND	1.6E-06	3.9E-06
	HQ	0.0018	--	0.0069	--	--	--	--	--	0.0087
RA4-2	Concentration	18.5	0.999	28.4	0.631 U	1.38	6.17	0.405	8.17	N/A
	ELCR	1.5E-06	3.4E-06	--	ND	4.4E-08	1.2E-07	9.9E-07	4.9E-06	1.1E-05
	HQ	0.0027	--	0.061	--	--	--	--	--	0.0640
RA4-3	Concentration	45	0.109	7.04	0.0467 U	1.97	1.75	0.283 U	2.63	N/A
	ELCR	3.7E-06	3.7E-07	--	ND	6.3E-08	3.5E-08	ND	1.6E-06	5.8E-06
	HQ	0.0065	--	0.015	--	--	--	--	--	0.0220
RA4-4	Concentration	14.1	0.0433	4.61	0.0323 U	1.25	1.29	0.434	1.73	N/A
	ELCR	1.1E-06	1.5E-07	--	ND	4.0E-08	2.6E-08	1.1E-06	1.0E-06	3.4E-06
	HQ	0.002	--	0.0099	--	--	--	--	--	0.0120
RA4-5	Concentration	44.1	0.21	238	0.22	1.85	25.5	4.32	4.37	N/A
	ELCR	3.6E-06	7.3E-07	--	8.8E-07	5.9E-08	5.1E-07	1.1E-05	2.6E-06	1.9E-05
	HQ	0.0064	--	0.51	--	--	--	--	--	0.5200
RA4-6	Concentration	28.1	0.14	20.3	0.437 U	2.6	6.82	0.434 U	11.4	N/A
	ELCR	2.3E-06	4.8E-07	--	ND	8.3E-08	1.4E-07	ND	6.9E-06	9.9E-06
	HQ	0.0041	--	0.044	--	--	--	--	--	0.0480
RA4-7	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
RA4-8	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
RA4-9	Concentration	13.9	0.00355 U	1.77	0.754 U	0.974 U	0.688 U	0.344 U	0.534	N/A
	ELCR	1.1E-06	ND	--	ND	ND	ND	ND	3.2E-07	1.4E-06
	HQ	0.002	--	0.0038	--	--	--	--	--	0.0058
RA4-10	Concentration	10.1	0.00392	5.78	8.1	77.8	227	16.1	330	N/A
	ELCR	8.2E-07	1.3E-08	--	3.3E-05	2.5E-06	4.5E-06	3.9E-05	2.0E-04	2.8E-04
	HQ	0.0015	--	0.012	--	--	--	--	--	0.0140
RA4-11	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
RA4-12	Concentration	15	0.039	1.01	0.812 U	0.59 U	2.37	0.376 U	2.17	N/A
	ELCR	1.2E-06	1.3E-07	--	ND	ND	4.7E-08	ND	1.3E-06	2.7E-06
	HQ	0.0022	--	0.0022	--	--	--	--	--	0.0044
RA4-13	Concentration	21.8	0.00386 U	9.79	0.65 U	1.05	0.537	0.316 U	1.22	N/A
	ELCR	1.8E-06	ND	--	ND	3.4E-08	1.1E-08	ND	7.3E-07	2.6E-06
	HQ	0.0031	--	0.021	--	--	--	--	--	0.0240
RA4-14	Concentration	19.4	0.00382 U	1.11	0.601 U	0.822	0.587	0.227 U	0.535	N/A
	ELCR	1.6E-06	ND	--	ND	2.6E-08	1.2E-08	ND	3.2E-07	2.0E-06
	HQ	0.0028	--	0.0024	--	--	--	--	--	0.0052
RA4-15	Concentration	20.6	0.0162	23.5	0.901 U	2.28	6.6	0.342	8.43	N/A
	ELCR	1.7E-06	5.5E-08	--	ND	7.3E-08	1.3E-07	8.4E-07	5.1E-06	7.9E-06
	HQ	0.003	--	0.05	--	--	--	--	--	0.0530
RA4-16	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
RA4-17	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
RA4-18	Concentration	22.0	0.21	28.7	4.16	9.2	25.5	4.32	31.2	N/A
	ELCR	1.8E-06	7.3E-07	--	1.7E-05	2.9E-07	5.1E-07	1.1E-05	1.9E-05	5.0E-05
	HQ	0.0032	--	0.062	--	--	--	--	--	0.0650
Sector 4 Surface Soil	Concentration	26.2	0.417	83.72	4.55	26.56	146	6.801	209	N/A
	ELCR	2.1E-06	1.4E-06	--	1.8E-05	8.5E-07	2.9E-06	1.7E-05	1.3E-04	**1.7E-04**
	HQ	0.0038	--	0.18	--	--	--	--	--	**0.18**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	>AL	
	% total ELCR	1.22%	0.81%	--	10.45%	0.49%	1.68%	9.87%	75.47%	
	% Total HI	2.11%	--	100.00%	--	--	--	--	--	
		Uranium-238 is a Priority COC								

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

NAL = No Action Level

Table C1.76. Sector 4 Surface and Subsurface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Iron	Manganese	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Plutonium-239/240	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	28000	820	N/A	N/A	4.6	0.28	0.1	0.025	1.4	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	--	--	2.35	30.9	--	0.582	1.63	18.3	28.2	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	23000	774	5.03	2.26	6.58	--	--	--	--	--	--	--	N/A
RA4-1	Concentration	7.2	22.4	27900	639	0.06	0.224	3.23	0.0396 U	0.346 U	0.341 U	1.23	2.35	0.362 U	2.66	N/A
	ELCR	1.9E-06	2.5E-06	--	--	2.4E-08	7.2E-09	--	ND	ND	ND	4.4E-08	5.5E-08	ND	3.0E-07	4.8E-06
	HQ	0.06	0.023	0.12	0.083	0.0011	0.0099	0.049	--	--	--	--	--	--	--	0.35
RA4-2	Concentration	4.38	18.5	16500	255	0.57	0.456	28.4	0.168	0.581 U	0.283 U	1.38	6.17	0.405	8.17	N/A
	ELCR	1.2E-06	2.0E-06	--	--	2.4E-07	1.5E-08	--	2.9E-07	ND	ND	4.9E-08	1.4E-07	1.5E-07	9.1E-07	5E-06
	HQ	0.037	0.019	0.072	0.033	0.011	0.02	0.43	--	--	--	--	--	--	--	0.62
RA4-3	Concentration	11	117	27700	2440	0.208	0.29	1000	0.0752	0.0309 U	0.0545 U	1.97	1.75	0.283 U	2.63	N/A
	ELCR	2.9E-06	1.3E-05	--	--	8.9E-08	9.4E-09	--	1.3E-07	ND	ND	7.0E-08	4.1E-08	ND	2.9E-07	2E-05
	HQ	0.092	0.12	0.12	0.32	0.0041	0.013	15	--	--	--	--	--	--	--	16
RA4-4	Concentration	7.82	24.4	27300	3050	0.05	1.73	8.95	0.025	0.0309 U	0.0549 U	1.43	2.54	0.434	3.04	N/A
	ELCR	2.1E-06	2.7E-06	--	--	2.2E-08	5.6E-08	--	4.3E-08	ND	ND	5.1E-08	5.9E-08	1.7E-07	3.4E-07	6E-06
	HQ	0.065	0.025	0.12	0.39	0.001	0.077	0.14	--	--	--	--	--	--	--	0.82
RA4-5	Concentration	22.9	44.1	55100	2670	0.038 U	112.5	340	0.101	0.219	0.249	1.85	25.7626	4.32025	4.37	N/A
	ELCR	6.1E-06	4.8E-06	--	--	ND	3.6E-06	--	1.7E-07	1.3E-07	1.4E-08	6.6E-08	6.0E-07	1.6E-06	4.9E-07	2E-05
	HQ	0.19	0.045	0.24	0.34	ND	5	5.2	--	--	--	--	--	--	--	11
RA4-6	Concentration	7.18	28.1	24300	593	0.0249	0.00184	20.3	0.106	0.371 U	0.238 U	2.6	6.82	0.434 U	11.4	N/A
	ELCR	1.9E-06	3.1E-06	--	--	1.1E-08	6.0E-11	--	1.8E-07	ND	ND	9.2E-08	1.6E-07	ND	1.3E-06	7E-06
	HQ	0.06	0.029	0.11	0.077	0.0005	0.000081	0.31	--	--	--	--	--	--	--	0.59
RA4-7	Concentration	8.51	30.2	23358	1043	0.0382 U	0.93 U	111	0.53	4.16	9.97	7.44	25.8	4.32	29.0	N/A
	ELCR	2.3E-06	3.3E-06	--	--	ND	ND	--	9.0E-07	2.6E-06	5.5E-07	2.6E-07	6.0E-07	1.6E-06	3.2E-06	1.5E-05
	HQ	0.071	0.031	0.1	0.13	ND	ND	1.7	--	--	--	--	--	--	--	2
RA4-8	Concentration	8.51	30.2	23358	1043	0.1	0.09	111	0.53	4.16	9.97	7.44	25.8	4.32	29.0	N/A
	ELCR	2.3E-06	3.3E-06	--	--	4.2E-08	2.8E-09	--	9.0E-07	2.6E-06	5.5E-07	2.6E-07	6.0E-07	1.6E-06	3.2E-06	1.5E-05
	HQ	0.071	0.031	0.1	0.13	0.002	0.0038	1.7	--	--	--	--	--	--	--	2
RA4-9	Concentration	4.22	15.9	13100	332	0.0355 U	0.01	1.77	0.0321 U	0.553 U	0.506 U	1.14	0.67 U	0.344 U	0.53	N/A
	ELCR	1.1E-06	1.7E-06	--	--	ND	3.5E-10	--	ND	ND	ND	4.0E-08	ND	ND	5.9E-08	2.9E-06
	HQ	0.035	0.016	0.057	0.043	ND	0.00048	0.027	--	--	--	--	--	--	--	0.18
RA4-10	Concentration	7.46	10.1	9260	234	0.0332 U	0.00918	5.78	2.82	8.1	19.7	77.8	227	16.1	330	N/A
	ELCR	2.0E-06	1.1E-06	--	--	ND	3.0E-10	--	4.8E-06	5.0E-06	1.1E-06	2.8E-06	5.3E-06	6.1E-06	3.7E-05	6.5E-05
	HQ	0.062	0.01	0.04	0.03	ND	0.00041	0.088	--	--	--	--	--	--	--	0.23
RA4-11	Concentration	8.51	30.2	23358.5	1043.2	0.18	8.32	111.1	0.53	4.16	9.97	7.44	25.8	4.32	29.0	N/A
	ELCR	2.3E-06	3.3E-06	--	--	7.5E-08	2.7E-07	--	9.0E-07	2.6E-06	5.5E-07	2.6E-07	6.0E-07	1.6E-06	3.2E-06	1.6E-05
	HQ	0.071	0.031	0.1	0.13	0.0035	0.37	1.7	--	--	--	--	--	--	--	2.4
RA4-12	Concentration	8.43	22.1	29600	384	0.18	0.	1.2	0.0327 U	0.78 U	0.496 U	1.34	2.37	0.376 U	2.17	N/A
	ELCR	2.3E-06	2.4E-06	--	--	7.5E-08	4.2E-11	--	ND	ND	ND	4.8E-08	5.5E-08	ND	2.4E-07	5.1E-06
	HQ	0.07	0.022	0.13	0.05	0.0035	0.000057	0.018	--	--	--	--	--	--	--	0.29
RA4-13	Concentration	12.2	21.8	20400	705	0.0388 U	0.00111 U	9.79	0.04 U	0.575 U	0.51 U	1.23	1.42	0.316 U	1.4	N/A
	ELCR	3.3E-06	2.4E-06	--	--	ND	ND	--	ND	ND	ND	4.4E-08	3.3E-08	ND	1.6E-07	5.9E-06
	HQ	0.1	0.022	0.089	0.091	ND	ND	0.15	--	--	--	--	--	--	--	0.45
RA4-14	Concentration	7.39	19.4	18200	691	0.039 U	0.00111	1.22	0.0496 U	0.587 U	0.317 U	1.28	0.606	0.227 U	1.81	N/A
	ELCR	2.0E-06	2.1E-06	--	--	ND	3.6E-11	--	ND	ND	ND	4.5E-08	1.4E-08	ND	2.0E-07	4.4E-06
	HQ	0.062	0.02	0.079	0.089	ND	0.000049	0.019	--	--	--	--	--	--	--	0.27
RA4-15	Concentration	6.71	32.3	21500	1260	0.37	0.95	23.5	0.39	0.741 U	0.4 U	2.28	6.6	0.34	8.43	N/A
	ELCR	1.8E-06	3.5E-06	--	--	1.6E-07	3.1E-08	--	6.7E-07	ND	ND	8.1E-08	1.5E-07	1.3E-07	9.4E-07	7.5E-06
	HQ	0.056	0.033	0.093	0.16	0.0073	0.042	0.36	--	--	--	--	--	--	--	0.75
RA4-16	Concentration	8.51	30.2	23358	1043	0.04	0.16	111	0.53	4.16	9.97	7.44	25.8	4.32	29.0	N/A
	ELCR	2.3E-06	3.3E-06	--	--	1.8E-08	5.1E-09	--	9.0E-07	2.6E-06	5.5E-07	2.6E-07	6.0E-07	1.6E-06	3.2E-06	1.5E-05
	HQ	0.071	0.031	0.1	0.13	0.00084	0.007	1.7	--	--	--	--	--	--	--	2.0
RA4-17	Concentration	8.51	30.2	23358	1043	0.18	8.32	111	0.53	4.16	9.97	7.44	25.8	4.32	29.	N/A
	ELCR	2.3E-06	3.3E-06	--	--	7.5E-08	2.7E-07	--	9.0E-07	2.6E-06	5.5E-07	2.6E-07	6.0E-07	1.6E-06	3.2E-06	1.6E-05
	HQ	0.071	0.031	0.1	0.13	0.0035	0.37	1.7	--	--	--	--	--	--	--	2.4
RA4-18	Concentration	3.69	16.4	12800	309	0.0395 U	0.00463	0.567	0.0728 U	1.41 U	0.385 U	1.22	1.04 U	0.471 U	0.902	N/A
	ELCR	9.9E-07	1.8E-06	--	--	ND	1.5E-10	--	ND	ND	ND	4.3E-08	ND	ND	1.0E-07	2.9E-06
	HQ	0.031	0.017	0.056	0.04	ND	0.0002	0.0086	--	--	--	--	--	--	--	0.15
Sector 4 Surface and Subsurface Soil	Concentration	10.31	53.9	28009	1501	0.179	51.87	268	0.95	4.32	10.4	25.7	146	6.62	207	N/A
	ELCR	2.8E-06	5.9E-06	--	--	7.6E-08	1.7E-06	--	1.6E-06	2.6E-06	5.7E-07	9.1E-07	3.4E-06	2.5E-06	2.3E-05	**4.5E-05**
	HQ	0.086	0.055	0.12	0.19	0.0036	2.3	4.1	--	--	--	--	--	--	--	**6.9**
	COC (Y/N?):	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	
	Reason:	>NAL	>NAL	>NAL	>NAL	<NAL	>AL	>AL	>NAL	>NAL	<NAL	<NAL	>NAL	>NAL	>NAL	
	% Total ELCR	6.21%	13.09%	--	--	0.17%	3.77%	--	3.55%	5.77%	1.27%	2.02%	7.55%	5.55%	51.05%	
	% Total HI	1.25%	0.80%	1.74%	2.75%	0.05%	33.33%	59.42%	--	--	--	--	--	--	--	
		Trichloroethene and Uranium are Priority COCs														

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

NAL = No Action Level

BG = Provisional Background Value

Table C1.77. Sector 4 Surface Soil Railroad Grids Risk Characterization Results

Grid	COPC	Chromium	Total PCB	Uranium	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	16	N/A	4.9	0.1	1.5	1.2	0.06	1.2	N/A
	Industrial NAL—Cancer	12.3	0.293	--	0.249	31.3	50.1	0.408	1.66	N/A
	Industrial NAL—Noncancer	693	--	46.6	--	--	--	--	--	N/A
RA4-RR1	Concentration	12.3	0.0398	11.4	0.768 U	0.973 U	2.3	0.404 U	2.37	N/A
	ELCR	1.0E-06	1.4E-07	--	ND	ND	4.6E-08	ND	1.4E-06	2.6E-06
	HQ	0.0018	--	0.024	--	--	--	--	--	0.026
RA4-RR2	Concentration	8.05	0.0215	15.1	0.932	1.99	6.74	0.436	7.52	N/A
	ELCR	6.5E-07	7.3E-08	--	3.7E-06	6.4E-08	1.3E-07	1.1E-06	4.5E-06	1.0E-05
	HQ	0.0012	--	0.032	--	--	--	--	--	0.033
RA4-RR3	Concentration	12.4	0.00408 U	0.732	0.697 U	1.28	1.1	0.413 U	0.926	N/A
	ELCR	1.0E-06	ND	--	ND	4.1E-08	2.2E-08	ND	5.6E-07	1.6E-06
	HQ	0.0018	--	0.0016	--	--	--	--	--	0.0034
RA4-RR4	Concentration	12.7	0.0132	30.8	0.832 U	1.36	6.87	0.58 U	9.17	N/A
	ELCR	1.0E-06	4.5E-08	--	ND	4.3E-08	1.4E-07	ND	5.5E-06	6.7E-06
	HQ	0.0018	--	0.066	--	--	--	--	--	0.068
RA4-RR5	Concentration	11.6	0.04	4.15	0.405 U	1.74	1.44	0.222 U	2.25	N/A
	ELCR	9.4E-07	1.4E-07	--	ND	5.6E-08	2.9E-08	ND	1.4E-06	2.6E-06
	HQ	0.0017	--	0.0089	--	--	--	--	--	0.011
RA4-RR6	Concentration	33	0.0121	11.8	0.687 U	1.08	2.13	0.32 U	3.02	N/A
	ELCR	2.7E-06	4.1E-08	--	ND	3.5E-08	4.3E-08	ND	1.8E-06	4.6E-06
	HQ	0.0048	--	0.025	--	--	--	--	--	0.030
RA4-RR7	Concentration	9.15	0.00351	18.9	0.659 U	2.33	4.35	0.238 U	6.39	N/A
	ELCR	7.4E-07	1.2E-08	--	ND	7.4E-08	8.7E-08	ND	3.8E-06	4.7E-06
	HQ	0.0013	--	0.041	--	--	--	--	--	0.042
RA4-RR8	Concentration	40.7	0.00436	154	0.538 U	1.86	6.76	0.529 U	15.4	N/A
	ELCR	3.3E-06	1.5E-08	--	ND	5.9E-08	1.3E-07	ND	9.3E-06	1.3E-05
	HQ	0.0059	--	0.33	--	--	--	--	--	0.34
Sector 4 RR Surface Soil	Concentration	40.7	0.0411	154	0.93	2.33	6.87	0.436	15	N/A
	ELCR	3.3E-06	1.4E-07	--	3.7E-06	7.4E-08	1.4E-07	1.1E-06	9.3E-06	**1.8E-05**
	HQ	0.0059	--	0.33	--	--	--	--	--	**0.34**
	COC (Y/N?):	**Yes**	No	**Yes**	**Yes**	No	No	**Yes**	**Yes**	
	Reason:	>NAL	<NAL	>NAL	>NAL	<NAL	<NAL	>NAL	>NAL	
	% Total ELCR	18.59%	0.79%	--	20.84%	0.42%	0.79%	6.20%	52.38%	
	% Total HI	1.74%	--	97.06%	--	--	--	--	--	
		No Priority COCs								

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
NAL = No Action Level

Table C1.78. Sector 4 Surface and Subsurface Soil Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Iron	Manganese	Total Dioxin/Furans	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Plutonium-239/240	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	28000	820	N/A	N/A	N/A	4.6	0.28	0.1	0.025	1.4	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	--	--	2.88E-05	2.35	30.9	--	0.582	1.63	18.3	28.2	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	23000	774	1.89E-05	5.03	2.26	6.58	--	--	--	--	--	--	--	N/A
RA4-RR1	Concentration	4.29	15.4	13500	412	8.5E-06	0	0.0141	11.4	0.0655 U	0.555 U	0.38 U	1.52	2.3	0.368 U	2.37	N/A
	ELCR	1.1E-06	1.7E-06	--	--	3.0E-07	1.2E-07	4.6E-10	--	ND	ND	ND	5.4E-08	5.3E-08	ND	2.6E-07	3.6E-06
	HQ	0.036	0.016	0.059	0.053	0.045	0.0057	0.00062	0.17	--	--	--	--	--	--	--	0.39
RA4-RR2	Concentration	10.4	18.3	23900	449	8.7E-06	0.0017	0.0274	15.1	0.0705 U	0.93	1.88	1.99	6.74	0.436	7.52	N/A
	ELCR	2.8E-06	2.0E-06	--	--	3.0E-07	7.2E-10	8.9E-10	--	ND	5.7E-07	1.0E-07	7.1E-08	1.6E-07	1.7E-07	8.4E-07	7.0E-06
	HQ	0.087	0.019	0.1	0.058	0.046	0.000034	0.0012	0.23	--	--	--	--	--	--	--	0.54
RA4-RR3	Concentration	4.58	12.4	11500	339	5.1E-06	0.0407 U	0.00376	6.81	0.087	2.09	3.0	2.24	1.63	0.364 U	3.51	N/A
	ELCR	1.2E-06	1.4E-06	--	--	1.8E-07	ND	1.2E-10	--	1.5E-07	1.3E-06	1.6E-07	7.9E-08	3.8E-08	ND	3.9E-07	4.9E-06
	HQ	0.038	0.013	0.05	0.044	0.027	ND	0.00017	0.1	--	--	--	--	--	--	--	0.27
RA4-RR4	Concentration	3.82	15.1	16500	560	5.7E-06	0.0406 U	0.000935	30.8	0.0389 U	0.465 U	0.559 U	1.36	6.87	0.494 U	9.17	N/A
	ELCR	1.0E-06	1.7E-06	--	--	2.0E-07	ND	3.0E-11	--	ND	ND	ND	4.8E-08	1.6E-07	ND	1.0E-06	4.1E-06
	HQ	0.032	0.015	0.072	0.072	0.03	ND	0.000041	0.47	--	--	--	--	--	--	--	0.69
RA4-RR5	Concentration	8.32	14	16600	214	4.8E-06	3.55266	0.0316	4.15	0.0443 U	0.405 U	0.327 U	1.74	1.44	0.222 U	2.25	N/A
	ELCR	2.2E-06	1.5E-06	--	--	1.7E-07	1.5E-06	1.0E-09	--	ND	ND	ND	6.2E-08	3.3E-08	ND	2.5E-07	5.7E-06
	HQ	0.069	0.014	0.072	0.028	0.025	0.071	0.0014	0.063	--	--	--	--	--	--	--	0.34
RA4-RR6	Concentration	6.55	33	20900	337	5.4E-05	0.0	0.0026	11.8	0.0362 U	0.582 U	0.526 U	1.08	2.13	0.32 U	3.02	N/A
	ELCR	1.8E-06	3.6E-06	--	--	1.9E-06	8.5E-09	8.4E-11	--	ND	ND	ND	3.8E-08	5.0E-08	ND	3.4E-07	7.7E-06
	HQ	0.055	0.034	0.091	0.044	0.28	0.0004	0.00012	0.18	--	--	--	--	--	--	--	0.68
RA4-RR7	Concentration	12.1	15.4	24900	619	4.7E-05	0.06	0.02	18.9	0.0402 U	0.481 U	0.527 U	2.33	4.35	0.61	6.39	N/A
	ELCR	3.2E-06	1.7E-06	--	--	1.6E-06	2.7E-08	7.9E-10	--	ND	ND	ND	8.3E-08	1.0E-07	2.3E-07	7.1E-07	7.7E-06
	HQ	0.1	0.016	0.11	0.08	0.25	0.0013	0.0011	0.29	--	--	--	--	--	--	--	0.85
RA4-RR8	Concentration	6.08	40.7	21900	686	5.0E-06	0.0389 U	0.	154	0.0393 U	0.471 U	0.47 U	1.86	6.76	0.266 U	15.4	N/A
	ELCR	1.6E-06	4.5E-06	--	--	1.7E-07	ND	1.5E-11	--	ND	ND	ND	6.6E-08	1.6E-07	ND	1.7E-06	8.2E-06
	HQ	0.051	0.041	0.095	0.089	0.027	ND	0.000021	2.3	--	--	--	--	--	--	--	2.6
Sector 4 RR Surface and Subsurface Soil	Concentration	12.1	40.7	24900	686	5.4E-05	4	0.0316	154	0.087	2.09	3	2.33	6.87	0.61	15.4	N/A
	ELCR	3.2E-06	4.5E-06	--	--	1.9E-06	1.5E-06	1.0E-09	--	1.5E-07	1.3E-06	1.6E-07	8.3E-08	1.6E-07	2.3E-07	1.7E-06	**1.5E-05**
	HQ	0.10	0.041	0.11	0.089	0.28	0.071	0.0014	2.3	--	--	--	--	--	--	--	**3.0**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No	No	No	No	**Yes**	
	Reason:	>NAL	>NAL	<BG; >NAL	<NAL	>NAL	>NAL	<NAL	>AL	<NAL	>NAL	<NAL	<NAL	<NAL	<NAL	>NAL	
	% Total ELCR	21.50%	30.23%	--	--	12.77%	10.08%	0.01%	--	1.01%	8.73%	1.07%	0.56%	1.07%	1.55%	11.42%	
	% Total HI	3.33%	1.37%	3.67%	2.97%	9.33%	2.37%	0.05%	76.67%	--	--	--	--	--	--	--	
		Uranium is a Priority COC															

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above $1\times^{-6}$ or the calculated hazard quotient (HQ) is above 0.1
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{4} or the calculated hazard quotient (HQ) is above 1
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
AL = Action Level
BG = Provisional Background Value
NAL = No Action Level

Table C1.79. Sector 5 Surface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Backgrounc	7.9	16	N/A	N/A	4.9	0.49	0.1	1.5	1.2	0.06	1.2	N/A
	Industrial NAL—Cancer	1.6	12.3	0.643	6.31	--	0.108	0.249	31.3	50.1	0.408	1.66	N/A
	Industrial NAL—Noncancer	25.7	693	6.85	1.9	46.6	--	--	--	--	--	--	N/A
RA5-1	Concentration	5.2	21.1	0.373345	3.31	6.21	0.0568 U	0.569 U	2.08	1.62	0.303 U	2.62	N/A
	ELCR	3.3E-06	1.7E-06	5.8E-07	5.2E-07	--	ND	ND	6.6E-08	3.2E-08	ND	1.6E-06	7.8E-06
	HQ	0.02	0.003	0.0055	0.17	0.013	--	--	--	--	--	--	0.21
RA5-2	Concentration	3.95	12.2	0.311122	0.000996 U	6.84	0.0411 U	0.928 U	1.52	2.14	0.488 U	3.14	N/A
	ELCR	2.5E-06	9.9E-07	4.8E-07	ND	--	ND	ND	4.9E-08	4.3E-08	ND	1.9E-06	6.0E-06
	HQ	0.015	0.0018	0.0045	ND	0.015	--	--	--	--	--	--	0.036
RA5-3	Concentration	5.09	18	6.89658	0.00102 U	27.4	0.0916	0.615 U	1.61	10.8	0.86	19.6	N/A
	ELCR	3.2E-06	1.5E-06	1.1E-05	ND	--	8.5E-07	ND	5.1E-08	2.2E-07	2.1E-06	1.2E-05	3.1E-05
	HQ	0.02	0.0026	0.1	ND	0.059	--	--	--	--	--	--	0.18
RA5-4	Concentration	5.19	13.8	0.184294	0.00101 U	8.99	0.0539 U	0.433 U	1.4	4.32	0.336 U	7.75	N/A
	ELCR	3.2E-06	1.1E-06	2.9E-07	ND	--	ND	ND	4.5E-08	8.6E-08	ND	4.7E-06	9.4E-06
	HQ	0.02	0.002	0.0027	ND	0.019	--	--	--	--	--	--	0.044
RA5-5	Concentration	4.27	13.3	0.75	0.000958 U	4.66	0.0765 U	0.993 U	0.679 U	7.87	0.47 U	7.03	N/A
	ELCR	2.7E-06	1.1E-06	1.2E-06	ND	--	ND	ND	ND	1.6E-07	ND	4.2E-06	9.4E-06
	HQ	0.017	0.0019	0.011	ND	0.01	--	--	--	--	--	--	0.04
RA5-6	Concentration	4.84	15.8	0.429274	0.00109 U	5.38	0.0325 U	0.576 U	1.64	1.72	0.287 U	2.34	N/A
	ELCR	3.0E-06	1.3E-06	6.7E-07	ND	--	ND	ND	5.2E-08	3.4E-08	ND	1.4E-06	6.5E-06
	HQ	0.019	0.0023	0.0063	ND	0.012	--	--	--	--	--	--	0.04
RA5-7	Concentration	4.32	16.3	0.41	0.00104 U	4.56	0.15	0.502 U	1.19	3.36	0.457 U	4.27	N/A
	ELCR	2.7E-06	1.3E-06	6.3E-07	ND	--	1.4E-06	ND	3.8E-08	6.7E-08	ND	2.6E-06	8.7E-06
	HQ	0.017	0.0024	0.0059	ND	0.0098	--	--	--	--	--	--	0.035
RA5-8	Concentration	3.21	42.4	0.322 U	0.000927 U	89.8	0.21	0.545 U	2.76	14.2	1.31 U	21.8	N/A
	ELCR	2.0E-06	3.4E-06	ND	ND	--	2.0E-06	ND	8.8E-08	2.8E-07	ND	1.3E-05	2.1E-05
	HQ	0.012	0.0061	ND	ND	0.19	--	--	--	--	--	--	0.21
RA5-9	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-10	Concentration	5.33	12.6	0.0193 U	0.00181 U	7.77	8.09	3.54	54	2900	177	3000	N/A
	ELCR	3.3E-06	1.0E-06	ND	ND	--	7.5E-05	1.4E-05	1.7E-06	5.8E-05	4.3E-04	1.8E-03	2.4E-03
	HQ	0.021	0.0018	ND	ND	0.017	--	--	--	--	--	--	0.04
RA5-11	Concentration	3.88	24.4	0.199 U	0.00121 U	73	4.17	0.349 U	1.97	10.1	0.557 U	11.4	N/A
	ELCR	2.4E-06	2.0E-06	ND	ND	--	3.9E-05	ND	6.3E-08	2.0E-07	ND	6.9E-06	5.1E-05
	HQ	0.015	0.0035	ND	ND	0.16	--	--	--	--	--	--	0.18
RA5-12	Concentration	17.4	23.1	0.0392 U	0.00117 U	8.38	0.0478 U	0.646 U	1.13	1.85	0.476 U	1.59	N/A
	ELCR	1.1E-05	1.9E-06	ND	ND	--	ND	ND	3.6E-08	3.7E-08	ND	9.6E-07	1.4E-05
	HQ	0.068	0.0033	ND	ND	0.018	--	--	--	--	--	--	0.089
RA5-13	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-14	Concentration	3.65	12.5	0.0384 U	23.6	0.914	0.0286 U	0.373 U	0.537	0.793	0.21 U	0.453	N/A
	ELCR	2.3E-06	1.0E-06	ND	3.7E-06	--	ND	ND	1.7E-08	1.6E-08	ND	2.7E-07	7.3E-06
	HQ	0.014	0.0018	ND	1.2	0.002	--	--	--	--	--	--	1.2
RA5-15	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-16	Concentration	2.96	4.79	0.0355 U	0.	3.18	0.0326 U	0.532 U	0.989 U	2.09	0.489 U	1.53	N/A
	ELCR	1.9E-06	3.9E-07	ND	7.0E-10	--	ND	ND	ND	4.2E-08	ND	9.2E-07	3.3E-06
	HQ	0.012	0.00069	ND	0.00023	0.0068	--	--	--	--	--	--	0.02
RA5-17	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-18	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-19	Concentration	4.93 U	7.9	0.0341 U	0.	0.93	0.0628 U	0.707 U	0.929 U	0.58	0.21	0.55	N/A
	ELCR	ND	6.4E-07	ND	8.8E-11	--	ND	ND	ND	1.2E-08	5.2E-07	3.3E-07	1.5E-06
	HQ	ND	0.0011	ND	0.000029	0.002	--	--	--	--	--	--	0.0031
RA5-20	Concentration	20	27.9	0.0108 U	0.916	1.49	0.0403 U	0.238 U	1.04	0.995	0.32 U	1.1	N/A
	ELCR	1.3E-05	2.3E-06	ND	1.5E-07	--	ND	ND	3.3E-08	2.0E-08	ND	6.6E-07	1.6E-05
	HQ	0.078	0.004	ND	0.048	0.0032	--	--	--	--	--	--	0.13
RA5-21	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-22	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-23	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37
RA5-24	Concentration	5.66	20.4	0.0345 U	0.000884 U	1.06	0.035 U	0.571 U	0.73	1.84	0.467 U	1.23	N/A
	ELCR	3.5E-06	1.7E-06	ND	ND	--	ND	ND	2.3E-08	3.7E-08	ND	7.4E-07	6.0E-06
	HQ	0.022	0.0029	ND	ND	0.0023	--	--	--	--	--	--	0.027
RA5-25	Concentration	6.33	17.9	1.34	5.57	15.7	2.54	3.54	5.51	185	59.4	193	N/A
	ELCR	4.0E-06	1.5E-06	2.1E-06	8.8E-07	--	2.4E-05	1.4E-05	1.8E-07	3.7E-06	1.5E-04	1.2E-04	3.2E-04
	HQ	0.025	0.0026	0.019	0.29	0.034	--	--	--	--	--	--	0.37

Table C1.79. Sector 5 Surface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
Grid	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Backgrounc	7.9	16	N/A	N/A	4.9	0.49	0.1	1.5	1.2	0.06	1.2	N/A
	Industrial NAL—Cancer	1.6	12.3	0.643	6.31	--	0.108	0.249	31.3	50.1	0.408	1.66	N/A
	Industrial NAL—Noncancei	25.7	693	6.85	1.9	46.6	--	--	--	--	--	--	N/A
Sector 5 Surface Soil	Concentration	7.7	20	2.1	13	33	3.1	3.5	14	900	82	932	N/A
	ELCR	4.8E-06	1.7E-06	3.2E-06	2.1E-06	--	2.9E-05	1.4E-05	4.5E-07	1.8E-05	2.0E-04	5.6E-04	**8.4E-04**
	HQ	0.03	0.0029	0.03	0.7	0.072	--	--	--	--	--	--	**0.83**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	
	Reason:	<BG; >NAL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	<NAL	>NAL	>AL	>AL	
	% Total ELCR	0.57%	0.20%	0.39%	0.25%	--	3.48%	1.70%	0.05%	2.15%	24.14%	67.07%	
	% Total HI	3.61%	0.35%	3.61%	84.34%	8.67%	--	--	--	--	--	--	
		Uranium-235/236 and Uranium-238 are Priority COCs											

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
AL = Action Level
BG = Provisional Background Value
NAL = No Action Level

Table C1. 80. Sector 5 Surface and Subsurface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Iron	Manganese	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
	Provisional Background	**7.9**	**16**	**13**	**28000**	**820**	**N/A**	**N/A**	**4.6**	**0.28**	**0.1**	**1.4**	**1.2**	**0.06**	**1.2**	**N/A**
	Excavation NAL—Cancer	**3.74**	**9.14**	**12500**	**--**	**--**	**2.35**	**30.9**	**--**	**0.582**	**1.63**	**28.2**	**43**	**2.62**	**8.98**	**N/A**
	Excavation NAL—Noncancer	**12**	**98.5**	**9.84**	**23000**	**774**	**5.03**	**2.26**	**6.58**	**--**	**--**	**--**	**--**	**--**	**--**	**N/A**
RA5-1	Concentration	5.2	45	15.5	21400	928	0.37	3.31	6.21	0.0568 U	0.51 U	2.08	1.62	0.241 U	2.62	N/A
	ELCR	1.4E-06	4.9E-06	1.2E-09	--	--	1.6E-07	1.1E-07	--	ND	ND	7.4E-08	3.8E-08	ND	2.9E-07	7.0E-06
	HQ	0.043	0.046	0.16	0.093	0.12	0.0074	0.15	0.094	--	--	--	--	--	--	0.71
RA5-2	Concentration	3.95	12.3	7.82	11600	508	0.31	0.000996 U	6.84	0.0373 U	0.828 U	1.52	2.14	0.488 U	3.14	N/A
	ELCR	1.1E-06	1.3E-06	6.3E-10	--	--	1.3E-07	ND	--	ND	ND	5.4E-08	5.0E-08	ND	3.5E-07	3.0E-06
	HQ	0.033	0.012	0.079	0.05	0.066	0.0062	ND	0.1	--	--	--	--	--	--	0.35
RA5-3	Concentration	5.09	18.4	8.49	17500	452	6.89658	0.00102 U	27.4	0.0916	0.609 U	1.61	10.8	0.86	19.6	N/A
	ELCR	1.4E-06	2.0E-06	6.8E-10	--	--	2.9E-06	ND	--	1.6E-07	ND	5.7E-08	2.5E-07	3.3E-07	2.2E-06	9.3E-06
	HQ	0.042	0.019	0.086	0.076	0.058	0.14	ND	0.42	--	--	--	--	--	--	0.84
RA5-4	Concentration	6.03	20.7	5.67	24300	306	0.18	0.00101 U	8.99	0.0322 U	0.433 U	1.4	4.32	0.336 U	7.75	N/A
	ELCR	1.6E-06	2.3E-06	4.5E-10	--	--	7.8E-08	ND	--	ND	ND	5.0E-08	1.0E-07	ND	8.6E-07	5.0E-06
	HQ	0.05	0.021	0.058	0.11	0.04	0.0037	ND	0.14	--	--	--	--	--	--	0.42
RA5-5	Concentration	5.29	14.9	7.36	16500	698	0.747537	0.000958 U	4.66	0.0413 U	0.797 U	0.84	7.87	0.402 U	7.03	N/A
	ELCR	1.4E-06	1.6E-06	5.9E-10	--	--	3.2E-07	ND	--	ND	ND	3.0E-08	1.8E-07	ND	7.8E-07	4.3E-06
	HQ	0.044	0.015	0.075	0.072	0.09	0.015	ND	0.071	--	--	--	--	--	--	0.38
RA5-6	Concentration	16.9	37.1	25.3	27700	721	0.429274	0.000802	5.38	0.0303 U	0.455 U	1.64	1.72	0.287 U	2.34	N/A
	ELCR	4.5E-06	4.1E-06	2.0E-09	--	--	1.8E-07	2.6E-11	--	ND	ND	5.8E-08	4.0E-08	ND	2.6E-07	9.1E-06
	HQ	0.14	0.038	0.26	0.12	0.093	0.0085	0.000035	0.082	--	--	--	--	--	--	0.74
RA5-7	Concentration	4.89	16.9	6.39	16700	465	0.41	0.00104 U	4.56	0.15	0.502 U	1.43	3.36	0.353 U	4.27	N/A
	ELCR	1.3E-06	1.8E-06	5.1E-10	--	--	1.7E-07	ND	--	2.6E-07	ND	5.1E-08	7.8E-08	ND	4.8E-07	4.1E-06
	HQ	0.041	0.017	0.065	0.073	0.06	0.0081	ND	0.069	--	--	--	--	--	--	0.33
RA5-8	Concentration	7.71	42.4	11.7	21900	548	0.0412 U	0.000927 U	89.8	0.21	0.497 U	2.76	14.2	0.54 U	21.8	N/A
	ELCR	2.1E-06	4.6E-06	9.4E-10	--	--	ND	ND	--	3.7E-07	ND	9.8E-08	3.3E-07	ND	2.4E-06	9.9E-06
	HQ	0.064	0.043	0.12	0.095	0.071	ND	ND	1.4	--	--	--	--	--	--	1.8
RA5-9	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-10	Concentration	5.33	12.6	5.77	8990	583	0.0193 U	0.00166 U	7.77	8.09	3.54	54	2900	177	3000	N/A
	ELCR	1.4E-06	1.4E-06	4.6E-10	--	--	ND	ND	--	1.4E-05	2.2E-06	1.9E-06	6.7E-05	6.8E-05	3.3E-04	4.9E-04
	HQ	0.044	0.013	0.059	0.039	0.075	ND	ND	0.12	--	--	--	--	--	--	0.35
RA5-11	Concentration	5.87	24.4	4.1	17800	196	0.0126 U	0.00121 U	73.0	4.17	0.349 U	1.97	10.1	0.525 U	11.4	N/A
	ELCR	1.6E-06	2.7E-06	3.3E-10	--	--	ND	ND	--	7.2E-06	ND	7.0E-08	2.3E-07	ND	1.3E-06	1.3E-05
	HQ	0.049	0.025	0.042	0.077	0.025	ND	ND	1.1	--	--	--	--	--	--	1.3
RA5-12	Concentration	17.4	23.1	18.0	33400	2650	0.0392 U	0.00101 U	8.38	0.0478 U	0.646 U	1.13	1.85	0.476 U	1.59	N/A
	ELCR	4.7E-06	2.5E-06	1.4E-09	--	--	ND	ND	--	ND	ND	4.0E-08	4.3E-08	ND	1.8E-07	7.5E-06
	HQ	0.15	0.023	0.18	0.15	0.34	ND	ND	0.13	--	--	--	--	--	--	0.97
RA5-13	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-14	Concentration	9.93	14.1	12.2	20800	911	0.0384 U	144	0.94	0.0286 U	0.373 U	1.29	0.793	0.21 U	1.11	N/A
	ELCR	2.7E-06	1.5E-06	9.8E-10	--	--	ND	4.7E-06	--	ND	ND	4.6E-08	1.8E-08	ND	1.2E-07	9.1E-06
	HQ	0.083	0.014	0.12	0.09	0.12	ND	6.4	0.014	--	--	--	--	--	--	6.8
RA5-15	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-16	Concentration	4.74	33.9	3.13	21500	298	0.0355 U	0.0044	3.18	0.0326 U	0.532 U	0.74	2.09	0.39 U	1.53	N/A
	ELCR	1.3E-06	3.7E-06	2.5E-10	--	--	ND	1.4E-10	--	ND	ND	2.6E-08	4.9E-08	ND	1.7E-07	5.2E-06
	HQ	0.04	0.034	0.032	0.093	0.039	ND	0.00019	0.048	--	--	--	--	--	--	0.29
RA5-17	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-18	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-19	Concentration	5.14	18.	5.56	14800	362	0.0341 U	0.00055	0.93	0.0517 U	0.591 U	0.99	0.58	0.21	1.35	N/A
	ELCR	1.4E-06	2.0E-06	4.4E-10	--	--	ND	1.8E-11	--	ND	ND	3.5E-08	1.3E-08	8.1E-08	1.5E-07	3.7E-06
	HQ	0.043	0.018	0.057	0.064	0.047	ND	0.000025	0.014	--	--	--	--	--	--	0.24
RA5-20	Concentration	20.	27.9	10.3	34500	793	0.0108 U	1.27	1.49	0.0403 U	0.238 U	1.04	1.	0.214 U	1.1	N/A
	ELCR	5.3E-06	3.1E-06	8.2E-10	--	--	ND	4.1E-08	--	ND	ND	3.7E-08	2.3E-08	ND	1.2E-07	8.6E-06
	HQ	0.17	0.028	0.1	0.15	0.1	ND	0.056	0.023	--	--	--	--	--	--	0.63
RA5-21	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-22	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
RA5-23	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7

Table C1. 80. Sector 5 Surface and Subsurface Soil Non-Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Iron	Manganese	Total PAH	Trichloroethene	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
Grid	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	13	28000	820	N/A	N/A	4.6	0.28	0.1	1.4	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	12500	--	--	2.35	30.9	--	0.582	1.63	28.2	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	9.84	23000	774	5.03	2.26	6.58	--	--	--	--	--	--	N/A
RA5-24	Concentration	9.49	20.4	11.1	24300	1370	0.0345 U	0.000884 U	1.25	0.035 U	0.499 U	0.73	1.84	0.2	1.23	N/A
	ELCR	2.5E-06	2.2E-06	8.9E-10	--	--	ND	ND	--	ND	ND	2.6E-08	4.3E-08	7.6E-08	1.4E-07	5.0E-06
	HQ	0.079	0.021	0.11	0.11	0.18	ND	ND	0.019	--	--	--	--	--	--	0.52
RA5-25	Concentration	8.31	23.9	9.9	20856	737	1.34	24.8	15.7	2.54	3.54	4.7	185	44.6	193	N/A
	ELCR	2.2E-06	2.6E-06	7.9E-10	--	--	5.7E-07	8.0E-07	--	4.4E-06	2.2E-06	1.7E-07	4.3E-06	1.7E-05	2.1E-05	5.5E-05
	HQ	0.069	0.024	0.1	0.091	0.095	0.027	1.1	0.24	--	--	--	--	--	--	1.7
Sector 5 Surface and Subsurface Soil	Concentration	9.755	27.09	12	22770	1143	2.085	74	32.8	3.149	3.54	13.77	900.1	72.38	932.1	N/A
	ELCR	2.6E-06	3.0E-06	9.5E-10	--	--	8.9E-07	2.4E-06	--	5.4E-06	2.2E-06	4.9E-07	2.1E-05	2.8E-05	1.0E-04	**1.7E-04**
	HQ	0.081	0.028	0.12	0.099	0.15	0.041	3.3	0.5	--	--	--	--	--	--	**4.3**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	<BG; >NAL	<NAL	>NAL	<NAL	>AL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	>NAL	
	% Total ELCR	1.57%	1.81%	0.00%	--	--	0.54%	1.45%	--	3.25%	1.33%	0.30%	12.65%	16.87%	60.25%	
	% Total HI	1.88%	0.65%	2.79%	2.30%	3.49%	0.95%	76.74%	11.63%	--	--	--	--	--	--	
		Trichloroethene is a Priority COC														

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

BG = Provisional Background Value

NAL = No Action Level

Table C1.81. Sector 5 Surface Soil Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Total PAH	Trichloroethene	Uranium	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
	Provisional Background	**7.9**	**16**	**N/A**	**N/A**	**4.9**	**1.5**	**1.2**	**0.06**	**1.2**	**N/A**
	Industrial NAL—Cancer	**1.6**	**12.3**	**0.643**	**6.31**	**--**	**31.3**	**50.1**	**0.408**	**1.66**	**N/A**
	Industrial NAL—Noncancer	**25.7**	**693**	**6.85**	**1.9**	**46.6**	**--**	**--**	**--**	**--**	**N/A**
RA5-RR-1	Concentration	3.62	18.6	0.0456355	0.000623	1.95	1.98	5.4	0.401	6.45	N/A
	ELCR	2.3E-06	1.5E-06	7.1E-08	9.9E-11	--	6.3E-08	1.1E-07	9.8E-07	3.9E-06	8.9E-06
	HQ	0.014	0.0027	0.00067	0.000033	0.0042	--	--	--	--	0.022
RA5-RR-2	Concentration	5.11	27.9	0.022835	0.000711	13.4	1.57	3.28	0.424	4.94	N/A
	ELCR	3.2E-06	2.3E-06	3.6E-08	1.1E-10	--	5.0E-08	6.5E-08	1.0E-06	3.0E-06	9.7E-06
	HQ	0.02	0.004	0.00033	0.000037	0.029	--	--	--	--	0.053
RA5-RR-3	Concentration	7.41	15.4	0.0230654	0.00466	56.7	1.5	6.8	0.617	8.09	N/A
	ELCR	4.6E-06	1.3E-06	3.6E-08	7.4E-10	--	4.8E-08	1.4E-07	1.5E-06	4.9E-06	1.3E-05
	HQ	0.029	0.0022	0.00034	0.00025	0.12	--	--	--	--	0.15
RA5-RR-4	Concentration	5.4	12.8	0.0396 U	0.0613	0.94	1.42	0.838	0.376 U	0.62	N/A
	ELCR	3.4E-06	1.0E-06	ND	9.7E-09	--	4.5E-08	1.7E-08	ND	3.7E-07	4.8E-06
	HQ	0.021	0.0018	ND	0.0032	0.002	--	--	--	--	0.028
RA5-RR-5	Concentration	7.15	13.8	0.11	0.08	1.04	0.85	1.59	0.399 U	1.25	N/A
	ELCR	4.5E-06	1.1E-06	1.8E-07	1.3E-08	--	2.7E-08	3.2E-08	ND	7.5E-07	6.6E-06
	HQ	0.028	0.002	0.0017	0.0043	0.0022	--	--	--	--	0.038
RA5-RR-6	Concentration	3.89	11.2	0.00156	0.000372	1.52	1.37	9.03	0.774	15.1	N/A
	ELCR	2.4E-06	9.1E-07	2.4E-09	5.9E-11	--	4.4E-08	1.8E-07	1.9E-06	9.1E-06	1.5E-05
	HQ	0.015	0.0016	0.000023	0.00002	0.0033	--	--	--	--	0.02
RA5-RR-7	Concentration	4.02	15.6	0.396 U	0.00115 U	6.49	1.24	4.1	0.266 U	6.34	N/A
	ELCR	2.5E-06	1.3E-06	ND	ND	--	4.0E-08	8.2E-08	ND	3.8E-06	7.7E-06
	HQ	0.016	0.0023	ND	ND	0.014	--	--	--	--	0.032
RA5-RR-8	Concentration	4.02	15.6	0.396 U	0.00115 U	6.49	1.24	4.1	0.266 U	6.34	N/A
	ELCR	2.5E-06	1.3E-06	ND	ND	--	4.0E-08	8.2E-08	ND	3.8E-06	7.7E-06
	HQ	0.016	0.0023	ND	ND	0.014	--	--	--	--	0.032
RA5-RR-9	Concentration	4.02	15.6	0.396 U	0.00115 U	6.49	1.24	4.1	0.266 U	6.34	N/A
	ELCR	2.5E-06	1.3E-06	ND	ND	--	4.0E-08	8.2E-08	ND	3.8E-06	7.7E-06
	HQ	0.016	0.0023	ND	ND	0.014	--	--	--	--	0.032
RA5-RR-10	Concentration	7.01	16.3	0.0386 U	0.00106 U	0.97	0.97	1.43	0.358 U	1.28	N/A
	ELCR	4.4E-06	1.3E-06	ND	ND	--	3.1E-08	2.9E-08	ND	7.7E-07	6.5E-06
	HQ	0.027	0.0024	ND	ND	0.0021	--	--	--	--	0.032
Sector 5 RR Surface Soil	Concentration	6.5	18.25	0.056	0.082	57	1.546	5.176	0.514	7	N/A
	ELCR	4.0E-06	1.5E-06	8.7E-08	1.3E-08	--	4.9E-08	1.0E-07	1.3E-06	4.5E-06	1.2E-05
	HQ	0.025	0.0026	0.00082	0.0043	0.12	--	--	--	--	0.15
	COC (Y/N?):	**Yes**	**Yes**	No	No	**Yes**	No	No	**Yes**	**Yes**	
	Reason:	<BG; >NAL	>NAL	<NAL	<NAL	>NAL	<NAL	<NAL	>NAL	>NAL	
	% Total ELCR	34.64%	12.99%	0.75%	0.11%	--	0.42%	0.87%	11.26%	38.96%	
	% Total HI	16.67%	1.73%	0.55%	2.87%	80.00%	--	--	--	--	
		No Priority COCs									

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

BG = Provisional Background Value

NAL = No Action Level

Table C1.82. Sector 5 Surface and Subsurface Soil Railroad Grids Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Iron	Manganese	Total PAH	Trichloroethene	Uranium	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	7.9	16	13	28000	820	N/A	N/A	4.6	1.4	1.2	0.06	1.2	N/A
	Excavation NAL—Cancer	3.74	9.14	12500	--	--	2.35	30.9	--	28.2	43	2.62	8.98	N/A
	Excavation NAL—Noncancer	12	98.5	9.84	23000	774	5.03	2.26	6.58	--	--	--	--	N/A
RA5-RR-1	Concentration	4.53	18.6	8.7	17100	286	0.0456355	0.000623	1.99	2.44	5.4	0.401	6.45	N/A
	ELCR	1.2E-06	2.0E-06	7.0E-10	--	--	1.9E-08	2.0E-11	--	8.7E-08	1.3E-07	1.5E-07	7.2E-07	4.3E-06
	HQ	0.038	0.019	0.088	0.074	0.037	0.00091	0.000028	0.03	--	--	--	--	0.29
RA5-RR-2	Concentration	5.11	51.4	9.58	29200	533	1.61126	0.00253	13.4	1.75	3.28	0.424	4.94	N/A
	ELCR	1.4E-06	5.6E-06	7.7E-10	--	--	6.9E-07	8.2E-11	--	6.2E-08	7.6E-08	1.6E-07	5.5E-07	8.5E-06
	HQ	0.043	0.052	0.097	0.13	0.069	0.032	0.00011	0.2	--	--	--	--	0.62
RA5-RR-3	Concentration	7.41	22.6	8.33	22100	593	0.0230654	0.00466	56.7	1.5	6.8	0.617	8.09	N/A
	ELCR	2.0E-06	2.5E-06	6.7E-10	--	--	9.8E-09	1.5E-10	--	5.3E-08	1.6E-07	2.4E-07	9.0E-07	5.9E-06
	HQ	0.062	0.023	0.085	0.096	0.077	0.00046	0.00021	0.86	--	--	--	--	1.2
RA5-RR-4	Concentration	5.4	17.3	16.8	18700	723	0.0382 U	0.554	0.971	1.42	0.929	0.336 U	0.771	N/A
	ELCR	1.4E-06	1.9E-06	1.3E-09	--	--	ND	1.8E-08	--	5.0E-08	2.2E-08	ND	8.6E-08	3.5E-06
	HQ	0.045	0.018	0.17	0.081	0.093	ND	0.025	0.015	--	--	--	--	0.45
RA5-RR-5	Concentration	7.15	18	9.12	19600	1230	0.114388	1.71	1.04	1.17	1.59	0.42	1.25	N/A
	ELCR	1.9E-06	2.0E-06	7.3E-10	--	--	4.9E-08	5.5E-08	--	4.1E-08	3.7E-08	1.6E-07	1.4E-07	4.4E-06
	HQ	0.06	0.018	0.093	0.085	0.16	0.0023	0.076	0.016	--	--	--	--	0.51
RA5-RR-6	Concentration	9.36	15.6	6.13	18100	587	0.00156	0.000372	1.52	1.63	9.03	0.774	15.1	N/A
	ELCR	2.5E-06	1.7E-06	4.9E-10	--	--	6.6E-10	1.2E-11	--	5.8E-08	2.1E-07	3.0E-07	1.7E-06	6.5E-06
	HQ	0.078	0.016	0.062	0.079	0.076	0.000031	0.000016	0.023	--	--	--	--	0.33
RA5-RR-7	Concentration	6.03	15.7	8.16	20200	1460	0.0411 U	0.00111 U	6.49	1.38	4.1	0.266 U	6.34	N/A
	ELCR	1.6E-06	1.7E-06	6.5E-10	--	--	ND	ND	--	4.9E-08	9.5E-08	ND	7.1E-07	4.2E-06
	HQ	0.05	0.016	0.083	0.088	0.19	ND	ND	0.099	--	--	--	--	0.53
RA5-RR-8	Concentration	6.03	15.7	8.16	20200	1460	0.0411 U	0.00111 U	6.49	1.38	4.1	0.266 U	6.34	N/A
	ELCR	1.6E-06	1.7E-06	6.5E-10	--	--	ND	ND	--	4.9E-08	9.5E-08	ND	7.1E-07	4.2E-06
	HQ	0.05	0.016	0.083	0.088	0.19	ND	ND	0.099	--	--	--	--	0.53
RA5-RR-9	Concentration	6.03	15.7	8.16	20200	1460	0.0411 U	0.00111 U	6.49	1.38	4.1	0.266 U	6.34	N/A
	ELCR	1.6E-06	1.7E-06	6.5E-10	--	--	ND	ND	--	4.9E-08	9.5E-08	ND	7.1E-07	4.2E-06
	HQ	0.05	0.016	0.083	0.088	0.19	ND	ND	0.099	--	--	--	--	0.53
RA5-RR-10	Concentration	7.67	18.0	8.88	21800	2860	0.02	0.	1.06	1.35	1.43	0.358 U	1.28	N/A
	ELCR	2.1E-06	2.0E-06	7.1E-10	--	--	9.8E-09	3.5E-11	--	4.8E-08	3.3E-08	ND	1.4E-07	4.3E-06
	HQ	0.064	0.018	0.09	0.095	0.37	0.00046	0.000047	0.016	--	--	--	--	0.65
Sector 5 RR Surface and Subsurface Soil	Concentration	7.84	28.0	12.1	22642	1555	1.193	0.08764	34.9	1.75	5.18	0.51	7.42	N/A
	ELCR	2.1E-06	3.1E-06	9.7E-10	--	--	5.1E-07	2.8E-09	--	6.2E-08	1.2E-07	1.9E-07	8.3E-07	**6.9E-06**
	HQ	0.065	0.028	0.12	0.098	0.2	0.024	0.0039	0.53	--	--	--	--	**1.1**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No	**Yes**	No	No	No	No	
	Reason:	<BG; >NAL	>NAL	>NAL	<NAL	>NAL	<NAL	<NAL	>NAL	<NAL	<NAL	<NAL	<NAL	
	% Total ELCR	30.37%	44.83%	0.01%	--	--	7.37%	0.04%	--	0.90%	1.74%	2.75%	12.00%	
	% Total HI	5.91%	2.55%	10.91%	8.91%	18.18%	2.18%	0.35%	48.18%	--	--	--	--	
		No Priority COCs												

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×1^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

BG = Provisional Background Value

NAL = No Action Level

Table C1.83. Sector 6 Surface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Total PAH	Total PCB	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
	Provisional Background	**12**	**16**	**14**	**N/A**	**N/A**	**4.9**	**N/A**	**0.49**	**0.1**	**0.025**	**2.5**	**1.5**	**1.2**	**0.06**	**1.2**	**N/A**
	Industrial NAL - Cancer	**1.6**	**12.3**	**1850**	**0.643**	**0.293**	**--**	**6.01**	**0.108**	**0.249**	**22.7**	**1270**	**31.3**	**50.1**	**0.408**	**1.66**	**N/A**
	Industrial NAL - Noncancer	**25.7**	**693**	**68.7**	**6.85**	**--**	**46.6**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**N/A**
RA6-1	Concentration	7.71	14.2	5.51	0.0973	0.0177	161	1.88	0.451	0.705 U	7.51	14.4	41.9	84.4	5.26	91.9	N/A
	ELCR	4.8E-06	1.2E-06	3.0E-09	1.5E-07	6.0E-08	--	3.1E-07	4.2E-06	ND	3.3E-07	1.1E-08	1.3E-06	1.7E-06	1.3E-05	5.5E-05	8E-05
	HQ	0.03	0.002	0.008	0.0014	--	0.35	--	--	--	--	--	--	--	--	--	0.39
RA6-2	Concentration	6.18	17.2	6.51	0.28	0.00166	43	0.439 U	0.78	0.719 U	1.23	12.2	16	10.6	1.02	11.7	N/A
	ELCR	3.9E-06	1.4E-06	3.5E-09	4.3E-07	5.7E-09	--	ND	7.2E-06	ND	5.4E-08	9.6E-09	5.1E-07	2.1E-07	2.5E-06	7.0E-06	2.3E-05
	HQ	0.024	0.0025	0.0095	0.004	--	0.092	--	--	--	--	--	--	--	--	--	0.13
RA6-3	Concentration	7.87	76.1	8.2	0.91	0.0111	21.7	0.539 U	1.2	0.568 U	0.471 U	25.8	7.58	6.86	0.406 U	6.69	N/A
	ELCR	4.9E-06	6.2E-06	4.4E-09	1.4E-06	3.8E-08	--	ND	1.1E-05	ND	ND	2.0E-08	2.4E-07	1.4E-07	ND	4.0E-06	2.8E-05
	HQ	0.031	0.011	0.012	0.013	--	0.047	--	--	--	--	--	--	--	--	--	0.11
RA6-4	Concentration	9.43	17.4	7.53	0.17	0.0759 U	33.9	0.674 U	0.874	0.594	1.81	5.49	24	10.8	0.80	11.3	N/A
	ELCR	5.9E-06	1.4E-06	4.1E-09	2.7E-07	ND	--	ND	8.1E-06	2.4E-06	8.0E-08	4.3E-09	7.7E-07	2.2E-07	2.0E-06	6.8E-06	2.8E-05
	HQ	0.037	0.0025	0.011	0.0025	--	0.073	--	--	--	--	--	--	--	--	--	0.13
RA6-5	Concentration	5.43	17.8	5.03	0.57	0.00367 U	12.6	0.571 U	0.24	0.609 U	0.36 U	173	2.71	7.81	0.5 U	9.43	N/A
	ELCR	3.4E-06	1.4E-06	2.7E-09	8.9E-07	ND	--	ND	2.2E-06	ND	ND	1.4E-07	8.7E-08	1.6E-07	ND	5.7E-06	1.4E-05
	HQ	0.021	0.0026	0.0073	0.0084	--	0.027	--	--	--	--	--	--	--	--	--	0.066
RA6-6	Concentration	4.81	14.3	6.01	0.03	0.0353 U	19.9	0.372 U	0.288	1 U	0.611 U	7.01	4.53	4.51	0.505 U	5.15	N/A
	ELCR	3.0E-06	1.2E-06	3.2E-09	4.5E-08	ND	--	ND	2.7E-06	ND	ND	5.5E-09	1.4E-07	9.0E-08	ND	3.1E-06	1.0E-05
	HQ	0.019	0.0021	0.0087	0.00043	--	0.043	--	--	--	--	--	--	--	--	--	0.073
RA6-7	Concentration	5.19	14.1	6.66	0.85	0.0359 U	8.59	0.696 U	0.0508 U	0.852 U	0.608 U	3.46 U	0.956 U	3.2	0.323 U	2.11	N/A
	ELCR	3.2E-06	1.1E-06	3.6E-09	1.3E-06	ND	--	ND	ND	ND	ND	ND	ND	6.4E-08	ND	1.3E-06	7.0E-06
	HQ	0.02	0.002	0.0097	0.012	--	0.018	--	--	--	--	--	--	--	--	--	0.062
RA6-8	Concentration	6.4	18.2	104	0.1	0.0371	12.3	0.381 U	0.339	0.713 U	0.558 U	59	2.95	3.19	0.62	4.99	N/A
	ELCR	4.0E-06	1.5E-06	5.6E-08	1.5E-07	1.3E-07	--	ND	3.1E-06	ND	ND	4.6E-08	9.4E-08	6.4E-08	1.5E-06	3.0E-06	1.4E-05
	HQ	0.025	0.0026	0.15	0.0014	--	0.026	--	--	--	--	--	--	--	--	--	0.21
RA6-9	Concentration	4.34	32.6	5.62	4.92	0.0101	161	1.51	0.378	1.43	4.84	405	68.4	54.8	2.56	66.4	N/A
	ELCR	2.7E-06	2.7E-06	3.0E-09	7.7E-06	3.4E-08	--	2.5E-07	3.5E-06	5.7E-06	2.1E-07	3.2E-07	2.2E-06	1.1E-06	6.3E-06	4.0E-05	7.3E-05
	HQ	0.017	0.0047	0.0082	0.072	--	0.35	--	--	--	--	--	--	--	--	--	0.45
RA6-10	Concentration	4.69	16.4	7.56	4.81	0.0179	72.8	0.407 U	0.364	0.658 U	0.443 U	4.68	3.93	15.1	0.619 U	18.8	N/A
	ELCR	2.9E-06	1.3E-06	4.1E-09	7.5E-06	6.1E-08	--	ND	3.4E-06	ND	ND	3.7E-09	1.3E-07	3.0E-07	ND	1.1E-05	2.7E-05
	HQ	0.018	0.0024	0.011	0.07	--	0.16	--	--	--	--	--	--	--	--	--	0.26
RA6-11	Concentration	22.4	53.9	7.3	0.56	0.733	300	39.3	3.42	18.6	239	1610	10600	413	28	440	N/A
	ELCR	1.4E-05	4.4E-06	3.9E-09	8.6E-07	2.5E-06	--	6.5E-06	3.2E-05	7.5E-05	1.1E-05	1.3E-06	3.4E-04	8.2E-06	6.9E-05	2.7E-04	8.3E-04
	HQ	0.087	0.0078	0.011	0.0081	--	0.64	--	--	--	--	--	--	--	--	--	0.75
Sector 6 Surface Soil	Concentration	10.97	53.23	54	3.435	0.5	175	39.3	1.94	18.6	239	1276	10600	413	21.83	440	N/A
	ELCR	6.9E-06	4.3E-06	2.9E-08	5.3E-06	1.7E-06	--	6.5E-06	1.8E-05	7.5E-05	1.1E-05	1.0E-06	3.4E-04	8.2E-06	5.4E-05	2.7E-04	**8.0E-04**
	HQ	0.043	0.0077	0.079	0.05	--	0.38	--	--	--	--	--	--	--	--	--	**0.56**
	COC (Y/N?):	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	<BG; >NAL	>NAL	<NAL	>NAL	>NAL	>NAL	>NAL	>NAL	>NAL	>NAL	<NAL	>AL	>NAL	>NAL	>AL	
	% Total ELCR	0.86%	0.54%	0.00%	0.66%	0.21%	--	0.81%	2.24%	9.35%	1.37%	0.12%	42.40%	1.02%	6.73%	33.67%	
	% Total HI	7.68%	1.38%	14.11%	8.93%	--	67.86%	--	--	--	--	--	--	--	--	--	
		Thorium-230 and Uranium-238 are Priority COCs															

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

BG = Provisional Background Value

NAL = No Action Level

Table C1.84. Sector 6 Surface and Subsurface Soil Risk Characterization Results

Grid	COPC	Antimony	Arsenic	Chromium	Cobalt	Iron	Manganese	Thallium	Total PAH	Uranium	Americium-241	Cesium-137	Neptunium-237	Plutonium-239/240	Technetium-99	Thorium-230	Uranium-233/234	Uranium-235/236	Uranium-238	Total Risk/HI
Grid	Concentration Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	0.21	7.9	16	13	28000	820	0.21	N/A	4.6	N/A	0.28	0.1	0.025	2.5	1.4	1.2	0.06	1.2	N/A
	Excavation NAL - Cancer	--	3.74	9.14	12500	--	--	--	2.35	--	16.4	0.582	1.63	18.3	1550	28.2	43	2.62	8.98	N/A
	Excavation NAL - Noncancer	13.2	12	98.5	9.84	23000	774	0.329	5.03	6.58	--	--	--	--	--	--	--	--	--	N/A
RA6-1	Concentration	1.69	7.71	14.2	5.51	14900	579	0.389 U	0.0973	161	1.88	0.451	0.705 U	7.51	20.1	41.9	84.4	5.26	91.9	N/A
	ELCR	--	2.1E-06	1.6E-06	4.4E-10	--	--	--	4.1E-08	--	1.1E-07	7.7E-07	ND	4.1E-07	1.3E-08	1.5E-06	2.0E-06	2.0E-06	1.0E-05	2.1E-05
	HQ	0.013	0.064	0.014	0.056	0.065	0.075	ND	0.0019	2.4	--	--	--	--	--	--	--	--	--	2.7
RA6-2	Concentration	2.07 U	7.62	27.3	14.2	25500	855	0.22	0.28	43	0.439 U	0.778	0.454 U	1.23	12.2	16	10.6	1.02	11.7	N/A
	ELCR	--	2.0E-06	3.0E-06	1.1E-09	--	--	--	1.2E-07	--	ND	1.3E-06	ND	6.7E-08	7.9E-09	5.7E-07	2.5E-07	3.9E-07	1.3E-06	9.0E-06
	HQ	ND	0.064	0.028	0.14	0.11	0.11	0.067	0.0055	0.65	--	--	--	--	--	--	--	--	--	1.2
RA6-3	Concentration	1.6	7.87	76.1	16.9	26100	1690	0.412 U	0.91	21.7	0.499 U	1.2	0.469 U	0.321 U	25.8	7.58	6.86	0.283 U	6.69	N/A
	ELCR	--	2.1E-06	8.3E-06	1.4E-09	--	--	--	3.9E-07	--	ND	2.1E-06	ND	ND	1.7E-08	2.7E-07	1.6E-07	ND	7.4E-07	1.4E-05
	HQ	0.012	0.066	0.077	0.17	0.11	0.22	ND	0.018	0.33	--	--	--	--	--	--	--	--	--	1
RA6-4	Concentration	2.52	9.43	17.4	7.53	16500	486	0.22	0.17	33.9	0.629 U	0.874	0.594	1.81	5.49	24	10.8	0.804	11.3	N/A
	ELCR	--	2.5E-06	1.9E-06	6.0E-10	--	--	--	7.4E-08	--	ND	1.5E-06	3.6E-07	9.9E-08	3.5E-09	8.5E-07	2.5E-07	3.1E-07	1.3E-06	9.1E-06
	HQ	0.019	0.079	0.018	0.077	0.072	0.063	0.065	0.0034	0.52	--	--	--	--	--	--	--	--	--	0.92
RA6-5	Concentration	2.08	6.53	18	8.27	18600	705	0.184	0.57	12.6	0.452 U	0.238	0.609 U	0.36 U	173	2.71	7.81	0.5 U	9.43	N/A
	ELCR	--	1.7E-06	2.0E-06	6.6E-10	--	--	--	2.4E-07	--	ND	4.1E-07	ND	ND	1.1E-07	9.6E-08	1.8E-07	ND	1.1E-06	5.8E-06
	HQ	0.016	0.054	0.018	0.084	0.081	0.091	0.056	0.011	0.19	--	--	--	--	--	--	--	--	--	0.6
RA6-6	Concentration	1.82	5.71	14.3	8.12	13300	743	0.152	0.03	19.9	0.372 U	0.288	1 U	0.606 U	7.01	4.53	4.51	0.441 U	5.15	N/A
	ELCR	--	1.5E-06	1.6E-06	6.5E-10	--	--	--	1.2E-08	--	ND	4.9E-07	ND	ND	4.5E-09	1.6E-07	1.0E-07	ND	5.7E-07	4.4E-06
	HQ	0.014	0.048	0.015	0.083	0.058	0.096	0.046	0.00058	0.3	--	--	--	--	--	--	--	--	--	0.66
RA6-7	Concentration	1.48	6.44	15.6	6.66	16700	317	0.19	0.85	8.59	0.3 U	0.0378 U	0.852 U	0.608 U	4.87	0.82	3.2	0.323 U	2.11	N/A
	ELCR	--	1.7E-06	1.7E-06	5.3E-10	--	--	--	3.6E-07	--	ND	ND	ND	ND	3.1E-09	2.9E-08	7.4E-08	ND	2.3E-07	4.1E-06
	HQ	0.011	0.054	0.016	0.068	0.073	0.041	0.057	0.017	0.13	--	--	--	--	--	--	--	--	--	0.47
RA6-8	Concentration	1.24	6.4	18.2	104	19100	3840	1.01	0.1	12.3	0.381 U	0.34	0.437 U	0.526 U	59.0	2.95	3.19	0.62	4.99	N/A
	ELCR	--	1.7E-06	2.0E-06	8.3E-09	--	--	--	4.2E-08	--	ND	5.8E-07	ND	ND	3.8E-08	1.0E-07	7.4E-08	2.4E-07	5.6E-07	5.3E-06
	HQ	0.0094	0.053	0.018	1.1	0.083	0.5	0.31	0.002	0.19	--	--	--	--	--	--	--	--	--	2.3
RA6-9	Concentration	3.93	6.62	41.2	10.9	24500	348	0.422 U	4.92	161	1.51	0.38	1.43	4.84	405	68.4	54.8	2.56	66.4	N/A
	ELCR	--	1.8E-06	4.5E-06	8.7E-10	--	--	--	2.1E-06	--	9.2E-08	6.5E-07	8.8E-07	2.6E-07	2.6E-07	2.4E-06	1.3E-06	9.8E-07	7.4E-06	2.3E-05
	HQ	0.03	0.055	0.042	0.11	0.11	0.045	ND	0.098	2.4	--	--	--	--	--	--	--	--	--	2.9
RA6-10	Concentration	63.51	4.69	16.4	11.1	18100	535	0.33	4.81	79.1	0.01	0.364	0.012 U	0.0063	10.8	3.93	22.8	1.36	24.4	N/A
	ELCR	--	1.3E-06	1.8E-06	8.9E-10	--	--	--	2.0E-06	--	6.1E-10	6.3E-07	ND	3.4E-10	7.0E-09	1.4E-07	5.3E-07	5.2E-07	2.7E-06	9.6E-06
	HQ	0.48	0.039	0.017	0.11	0.079	0.069	0.1	0.096	1.2	--	--	--	--	--	--	--	--	--	2.2
RA6-11	Concentration	71.02	22.4	53.9	7.3	29500	345	0.17	0.56	300	39.3	3.42	18.6	239	1610	10600	413	28	440	N/A
	ELCR	--	6.0E-06	5.9E-06	5.8E-10	--	--	--	2.4E-07	--	2.4E-06	5.9E-06	1.1E-05	1.3E-05	1.0E-06	3.8E-04	9.6E-06	1.1E-05	4.9E-05	5.0E-04
	HQ	0.54	0.19	0.055	0.074	0.13	0.045	0.052	0.011	4.6	--	--	--	--	--	--	--	--	--	5.7
Sector 6 Surface and Subsurface Soil	Concentration	64.0	11.2	55.1	30.9	23134	1659	0.62	3.435	177	39.3	1.94	18.6	239	1610	10552	413	21.3	440	N/A
	ELCR	--	3.0E-06	6.0E-06	2.5E-09	--	--	--	1.5E-06	--	2.4E-06	3.3E-06	1.1E-05	1.3E-05	1.0E-06	3.7E-04	9.6E-06	8.1E-06	4.9E-05	**4.8E-04**
	HQ	0.48	0.093	0.056	0.31	0.1	0.21	0.19	0.068	2.7	--	--	--	--	--	--	--	--	--	**4.2**
	COC (Y/N?):	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	>NAL	>NAL	<NAL	>NAL	>NAL	>NAL	>AL	>NAL	>NAL	>NAL	>NAL	<NAL	>AL	>NAL	>NAL	>NAL	
	% Total ELCR	--	0.63%	1.26%	0.00%	--	--	--	0.31%	--	0.50%	0.69%	2.30%	2.72%	0.21%	77.42%	2.01%	1.69%	10.25%	
	% Total HI	11.43%	2.21%	1.33%	7.38%	2.38%	5.00%	4.52%	1.62%	64.29%	--	--	--	--	--	--	--	--	--	
		Uranium and Thorium-230 are Priority COCs																		

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
AL = Action Level
NAL = No Action Level

Table C1.85. Sector 7 Surface Soil Risk Characterization Results

Grid	COPC	Chromium	Total PAH	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-235	Uranium-235/236	Uranium-238	Total Risk/HI
	Concentration Unit	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	N/A
	Provisional Background	16	N/A	4.9	0.49	0.1	1.5	0.06	0.06	1.2	N/A
	Industrial NAL—Cancer	12.3	0.643	--	0.108	0.249	31.3	0.408	0.408	1.66	N/A
	Industrial NAL—Noncancer	693	6.85	46.6	--	--	--	--	--	--	N/A
RA7-1	Concentration	19	0.358 U	25.5	0.573	0.777 U	4.29	0.777	0.77	8.91	N/A
	ELCR	1.5E-06	ND	--	5.3E-06	ND	1.4E-07	1.9E-06	1.9E-06	5.4E-06	1.6E-05
	HQ	0.0027	ND	0.055	--	--	--	--	--	--	0.058
RA7-2	Concentration	17.1	0.184 U	24.7	1.21	0.647 U	4.62	0.521 U	0.638	9.12	N/A
	ELCR	1.4E-06	ND	--	1.1E-05	ND	1.5E-07	ND	1.6E-06	5.5E-06	2.0E-05
	HQ	0.0025	ND	0.053	--	--	--	--	--	--	0.056
RA7-3	Concentration	17.1	0.280212	20.7	1.48	0.685 U	5.78	0.825	0.77	13.2	N/A
	ELCR	1.4E-06	4.4E-07	--	1.4E-05	ND	1.8E-07	2.0E-06	1.9E-06	8.0E-06	2.8E-05
	HQ	0.0025	0.0041	0.044	--	--	--	--	--	--	0.051
RA7-4	Concentration	25.3	0.189 U	49.9	2.93	0.655 U	5.34	0.486 U	0.77	9.07	N/A
	ELCR	2.1E-06	ND	--	2.7E-05	ND	1.7E-07	ND	1.9E-06	5.5E-06	3.7E-05
	HQ	0.0037	ND	0.11	--	--	--	--	--	--	0.11
RA7-5	Concentration	40.1	0.01	5.75	0.11	0.511 U	1.71	0.587 U	0.355 U	2.77	N/A
	ELCR	3.3E-06	2.0E-08	--	9.7E-07	ND	5.5E-08	ND	ND	1.7E-06	6.0E-06
	HQ	0.0058	0.00018	0.012	--	--	--	--	--	--	0.018
RA7-6	Concentration	16.6	0.549992	2.33	0.195	0.408 U	2.03	0.305 U	0.349 U	3.79	N/A
	ELCR	1.3E-06	8.6E-07	--	1.8E-06	ND	6.5E-08	ND	ND	2.3E-06	6.3E-06
	HQ	0.0024	0.008	0.005	--	--	--	--	--	--	0.015
RA7-7	Concentration	24.2	0.15	20.8	0.18	0.489 U	3.03	0.376 U	0.56	8.35	N/A
	ELCR	2.0E-06	2.4E-07	--	1.6E-06	ND	9.7E-08	ND	1.4E-06	5.0E-06	1.0E-05
	HQ	0.0035	0.0023	0.045	--	--	--	--	--	--	0.051
RA7-8	Concentration	14.1	3.36	22.8	1.46	0.687 U	7.82	0.24 U	0.63 U	10.1	N/A
	ELCR	1.1E-06	5.2E-06	--	1.4E-05	ND	2.5E-07	ND	ND	6.1E-06	2.7E-05
	HQ	0.002	0.049	0.049	--	--	--	--	--	--	0.1
RA7-9	Concentration	9.08	0.0346 U	3.92	0.0292 U	1.03 U	0.71	0.801	0.296 U	1.1	N/A
	ELCR	7.4E-07	ND	--	ND	ND	2.3E-08	2.0E-06	ND	6.6E-07	3.4E-06
	HQ	0.0013	ND	0.0084	--	--	--	--	--	--	0.0097
RA7-10	Concentration	20.8	1.25	22.7	0.92	6.5	15.8	0.801	0.77	9.19	N/A
	ELCR	1.7E-06	1.9E-06	--	8.5E-06	2.6E-05	5.1E-07	2.0E-06	1.9E-06	5.5E-06	4.8E-05
	HQ	0.003	0.018	0.049	--	--	--	--	--	--	0.07
RA7-11	Concentration	20.8	1.25	22.7	0.92	6.5	15.8	0.801	0.77	9.19	N/A
	ELCR	1.7E-06	1.9E-06	--	8.5E-06	2.6E-05	5.1E-07	2.0E-06	1.9E-06	5.5E-06	4.8E-05
	HQ	0.003	0.018	0.049	--	--	--	--	--	--	0.07
RA7-12	Concentration	24.8	0.69	83.9	1.86	6.5	152	0.801	1.12	33.6	N/A
	ELCR	2.0E-06	1.1E-06	--	1.7E-05	2.6E-05	4.9E-06	2.0E-06	2.7E-06	2.0E-05	7.6E-05
	HQ	0.0036	0.01	0.18	--	--	--	--	--	--	0.19
RA7-13	Concentration	21.8	1.57	8.92	0.06	0.734 U	1.77	0.801	0.663 U	8.19	N/A
	ELCR	1.8E-06	2.4E-06	--	5.6E-07	ND	5.7E-08	2.0E-06	ND	4.9E-06	1.2E-05
	HQ	0.0031	0.023	0.019	--	--	--	--	--	--	0.045
RA7-14	Concentration	20.1	3.39	3.55	0.081	0.337 U	1.09	0.801	0.459 U	2.06	N/A
	ELCR	1.6E-06	5.3E-06	--	7.5E-07	ND	3.5E-08	2.0E-06	ND	1.2E-06	1.1E-05
	HQ	0.0029	0.05	0.0076	--	--	--	--	--	--	0.061
Sector 7 Surface Soil	Concentration	24.13	1.473	39.53	1.27	6.5	61.85	0.821	0.76	18.05	N/A
	ELCR	2.0E-06	2.3E-06	--	1.2E-05	2.6E-05	2.0E-06	2.0E-06	1.9E-06	1.1E-05	**5.9E-05**
	HQ	0.0035	0.022	0.085	--	--	--	--	--	--	**0.11**
	COC (Y/N?):	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	
	Reason:	>NAL	>NAL	<NAL	>NAL	>NAL	>NAL	>NAL	>NAL	>NAL	
	% Total ELCR	3.38%	3.89%	--	20.27%	43.92%	3.38%	3.38%	3.21%	18.58%	
	% Total HI	3.18%	20.00%	77.27%	--	--	--	--	--	--	
		No Priority COCs									

Table C1.85. Sector 7 Surface Soil Risk Characterization Results

Notes:
Orange Shading = The EPC concentration is above the provisional background value.
Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1
Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1
N/A = Not applicable
"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.
"<" = Less than
NAL = No Action Level

Table C1.86. Sector 7 Surface and Subsurface Soil Risk Characterization Results

Grid	COPC	Arsenic	Chromium	Cobalt	Manganese	Total PAH	Uranium	Cesium-137	Neptunium-237	Thorium-230	Uranium-238	Total Risk/HI
	Concentration Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**N/A**
	Provisional Background	**7.9**	**16**	**13**	**820**	**N/A**	**4.6**	**0.28**	**0.1**	**1.4**	**1.2**	**N/A**
	Excavation NAL—Cancer	**3.74**	**9.14**	**12500**	**--**	**2.35**	**--**	**0.582**	**1.63**	**28.2**	**8.98**	**N/A**
	Excavation NAL—Noncancer	**12**	**98.5**	**9.84**	**774**	**5.03**	**6.58**	**--**	**--**	**--**	**--**	**N/A**
RA7-1	Concentration	6.58	19	7.31	808	0.193 U	25.5	0.57	0.777 U	4.29	8.91	N/A
	ELCR	1.8E-06	2.1E-06	5.8E-10	--	ND	--	9.8E-07	ND	1.5E-07	9.9E-07	6.0E-06
	HQ	0.055	0.019	0.074	0.1	ND	0.39	--	--	--	--	0.64
RA7-2	Concentration	5.95	27.9	7.09	595	0.	24.7	3.03	0.873	4.62	17.8	N/A
	ELCR	1.6E-06	3.1E-06	5.7E-10	--	1.3E-09	--	5.2E-06	5.4E-07	1.6E-07	2.0E-06	1.3E-05
	HQ	0.05	0.028	0.072	0.077	0.000059	0.38	--	--	--	--	0.61
RA7-3	Concentration	6.42	22.8	7.19	336	0.28	20.7	1.48	0.499 U	13.0	13.2	N/A
	ELCR	1.7E-06	2.5E-06	5.8E-10	--	1.2E-07	--	2.5E-06	ND	4.6E-07	1.5E-06	8.8E-06
	HQ	0.054	0.023	0.073	0.043	0.0056	0.31	--	--	--	--	0.51
RA7-4	Concentration	8.89	25.3	6.12	566	0.038 U	49.9	2.93	0.655 U	5.34	9.07	N/A
	ELCR	2.4E-06	2.8E-06	4.9E-10	--	ND	--	5.0E-06	ND	1.9E-07	1.0E-06	1.1E-05
	HQ	0.074	0.026	0.062	0.073	ND	0.76	--	--	--	--	1
RA7-5	Concentration	7.62	40.1	9.5	381	0.02	7.27	0.105	0.511 U	3.02	2.77	N/A
	ELCR	2.0E-06	4.4E-06	7.6E-10	--	9.7E-09	--	1.8E-07	ND	1.1E-07	3.1E-07	7.0E-06
	HQ	0.064	0.041	0.097	0.049	0.00045	0.11	--	--	--	--	0.36
RA7-6	Concentration	5.5	19.7	7.17	435	0.55	2.33	0.195	0.408 U	2.03	3.79	N/A
	ELCR	1.5E-06	2.2E-06	5.7E-10	--	2.3E-07	--	3.4E-07	ND	7.2E-08	4.2E-07	4.8E-06
	HQ	0.046	0.02	0.073	0.056	0.011	0.035	--	--	--	--	0.24
RA7-7	Concentration	9	24.2	9.63	581	0.15	20.8	0.176	0.456 U	3.03	8.35	N/A
	ELCR	2.4E-06	2.6E-06	7.7E-10	--	6.6E-08	--	3.0E-07	ND	1.1E-07	9.3E-07	6.4E-06
	HQ	0.075	0.025	0.098	0.075	0.0031	0.32	--	--	--	--	0.6
RA7-8	Concentration	8.65	27.2	6.74	348	3.36	22.8	1.46	0.475 U	7.82	10.1	N/A
	ELCR	2.3E-06	3.0E-06	5.4E-10	--	1.4E-06	--	2.5E-06	ND	2.8E-07	1.1E-06	1.1E-05
	HQ	0.072	0.028	0.068	0.045	0.067	0.35	--	--	--	--	0.63
RA7-9	Concentration	3.24	9.08	1.88	116	0.0346 U	3.92	0.0292 U	1.03 U	0.71	1.1	N/A
	ELCR	8.7E-07	9.9E-07	1.5E-10	--	ND	--	ND	ND	2.5E-08	1.2E-07	2.0E-06
	HQ	0.027	0.0092	0.019	0.015	ND	0.06	--	--	--	--	0.13
RA7-10	Concentration	7.19	24.7	8.27	555	1.11	22.1	1.09	3.69	15.4	9.65	N/A
	ELCR	1.9E-06	2.7E-06	6.6E-10	--	4.7E-07	--	1.9E-06	2.3E-06	5.4E-07	1.1E-06	1.1E-05
	HQ	0.06	0.025	0.084	0.072	0.022	0.34	--	--	--	--	0.6
RA7-11	Concentration	7	21.5	8.02	258	0.204 U	12.9	0.0459 U	0.606 U	0.85	6.55	N/A
	ELCR	1.9E-06	2.4E-06	6.4E-10	--	ND	--	ND	ND	3.0E-08	7.3E-07	5.1E-06
	HQ	0.058	0.022	0.082	0.033	ND	0.2	--	--	--	--	0.4
RA7-12	Concentration	7.01	24.8	14.2	433	0.69	83.9	1.86	6.5	152	33.6	N/A
	ELCR	1.9E-06	2.7E-06	1.1E-09	--	2.9E-07	--	3.2E-06	4.0E-06	5.4E-06	3.7E-06	2.1E-05
	HQ	0.058	0.025	0.14	0.056	0.014	1.3	--	--	--	--	1.6
RA7-13	Concentration	8.14	21.8	8.89	776	1.57	8.92	0.0607	0.734 U	1.77	8.19	N/A
	ELCR	2.2E-06	2.4E-06	7.1E-10	--	6.7E-07	--	1.0E-07	ND	6.3E-08	9.1E-07	6.3E-06
	HQ	0.068	0.022	0.09	0.1	0.031	0.14	--	--	--	--	0.45
RA7-14	Concentration	9.52	37.4	13.8	1580	3.39	3.55	0.08	0.337 U	1.09	2.06	N/A
	ELCR	2.5E-06	4.1E-06	1.1E-09	--	1.4E-06	--	1.4E-07	ND	3.9E-08	2.3E-07	8.4E-06
	HQ	0.079	0.038	0.14	0.2	0.067	0.054	--	--	--	--	0.58
Sector 7 Surface and Subsurface Soil	Concentration	7.98	28.24	9.722	776.9	1.38	38.35	1.445	6.5	61.46	15.55	N/A
	ELCR	2.1E-06	3.1E-06	7.8E-10	--	5.9E-07	--	2.5E-06	4.0E-06	2.2E-06	1.7E-06	**1.6E-05**
	HQ	0.067	0.029	0.099	0.1	0.027	0.58	--	--	--	--	**0.90**
	COC (Y/N?):	**Yes**	**Yes**	No	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	
	Reason:	>NAL	>NAL	<NAL	<NAL	<NAL	>NAL	>NAL	>NAL	>NAL	>NAL	
	% Total ELCR	12.97%	19.15%	0.00%	--	3.64%	--	15.44%	24.71%	13.59%	10.50%	
	% Total HI	7.44%	3.22%	11.00%	11.11%	3.00%	64.44%	--	--	--	--	
		No Priority COCs										

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

NAL = No Action Level

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Table C1.87. Regional Gravel Aquifer Groundwater Risk Characterization Results

COPC	Concentration Unit	Provisional Background	Resident NAL—Cancer	Resident NAL—Noncancer	Concentration	ELCR	HQ	% Total ELCR	% Total HI	COC (Y/N)?	Reason
Aluminum	mg/L	2.19	--	2	0.4	--	0.02	--	<0.01%	No	<NAL
Arsenic	mg/L	0.005	0.0000517	0.0000517	0.00307	5.9E-05	5.9	<0.01%	<0.01%	**Yes**	<BG; >NAL
Barium	mg/L	0.235	--	0.377	0.299	--	0.079	--	<0.01%	No	<NAL
Chromium	mg/L	0.144	0.000035	0.000035	0.0667	1.9E-03	190	2.79%	1.82%	**Yes**	<BG; >NAL
Fluoride	mg/L	0.27	--	0.0799	0.303	--	0.38	--	<0.01%	Yes	>NAL
Iron	mg/L	5.03	--	1.4	2.819	--	0.2	--	<0.01%	Yes	<BG; >NAL
Manganese	mg/L	0.119	--	0.0434	0.452	--	1	--	<0.01%	Yes	>NAL
Molybdenum	mg/L	0.05	--	0.00998	0.006	--	0.06	--	<0.01%	No	<NAL
Nitrate as Nitrogen	mg/L	15.6	--	3.19	20.19	--	0.63	--	<0.01%	Yes	>NAL
Uranium	mg/L	0.002	--	0.000399	0.00115	--	0.29	--	<0.01%	Yes	<BG; >NAL
Bis(2-ethylhexyl)phthalate	mg/L	N/A	0.00556	0.00556	0.002	3.6E-07	0.036	<0.01%	<0.01%	No	<NAL
Hexachlorocyclopentadiene	mg/L	N/A	--	0.0000412	0.00474	--	12	--	<0.01%	**Yes**	>NAL
Pentachlorophenol	mg/L	N/A	0.0000413	0.0000413	0.00641	1.6E-04	16	<0.01%	<0.01%	**Yes**	>NAL
p-Nitroaniline	mg/L	N/A	0.00378	0.0078	0.005	1.3E-06	0.064	<0.01%	<0.01%	Yes	>NAL
Total PAH	mg/L	N/A	0.0000251	0.0000251	0.00076	3.0E-05	3	<0.01%	<0.01%	**Yes**	>NAL
Total PCB	mg/L	N/A	0.0000436	0.0000436	0.000066834	1.5E-06	0.15	<0.01%	<0.01%	Yes	>NAL
1,1,2-Trichloroethane	mg/L	N/A	0.000275	0.0000415	0.00177	6.4E-06	4.3	<0.01%	<0.01%	**Yes**	>NAL
1,1-Dichloroethane	mg/L	N/A	0.00275	0.00275	0.00061343	2.2E-07	0.022	<0.01%	<0.01%	No	<NAL
1,1-Dichloroethene	mg/L	N/A	--	0.0285	0.0098	--	0.023	--	<0.01%	No	<NAL
1,2-Dichloroethane	mg/L	N/A	0.000171	0.000171	0.00071844	4.2E-06	0.42	<0.01%	<0.01%	Yes	>NAL
1,4-Dioxane	mg/L	N/A	0.000459	0.00567	3.94	8.6E-03	69	12.54%	<0.01%	**Yes**	>NAL
Benzene	mg/L	N/A	0.000455	0.000455	0.00015198	3.3E-07	0.033	<0.01%	<0.01%	No	<NAL
Bromodichloromethane	mg/L	N/A	0.000134	0.000134	0.01	7.5E-05	0.59	<0.01%	<0.01%	Yes	>NAL
Carbon tetrachloride	mg/L	N/A	0.000455	0.000455	0.0037	8.1E-06	0.81	<0.01%	<0.01%	Yes	>NAL
Chloroform	mg/L	N/A	0.000221	0.000221	0.003	1.4E-05	1.4	<0.01%	<0.01%	**Yes**	>NAL
cis-1,2-Dichloroethene	mg/L	N/A	--	0.00361	2.71	--	75	--	<0.01%	**Yes**	>NAL
Methylene chloride	mg/L	N/A	0.0114	0.0107	0.0204	1.8E-06	0.19	<0.01%	<0.01%	Yes	>NAL
Tetrachloroethene	mg/L	N/A	0.0113	0.00406	0.00381	3.4E-07	0.094	<0.01%	<0.01%	No	<NAL
trans-1,2-Dichloroethene	mg/L	N/A	--	0.00929	0.00093269	--	0.01	--	<0.01%	No	<NAL
Trichloroethene	mg/L	N/A	0.000494	0.000283	28.32	5.7E-02	10000	83.70%	96.03%	**Yes**	>NAL
Vinyl chloride	mg/L	N/A	0.0000188	0.0000188	0.00344	1.8E-04	18	<0.01%	<0.01%	**Yes**	>NAL
Neptunium-237	pCi/L	0.8	0.763	0.763	0.105	1.4E-07	0.014	<0.01%	<0.01%	No	<NAL
Technetium-99	pCi/L	22.3	19	19	2482	1.3E-04	13	<0.01%	<0.01%	**Yes**	>NAL
Uranium-233/234	pCi/L	0.7	0.739	0.739	0.00422	5.7E-09	0.00057	<0.01%	<0.01%	No	<NAL
Uranium-235/236	pCi/L	0.3	0.728	0.728	4.68	6.4E-06	0.64	<0.01%	<0.01%	Yes	>NAL
Uranium-238	pCi/L	0.7	0.601	0.601	0.0337	5.6E-08	0.0056	<0.01%	<0.01%	No	<NAL
					Total	6.8E-02	10413				

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.

Bold = the COC is identified as a priority COC

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

BG = Provisional Background Value

NAL = No Action Level

Table C1.88. McNairy Groundwater Risk Characterization Results

COPC	Concentration Unit	Provisional Background	Resident NAL - Cancer	Resident NAL - Noncancer	Concentration	ELCR	HQ	% Total ELCR	% Total HI	COC (Y/N)?	Reason
p-Nitroaniline	mg/L	N/A	0.00378	0.0078	0.00603	1.6E-06	0.077	<0.01%	<0.01%	Yes	>NAL
1,1,2-Trichloroethane	mg/L	N/A	0.000275	0.0000415	0.00051	1.9E-06	1.2	<0.01%	<0.01%	**Yes**	>NAL
cis-1,2-Dichloroethene	mg/L	N/A	--	0.00361	0.276	--	7.6	--	<0.01%	**Yes**	>NAL
Trichloroethene	mg/L	N/A	0.000494	0.000283	6.8	1.4E-02	2400	99.97%	99.63%	**Yes**	>NAL
Uranium-238	pCi/L	0.3	0.601	0.601	0.692	1.2E-06	0.12	<0.01%	<0.01%	**Yes**	>NAL
					Total	1.4E-02	2409				

Notes:

Orange Shading = The EPC concentration is above the provisional background value.

Yellow shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-6} or the calculated hazard quotient (HQ) is above 0.1.

Red shading = the calculated excess lifetime cancer risk (ELCR) is above 1×10^{-4} or the calculated hazard quotient (HQ) is above 1.

Bold = the COC is identified as a priority COC

N/A = Not applicable

"--" = No screening value available for endpoint, no risk/hazard calculation possible. Also, no calculated ELCR/HQ due to lack of screening value for endpoint.

"<" = Less than

AL = Action Level

BG = Provisional Background Value

NAL = No Action Level

Table C1.89. Surface Soil COCs and Priority COCs

Sector	Media	COC	Priority COC?
Sector 1	Surface Soil	Chromium	No
Sector 1	Surface Soil	Total PAH	No
Sector 1	Surface Soil	Total PCB	No
Sector 1	Surface Soil	Uranium	No
Sector 1	Surface Soil	Cesium-137	No
Sector 1	Surface Soil	Neptunium-237	No
Sector 1	Surface Soil	Radium-226	No
Sector 1	Surface Soil	Uranium-233/234	No
Sector 1	Surface Soil	Uranium-235/236	No
Sector 1	Surface Soil	Uranium-238	No
Sector 2	Surface Soil	Arsenic	No
Sector 2	Surface Soil	Chromium	No
Sector 2	Surface Soil	Uranium	Yes
Sector 2	Surface Soil	Neptunium-237	No
Sector 2	Surface Soil	Uranium-233/234	No
Sector 2	Surface Soil	Uranium-235/236	No
Sector 2	Surface Soil	Uranium-238	Yes
Sector 3	Surface Soil	Arsenic	No
Sector 3	Surface Soil	Chromium	No
Sector 3	Surface Soil	Total PAHs	No
Sector 3	Surface Soil	Trichloroethene	No
Sector 3	Surface Soil	Uranium-235/236	No
Sector 3	Surface Soil	Uranium-238	No
Sector 4	Surface Soil - Non RR	Chromium	No
Sector 4	Surface Soil - Non RR	Total PCB	No
Sector 4	Surface Soil - Non RR	Uranium	No
Sector 4	Surface Soil - Non RR	Neptunium-237	No
Sector 4	Surface Soil - Non RR	Uranium-233/234	No
Sector 4	Surface Soil - Non RR	Uranium-235/236	No
Sector 4	Surface Soil - Non RR	Uranium-238	Yes
Sector 4	Surface Soil - RR	Chromium	No
Sector 4	Surface Soil - RR	Uranium	No
Sector 4	Surface Soil - RR	Neptunium-237	No
Sector 4	Surface Soil - RR	Uranium-235/236	No
Sector 4	Surface Soil - RR	Uranium-238	No
Sector 5	Surface Soil - Non RR	Arsenic	No
Sector 5	Surface Soil - Non RR	Chromium	No
Sector 5	Surface Soil - Non RR	Total PAH	No
Sector 5	Surface Soil - Non RR	Trichloroethene	No
Sector 5	Surface Soil - Non RR	Cesium-137	No
Sector 5	Surface Soil - Non RR	Neptunium-237	No
Sector 5	Surface Soil - Non RR	Uranium-233/234	No
Sector 5	Surface Soil - Non RR	Uranium-235/236	Yes
Sector 5	Surface Soil - Non RR	Uranium-238	Yes
Sector 5	Surface Soil - RR	Arsenic	No
Sector 5	Surface Soil - RR	Chromium	No
Sector 5	Surface Soil - RR	Uranium	No
Sector 5	Surface Soil - RR	Uranium-235/236	No
Sector 5	Surface Soil - RR	Uranium-238	No
Sector 6	Surface Soil	Arsenic	No
Sector 6	Surface Soil	Chromium	No
Sector 6	Surface Soil	Total PAH	No

Table C1.89. Surface Soil COCs and Priority COCs (Continued)

Sector	Media	COC	Priority COC?
Sector 6	Surface Soil	Total PCB	No
Sector 6	Surface Soil	Uranium	No
Sector 6	Surface Soil	Americium-241	No
Sector 6	Surface Soil	Cesium-137	No
Sector 6	Surface Soil	Neptunium-237	No
Sector 6	Surface Soil	Plutonium-239/240	No
Sector 6	Surface Soil	Technetium-99	No
Sector 6	Surface Soil	Thorium-230	Yes
Sector 6	Surface Soil	Uranium-233/234	No
Sector 6	Surface Soil	Uranium-235/236	No
Sector 6	Surface Soil	Uranium-238	Yes
Sector 7	Surface Soil	Chromium	No
Sector 7	Surface Soil	Total PAH	No
Sector 7	Surface Soil	Cesium-137	No
Sector 7	Surface Soil	Neptunium-237	No
Sector 7	Surface Soil	Thorium-230	No
Sector 7	Surface Soil	Uranium-235	No
Sector 7	Surface Soil	Uranium-235/236	No
Sector 7	Surface Soil	Uranium-238	No

Table C1.90. Surface and Subsurface Soil COCs and Priority COCs

Sector	Media	COC	Priority COC?
Sector 1	Surface and Subsurface Soil	Arsenic	No
Sector 1	Surface and Subsurface Soil	Chromium	No
Sector 1	Surface and Subsurface Soil	Cobalt	No
Sector 1	Surface and Subsurface Soil	Total PCB	No
Sector 1	Surface and Subsurface Soil	Uranium	Yes
Sector 1	Surface and Subsurface Soil	Cesium-137	No
Sector 1	Surface and Subsurface Soil	Neptunium-237	No
Sector 1	Surface and Subsurface Soil	Radium-226	No
Sector 1	Surface and Subsurface Soil	Uranium-233/234	No
Sector 1	Surface and Subsurface Soil	Uranium-235/236	No
Sector 1	Surface and Subsurface Soil	Uranium-238	No
Sector 2	Surface and Subsurface Soil	Arsenic	No
Sector 2	Surface and Subsurface Soil	Chromium	No
Sector 2	Surface and Subsurface Soil	Nickel	No
Sector 2	Surface and Subsurface Soil	Uranium	Yes
Sector 2	Surface and Subsurface Soil	Uranium-233/234	No
Sector 2	Surface and Subsurface Soil	Uranium-235/236	No
Sector 2	Surface and Subsurface Soil	Uranium-238	No
Sector 3	Surface and Subsurface Soil	Arsenic	No
Sector 3	Surface and Subsurface Soil	Chromium	No
Sector 3	Surface and Subsurface Soil	Cobalt	No
Sector 3	Surface and Subsurface Soil	Manganese	No
Sector 3	Surface and Subsurface Soil	Trichloroethene	No
Sector 3	Surface and Subsurface Soil	Uranium	Yes
Sector 3	Surface and Subsurface Soil	Uranium-238	No
Sector 4	Surface and Subsurface Soil - Non RR	Arsenic	No
Sector 4	Surface and Subsurface Soil - Non RR	Chromium	No
Sector 4	Surface and Subsurface Soil - Non RR	Iron	No
Sector 4	Surface and Subsurface Soil - Non RR	Manganese	No
Sector 4	Surface and Subsurface Soil - Non RR	Trichloroethene	Yes
Sector 4	Surface and Subsurface Soil - Non RR	Uranium	Yes
Sector 4	Surface and Subsurface Soil - Non RR	Cesium-137	No
Sector 4	Surface and Subsurface Soil - Non RR	Neptunium-237	No
Sector 4	Surface and Subsurface Soil - Non RR	Uranium-233/234	No
Sector 4	Surface and Subsurface Soil - Non RR	Uranium-235/236	No
Sector 4	Surface and Subsurface Soil - Non RR	Uranium-238	No
Sector 4	Surface and Subsurface Soil - RR	Arsenic	No
Sector 4	Surface and Subsurface Soil - RR	Chromium	No
Sector 4	Surface and Subsurface Soil - RR	Iron	No
Sector 4	Surface and Subsurface Soil - RR	Total Dioxin/Furans	No
Sector 4	Surface and Subsurface Soil - RR	Total PAH	No
Sector 4	Surface and Subsurface Soil - RR	Uranium	Yes
Sector 4	Surface and Subsurface Soil - RR	Neptunium-237	No
Sector 4	Surface and Subsurface Soil - RR	Uranium-238	No
Sector 5	Surface and Subsurface Soil - Non RR	Arsenic	No
Sector 5	Surface and Subsurface Soil - Non RR	Chromium	No
Sector 5	Surface and Subsurface Soil - Non RR	Cobalt	No
Sector 5	Surface and Subsurface Soil - Non RR	Manganese	No
Sector 5	Surface and Subsurface Soil - Non RR	Trichloroethene	Yes
Sector 5	Surface and Subsurface Soil - Non RR	Uranium	No
Sector 5	Surface and Subsurface Soil - Non RR	Cesium-137	No
Sector 5	Surface and Subsurface Soil - Non RR	Neptunium-237	No

Table C1.90. Surface and Subsurface Soil COCs and Priority COCs (Continued)

Sector	Media	COC	Priority COC?
Sector 5	Surface and Subsurface Soil - Non RR	Uranium-233/234	No
Sector 5	Surface and Subsurface Soil - Non RR	Uranium-235/236	No
Sector 5	Surface and Subsurface Soil - Non RR	Uranium-238	No
Sector 5	Surface and Subsurface Soil - RR	Arsenic	No
Sector 5	Surface and Subsurface Soil - RR	Chromium	No
Sector 5	Surface and Subsurface Soil - RR	Cobalt	No
Sector 5	Surface and Subsurface Soil - RR	Manganese	No
Sector 5	Surface and Subsurface Soil - RR	Uranium	No
Sector 6	Surface and Subsurface Soil	Antimony	No
Sector 6	Surface and Subsurface Soil	Arsenic	No
Sector 6	Surface and Subsurface Soil	Chromium	No
Sector 6	Surface and Subsurface Soil	Cobalt	No
Sector 6	Surface and Subsurface Soil	Manganese	No
Sector 6	Surface and Subsurface Soil	Thallium	No
Sector 6	Surface and Subsurface Soil	Total PAH	No
Sector 6	Surface and Subsurface Soil	Uranium	Yes
Sector 6	Surface and Subsurface Soil	Americium-241	No
Sector 6	Surface and Subsurface Soil	Cesium-137	No
Sector 6	Surface and Subsurface Soil	Neptunium-237	No
Sector 6	Surface and Subsurface Soil	Plutonium-239/240	No
Sector 6	Surface and Subsurface Soil	Thorium-230	Yes
Sector 6	Surface and Subsurface Soil	Uranium-233/234	No
Sector 6	Surface and Subsurface Soil	Uranium-235/236	No
Sector 6	Surface and Subsurface Soil	Uranium-238	No
Sector 7	Surface and Subsurface Soil	Arsenic	No
Sector 7	Surface and Subsurface Soil	Chromium	No
Sector 7	Surface and Subsurface Soil	Uranium	No
Sector 7	Surface and Subsurface Soil	Cesium-137	No
Sector 7	Surface and Subsurface Soil	Neptunium-237	No
Sector 7	Surface and Subsurface Soil	Thorium-230	No
Sector 7	Surface and Subsurface Soil	Uranium-238	No

Table C1.91. Groundwater COCs and Priority COCs

Exposure Unit	COC	Priority COC?
RGA	Arsenic	Yes
RGA	Chromium	Yes
RGA	Fluoride	No
RGA	Iron	No
RGA	Manganese	No
RGA	Nitrate as Nitrogen	No
RGA	Uranium	No
RGA	Hexachlorocyclopentadiene	Yes
RGA	Pentachlorophenol	Yes
RGA; McNairy	p-Nitroaniline	No
RGA	Total PAH	Yes
RGA	Total PCB	No
RGA; McNairy	1,1,2-Trichloroethane	Yes
RGA	1,2-Dichloroethane	No
RGA	1,4-Dioxane	Yes
RGA	Bromodichloromethane	No
RGA	Carbon tetrachloride	No
RGA	Chloroform	Yes
RGA; McNairy	*cis* -1,2-Dichloroethene	Yes
RGA	Methylene chloride	No
RGA; McNairy	Trichloroethene	Yes
RGA	Vinyl chloride	Yes
RGA	Technetium-99	Yes
RGA	Uranium-235/236	No
McNairy	Uranium-238	Yes

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Table C1.92. UCRS Groundwater Screen

Type	Analysis	Unit	Detected Results			FOD	Resident		Resident		MCL		DL Range
			Min	Max	Avg	FOD	FOE	NAL	FOE	AL	FOE	MCL	
METAL	Aluminum	mg/L	4.01E-02	8.10E-01	3.75E-01	11/13	0/13	2.00E+00	0/13	6.00E+01	0/13	N/A	0.05 - 0.05
METAL	Antimony	mg/L	1.03E-03	1.07E-03	1.05E-03	2/13	2/13	7.79E-04	0/13	2.34E-02	0/13	6.00E-03	0.003 - 0.003
METAL	Arsenic	mg/L	2.00E-03	2.73E-03	2.48E-03	6/13	6/13	5.17E-05	0/13	5.17E-03	0/13	1.00E-02	0.005 - 0.005
METAL	Barium	mg/L	7.79E-02	1.73E-01	1.11E-01	13/13	0/13	3.77E-01	0/13	1.13E+01	0/13	2.00E+00	0.004 - 0.004
METAL	Boron	mg/L	5.38E-03	2.13E-02	1.12E-02	11/13	0/13	3.99E-01	0/13	1.20E+01	0/13	N/A	0.015 - 0.015
METAL	Cadmium	mg/L	4.08E-04	4.08E-04	4.08E-04	1/13	0/13	9.22E-04	0/13	2.77E-02	0/13	5.00E-03	0.001 - 0.001
METAL	Chromium	mg/L	3.23E-03	1.14E-02	6.07E-03	7/13	7/13	3.50E-05	6/13	3.50E-03	0/13	1.00E-01	0.01 - 0.01
METAL	Cobalt	mg/L	3.80E-04	3.50E-03	1.27E-03	13/13	11/13	6.01E-04	0/13	1.80E-02	0/13	N/A	0.001 - 0.001
METAL	Copper	mg/L	3.39E-04	4.92E-03	1.83E-03	13/13	0/13	7.99E-02	0/13	2.40E+00	0/13	1.30E+00	0.002 - 0.002
METAL	Iron	mg/L	5.49E-02	1.17E+00	6.08E-01	11/13	0/13	1.40E+00	0/13	4.20E+01	0/13	N/A	0.1 - 0.1
METAL	Lead	mg/L	5.89E-04	2.41E-03	1.15E-03	10/13	0/13	1.50E-02	0/13	3.00E-02	0/13	1.50E-02	0.002 - 0.002
METAL	Manganese	mg/L	1.09E-02	5.14E-01	1.14E-01	13/13	5/13	4.34E-02	0/13	1.30E+00	0/13	N/A	0.005 - 0.005
METAL	Mercury	mg/L	9.50E-05	2.36E-04	1.66E-04	2/13	0/13	5.66E-04	0/13	1.70E-02	0/13	2.00E-03	0.0002 - 0.0002
METAL	Molybdenum	mg/L	2.62E-04	1.03E-03	5.87E-04	8/13	0/13	9.98E-03	0/13	2.99E-01	0/13	N/A	0.001 - 0.001
METAL	Nickel	mg/L	6.61E-04	3.09E-03	1.94E-03	13/13	0/13	3.92E-02	0/13	1.18E+00	0/13	N/A	0.002 - 0.002
METAL	Uranium	mg/L	1.23E-04	1.26E-03	3.14E-04	12/13	1/13	3.99E-04	0/13	1.20E-02	0/13	3.00E-02	0.0002 - 0.0002
METAL	Vanadium	mg/L	3.52E-03	4.76E-03	4.40E-03	4/13	0/13	8.64E-03	0/13	2.59E-01	0/13	N/A	0.02 - 0.02
METAL	Zinc	mg/L	3.46E-03	2.59E-02	9.20E-03	11/13	0/13	6.00E-01	0/13	1.80E+01	0/13	N/A	0.02 - 0.02
ANION	Fluoride	mg/L	6.17E-02	2.29E-01	1.63E-01	13/13	12/13	7.99E-02	0/13	2.40E+00	0/13	4.00E+00	0.1 - 0.1
ANION	Nitrate as Nitrogen	mg/L	5.98E-02	1.73E+00	1.14E+00	3/4	0/4	3.19E+00	0/4	9.57E+01	0/4	1.00E+01	0.1 - 0.1
RADS	Technetium-99	pCi/L	1.96E+01	5.77E+01	3.42E+01	8/13	8/13	1.90E+01	0/13	1.90E+03	0/13	9.00E+02	2.92 - 4.17
SVOA	Bis(2-ethylhexyl)phthalate	mg/L	3.20E-04	7.24E-04	4.95E-04	3/13	0/13	5.56E-03	0/13	5.56E-01	0/13	6.00E-03	0.000952 - 0.00116
SVOA	Butyl benzyl phthalate	mg/L	6.20E-04	6.20E-04	6.20E-04	1/13	0/13	1.63E-02	0/13	1.63E+00	0/13	N/A	0.00952 - 0.0116
SVOA	Di-n-butyl phthalate	mg/L	9.10E-04	9.10E-04	9.10E-04	1/13	0/13	9.02E-02	0/13	2.71E+00	0/13	N/A	0.00952 - 0.0116
SVOA	Di-n-octylphthalate	mg/L	6.38E-04	1.07E-03	8.54E-04	2/13	0/13	2.01E-02	0/13	6.03E-01	0/13	N/A	0.00952 - 0.0116
SVOA	Naphthalene	mg/L	3.30E-04	3.30E-04	3.30E-04	1/13	1/13	1.17E-04	0/13	1.17E-02	0/13	N/A	0.000952 - 0.00116
SVOA	p-Nitroaniline	mg/L	5.10E-03	5.10E-03	5.10E-03	1/13	1/13	3.78E-03	0/13	2.34E-01	0/13	N/A	0.00952 - 0.0116
VOA	1,1,2-Trichloroethane	mg/L	2.16E-03	2.16E-03	2.16E-03	1/13	1/13	4.15E-05	1/13	1.25E-03	0/13	5.00E-03	0.001 - 50
VOA	1,1-Dichloroethene	mg/L	1.70E-02	1.70E-02	1.70E-02	1/13	0/13	2.85E-02	0/13	8.55E-01	1/13	7.00E-03	0.001 - 50
VOA	1,2-Dichloroethane	mg/L	3.90E-04	3.90E-04	3.90E-04	1/13	1/13	1.71E-04	0/13	1.71E-02	0/13	5.00E-03	0.001 - 50
VOA	1,4-Dioxane	mg/L	2.33E+05	2.33E+05	2.33E+05	1/10	1/10	4.59E-04	1/10	4.59E-02	0/10	N/A	0.05 - 2500
VOA	Acetone	mg/L	2.16E+02	2.16E+02	2.16E+02	1/13	1/13	1.80E+00	1/13	5.40E+01	0/13	N/A	0.005 - 250
VOA	Benzene	mg/L	8.50E-04	8.50E-04	8.50E-04	1/13	1/13	4.55E-04	0/13	4.55E-02	0/13	5.00E-03	0.001 - 50
VOA	Carbon tetrachloride	mg/L	5.60E-04	5.60E-04	5.60E-04	1/13	1/13	4.55E-04	0/13	4.55E-02	0/13	5.00E-03	0.001 - 50
VOA	Chloroform	mg/L	6.90E-04	6.90E-04	6.90E-04	1/13	1/13	2.21E-04	0/13	2.21E-02	0/13	8.00E-02	0.001 - 50
VOA	*cis* -1,2-Dichloroethene	mg/L	5.70E-02	7.37E+00	1.94E+00	4/13	4/13	3.61E-03	3/13	1.08E-01	3/13	7.00E-02	0.001 - 50
VOA	Methylene chloride	mg/L	5.20E-03	5.20E-03	5.20E-03	1/13	0/13	1.07E-02	0/13	3.21E-01	1/13	5.00E-03	0.005 - 250
VOA	Tetrachloroethene	mg/L	3.90E-03	3.90E-03	3.90E-03	1/13	0/13	4.06E-03	0/13	1.22E-01	0/13	5.00E-03	0.001 - 50
VOA	*trans* -1,2-Dichloroethene	mg/L	4.15E-03	4.15E-03	4.15E-03	1/13	0/13	9.29E-03	0/13	2.79E-01	0/13	1.00E-01	0.001 - 50
VOA	Trichloroethene	mg/L	1.86E-03	6.45E+02	5.34E+01	13/13	13/13	2.83E-04	10/13	8.49E-03	12/13	5.00E-03	0.001 - 50
VOA	Vinyl chloride	mg/L	2.71E-02	2.71E-02	2.71E-02	1/13	1/13	1.88E-05	1/13	1.88E-03	1/13	2.00E-03	0.001 - 50

One or more samples exceed AL value

One or more samples exceed NAL value

One or more samples exceed groundwater MCL

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

-- = No calculation completed, analyte not detected

Notes:

Counts of analyses are based on the maximum detected result from a sample (e.g., if a sample has analytical results from two different labs, only the maximum value is counted).

Uranium was screened against Uranium (Soluble Salts).

Total PCBs were calculated by laboratory.

Total PAHs were calculated using TEF values in the 2021 RMD.

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Table C1.93. Human Health Uncertainty Analysis Summary, C-400 Complex

Description of Uncertainty	Direction of Uncertainty	Estimated Effect*		
		Small	Moderate	Large
Data Analysis Uncertainties				
Common Laboratory Contaminants—Soil	Overestimates	X		
Common Laboratory Contaminants—Groundwater	Overestimates	X		
Retention of Infrequently Detected Analytes as COPCs—Soil	Overestimates	X		
Retention of Infrequently Detected Analytes as COPCs—Groundwater	Overestimates	X		
Lack of Consideration of Temporal Patterns in Data	Overestimates	X		
COPC Selection Uncertainties				
Surface Soil Detection Limits	Underestimates	X		
Surface and Subsurface Soil Detection Limits	Underestimates	X		
Groundwater Detection Limits	Underestimates	X		
Use of surrogates for chemicals without screening values	Over or Underestimates	X		
Exposure Assessment Uncertainties				
Grid Concentration Assignment Uncertainties	Over or Underestimates	X		
Inclusion of XRF Data—Uranium metal	Underestimates	X		
Inclusion of XRF Data—Antimony	Overestimates	X		
Groundwater UCL95 Data Selection	Over or Underestimates		X	
UCL95 Compared to the Maximum as the EPC	Underestimates		X	
Risk Characterization Uncertainties				
Combination of Chemical and Pathway Risk Estimates—Noncarcinogenic	Overestimates	X		
Combination of Chemical and Pathway Risk Estimates—Carcinogenic	Overestimates	X		
Combining Chemical and Radionuclide Risk Estimates	Overestimates	X		
Assumption of Linearity for High Cancer Risk Estimates	Overestimates	X		

*The definitions of the effects on risk estimates are as follows:
Small—Uncertainty should not cause risk or hazard estimate to vary by more than one order of magnitude;
Moderate—Uncertainty may cause the risk or hazard estimate to vary between one and two orders of magnitude; and
Large—Uncertainty may cause the risk or hazard estimate to vary by more than two orders of magnitude.

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Table C1.94. Screening Risk Evaluation Soil Human Health RGOs

Media	Receptor	Analytical Group	COCs	Units	Provisional Background	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at HQ=0.1	RGO at HQ=1	RGO at HQ=3
Surface Soil	Industrial Worker	METAL	Arsenic	mg/kg	12	1.60	16	160	25.7	257	771
Surface Soil	Industrial Worker	METAL	Chromium	mg/kg	16	12.3	123	1230	693	6930	20790
Surface Soil	Industrial Worker	METAL	Uranium	mg/kg	4.9	--	--	--	46.6	466	1398
Surface Soil	Industrial Worker	PPCB	Total PCB	mg/kg	N/A	0.293	2.93	29.3	--	--	--
Surface Soil	Industrial Worker	SVOA	Total PAH	mg/kg	N/A	0.643	6.43	64.3	6.85	68.5	206
Surface Soil	Industrial Worker	VOA	Trichloroethene	mg/kg	N/A	6.31	63.1	631	1.9	19	57
Surface Soil	Industrial Worker	RADIONUCLIDE	Americium-241	pCi/g	N/A	6.01	60.1	601	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Cesium-137	pCi/g	0.49	0.108	1.08	10.8	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Neptunium-237	pCi/g	0.1	0.249	2.49	24.9	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Plutonium-239/240	pCi/g	0.025	22.7	227	2270	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Radium-226	pCi/g	1.5	0.0248	0.248	2.48	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Technetium-99	pCi/g	2.5	1270	12700	127000	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Thorium-230	pCi/g	1.5	31.3	313	3130	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-233/234	pCi/g	1.2	50.1	501	5010	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-235	pCi/g	0.06	0.408	4.08	40.8	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-235/236	pCi/g	0.06	0.408	4.08	40.8	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-238	pCi/g	1.2	1.66	16.6	166	--	--	--
Surface and Subsurface Soil	Excavation Worker	METAL	Antimony	mg/kg	0.21	--	--	--	13.2	132	396
Surface and Subsurface Soil	Excavation Worker	METAL	Arsenic	mg/kg	7.9	3.74	37.4	374	12	120	360
Surface and Subsurface Soil	Excavation Worker	METAL	Chromium	mg/kg	16	9.14	91.4	914	98.5	985	2955
Surface and Subsurface Soil	Excavation Worker	METAL	Cobalt	mg/kg	13	12500	125000	1250000	9.84	98.4	295
Surface and Subsurface Soil	Excavation Worker	METAL	Iron	mg/kg	28000	--	--	--	23000	230000	690000
Surface and Subsurface Soil	Excavation Worker	METAL	Manganese	mg/kg	820	--	--	--	774	7740	23220
Surface and Subsurface Soil	Excavation Worker	METAL	Nickel	mg/kg	21	--	--	--	652	6520	19560
Surface and Subsurface Soil	Excavation Worker	METAL	Thallium	mg/kg	0.21	--	--	--	0.329	3.29	9.87
Surface and Subsurface Soil	Excavation Worker	METAL	Uranium	mg/kg	4.6	--	--	--	6.58	65.8	197
Surface and Subsurface Soil	Excavation Worker	DI/FURA	Total Dioxin/Furans	mg/kg	N/A	0.000029	0.00029	0.0029	0.000019	0.00019	0.00057
Surface and Subsurface Soil	Excavation Worker	PPCB	Total PCB	mg/kg	N/A	1.12	11.2	112	--	--	--
Surface and Subsurface Soil	Excavation Worker	SVOA	Total PAH	mg/kg	N/A	2.35	23.5	235	5.03	50.3	151
Surface and Subsurface Soil	Excavation Worker	VOA	Trichloroethene	mg/kg	N/A	30.9	309	3090	2.26	22.6	67.8
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Americium-241	pCi/g	N/A	16.4	164	1640	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Cesium-137	pCi/g	0.28	0.582	5.82	58.2	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Neptunium-237	pCi/g	0.1	1.63	16.3	163	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Plutonium-239/240	pCi/g	0.025	18.3	183	1830	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Radium-226	pCi/g	1.5	0.164	1.64	16.4	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Thorium-230	pCi/g	1.4	28.2	282	2820	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Uranium-235/236	pCi/g	0.06	2.62	26.2	262	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Uranium-238	pCi/g	1.2	8.98	89.8	898	--	--	--

Table C1.95. Screening Risk Evaluation Groundwater Human Health RGOs

Media	Exposure Unit	Analytical Group	COCs	Units	Provisional RGA Background	Provisional McNairy Background	Primary MCL	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at HQ=0.1	RGO at HQ=1	RGO at HQ=3
Groundwater	RGA	METAL	Arsenic	µg/L	5	5	10	0.0517	0.517	5.17	0.599	5.99	18.0
Groundwater	RGA	METAL	Chromium	µg/L	144	60	100	0.035	0.35	3.5	4.45	44.5	133.5
Groundwater	RGA	METAL	Iron	µg/L	5030	18400	N/A	--	--	--	1400	14000	42000
Groundwater	RGA	METAL	Manganese	µg/L	119	941	N/A	--	--	--	43.4	434	1302
Groundwater	RGA	METAL	Uranium	µg/L	2	1	30	--	--	--	0.399	3.99	12.0
Groundwater	RGA	ANION	Fluoride	µg/L	270	330	4000	--	--	--	79.9	799	2397
Groundwater	RGA	ANION	Nitrate/Nitrite	µg/L	N/A	N/A	10000/1000	--	--	--	3190	31900	95700
Groundwater	RGA	PAH	Total PAH	µg/L	N/A	N/A	0.2	0.0251	0.251	2.51	0.602	6.02	18.06
Groundwater	RGA	PPCB	Total PCB	µg/L	N/A	N/A	0.5	0.0436	0.436	4.36	--	--	--
Groundwater	RGA	SVOA	Pentachlorophenol	µg/L	N/A	N/A	1	0.0413	0.413	4.13	2.27	22.7	68.1
Groundwater	RGA; McNairy	SVOA	p-Nitroaniline	µg/L	N/A	N/A	N/A	3780	37800	378000	234	2340	7020
Groundwater	RGA; McNairy	VOA	1,1,2-Trichloroethane	µg/L	N/A	N/A	5	0.275	2.75	27.5	0.0415	0.415	1.25
Groundwater	RGA	VOA	1,2-Dichloroethane	µg/L	N/A	N/A	5	0.171	1.71	17.1	1.3	13	39
Groundwater	RGA	VOA	1,4-Dioxane	µg/L	N/A	N/A	N/A	0.459	4.59	45.9	5.67	56.7	170
Groundwater	RGA	VOA	Bromodichloromethane	µg/L	N/A	N/A	80	0.134	1.34	13.4	37.8	378	1134
Groundwater	RGA	VOA	Carbon tetrachloride	µg/L	N/A	N/A	5	0.455	4.55	45.5	4.95	49.5	149
Groundwater	RGA	VOA	Chloroform	µg/L	N/A	N/A	80	0.221	2.21	22.1	9.72	97.2	292
Groundwater	RGA; McNairy	VOA	*cis*-1,2-Dichloroethene	µg/L	N/A	N/A	70	--	--	--	3.61	36.1	108
Groundwater	RGA	VOA	*trans*-1,2-dichloethene	µg/L	N/A	N/A							
Groundwater	RGA	VOA	Methylene chloride	µg/L	N/A	N/A	5	11.4	114	1140	10.7	107	321
Groundwater	RGA; McNairy	VOA	Trichloroethene	µg/L	N/A	N/A	5	0.494	4.94	49.4	0.283	2.83	8.49
Groundwater	RGA	VOA	Vinyl chloride	mg/L	N/A	N/A	2	0.0188	0.188	1.88	4.44	44.4	133
Groundwater	RGA	RADIONUCLIDE	Technetium-99	pCi/L	22.3	20.6	900	19	190	1900	--	--	--
Groundwater	RGA	RADIONUCLIDE	Uranium-235/236	pCi/L	0.3	0.3	0.466	0.728	7.28	72.8	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Uranium-238	pCi/L	0.7	0.3	9.99	0.601	6.01	60.1	--	--	--

Notes:

MCL is for the sum of the concentrations for trihalomethanes.

"Maximum Contaminant Level's in EPA's Preliminary Remediation Goal and Dose Compliance Concentration Calculators," revised September 2015, found on https://epa-prgs.ornl.gov/radionuclides/MCLs_2015.pdf; accessed November 2, 2020.

The value derived by the EPA from the 4 mrem/yr MCL for Technetium-99 is 900 pCi/L, (https://www.epa.gov/sites/default/files/2015-09/documents/guide_radionuclides_table-betaphotonemitters.pdf). An alternate value derived by EPA from the 4 mrem/yr MCL is 3,790 pCi/L and was proposed in the July 18, 1991, Federal Register. See Table A.9 for Technetium-99 dose-based groundwater screening levels resulting in a 4 mrem/yr dose based upon more recent dosimetry.

Additional information regarding thorium can be found at the following link: https://www.epa.gov/radiation/radionuclides.

The uranium MCL is 30 µg/L and can be assumed to be at a 1:1 ratio for pCi/L (or 30 pCi/L). The MCL also can be converted to 20 pCi/L for total uranium using a uranium activity expected at PGDP. Isotopic uranium values derived from this conversion are 10.24 pCi/L for U-234, 0.466 pCi/L for U-235, and 9.99 pCi/L for U-238, assuming natural occurring uranium at 0.725% U-235 and the following ratios:

U-234/U-235 ranges 21-22 obtained from conversion approximately 21.9.

U-235/U-238 ranges 0.04-0.05 obtained from conversion approximately 0.045.

MCL is for the sum of the concentrations for trihalomethanes.

Table C1.96. Historical Risk Assessments Soil Human Health RGOs

Media	Receptor	Analytical Group	COCs	Units	Provisional Background	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at ELCR=0.1	RGO at HQ=1	RGO at HQ=3
Surface Soil	Industrial Worker	METAL	Aluminum	mg/kg	13000	--	--	--	100000	1000000	3000000
Surface Soil	Industrial Worker	METAL	Antimony	mg/kg	0.21	--	--	--	93.4	934	2802
Surface Soil	Industrial Worker	METAL	Arsenic	mg/kg	12	1.6	16	160	25.7	257	771
Surface Soil	Industrial Worker	METAL	Beryllium	mg/kg	0.67	6950	69500	695000	450	4500	13500
Surface Soil	Industrial Worker	METAL	Cadmium	mg/kg	0.21	9260	92600	926000	60.5	605	1815
Surface Soil	Industrial Worker	METAL	Chromium	mg/kg	16	12.3	123	1230	693	6930	20790
Surface Soil	Industrial Worker	METAL	Cobalt	mg/kg	14	1850	18500	185000	68.7	687	2061
Surface Soil	Industrial Worker	METAL	Iron	mg/kg	28000	--	--	--	100000	1000000	3000000
Surface Soil	Industrial Worker	METAL	Lead	mg/kg	36	--	--	--	800	8000	24000
Surface Soil	Industrial Worker	METAL	Mercury	mg/kg	0.2	--	--	--	70.1	701	2103
Surface Soil	Industrial Worker	METAL	Nickel	mg/kg	21	64100	641000	6410000	4300	43000	129000
Surface Soil	Industrial Worker	METAL	Silver	mg/kg	2.3	--	--	--	1170	11700	35100
Surface Soil	Industrial Worker	METAL	Thallium	mg/kg	0.21	--	--	--	2.34	23.4	70.2
Surface Soil	Industrial Worker	METAL	Uranium	mg/kg	4.9	--	--	--	46.6	466	1398
Surface Soil	Industrial Worker	METAL	Vanadium	mg/kg	38	--	--	--	1150	11500	34500
Surface Soil	Industrial Worker	PPCB	Total PCB	mg/kg	N/A	0.293	2.93	29.3	--	--	--
Surface Soil	Industrial Worker	SVOA	Total PAH	mg/kg	N/A	0.643	6.43	64.3	6.85	68.5	206
Surface Soil	Industrial Worker	RADIONUCLIDE	Cesium-137	pCi/g	0.49	0.108	1.08	10.8	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Neptunium-237	pCi/g	0.1	0.249	2.49	24.9	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Technetium-99	pCi/g	2.5	1270	12700	127000	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Thorium-230	pCi/g	1.5	31.3	313	3130	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-234	pCi/g	1.2	50.1	501	5010	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-235	pCi/g	0.06	0.408	4.08	40.8	--	--	--
Surface Soil	Industrial Worker	RADIONUCLIDE	Uranium-238	pCi/g	1.2	1.66	16.6	166	--	--	--
Surface and Subsurface Soil	Excavation Worker	METAL	Aluminum	mg/kg	12000	--	--	--	32600	326000	978000
Surface and Subsurface Soil	Excavation Worker	METAL	Antimony	mg/kg	0.21	--	--	--	13.2	132	396
Surface and Subsurface Soil	Excavation Worker	METAL	Arsenic	mg/kg	7.9	3.74	37.4	374	12	120	360
Surface and Subsurface Soil	Excavation Worker	METAL	Beryllium	mg/kg	0.67	46900	469000	4690000	65.5	655	1965
Surface and Subsurface Soil	Excavation Worker	METAL	Chromium	mg/kg	16	9.14	91.4	914	98.5	985	2955
Surface and Subsurface Soil	Excavation Worker	METAL	Cobalt	mg/kg	13	12500	125000	1250000	9.84	98.4	295
Surface and Subsurface Soil	Excavation Worker	METAL	Copper	mg/kg	19	--	--	--	1320	13200	39600
Surface and Subsurface Soil	Excavation Worker	METAL	Iron	mg/kg	28000	--	--	--	23000	230000	690000
Surface and Subsurface Soil	Excavation Worker	METAL	Lead	mg/kg	23	--	--	--	800	8000	24000
Surface and Subsurface Soil	Excavation Worker	METAL	Manganese	mg/kg	820	--	--	--	774	7740	23220
Surface and Subsurface Soil	Excavation Worker	METAL	Mercury	mg/kg	0.13	--	--	--	9.86	98.6	296
Surface and Subsurface Soil	Excavation Worker	METAL	Nickel	mg/kg	21	100000	1000000	10000000	652	6520	19560
Surface and Subsurface Soil	Excavation Worker	METAL	Thallium	mg/kg	0.21	--	--	--	0.329	3.29	9.87
Surface and Subsurface Soil	Excavation Worker	METAL	Uranium	mg/kg	4.6	--	--	--	6.58	65.8	197
Surface and Subsurface Soil	Excavation Worker	METAL	Vanadium	mg/kg	37	--	--	--	165	1650	4950
Surface and Subsurface Soil	Excavation Worker	PPCB	Total PCB	mg/kg	N/A	1.12	11.2	112	--	--	--
Surface and Subsurface Soil	Excavation Worker	SVOA	N-Nitroso-di-N-propyla	mg/kg	N/A	0.379	3.79	37.9	--	--	--
Surface and Subsurface Soil	Excavation Worker	SVOA	Total PAH	mg/kg	N/A	2.35	23.5	235	5.03	50.3	151
Surface and Subsurface Soil	Excavation Worker	VOA	1,1-Dichloroethene	mg/kg	N/A	--	--	--	126	1260	3780
Surface and Subsurface Soil	Excavation Worker	VOA	Trichloroethene	mg/kg	N/A	30.9	309	3090	2.26	22.6	67.8
Surface and Subsurface Soil	Excavation Worker	VOA	Vinyl chloride	mg/kg	N/A	4.72	47.2	472	36	360	1080
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Cesium-137	pCi/g	0.28	0.582	5.82	58.2	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Neptunium-237	pCi/g	0.1	1.63	16.3	163	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Plutonium-239	pCi/g	0.025	18.3	183	1830	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Technetium-99	pCi/g	2.5	1550	15500	155000	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Uranium-234	pCi/g	1.2	43	430	4300	--	--	--

Table C1.96. Historical Risk Assessments Soil Human Health RGOs (Continued)

Media	Receptor	Analytical Group	COCs	Units	Provisional Background	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at ELCR=0.1	RGO at HQ=1	RGO at HQ=3
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Uranium-235	pCi/g	0.06	2.62	26.2	262	--	--	--
Surface and Subsurface Soil	Excavation Worker	RADIONUCLIDE	Uranium-238	pCi/g	1.2	8.98	89.8	898	--	--	--

Table C1.97. Historical Risk Assessments Groundwater Human Health RGOs

Media	Receptor	Analytical Group	COCs	Units	Provisional RGA Background	Provisional McNairy Background	Primary MCL	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at HQ=0.1	RGO at HQ=1	RGO at HQ=3
Groundwater	RGA; McNairy; UCRS	METAL	Aluminum	µg/L	2190	687	N/A	--	--	--	2000	20000	60000
Groundwater	McNairy; UCRS	METAL	Antimony	µg/L	60	60	6	--	--	--	0.779	7.79	23.37
Groundwater	RGA; McNairy; UCRS	METAL	Arsenic	µg/L	5	5	10	0.0517	0.517	5.17	0.599	5.99	17.97
Groundwater	RGA; McNairy; UCRS	METAL	Barium	µg/L	235	296	2000	--	--	--	377	3770	11310
Groundwater	RGA; McNairy; UCRS	METAL	Beryllium	µg/L	4	17	4	--	--	--	2.46	24.6	73.8
Groundwater	RGA; McNairy; UCRS	METAL	Cadmium	µg/L	10	10	5	--	--	--	0.922	9.22	27.66
Groundwater	RGA; McNairy; UCRS	METAL	Chromium	µg/L	144	60	100	0.035	0.35	3.5	4.45	44.5	133.5
Groundwater	McNairy	METAL	Cobalt	µg/L	45	96	N/A	--	--	--	0.601	6.01	18.03
Groundwater	McNairy	METAL	Copper	µg/L	36	57	1300	--	--	--	79.9	799	2397
Groundwater	RGA; McNairy; UCRS	METAL	Iron	µg/L	5030	18400	N/A	--	--	--	1400	14000	42000
Groundwater	RGA; UCRS	METAL	Lead	µg/L	129	50	15	--	--	--	15	150	450
Groundwater	RGA; McNairy; UCRS	METAL	Manganese	µg/L	119	941	N/A	--	--	--	43.4	434	1302
Groundwater	RGA; UCRS	METAL	Molybdenum	µg/L	50	50	N/A	--	--	--	9.98	99.8	299.4
Groundwater	McNairy; UCRS	METAL	Nickel	µg/L	682	109	N/A	--	--	--	39.2	392	1176
Groundwater	McNairy	METAL	Selenium	µg/L	5	5	50	--	--	--	9.98	99.8	299.4
Groundwater	McNairy	METAL	Silver	µg/L	11	50	N/A	--	--	--	9.41	94.1	282.3
Groundwater	UCRS	METAL	Strontium	µg/L	N/A	N/A	N/A	--	--	--	1200	12000	36000
Groundwater	RGA; McNairy; UCRS	METAL	Uranium	µg/L	2	1	30	--	--	--	0.399	3.99	11.97
Groundwater	RGA; McNairy; UCRS	METAL	Vanadium	µg/L	134	126	N/A	--	--	--	8.64	86.4	259.2
Groundwater	McNairy	METAL	Zinc	µg/L	54	142	N/A	--	--	--	600	6000	18000
Groundwater	RGA; UCRS	ANION	Fluoride	µg/L	270	330	4000	--	--	--	79.9	799	2397
Groundwater	UCRS	ANION	Nitrate/Nitrite	µg/L	15600	1470	10000/1000	--	--	--	3190	31900	95700
Groundwater	UCRS	SVOA	2,4-Dimethylphenol	µg/L	N/A	N/A	N/A	--	--	--	35.5	355	1065
Groundwater	McNairy	SVOA	Bis(2-ethylhexyl)phthalate	µg/L	N/A	N/A	6	5.56	55.6	556	40.1	401	1203
Groundwater	McNairy	SVOA	Di-N-octylphthalate	µg/L	N/A	N/A	N/A	--	--	--	20.1	201	603
Groundwater	UCRS	SVOA	Naphthalene	µg/L	N/A	N/A	N/A	0.117	1.17	11.7	0.611	6.11	18.33
Groundwater	McNairy	SVOA	N-nitroso-di-n-propylamine	µg/L	N/A	N/A	N/A	0.0108	0.108	1.08	--	--	--
Groundwater	RGA	VOA	1,1,2-Trichloroethane	µg/L	N/A	N/A	5	0.275	2.75	27.5	0.042	0.415	1.25
Groundwater	RGA; McNairy; UCRS	VOA	1,1-Dichloroethene	µg/L	N/A	N/A	7	--	--	--	28.5	285	855
Groundwater	RGA; McNairy; UCRS	VOA	1,2-Dichloroethane	µg/L	N/A	N/A	5	0.171	1.71	17.1	1.3	13	39
Groundwater	UCRS	VOA	1,2-Dichloroethene	µg/L	N/A	N/A	N/A	--	--	--	16.3	163	489
Groundwater	UCRS	VOA	Benzene	µg/L	N/A	N/A	5	0.455	4.55	45.5	3.32	33.2	99.6
Groundwater	McNairy	VOA	Bromodichloromethane	µg/L	N/A	N/A	80	0.134	1.34	13.4	37.8	378	1134
Groundwater	RGA; McNairy	VOA	Carbon Tetrachloride	µg/L	N/A	N/A	5	0.455	4.55	45.5	4.95	49.5	148.5
Groundwater	RGA	VOA	Chlorobenzene	µg/L	N/A	N/A	100	--	--	--	7.77	77.7	233.1
Groundwater	UCRS	VOA	Chloroethane	µg/L	N/A	N/A	N/A	--	--	--	834	8340	25020
Groundwater	RGA; McNairy; UCRS	VOA	Chloroform	µg/L	N/A	N/A	80	0.221	2.21	22.1	9.72	97.2	292
Groundwater	RGA; McNairy; UCRS	VOA	*cis*-1,2-Dichloroethene	µg/L	N/A	N/A	70	--	--	--	3.61	36.1	108.3
Groundwater	McNairy	VOA	Dibromochloromethane	µg/L	N/A	N/A	80	0.871	8.71	87.1	37.9	379	1137
Groundwater	RGA; UCRS	VOA	Dimethylbenzene	µg/L	N/A	N/A	10000	--	--	--	19.3	193	579
Groundwater	RGA; UCRS	VOA	Ethylbenzene	µg/L	N/A	N/A	700	1.5	15	150	80.6	806	2418
Groundwater	RGA; UCRS	VOA	Methylene Chloride	µg/L	N/A	N/A	5	11.4	114	1140	10.7	107	321
Groundwater	RGA; McNairy	VOA	Tetrachloroethene	µg/L	N/A	N/A	5	11.3	113	1130	4.06	40.6	122
Groundwater	McNairy	VOA	Toluene	µg/L	N/A	N/A	1000	--	--	--	110	1100	3300
Groundwater	RGA; McNairy; UCRS	VOA	*trans*-1,2-Dichloroethene	µg/L	N/A	N/A	100	--	--	--	9.29	92.9	279
Groundwater	RGA; McNairy; UCRS	VOA	Trichloroethene	µg/L	N/A	N/A	5	0.494	4.94	49.4	0.283	2.83	8.49
Groundwater	RGA; McNairy; UCRS	VOA	Vinyl chloride	µg/L	N/A	N/A	2	0.0188	0.188	1.88	4.44	44.4	133
Groundwater	McNairy	RADIONUCLIDE	Actinium-228	pCi/L	N/A	N/A	N/A	27.7	277	2770	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Americium-241	pCi/L	N/A	N/A	15	0.504	5.04	50.4	--	--	--
Groundwater	RGA; McNairy	RADIONUCLIDE	Cesium-137	pCi/L	N/A	N/A	200	1.71	17.1	171	--	--	--

Table C1.97. Historical Risk Assessments Groundwater Human Health RGOs (Continued)

Media	Receptor	Analytical Group	COCs	Units	Provisional RGA Background	Provisional McNairy Background	Primary MCL	RGO at ELCR=1E-6	RGO at ELCR=1E-5	RGO at ELCR=1E-4	RGO at HQ=0.1	RGO at HQ=1	RGO at HQ=3
Groundwater	McNairy	RADIONUCLIDE	Lead-210	pCi/L	N/A	N/A	N/A	0.0501	0.501	5.01	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Lead-212	pCi/L	N/A	N/A	N/A	2.07	20.7	207	--	--	--
Groundwater	RGA; McNairy; UCRS	RADIONUCLIDE	Neptunium-237	pCI/L	0.8	0.5	15	0.763	7.63	76.3	--	--	--
Groundwater	McNairy; UCRS	RADIONUCLIDE	Plutonium-239	pCI/L	0.1	0.2	15	0.387	3.87	38.7	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Potassium-40	pCi/L	N/A	N/A	N/A	0.898	8.98	89.8	--	--	--
Groundwater	RGA; UCRS	RADIONUCLIDE	Radium-226	pCI/L	0.6	1.2	N/A	0.113	1.13	11.3	--	--	--
Groundwater	RGA; UCRS	RADIONUCLIDE	Radon-222	pCI/L	626	295	N/A	5.45	54.5	545	--	--	--
Groundwater	RGA; McNairy; UCRS	RADIONUCLIDE	Technetium-99	pCI/L	22.3	20.6	900	19	190	1900	--	--	--
Groundwater	McNairy; UCRS	RADIONUCLIDE	Thorium-228	pCI/L	N/A	N/A	N/A	0.418	4.18	41.8	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Thorium-230	pCi/L	1.1	1.5	15	0.572	5.72	57.2	--	--	--
Groundwater	McNairy	RADIONUCLIDE	Thorium-234	pCi/L	N/A	N/A	N/A	2.03	20.3	203	--	--	--
Groundwater	RGA; McNairy; UCRS	RADIONUCLIDE	Uranium-234	pCI/L	0.7	0.3	10.2	0.739	7.39	73.9	--	--	--
Groundwater	McNairy; UCRS	RADIONUCLIDE	Uranium-235	pCI/L	0.3	0.2	0.466	0.728	7.28	72.8	--	--	--
Groundwater	RGA; McNairy; UCRS	RADIONUCLIDE	Uranium-238	pCI/L	0.7	0.3	9.99	0.601	6.01	60.1	--	--	--

Notes:

MCL is for the sum of the concentrations for trihalomethanes.

Additional information regarding Am-241 can be found in “EPA Facts about Americium-241,” dated July 2002, at the following link: https://semspub.epa.gov/work/HQ/176296.pdf; accessed November 2, 2020.

The EPA MCL for Cs-137 is 4 mrem/yr. The value derived by the EPA from the 4 mrem/yr MCL for Cs-137 is 200 pCi/L (“Limits for Beta Particles and Photon Emitters at 4 millrems/year” found on https://www.epa.gov/sites/default/files/2015-09/documents/guide_radionuclides_table-betaphotonemitters.pdf; accessed November 2, 2020).

“Maximum Contaminant Level’s in EPA’s Preliminary Remediation Goal and Dose Compliance Concentration Calculators,” revised September 2015, found on https://epa-prgs.ornl.gov/radionuclides/MCLs_2015.pdf; accessed November 2, 2020.

Additional information regarding plutonium can be found at the following link: http://www.epa.gov/radiation/radionuclides.

The value derived by the EPA from the 4 mrem/yr MCL for Technetium-99 is 900 pCi/L, (https://epa-prgs.ornl.gov/radionuclides/MCLs_2015.pdf). An alternate value derived by EPA from the 4 mrem/yr MCL is 3,790 pCi/L and was proposed in the July 18, 1991, Federal Register. See Table A.9 for Tc-99 dose-based groundwater screening levels resulting in a 4 mrem/yr dose based upon more recent dosimetry.

Additional information regarding thorium can be found at the following link: https://www.epa.gov/radiation/radionuclides.

The uranium MCL is 30 µg/L and can be assumed to be at a 1:1 ratio for pCi/L (or 30 pCi/L). The MCL also can be converted to 20 pCi/L for total uranium using a uranium activity expected at PGDP. Isotopic uranium values derived from this conversion are 10.24 pCi/L for U-234, 0.466 pCi/L for U-235, and 9.99 pCi/L for U-238,

U-234/U-235 ranges 21-22 obtained from conversion approximately 21.9.

U-235/U-238 ranges 0.04-0.05 obtained from conversion approximately 0.045.

Table C1.98. Protection of Groundwater RGOs

Chemical	Units	NAL SSL	MCL SSL
Chlorobenzene	mg/kg	5.71E-02	7.34E-01
Benzene	mg/kg	2.77E-03	3.05E-02
Ethylbenzene	mg/kg	1.57E-02	7.31E+00
Toluene	mg/kg	8.11E-01	7.38E+00
Dimethylbenzene	mg/kg	1.84E-01	9.52E+01
Total PAH	mg/kg	2.12E-01	1.69E+00
Bis(2-ethylhexyl)phthalate	mg/kg	9.60E+00	1.04E+01
Di-n-octylphthalate	mg/kg	4.09E+01	--
Naphthalene	mg/kg	3.07E-03	--
Pentachlorophenol	mg/kg	5.15E-04	1.25E-02
Hexachlorocyclopentadiene	mg/kg	1.01E-03	1.22E+00
N-Nitroso-di-n-propylamine	mg/kg	8.55E-05	--
p-Nitroaniline	mg/kg	2.08E-02	--
2,4-Dimethylphenol	mg/kg	3.92E-01	--
1,1,2-Trichloroethane	mg/kg	2.00E-04	2.41E-02
1,2-Dichloroethane	mg/kg	7.74E-04	2.26E-02
Carbon tetrachloride	mg/kg	2.20E-03	2.42E-02
cis -1,2-Dichloroethylene	mg/kg	1.64E-02	3.19E-01
Tetrachloroethylene	mg/kg	2.22E-02	2.74E-02
trans -1,2-Dichloroethylene	mg/kg	4.28E-02	4.60E-01
Trichloroethylene	mg/kg	1.39E-03	2.46E-02
1,1-Dichloroethylene	mg/kg	1.33E-01	3.25E-02
Chloroethane	mg/kg	3.64E+00	--
Chloroform	mg/kg	9.81E-04	3.55E-01
Methylene chloride	mg/kg	4.59E-02	2.14E-02
Vinyl chloride	mg/kg	8.50E-05	9.04E-03
Bromodichloromethane	mg/kg	5.93E-04	3.54E-01
Dibromochloromethane	mg/kg	3.84E-03	3.53E-01
1,4-Dioxane	mg/kg	1.83E-03	--
Total PCBs	mg/kg	8.22E-02	9.42E-01
Aluminum	mg/kg	6.49E+04	--
Antimony	mg/kg	7.62E-01	5.87E+00
Arsenic	mg/kg	3.26E-02	6.31E+00
Barium	mg/kg	3.36E+02	1.78E+03
Beryllium	mg/kg	4.21E+01	6.84E+01
Cadmium	mg/kg	1.50E+00	8.13E+00
Chromium	mg/kg	7.73E-01	2.21E+03
Cobalt	mg/kg	5.88E-01	--
Copper	mg/kg	6.08E+01	9.90E+02
Fluoride	mg/kg	2.60E+02	1.30E+04
Iron	mg/kg	7.63E+02	--
Lead	mg/kg	2.92E+02	2.92E+02
Manganese	mg/kg	6.12E+01	--
Molybdenum	mg/kg	4.36E+00	--
Nickel	mg/kg	5.53E+01	--
Nitrate as Nitrogen	mg/kg	--	--
Nitrite as Nitrogen	mg/kg	--	--
Selenium	mg/kg	1.12E+00	5.61E+00
Silver	mg/kg	1.73E+00	--
Strontium	mg/kg	9.14E+02	--
Uranium	mg/kg	7.40E+00	5.57E+02
Vanadium	mg/kg	1.87E+02	--

Table C1.98. Protection of Groundwater RGOs (Continued)

Chemical	Units	NAL SSL	MCL SSL
Zinc	mg/kg	8.07E+02	--
Actinium-228	pCi/g	1.02E+03	--
Americium-241	pCi/g	2.07E+01	6.17E+02
Cesium-137	pCi/g	1.04E+01	1.21E+03
Lead-210	pCi/g	1.92E-01	--
Lead-212	pCi/g	6.76E+00	--
Neptunium-237	pCi/g	1.16E+00	2.28E+01
Plutonium-239	pCi/g	4.61E+00	1.79E+02
Potassium-40	pCi/g	6.05E-01	--
Radium-226	pCi/g	3.48E-03	1.28E-01
Radon-222	pCi/g	--	--
Technetium-99	pCi/g	7.53E-01	3.57E+01
Thorium-228	pCi/g	3.36E+01	--
Thorium-230	pCi/g	3.96E+01	1.04E+03
Thorium-234	pCi/g	1.56E+02	--
Uranium-233/234	pCi/g	1.37E+01	1.90E+02
Uranium-234	pCi/g	1.37E+01	1.90E+02
Uranium-235	pCi/g	1.35E+01	8.65E+00
Uranium-235/236	pCi/g	1.35E+01	8.65E+00
Uranium-238	pCi/g	1.11E+01	1.85E+02

Notes:
Benzo[a]pyrene was used as a surrogate for Total PAH; Aroclor 1254 was used as a surrogate for Total PCBs.
No value for Koc or Kd was available for Nitrate or Nitrite in RAIS.

ATTACHMENT C2

SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT SUMMARY TABLES

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TABLES

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Table C2.1. C-400 Complex OU Identified Threatened and Endangered Species

Common Name	Scientific Name	Animal Type	Endangered Species Act Status
Indiana bat	*Myotis sodalist*	Mammal	Listed endangered
Interior least tern	*Sterna antillarum athalassos*	Bird	Listed endangered
Pink mucket	*Lampsilis abrupta*	Mussel	Listed endangered
Ring pink	*Obovaria retusa*	Mussel	Listed endangered
Orangefoot pimpleback	*Plethobasus cooperianus*	Mussel	Listed endangered
Fat pocketbook	*Potamilus capax*	Mussel	Listed endangered

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Table C2.2. Sector 2 Step 2 COPEC Screen

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Metals (mg/kg)											
Aluminum	16/16	10.7 - 122	2.54E+03 - 1.80E+04	9.91E+03	400S2-07	1.80E+04	5.00E+01	**360.0**	16/16	Yes	HQ>1
Antimony	6/16	1.94 - 2.36	3.86E-01 - 1.54E+00	9.94E-01	400S2-G01	1.54E+00	2.70E-01	**5.7**	6/16	Yes	HQ>1
Arsenic	16/16	1.06 - 5.51	1.84E+00 - 1.25E+01	6.01E+00	400S2-03	1.25E+01	1.80E+01	0.7	0/16	No	HQ<1
Barium	16/16	0.851 - 0.978	6.97E+00 - 1.64E+02	7.85E+01	400S2-06	1.64E+02	3.30E+02	0.5	0/16	No	HQ<1
Beryllium	16/16	0.106 - 0.122	9.81E-02 - 6.65E-01	4.10E-01	400S2-03	6.65E-01	2.50E+00	0.3	0/16	No	HQ<1
Boron	14/16	3.19 - 3.67	1.82E+00 - 4.99E+00	2.91E+00	400S2-04	4.99E+00	7.50E+00	0.7	0/16	No	HQ<1
Cadmium	12/16	0.213 - 1.1	2.45E-02 - 1.12E+00	2.92E-01	400S2-02	1.12E+00	3.60E-01	**3.1**	3/16	Yes	HQ>1
Chromium	16/16	0.638 - 0.733	5.96E+00 - 5.35E+01	1.91E+01	400S2-12	5.35E+01	2.30E+01	**2.3**	3/16	Yes	HQ>1
Cobalt	16/16	0.213 - 0.244	8.34E-01 - 1.09E+01	6.68E+00	400S2-07	1.09E+01	1.30E+01	0.8	0/16	No	HQ<1
Copper	16/16	0.425 - 4.5	1.86E+00 - 8.93E+02	6.55E+01	400S2-02	8.93E+02	2.80E+01	**31.9**	2/16	Yes	HQ>1
Iron	16/16	21.4 - 244	2.72E+03 - 2.68E+04	1.58E+04	400S2-10	2.68E+04	N/A	N/A	N/A	Yes	No NFA
Lead	16/16	0.425 - 0.489	1.93E+00 - 2.40E+01	1.10E+01	400S2-07	2.40E+01	1.10E+01	**2.2**	7/16	Yes	HQ>1
Manganese	16/16	1.07 - 12.2	8.24E+01 - 1.35E+03	4.51E+02	400S2-03	1.35E+03	2.20E+02	**6.1**	13/16	Yes	HQ>1
Mercury	13/16	0.0241 - 0.0298	1.51E-02 - 7.92E-02	2.82E-02	400S2-G01	7.92E-02	1.30E-02	**6.1**	13/16	Yes	HQ>1
Molybdenum	16/16	0.213 - 1.1	3.38E-01 - 1.28E+00	6.90E-01	400S2-01	1.28E+00	2.00E+00	0.6	0/16	No	HQ<1
Nickel	16/16	0.425 - 4.41	4.94E+00 - 1.43E+03	9.93E+01	400S2-02	1.43E+03	3.80E+01	**37.6**	1/16	Yes	HQ>1
Selenium	12/16	1.06 - 5.51	4.00E-01 - 1.85E+00	9.92E-01	400S2-G02	2.76E+00	5.20E-01	**5.3**	11/16	Yes	HQ>1
Silver	5/16	0.485 - 5.68	3.99E-01 - 1.70E+00	9.05E-01	400S2-01	2.84E+00	4.20E+00	0.7	0/16	No	HQ<1
Thallium	8/16	0.425 - 0.489	1.57E-01 - 2.47E-01	1.98E-01	400S2-06	2.47E-01	5.00E-02	**4.9**	8/16	Yes	HQ>1
Uranium	16/16	0.0425 - 0.221	9.52E-01 - 9.10E+02	6.56E+01	400S2-02	9.10E+02	2.50E+01	**36.4**	2/16	Yes	HQ>1
Vanadium	16/16	4.25 - 4.89	6.18E+00 - 3.80E+01	2.45E+01	400S2-06	3.80E+01	7.80E+00	**4.9**	15/16	Yes	HQ>1
Zinc	16/16	4.25 - 22.1	1.35E+01 - 1.44E+02	4.10E+01	400S2-04	1.44E+02	4.60E+01	**3.1**	3/16	Yes	HQ>1
Fluoride	16/16	1.09 - 1.24	1.18E+00 - 2.65E+01	9.68E+00	400S2-02	2.65E+01	3.20E+01	0.8	0/16	No	HQ<1
Total PCBs (mg/kg)											
Total PCBs	6/16	0.00361 - 0.0225	1.85E-03 - 8.62E-02	3.90E-02	400S2-G02	8.62E-02	4.10E-02	**2.1**	3/16	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)											
1,1-biphenyl	0/16	0.367 - 3.58	-	-	-	-	2.00E-01	N/A	0/16	No	ND
2,4,5-Trichlorophenol	0/16	0.367 - 3.58	-	-	-	-	4.00E+00	N/A	0/16	No	ND
2,4,6-Trichlorophenol	0/16	0.367 - 3.58	-	-	-	-	9.94E+00	N/A	0/16	No	ND
2,4-Dichlorophenol	0/16	0.367 - 3.58	-	-	-	-	5.00E-02	N/A	0/16	No	ND
2,4-Dimethylphenol	0/16	0.367 - 3.58	-	-	-	-	4.00E-02	N/A	0/16	No	ND
2,4-Dinitrophenol	0/16	0.733 - 7.16	-	-	-	-	6.10E-02	N/A	0/16	No	ND
2,4-Dinitrotoluene	0/16	0.367 - 3.58	-	-	-	-	6.00E+00	N/A	0/16	No	ND
2,6-Dinitrotoluene	0/16	0.367 - 3.58	-	-	-	-	4.00E+00	N/A	0/16	No	ND
2-Chloronaphthalene	0/16	0.0367 - 0.358	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/16	0.367 - 3.58	-	-	-	-	6.00E-02	N/A	0/16	No	ND
2-Methyl-4,6-dinitrophenol	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylphenol	0/16	0.367 - 3.58	-	-	-	-	1.00E-01	N/A	0/16	No	ND
2-Nitrobenzenamine	0/16	0.367 - 3.58	-	-	-	-	2.00E-02	N/A	0/16	No	ND
2-Nitrophenol	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
3,3'-Dichlorobenzidine	0/16	0.367 - 3.58	-	-	-	-	3.00E-02	N/A	0/16	No	ND
3-Nitrobenzenamine	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Bromophenyl phenyl ether	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chloro-3-methylphenol	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA

Table C2.2. Sector 2 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
4-Chlorobenzenamine	0/16	0.367 - 3.58	-	-	-	-	1.00E+00	N/A	0/16	No	ND
4-Chlorophenyl phenyl ether	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/16	0.367 - 3.58	-	-	-	-	5.12E+00	N/A	0/16	No	ND
Acetophenone	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Atrazine	0/16	0.367 - 3.58	-	-	-	-	5.00E-05	N/A	0/16	No	ND
Benzaldehyde	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethoxy)methane	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroisopropyl) ether	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	0/16	0.0367 - 0.358	-	-	-	-	2.00E-02	N/A	0/16	No	ND
Butyl benzyl phthalate	0/16	0.0367 - 0.358	-	-	-	-	5.90E-01	N/A	0/16	No	ND
Caprolactam	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	3/16	0.0367 - 0.358	3.66E-02 - 1.38E-01	7.96E-02	400S2-02	1.79E-01	7.00E-02	**2.6**	1/16	Yes	HQ>1
Dibenzofuran	0/16	0.367 - 3.58	-	-	-	-	1.50E-01	N/A	0/16	No	ND
Diethyl phthalate	0/16	0.0367 - 0.358	-	-	-	-	2.50E-01	N/A	0/16	No	ND
Dimethyl phthalate	0/16	0.0367 - 0.358	-	-	-	-	3.50E-01	N/A	0/16	No	ND
Di-n-butyl phthalate	4/16	0.0367 - 0.358	1.38E-02 - 1.78E-02	1.67E-02	400S2-10 & 400S2-11	1.79E-01	1.10E-02	**16.3**	4/16	Yes	HQ>1
Di-n-octylphthalate	0/16	0.0367 - 0.358	-	-	-	-	9.10E-01	N/A	0/16	No	ND
Diphenylamine	0/16	0.367 - 3.58	-	-	-	-	1.01E+00	N/A	0/16	No	ND
Hexachlorobenzene	0/16	0.367 - 3.58	-	-	-	-	7.90E-02	N/A	0/16	No	ND
Hexachlorobutadiene	0/16	0.367 - 3.58	-	-	-	-	9.00E-03	N/A	0/16	No	ND
Hexachlorocyclopentadiene	0/16	0.367 - 3.58	-	-	-	-	1.00E-03	N/A	0/16	No	ND
Hexachloroethane	0/16	0.367 - 3.58	-	-	-	-	2.40E-02	N/A	0/16	No	ND
Isophorone	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m+p Methylphenol	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Nitrobenzene	0/16	0.367 - 3.58	-	-	-	-	2.20E+00	N/A	0/16	No	ND
N-Nitroso-di-n-propylamine	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pentachlorophenol	0/16	0.367 - 3.58	-	-	-	-	2.10E+00	N/A	0/16	No	ND
Phenol	0/16	0.367 - 3.58	-	-	-	-	7.90E-01	N/A	0/16	No	ND
p-Nitroaniline	0/16	0.367 - 3.58	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Low Molecular Weight Polycylic Aromatic Hydrocarbons [LMW-PAHs] (mg/kg)											
2-Methylnaphthalene	0/16	0.0367 - 0.358	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthene	3/16	0.0367 - 0.358	3.87E-02 - 2.82E-01	1.31E-01	400S2-02	2.82E-01	N/A	N/A	N/A	--	--
Acenaphthylene	0/16	0.0367 - 0.358	-	-	-	-	N/A	N/A	N/A	--	--
Anthracene	3/16	0.0367 - 0.358	5.90E-02 - 5.42E-01	2.35E-01	400S2-02	5.42E-01	N/A	N/A	N/A	--	--
Fluorene	3/16	0.0367 - 0.358	2.11E-02 - 5.18E-01	1.96E-01	400S2-02	5.18E-01	N/A	N/A	N/A	--	--
Naphthalene	0/16	0.0367 - 0.358	-	-	-	-	N/A	N/A	N/A	--	--
Phenanthrene	5/16	0.0367 - 0.358	7.54E-02 - 1.80E+00	5.70E-01	400S2-02	1.80E+00	N/A	N/A	N/A	--	--
LMW PAHs	5/16	0.0367 - 0.358	6.36E-01 - 3.36E+00	1.20E+00	400S2-02	3.36E+00	2.90E+01	0.1	0/16	No	HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)											
Benz(a)anthracene	6/16	0.0367 - 0.358	1.70E-02 - 3.16E-01	1.81E-01	400S2-02	3.16E-01	N/A	N/A	N/A	--	--
Benzo(a)pyrene	5/16	0.0367 - 0.358	6.96E-02 - 3.46E-01	2.35E-01	400S2-04	3.46E-01	N/A	N/A	N/A	--	--
Benzo(b)fluoranthene	6/16	0.0367 - 0.358	1.41E-02 - 4.98E-01	2.70E-01	400S2-04	4.98E-01	N/A	N/A	N/A	--	--
Benzo(ghi)perylene	5/16	0.0367 - 0.358	9.08E-02 - 2.01E-01	1.46E-01	400S2-04	2.01E-01	N/A	N/A	N/A	--	--

Table C2.2. Sector 2 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Benzo(k)fluoranthene	4/16	0.0367 - 0.358	1.08E-01 - 1.84E-01	1.37E-01	400S2-04	1.84E-01	N/A	N/A	N/A	--	--
Chrysene	5/16	0.0367 - 0.358	6.96E-02 - 3.54E-01	2.43E-01	400S2-04	3.54E-01	N/A	N/A	N/A	--	--
Dibenz(a,h)anthracene	2/16	0.0367 - 0.358	4.47E-02 - 4.65E-02	4.56E-02	400S2-03	1.79E-01	N/A	N/A	N/A	--	--
Fluoranthene	7/16	0.0367 - 0.358	1.50E-02 - 1.46E+00	4.73E-01	400S2-02	1.46E+00	N/A	N/A	N/A	--	--
Indeno(1,2,3-cd)pyrene	5/16	0.0367 - 0.358	8.02E-02 - 2.30E-01	1.49E-01	400S2-04	2.30E-01	N/A	N/A	N/A	--	--
Pyrene	8/16	0.0367 - 0.358	1.35E-02 - 8.02E-01	2.80E-01	400S2-02	8.02E-01	N/A	N/A	N/A	--	--
HMW PAHs	8/16	0.0367 - 0.358	1.78E-01 - 4.09E+00	1.70E+00	400S2-02	4.09E+00	1.10E+00	**3.7**	4/16	Yes	HQ>1
Radionuclides (pCi/g)											
Americium-241	1/17	0.238 - 0.874	6.59E-01 - 6.59E-01	6.59E-01	400S2-G01	6.59E-01	2.16E+03	0.0	0/17	No	HQ<1
Cesium-137	2/17	0.0255 - 0.0966	6.34E-02 - 6.65E-02	6.50E-02	400S2-G02	6.65E-02	2.08E+01	0.0	0/17	No	HQ<1
Neptunium-237	1/17	0.364 - 0.919	1.15E+00 - 1.15E+00	1.15E+00	400S2-G01	1.15E+00	8.14E+02	0.0	0/17	No	HQ<1
Plutonium-238	0/17	0.337 - 0.897	-	-	-	-	1.75E+03	N/A	0/17	No	ND
Plutonium-239/240	1/17	0.323 - 0.864	3.33E+00 - 3.33E+00	3.33E+00	400S2-G01	3.33E+00	1.27E+03	0.0	0/17	No	HQ<1
Technetium-99	6/17	2.36 - 3.92	8.33E+00 - 2.53E+01	1.90E+01	400S2-03	2.53E+01	2.19E+03	0.0	0/17	No	HQ<1
Thorium-230	16/17	0.365 - 1.15	6.24E-01 - 1.12E+01	2.09E+00	400S2-G01	1.12E+01	9.98E+03	0.0	0/17	No	HQ<1
Uranium-233/234	16/17	0.385 - 2.27	7.64E-01 - 5.12E+02	3.70E+01	400S2-02	5.12E+02	5.14E+03	0.1	0/17	No	HQ<1
Uranium-235/236	6/17	0.134 - 0.746	3.16E-01 - 2.84E+01	5.43E+00	400S2-02	2.84E+01	2.75E+03	0.0	0/17	No	HQ<1
Uranium-238	16/17	0.16 - 1.41	4.93E-01 - 5.54E+02	4.10E+01	400S2-02	5.54E+02	1.57E+03	0.4	0/17	No	HQ<1
Volatile Organic Compounds (mg/kg)											
1,1,1-Trichloroethane	0/16	0.000986 - 0.053	-	-	-	-	4.00E-02	N/A	0/16	No	ND
1,1,2,2-Tetrachloroethane	0/16	0.000986 - 0.053	-	-	-	-	1.27E-01	N/A	0/16	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/16	0.00493 - 0.265	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	0/16	0.000986 - 0.053	-	-	-	-	3.20E-01	N/A	0/16	No	ND
1,1-Dichloroethane	0/16	0.000986 - 0.053	-	-	-	-	1.40E-01	N/A	0/16	No	ND
1,1-Dichloroethene	0/16	0.000986 - 0.053	-	-	-	-	4.00E-02	N/A	0/16	No	ND
1,2,3-Trichlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	2.00E+01	N/A	0/16	No	ND
1,2,4-Trichlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	2.70E-01	N/A	0/16	No	ND
1,2-Dibromo-3-chloropropane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	9.00E-02	N/A	0/16	No	ND
1,2-Dichloroethane	0/16	0.000986 - 0.053	-	-	-	-	4.00E-01	N/A	0/16	No	ND
1,2-Dichloropropane	0/16	0.000986 - 0.053	-	-	-	-	2.80E-01	N/A	0/16	No	ND
1,2-Dimethylbenzene	2/16	0.000986 - 0.053	5.81E-04 - 2.08E-02	1.07E-02	400S2-01	2.65E-02	N/A	N/A	N/A	Yes	No NFA
1,3-Dichlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	8.00E-02	N/A	0/16	No	ND
1,4-Dichlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	8.80E-01	N/A	0/16	No	ND
1,4-Dioxane	1/16	0.0493 - 2.65	5.52E-02 - 5.52E-02	5.52E-02	400S2-14	1.33E+00	N/A	N/A	N/A	Yes	No NFA
2-Butanone	2/16	0.00493 - 0.265	3.18E-03 - 1.27E-01	6.51E-02	400S2-10	1.33E-01	1.00E+00	0.1	0/16	No	HQ<1
2-Chloroethyl vinyl ether	0/16	0.00493 - 0.265	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/16	0.00493 - 0.265	-	-	-	-	3.60E-01	N/A	0/16	No	ND
2-Methoxy-2-methylpropane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	1/16	0.00493 - 0.265	2.60E-03 - 2.60E-03	2.60E-03	400S2-01	1.33E-01	N/A	N/A	N/A	Yes	No NFA
Acetone	6/16	0.00493 - 0.265	4.37E-03 - 2.03E-02	1.13E-02	400S2-05	1.33E-01	1.20E+00	0.1	0/16	No	HQ<1
Acrolein	0/16	0.00493 - 0.265	-	-	-	-	3.00E-04	N/A	0/16	No	ND
Acrylonitrile	0/16	0.00493 - 0.265	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzene	2/16	0.000986 - 0.053	6.16E-04 - 7.59E-04	6.88E-04	400S2-01	2.65E-02	1.20E-01	0.2	0/16	No	HQ<1

Table C2.2. Sector 2 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Bromochloromethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/16	0.000986 - 0.053	-	-	-	-	7.00E-02	N/A	0/16	No	ND
Bromomethane	0/16	0.000986 - 0.053	-	-	-	-	2.00E-03	N/A	0/16	No	ND
Carbon disulfide	0/16	0.00493 - 0.265	-	-	-	-	5.00E-03	N/A	0/16	No	ND
Carbon tetrachloride	0/16	0.000986 - 0.053	-	-	-	-	5.00E-02	N/A	0/16	No	ND
Chlorobenzene	0/16	0.000986 - 0.053	-	-	-	-	2.40E+00	N/A	0/16	No	ND
Chloroethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	3/16	0.000986 - 0.053	5.24E-04 - 2.43E-03	1.22E-03	400S2-01	2.65E-02	5.00E-02	0.5	0/16	No	HQ<1
Chloromethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	0/16	Yes	No NFA
cis -1,2-Dichloroethene	0/16	0.000986 - 0.053	-	-	-	-	4.00E-02	N/A	0/16	No	ND
cis -1,3-Dichloropropene	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	1/16	0.000986 - 0.053	4.34E-04 - 4.34E-04	4.34E-04	400S2-01	2.65E-02	4.00E-02	0.7	0/16	No	HQ<1
Cyclohexane	3/16	0.000986 - 0.053	4.68E-04 - 3.58E-03	1.77E-03	400S2-03	2.65E-02	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	3/16	0.000986 - 0.053	3.76E-04 - 1.24E-02	4.62E-03	400S2-01	2.65E-02	2.70E-01	0.1	0/16	No	HQ<1
m,p-Xylene	4/16	0.00197 - 0.106	7.91E-04 - 5.56E-02	1.47E-02	400S2-01	5.56E-02	1.00E-01	0.6	0/16	No	HQ<1
Methyl acetate	0/16	0.00493 - 0.265	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	7/16	0.000989 - 0.108	3.81E-04 - 2.45E+00	3.52E-01	400S2-01	2.45E+00	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	0/16	0.00493 - 0.265	-	-	-	-	2.10E-01	N/A	0/16	No	ND
Styrene	0/16	0.000986 - 0.053	-	-	-	-	1.20E+00	N/A	0/16	No	ND
Tetrachloroethene	0/16	0.000986 - 0.053	-	-	-	-	6.00E-02	N/A	0/16	No	ND
Toluene	6/16	0.000989 - 0.108	5.04E-04 - 3.92E+00	6.60E-01	400S2-01	3.92E+00	1.50E-01	**26.1**	1/16	Yes	HQ>1
Total Xylene	2/16	0.00296 - 0.159	2.31E-03 - 7.64E-02	3.94E-02	400S2-01	7.95E-02	1.00E-01	0.8	0/16	No	HQ<1
trans -1,2-Dichloroethene	0/16	0.000986 - 0.053	-	-	-	-	4.00E-02	N/A	0/16	No	ND
trans -1,3-Dichloropropene	0/16	0.000986 - 0.053	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	1/16	0.000986 - 0.053	2.57E-03 - 2.57E-03	2.57E-03	400S2-02	2.65E-02	6.00E-02	0.4	0/16	No	HQ<1
Trichlorofluoromethane	0/16	0.000986 - 0.053	-	-	-	-	1.64E+01	N/A	0/16	No	ND
Vinyl chloride	0/16	0.000986 - 0.053	-	-	-	-	3.00E-02	N/A	0/16	No	ND

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.
HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.
Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.
High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.
m,p-xylene uses NFA for Xylene (Total).
Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

Table C2.3. Sector 3 Step 2 COPEC Screen

Analyte	FOD	Detection Limit Range	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
			Range	Average							
Metals (mg/kg)											
Aluminum	12/12	10.2 - 114	4.44E+03 - 1.73E+04	1.11E+04	400S3-06	1.73E+04	5.00E+01	**346.0**	12/12	Yes	HQ>1
Antimony	6/12	1.96 - 2.4	6.86E-01 - 2.10E+00	1.22E+00	400S3-G02	2.10E+00	2.70E-01	**7.8**	6/12	Yes	HQ>1
Arsenic	12/12	1.01 - 1.2	2.82E+00 - 1.31E+01	6.34E+00	400S3-02	1.31E+01	1.80E+01	0.7	0/12	No	HQ<1
Barium	12/12	0.806 - 0.958	2.92E+01 - 1.29E+02	8.44E+01	400S3-06	1.29E+02	3.30E+02	0.4	0/12	No	HQ<1
Beryllium	12/12	0.101 - 0.12	1.83E-01 - 6.10E-01	4.03E-01	400S3-06	6.10E-01	2.50E+00	0.2	0/12	No	HQ<1
Boron	12/12	3.02 - 3.59	1.11E+00 - 5.93E+00	3.87E+00	400S3-06	5.93E+00	7.50E+00	0.8	0/12	No	HQ<1
Cadmium	10/12	0.202 - 0.24	3.04E-02 - 3.49E-01	1.43E-01	400S3-01	3.49E-01	3.60E-01	1.0	0/12	No	HQ<1
Chromium	12/12	0.605 - 0.719	1.03E+01 - 2.08E+01	1.64E+01	400S3-02	2.08E+01	2.30E+01	0.9	0/12	No	HQ<1
Cobalt	12/12	0.202 - 0.24	2.26E+00 - 8.99E+00	5.60E+00	400S3-06	8.99E+00	1.30E+01	0.7	0/12	No	HQ<1
Copper	12/12	0.403 - 0.479	3.49E+00 - 1.70E+01	1.11E+01	400S3-06	1.70E+01	2.80E+01	0.6	0/12	No	HQ<1
Iron	12/12	20.3 - 228	5.71E+03 - 2.42E+04	1.60E+04	400S3-06	2.42E+04	N/A	N/A	N/A	Yes	No NFA
Lead	12/12	0.403 - 0.479	5.33E+00 - 1.61E+01	1.11E+01	400S3-06	1.61E+01	1.10E+01	**1.5**	7/12	Yes	HQ>1
Manganese	12/12	1.02 - 11.4	1.75E+02 - 5.97E+02	3.65E+02	400S3-06	5.97E+02	2.20E+02	**2.7**	11/12	Yes	HQ>1
Mercury	11/12	0.0225 - 0.0281	1.04E-02 - 5.02E-02	2.64E-02	400S3-06	5.02E-02	1.30E-02	**3.9**	9/12	Yes	HQ>1
Molybdenum	12/12	0.202 - 0.24	3.00E-01 - 8.65E-01	5.96E-01	400S3-G02	8.65E-01	2.00E+00	0.4	0/12	No	HQ<1
Nickel	12/12	0.403 - 0.479	4.10E+00 - 1.83E+01	1.17E+01	400S3-06	1.83E+01	3.80E+01	0.5	0/12	No	HQ<1
Selenium	12/12	1.01 - 1.2	5.76E-01 - 1.65E+00	9.65E-01	400S3-G02	1.65E+00	5.20E-01	**3.2**	12/12	Yes	HQ>1
Silver	2/12	0.531 - 5.45	3.43E-01 - 4.43E-01	3.93E-01	400S3-07	2.73E+00	4.20E+00	0.7	0/12	No	HQ<1
Thallium	7/12	0.403 - 0.479	1.70E-01 - 2.42E-01	2.01E-01	400S3-06	2.42E-01	5.00E-02	**4.8**	7/12	Yes	HQ>1
Uranium	12/12	0.0403 - 0.0479	1.08E+00 - 2.97E+01	9.31E+00	400S3-08	2.97E+01	2.50E+01	**1.2**	1/12	Yes	HQ>1
Vanadium	12/12	4.03 - 4.79	1.27E+01 - 3.69E+01	2.59E+01	400S3-06	3.69E+01	7.80E+00	**4.7**	12/12	Yes	HQ>1
Zinc	12/12	4.03 - 4.79	1.27E+01 - 2.39E+02	6.78E+01	400S3-01	2.39E+02	4.60E+01	**5.2**	6/12	Yes	HQ>1
Fluoride	12/12	1.06 - 1.21	3.15E+00 - 5.24E+01	2.03E+01	400S3-06	5.24E+01	3.20E+01	1.6	3/12	Yes	HQ>1
Total Dioxins and Furans (mg/kg)											
Total Dioxin/Furans	1/1	-	3.33E-06 - 3.33E-06	3.33E-06	400S3-07	3.33E-06	3.15E-06	1.1	1/1	Yes	HQ>1
Total PCBs (mg/kg)											
Polychlorinated biphenyl	10/11	0.00364 - 0.0364	1.69E-03 - 1.98E-01	5.94E-02	400S3-07	1.98E-01	4.10E-02	4.8	5/11	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)											
1,1-biphenyl	0/11	0.36 - 7.36	-	-	-	-	2.00E-01	N/A	0/11	No	ND
2,4,5-Trichlorophenol	0/11	0.36 - 7.36	-	-	-	-	4.00E+00	N/A	0/11	No	ND
2,4,6-Trichlorophenol	0/11	0.36 - 7.36	-	-	-	-	9.94E+00	N/A	0/11	No	ND
2,4-Dichlorophenol	0/11	0.36 - 7.36	-	-	-	-	5.00E-02	N/A	0/11	No	ND
2,4-Dimethylphenol	0/11	0.36 - 7.36	-	-	-	-	4.00E-02	N/A	0/11	No	ND
2,4-Dinitrophenol	0/11	0.72 - 14.7	-	-	-	-	6.10E-02	N/A	0/11	No	ND
2,4-Dinitrotoluene	0/11	0.36 - 7.36	-	-	-	-	6.00E+00	N/A	0/11	No	ND
2,6-Dinitrotoluene	0/11	0.36 - 7.36	-	-	-	-	4.00E+00	N/A	0/11	No	ND
2-Chloronaphthalene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/11	0.36 - 7.36	-	-	-	-	6.00E-02	N/A	0/11	No	ND
2-Methyl-4,6-dinitrophenol	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylphenol	0/11	0.36 - 7.36	-	-	-	-	1.00E-01	N/A	0/11	No	ND
2-Nitrobenzenamine	0/11	0.36 - 7.36	-	-	-	-	2.00E-02	N/A	0/11	No	ND
2-Nitrophenol	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
3,3'-Dichlorobenzidine	0/11	0.36 - 7.36	-	-	-	-	3.00E-02	N/A	0/11	No	ND
3-Nitrobenzenamine	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA

Table C2.3. Sector 3 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
4-Bromophenyl phenyl ether	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chloro-3-methylphenol	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chlorobenzenamine	0/11	0.36 - 7.36	-	-	-	-	1.00E+00	N/A	0/11	No	ND
4-Chlorophenyl phenyl ether	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/11	0.36 - 7.36	-	-	-	-	5.12E+00	N/A	0/11	No	ND
Acetophenone	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Atrazine	0/11	0.36 - 7.36	-	-	-	-	5.00E-05	N/A	0/11	No	ND
Benzaldehyde	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethoxy)methane	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroisopropyl) ether	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	0/11	0.036 - 0.736	-	-	-	-	2.00E-02	N/A	0/11	No	ND
Butyl benzyl phthalate	0/11	0.036 - 0.736	-	-	-	-	5.90E-01	N/A	0/11	No	ND
Caprolactam	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	1/11	0.036 - 0.736	7.77E-02 - 7.77E-02	7.77E-02	400S3-G02	3.68E-01	7.00E-02	5.3	1/11	Yes	HQ>1
Dibenzofuran	0/11	0.36 - 7.36	-	-	-	-	1.50E-01	N/A	0/11	No	ND
Diethyl phthalate	0/11	0.036 - 0.736	-	-	-	-	2.50E-01	N/A	0/11	No	ND
Dimethyl phthalate	0/11	0.036 - 0.736	-	-	-	-	3.50E-01	N/A	0/11	No	ND
Di-n-butyl phthalate	2/11	0.036 - 0.736	1.43E-02 - 1.80E-02	1.62E-02	400S3-08	3.68E-01	1.10E-02	33.5	2/11	Yes	HQ>1
Di-n-octylphthalate	2/11	0.036 - 0.736	1.28E-02 - 5.96E-02	3.62E-02	400S3-G02	3.68E-01	9.10E-01	0.4	0/11	No	HQ<1
Diphenylamine	0/11	0.36 - 7.36	-	-	-	-	1.01E+00	N/A	0/11	No	ND
Hexachlorobenzene	0/11	0.36 - 7.36	-	-	-	-	7.90E-02	N/A	0/11	No	ND
Hexachlorobutadiene	0/11	0.36 - 7.36	-	-	-	-	9.00E-03	N/A	0/11	No	ND
Hexachlorocyclopentadiene	0/11	0.36 - 7.36	-	-	-	-	1.00E-03	N/A	0/11	No	ND
Hexachloroethane	0/11	0.36 - 7.36	-	-	-	-	2.40E-02	N/A	0/11	No	ND
Isophorone	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m+p Methylphenol	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Nitrobenzene	0/11	0.36 - 7.36	-	-	-	-	2.20E+00	N/A	0/11	No	ND
N-Nitroso-di-n-propylamine	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pentachlorophenol	0/11	0.36 - 7.36	-	-	-	-	2.10E+00	N/A	0/11	No	ND
Phenol	0/11	0.36 - 7.36	-	-	-	-	7.90E-01	N/A	0/11	No	ND
p-Nitroaniline	0/11	0.36 - 7.36	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Low Molecular Weight Polycyclic Aromatic Hydrocarbons [LMW-PAHs] (mg/kg)											
2-Methylnaphthalene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthylene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Anthracene	2/11	0.036 - 0.736	9.28E-02 - 9.39E-02	9.34E-02	400S3-G02	3.68E-01	N/A	N/A	N/A	--	--
Fluorene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Naphthalene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Phenanthrene	10/11	0.036 - 0.736	1.25E-02 - 1.69E+00	2.85E-01	400S3-01	1.69E+00	N/A	N/A	N/A	--	--
LMW PAHs	10/11	0.036 - 0.736	1.32E-01 - 3.90E+00	7.03E-01	400S3-01	3.90E+00	2.90E+01	0.1	0/11	No	HQ<1
High Molecular Weight Polycyclic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)											
Benz(a)anthracene	10/11	0.036 - 0.736	1.73E-02 - 9.78E-01	1.99E-01	400S3-01	9.78E-01	N/A	N/A	N/A	--	--
Benzo(a)pyrene	10/11	0.036 - 0.736	1.57E-02 - 8.09E-01	1.85E-01	400S3-01	8.09E-01	N/A	N/A	N/A	--	--
Benzo(b)fluoranthene	9/11	0.036 - 0.736	2.05E-02 - 1.41E+00	3.09E-01	400S3-01	1.41E+00	N/A	N/A	N/A	--	--

Table C2.3. Sector 3 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Benzo(ghi)perylene	6/11	0.036 - 0.736	1.66E-02 - 2.75E-01	8.20E-02	400S3-G02	3.68E-01	N/A	N/A	N/A	--	--
Benzo(k)fluoranthene	8/11	0.036 - 0.736	1.16E-02 - 4.19E-01	1.22E-01	400S3-01	4.19E-01	N/A	N/A	N/A	--	--
Chrysene	9/11	0.036 - 0.736	1.21E-02 - 1.13E+00	2.34E-01	400S3-01	1.13E+00	N/A	N/A	N/A	--	--
Dibenz(a,h)anthracene	0/11	0.036 - 0.736	-	-	-	-	N/A	N/A	N/A	--	--
Fluoranthene	11/11	0.036 - 0.736	1.22E-02 - 3.99E+00	5.68E-01	400S3-01	3.99E+00	N/A	N/A	N/A	--	--
Indeno(1,2,3-cd)pyrene	5/11	0.036 - 0.736	2.56E-02 - 3.97E-01	1.80E-01	400S3-01	3.97E-01	N/A	N/A	N/A	--	--
Pyrene	10/11	0.036 - 0.736	1.77E-02 - 3.62E+00	5.41E-01	400S3-01	3.62E+00	N/A	N/A	N/A	--	--
HMW PAHs	11/11	0.036 - 0.736	1.74E-01 - 1.35E+01	2.20E+00	400S3-01	1.35E+01	1.10E+00	12.3	3/11	Yes	HQ>1
Radionuclides (pCi/g)											
Americium-241	0/13	0.277 - 0.936	-	-	-	-	2.16E+03	N/A	0/13	No	ND
Cesium-137	6/13	0.0369 - 0.0859	5.37E-02 - 1.57E-01	1.00E-01	400S3-06	1.57E-01	2.08E+01	0.0	0/13	No	HQ<1
Neptunium-237	0/13	0.432 - 1.01	-	-	-	-	8.14E+02	N/A	0/13	No	ND
Plutonium-238	0/13	0.245 - 0.788	-	-	-	-	1.75E+03	N/A	0/13	No	ND
Plutonium-239/240	1/13	0.367 - 0.815	1.05E+00 - 1.05E+00	1.05E+00	400S3-G01	1.05E+00	1.27E+03	0.0	0/13	No	HQ<1
Technetium-99	3/13	2.28 - 3.97	3.92E+00 - 1.96E+01	9.91E+00	400S3-GS1	1.96E+01	2.19E+03	0.0	0/13	No	HQ<1
Thorium-230	12/13	0.51 - 1.33	5.50E-01 - 2.24E+00	1.39E+00	400S3-01	2.24E+00	9.98E+03	0.0	0/13	No	HQ<1
Uranium-233/234	13/13	0.502 - 1.02	1.28E+00 - 3.58E+01	6.56E+00	400S3-GS1	3.58E+01	5.14E+03	0.0	0/13	No	HQ<1
Uranium-235/236	2/13	0.33 - 0.578	1.06E+00 - 1.57E+00	1.32E+00	400S3-GS1	1.57E+00	2.75E+03	0.0	0/13	No	HQ<1
Uranium-238	13/13	0.274 - 0.733	1.60E+00 - 3.86E+01	7.49E+00	400S3-GS1	3.86E+01	1.57E+03	0.0	0/13	No	HQ<1
Volatile Organic Compounds (mg/kg)											
1,1,1-Trichloroethane	0/11	0.000933 - 0.107	-	-	-	-	4.00E-02	N/A	0/11	No	ND
1,1,2,2-Tetrachloroethane	0/11	0.000933 - 0.107	-	-	-	-	1.27E-01	N/A	0/11	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/11	0.00466 - 0.535	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	0/11	0.000933 - 0.107	-	-	-	-	3.20E-01	N/A	0/11	No	ND
1,1-Dichloroethane	0/11	0.000933 - 0.107	-	-	-	-	1.40E-01	N/A	0/11	No	ND
1,1-Dichloroethene	0/11	0.000933 - 0.107	-	-	-	-	4.00E-02	N/A	0/11	No	ND
1,2,3-Trichlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	2.00E+01	N/A	0/11	No	ND
1,2,4-Trichlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	2.70E-01	N/A	0/11	No	ND
1,2-Dibromo-3-chloropropane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	9.00E-02	N/A	0/11	No	ND
1,2-Dichloroethane	0/11	0.000933 - 0.107	-	-	-	-	4.00E-01	N/A	0/11	No	ND
1,2-Dichloropropane	0/11	0.000933 - 0.107	-	-	-	-	2.80E-01	N/A	0/11	No	ND
1,2-Dimethylbenzene	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,3-Dichlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	8.00E-02	N/A	0/11	No	ND
1,4-Dichlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	8.80E-01	N/A	0/11	No	ND
1,4-Dioxane	0/11	0.0466 - 5.35	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Butanone	2/11	0.00466 - 0.535	7.33E-03 - 1.53E-02	1.13E-02	400S3-03	2.68E-01	1.00E+00	0.3	0/11	No	HQ<1
2-Chloroethyl vinyl ether	0/11	0.00466 - 0.535	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/11	0.00466 - 0.535	-	-	-	-	3.60E-01	N/A	0/11	No	ND
2-Methoxy-2-methylpropane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	0/11	0.00466 - 0.535	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Acetone	7/11	0.00466 - 0.535	1.77E-03 - 7.41E-02	1.89E-02	400S3-03	2.68E-01	1.20E+00	0.2	0/11	No	HQ<1
Acrolein	0/11	0.00466 - 0.535	-	-	-	-	3.00E-04	N/A	0/11	No	ND
Acrylonitrile	0/11	0.00466 - 0.535	-	-	-	-	N/A	N/A	N/A	Yes	No NFA

Table C2.3. Sector 3 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Benzene	0/11	0.000933 - 0.107	-	-	-	-	1.20E-01	N/A	0/11	No	ND
Bromochloromethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/11	0.000933 - 0.107	-	-	-	-	7.00E-02	N/A	0/11	No	ND
Bromomethane	0/11	0.000933 - 0.107	-	-	-	-	2.00E-03	N/A	0/11	No	ND
Carbon disulfide	0/11	0.00466 - 0.535	-	-	-	-	5.00E-03	N/A	0/11	No	ND
Carbon tetrachloride	0/11	0.000933 - 0.107	-	-	-	-	5.00E-02	N/A	0/11	No	ND
Chlorobenzene	0/11	0.000933 - 0.107	-	-	-	-	2.40E+00	N/A	0/11	No	ND
Chloroethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	0/11	0.000933 - 0.107	-	-	-	-	5.00E-02	N/A	0/11	No	ND
Chloromethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
cis -1,2-Dichloroethene	2/11	0.000933 - 0.107	5.02E-04 - 7.66E-02	3.86E-02	400S3-03	7.66E-02	4.00E-02	1.9	1/11	Yes	HQ>1
cis -1,3-Dichloropropene	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	0/11	0.000933 - 0.107	-	-	-	-	4.00E-02	N/A	0/11	No	ND
Cyclohexane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	0/11	0.000933 - 0.107	-	-	-	-	2.70E-01	N/A	0/11	No	ND
m,p-Xylene	0/11	0.00187 - 0.214	-	-	-	-	1.00E-01	N/A	0/11	No	ND
Methyl acetate	0/11	0.00466 - 0.535	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	1/11	0.000933 - 0.107	4.17E-04 - 4.17E-04	4.17E-04	400S3-07	5.35E-02	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	3/11	0.00466 - 0.535	2.00E-03 - 2.60E-03	2.21E-03	400S3-04	2.68E-01	2.10E-01	1.3	0/11	Yes	HQ>1
Styrene	0/11	0.000933 - 0.107	-	-	-	-	1.20E+00	N/A	0/11	No	ND
Tetrachloroethene	0/11	0.000933 - 0.107	-	-	-	-	6.00E-02	N/A	0/11	No	ND
Toluene	5/11	0.000933 - 0.107	3.71E-04 - 8.23E-04	6.11E-04	400S3-07	5.35E-02	1.50E-01	0.4	0/11	No	HQ<1
Total Xylene	0/11	0.0028 - 0.321	-	-	-	-	1.00E-01	N/A	0/11	No	ND
trans -1,2-Dichloroethene	1/11	0.000933 - 0.107	5.50E-04 - 5.50E-04	5.50E-04	400S3-03	5.50E-04	4.00E-02	0.01	0/11	No	HQ<1
trans -1,3-Dichloropropene	0/11	0.000933 - 0.107	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	7/11	0.000933 - 0.112	5.93E-04 - 3.01E+00	4.32E-01	400S3-03	3.01E+00	6.00E-02	50	1/11	Yes	HQ>1
Trichlorofluoromethane	0/11	0.000933 - 0.107	-	-	-	-	1.64E+01	N/A	0/11	No	ND
Vinyl chloride	0/11	0.000933 - 0.107	-	-	-	-	3.00E-02	N/A	0/11	No	ND

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.
HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.
Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.
High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.
m,p-xylene uses NFA for Xylene (Total).
Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

Table C2.4. Sector 4 Step 2 COPEC Screen

		Detection Limit	Detected Concentration		Location of Max	Max Sector		Maximum	FOE		
Analyte	FOD	Range	Range	Average	Detected Conc.	Concentration	NFA	HQ	NFA	COPEC?	Reason
Metals (mg/kg)											
Aluminum	45/45	9.76 - 112	1.63E+04	7.86E+03	6P-PZ10	1.63E+04	5.00E+01	**326.0**	45/45	Yes	HQ>1
Antimony	17/27	1.97 - 20	3.85E+00	1.30E+00	400S4-04	1.00E+01	2.70E-01	**37.0**	17/27	Yes	HQ>1
Arsenic	30/46	1.02 - 20	1.10E+01	4.69E+00	6P-PZ01	1.10E+01	1.80E+01	0.6	0/46	No	HQ<1
Barium	46/46	0.781 - 8.18	3.29E+02	6.24E+01	400S4-05	3.29E+02	3.30E+02	1.0	0/46	No	HQ<1
Beryllium	26/27	0.0976 - 0.5	01	3.30E-01	400S4-G08	5.83E-01	2.50E+00	0.2	0/27	No	HQ<1
Boron	24/26	2.93 - 3.53	6.12E+00	3.22E+00	400S4-08	6.12E+00	7.50E+00	0.8	0/26	No	HQ<1
Cadmium	25/27	0.195 - 2	2.40E+00	2.94E-01	400S4-G05	2.40E+00	3.60E-01	**6.7**	5/27	Yes	HQ>1
Calcium	19/19	100 - 2000	1.65E+05	1.93E+04	6P-PZ01	1.65E+05	N/A	N/A	N/A	Yes	No NFA
Chromium	46/46	0.586 - 2.5	4.50E+01	1.86E+01	400S4-07	4.50E+01	2.30E+01	**2.0**	10/46	Yes	HQ>1
Cobalt	26/26	0.195 - 0.235	9.35E+00	4.64E+00	400S4-G08	9.35E+00	1.30E+01	0.7	0/26	No	HQ<1
Copper	27/27	0.39 - 2.5	3.14E+01	8.70E+00	400S4-04	3.14E+01	2.80E+01	**1.1**	1/27	Yes	HQ>1
Iron	46/46	19.5 - 235	3.09E+04	1.44E+04	6P-PZ05	3.09E+04	N/A	N/A	0/46	Yes	No NFA
Lead	27/46	0.39 - 20	3.66E+01	1.08E+01	6P-PZ11	3.66E+01	1.10E+01	**3.3**	10/46	Yes	HQ>1
Magnesium	19/19	2.5 - 5	3.96E+03	1.23E+03	6P-PZ01	3.96E+03	N/A	N/A	N/A	Yes	No NFA
Manganese	45/45	0.976 - 11.6	1.10E+03	2.58E+02	6P-PZ02F	1.10E+03	2.20E+02	**5.0**	21/45	Yes	HQ>1
Mercury	22/46	0.0215 - 0.2	01	3.26E-02	6P-PZ11	2.90E-01	1.30E-02	**22.3**	15/46	Yes	HQ>1
Molybdenum	26/26	0.195 - 0.235	5.92E+00	8.78E-01	400S4-10	5.92E+00	2.00E+00	**3.0**	1/26	Yes	HQ>1
Nickel	42/46	0.39 - 5	5.71E+01	1.05E+01	400S4-C22	5.71E+01	3.80E+01	**1.5**	1/46	Yes	HQ>1
Potassium	17/19	100 - 200	6.26E+02	4.07E+02	6P-PZ10F	6.26E+02	N/A	N/A	N/A	Yes	No NFA
Selenium	21/45	1 - 20	1.26E+00	7.61E-01	400S4-C22	1.00E+01	5.20E-01	**19.2**	18/45	Yes	HQ>1
Silver	11/27	0.504 - 5.82	9.97E+00	2.51E+00	400S4-G01	9.97E+00	4.20E+00	**2.4**	3/27	Yes	HQ>1
Sodium	3/19	200 - 250	3.11E+02	2.72E+02	6P-PZ10	3.11E+02	N/A	N/A	N/A	Yes	No NFA
Thallium	3/27	0.39 - 20	01	1.83E-01	400S4-C22	1.00E+01	5.00E-02	**200.0**	3/27	Yes	HQ>1
Uranium	30/45	0.039 - 100	2.38E+02	3.95E+01	6P-PZ11	2.38E+02	2.50E+01	**9.5**	7/45	Yes	HQ>1
Vanadium	45/45	2.5 - 4.71	4.41E+01	2.08E+01	400S4-G08	4.41E+01	7.80E+00	**5.7**	44/45	Yes	HQ>1
Zinc	27/27	4.09 - 45.9	9.27E+02	8.89E+01	400S4-G04	9.27E+02	4.60E+01	**20.2**	9/27	Yes	HQ>1
Fluoride	26/26	1.03 - 1.2	3.69E+01	9.59E+00	400S4-01	3.69E+01	3.20E+01	**1.2**	1/26	Yes	HQ>1
Total Dioxins and Furans (mg/kg)											
Total Dioxin/Furans	8/8	-	06	4.14E-06	400S4-G01	5.32E-06	3.15E-06	**1.7**	7/8	Yes	HQ>1
Total PCBs (mg/kg)											
Total PCBs	20/27	0.00336 - 0.182	01	1.04E-01	400S4-01	9.99E-01	4.10E-02	**24.4**	7/27	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)											
1,1-biphenyl	0/26	0.332 - 3.83	-	-	-	-	2.00E-01	N/A	0/26	No	ND
2,4,5-Trichlorophenol	0/26	0.332 - 3.83	-	-	-	-	4.00E+00	N/A	0/26	No	ND
2,4,6-Trichlorophenol	0/26	0.332 - 3.83	-	-	-	-	9.94E+00	N/A	0/26	No	ND
2,4-Dichlorophenol	0/26	0.332 - 3.83	-	-	-	-	5.00E-02	N/A	0/26	No	ND
2,4-Dimethylphenol	0/26	0.332 - 3.83	-	-	-	-	4.00E-02	N/A	0/26	No	ND
2,4-Dinitrophenol	0/26	0.664 - 7.66	-	-	-	-	6.10E-02	N/A	0/26	No	ND
2,4-Dinitrotoluene	0/26	0.332 - 3.83	-	-	-	-	6.00E+00	N/A	0/26	No	ND
2,6-Dinitrotoluene	0/26	0.332 - 3.83	-	-	-	-	4.00E+00	N/A	0/26	No	ND
2-Chloronaphthalene	0/26	0.0332 - 0.383	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/26	0.332 - 3.83	-	-	-	-	6.00E-02	N/A	0/26	No	ND
2-Methyl-4,6-dinitrophenol	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylphenol	0/26	0.332 - 3.83	-	-	-	-	1.00E-01	N/A	0/26	No	ND
2-Nitrobenzenamine	0/26	0.332 - 3.83	-	-	-	-	2.00E-02	N/A	0/26	No	ND

Table C2.4. Sector 4 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
2-Nitrophenol	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
3,3'-Dichlorobenzidine	0/26	0.332 - 3.83	-	-	-	-	3.00E-02	N/A	0/26	No	ND
3-Nitrobenzenamine	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Bromophenyl phenyl ether	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chloro-3-methylphenol	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chlorobenzenamine	0/26	0.332 - 3.83	-	-	-	-	1.00E+00	N/A	0/26	No	ND
4-Chlorophenyl phenyl ether	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/26	0.332 - 3.83	-	-	-	-	5.12E+00	N/A	0/26	No	ND
Acetophenone	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Atrazine	0/26	0.332 - 3.83	-	-	-	-	5.00E-05	N/A	0/26	No	ND
Benzaldehyde	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethoxy)methane	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroisopropyl) ether	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	5/26	0.0332 - 0.383	02	1.72E-02	400S4-08	1.92E-01	2.00E-02	**9.6**	1/26	Yes	HQ>1
Butyl benzyl phthalate	1/26	0.0332 - 0.383	02	3.08E-02	400S4-07	1.92E-01	5.90E-01	N/A	0/26	No	ND
Caprolactam	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	3/26	0.0332 - 0.383	02	3.12E-02	400S4-08	1.92E-01	7.00E-02	**2.7**	0/26	Yes	HQ>1
Dibenzofuran	0/26	0.332 - 3.83	-	-	-	-	1.50E-01	N/A	0/26	No	ND
Diethyl phthalate	0/26	0.0332 - 0.383	-	-	-	-	2.50E-01	N/A	0/26	No	ND
Dimethyl phthalate	0/26	0.0332 - 0.383	-	-	-	-	3.50E-01	N/A	0/26	No	ND
Di-n-butyl phthalate	6/26	0.0332 - 0.383	1.55E-02 - 3.12E-02	2.01E-02	400S4-15	1.92E-01	1.10E-02	**17.4**	6/26	Yes	HQ>1
Di-n-octylphthalate	0/26	0.0332 - 0.383	-	-	-	-	9.10E-01	N/A	0/26	No	ND
Diphenylamine	0/26	0.332 - 3.83	-	-	-	-	1.01E+00	N/A	0/26	No	ND
Hexachlorobenzene	0/26	0.332 - 3.83	-	-	-	-	7.90E-02	N/A	0/26	No	ND
Hexachlorobutadiene	0/26	0.332 - 3.83	-	-	-	-	9.00E-03	N/A	0/26	No	ND
Hexachlorocyclopentadiene	0/26	0.332 - 3.83	-	-	-	-	1.00E-03	N/A	0/26	No	ND
Hexachloroethane	0/26	0.332 - 3.83	-	-	-	-	2.40E-02	N/A	0/26	No	ND
Isophorone	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m+p Methylphenol	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Nitrobenzene	0/26	0.332 - 3.83	-	-	-	-	2.20E+00	N/A	0/26	No	ND
N-Nitroso-di-n-propylamine	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pentachlorophenol	0/26	0.332 - 3.83	-	-	-	-	2.10E+00	N/A	0/26	No	ND
Phenol	0/26	0.332 - 3.83	-	-	-	-	7.90E-01	N/A	0/26	No	ND
p-Nitroaniline	0/26	0.332 - 3.83	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Low Molecular Weight Polycylic Aromatic Hydrocarbons [LMW-PAHs] (mg/kg)											
2-Methylnaphthalene	0/26	0.0332 - 0.383	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthene	3/26	0.0332 - 0.383	01	7.24E-02	400S4-01	1.92E-01	N/A	N/A	N/A	--	--
Acenaphthylene	0/26	0.0332 - 0.383	-	-	-	-	N/A	N/A	N/A	--	--
Anthracene	6/26	0.0332 - 0.383	01	7.91E-02	400S4-01	2.59E-01	N/A	N/A	N/A	--	--
Fluorene	2/26	0.0332 - 0.383	02	3.51E-02	400S4-08	1.92E-01	N/A	N/A	N/A	--	--
Naphthalene	0/26	0.0332 - 0.383	-	-	-	-	N/A	N/A	N/A	--	--
Phenanthrene	13/26	0.0332 - 0.383	01	1.70E-01	400S4-01	7.74E-01	N/A	N/A	N/A	--	--
LMW PAHs	13/26	0.0332 - 0.383	1.90E+00	5.41E-01	400S4-01	1.90E+00	2.90E+01	0.1	0/26	No	HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)											

Table C2.4. Sector 4 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Benz(a)anthracene	14/26	0.0332 - 0.383	01	1.35E-01	400S4-01	5.15E-01	N/A	N/A	N/A	--	--
Benzo(a)pyrene	15/26	0.0332 - 0.383	01	1.45E-01	400S4-01	4.42E-01	N/A	N/A	N/A	--	--
Benzo(b)fluoranthene	14/26	0.0332 - 0.383	01	2.21E-01	400S4-G05	6.97E-01	N/A	N/A	N/A	--	--
Benzo(ghi)perylene	11/26	0.0332 - 0.383	01	8.65E-02	400S4-11	2.03E-01	N/A	N/A	N/A	--	--
Benzo(k)fluoranthene	12/26	0.0332 - 0.383	01	9.56E-02	400S4-01	2.63E-01	N/A	N/A	N/A	--	--
Chrysene	13/26	0.0332 - 0.383	01	1.45E-01	400S4-01	5.04E-01	N/A	N/A	N/A	--	--
Dibenz(a,h)anthracene	3/26	0.0332 - 0.383	02	2.34E-02	400S4-08	1.92E-01	N/A	N/A	N/A	--	--
Fluoranthene	16/26	0.0332 - 0.383	1.10E+00	2.36E-01	400S4-01	1.10E+00	N/A	N/A	N/A	--	--
Indeno(1,2,3-cd)pyrene	12/26	0.0332 - 0.383	01	1.00E-01	400S4-G05	2.23E-01	N/A	N/A	N/A	--	--
Pyrene	15/26	0.0332 - 0.383	1.03E+00	2.31E-01	400S4-01	1.03E+00	N/A	N/A	N/A	--	--
HMW PAHs	16/26	0.0332 - 0.383	4.95E+00	1.34E+00	400S4-01	4.95E+00	1.10E+00	**4.5**	7/26	Yes	HQ>1
Radionuclides (pCi/g)											
Americium-241	2/47	0.0723 - 1.03	2.02E+00	1.77E+00	400S4-GS1	2.02E+00	2.16E+03	0.0	0/47	No	HQ<1
Americium-243	0/1	0.0491 - 0.0491	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cesium-134	0/1	0.0162 - 0.0162	-	-	-	-	1.13E+01	N/A	0/1	No	ND
Cesium-137	17/47	0.0154 - 0.0778	2.82E+00	3.92E-01	400S4-GS1	2.82E+00	2.08E+01	0.1	0/47	No	HQ<1
Cobalt-60	0/19	0.0119 - 0.0533	-	-	-	-	6.13E+02	N/A	0/19	No	ND
Neptunium-237	5/47	0.0323 - 1.26	8.10E+00	3.46E+00	400S4-GS1	8.10E+00	8.14E+02	0.0	0/47	No	HQ<1
Neptunium-239	0/1	0.169 - 0.169	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Plutonium-238	0/29	0.161 - 1.19	-	-	-	-	1.75E+03	N/A	0/29	No	ND
Plutonium-239/240	9/48	0.0435 - 1.19	1.97E+01	3.57E+00	400S4-GS1	1.97E+01	1.27E+03	0.0	0/48	No	HQ<1
Technetium-99	14/48	1.58 - 4.76	3.23E+02	5.13E+01	400S4-GS1	3.23E+02	2.19E+03	0.1	0/48	No	HQ<1
Thorium-228	1/1	0.0642 - 0.0642	01	3.98E-01	Point-5	3.98E-01	5.30E+02	0.0	0/1	No	HQ<1
Thorium-230	39/48	0.0882 - 1.15	7.78E+01	4.87E+00	400S4-GS1	7.78E+01	9.98E+03	0.0	0/48	No	HQ<1
Thorium-232	1/1	0.0438 - 0.0438	01	4.17E-01	Point-5	4.17E-01	1.52E+03	0.0	0/1	No	HQ<1
Uranium-233/234	26/28	0.255 - 0.976	2.27E+02	1.67E+01	400S4-GS1	2.27E+02	5.14E+03	0.0	0/28	No	HQ<1
Uranium-234	6/17	0.217 - 1.3	3.32E+00	2.48E+00	6P-PZ05F	3.32E+00	5.14E+03	0.0	0/17	No	HQ<1
Uranium-235	18/19	0.0176 - 0.0489	01	1.20E-01	Point-5	2.64E-01	2.75E+03	0.0	0/19	No	HQ<1
Uranium-235/236	6/28	0.135 - 0.913	1.61E+01	4.48E+00	400S4-GS1	1.61E+01	2.75E+03	0.0	0/28	No	HQ<1
Uranium-238	45/46	0.188 - 1.31	3.30E+02	1.54E+01	400S4-GS1	3.30E+02	1.57E+03	0.2	0/46	No	HQ<1
Volatile Organic Compounds (mg/kg)											
1,1,1-Trichloroethane	0/39	0.000808 - 1.3	-	-	-	-	4.00E-02	N/A	0/39	No	ND
1,1,2,2-Tetrachloroethane	0/39	0.000808 - 1.3	-	-	-	-	1.27E-01	N/A	0/39	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/28	0.00404 - 0.00735	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	0/39	0.000808 - 1.3	-	-	-	-	3.20E-01	N/A	0/39	No	ND
1,1-Dichloroethane	0/39	0.000808 - 1.3	-	-	-	-	1.40E-01	N/A	0/39	No	ND
1,1-Dichloroethene	0/39	0.000808 - 1.3	-	-	-	-	4.00E-02	N/A	0/39	No	ND
1,2,3-Trichlorobenzene	0/28	0.00147	-	-	-	-	2.00E+01	N/A	0/28	No	ND
1,2,4-Trichlorobenzene	0/28	0.00147	-	-	-	-	2.70E-01	N/A	0/28	No	ND
1,2-Dibromo-3-chloropropane	0/28	0.00147	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/28	0.00147	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/28	0.00147	-	-	-	-	9.00E-02	N/A	0/28	No	ND
1,2-Dichloroethane	0/39	0.000808 - 1.3	-	-	-	-	4.00E-01	N/A	0/39	No	ND
1,2-Dichloroethene	0/1	0.14 - 0.14	-	-	-	-	4.00E-02	N/A	0/1	No	ND
1,2-Dichloropropane	0/39	0.000808 - 1.3	-	-	-	-	2.80E-01	N/A	0/39	No	ND
1,2-Dimethylbenzene	2/39	0.000808 - 1.3	02	1.12E-02	400S4-10	6.50E-01	N/A	N/A	N/A	Yes	No NFA

Table C2.4. Sector 4 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
1,3-Dichlorobenzene	0/28	0.00147	-	-	-	-	8.00E-02	N/A	0/28	No	ND
1,4-Dichlorobenzene	0/28	0.00147	-	-	-	-	8.80E-01	N/A	0/28	No	ND
1,4-Dioxane	0/28	0.0404 - 0.0735	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Butanone	8/39	0.00404 - 1.3	02	7.25E-03	400S4-G02	6.50E-01	1.00E+00	0.7	0/39	No	HQ<1
2-Chloroethyl vinyl ether	0/28	0.00404 - 0.00735	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/39	0.00404 - 1.3	-	-	-	-	3.60E-01	N/A	0/39	No	ND
2-Methoxy-2-methylpropane	0/28	0.00147	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	0/39	0.00404 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Acetone	29/39	0.00404 - 1.3	01	2.58E-02	6P-PZ08F	6.50E-01	1.20E+00	0.5	0/39	No	HQ<1
Acrolein	0/28	0.00404 - 0.00735	-	-	-	-	3.00E-04	N/A	0/28	No	ND
Acrylonitrile	0/28	0.00404 - 0.00735	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzene	4/39	0.000808 - 1.3	03	1.59E-03	400S4-10	6.50E-01	1.20E-01	**5.4**	0/39	Yes	HQ>1
Bromochloromethane	0/28	0.00147	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/39	0.000808 - 1.3	-	-	-	-	7.00E-02	N/A	0/39	No	ND
Bromomethane	0/39	0.000808 - 1.3	-	-	-	-	2.00E-03	N/A	0/39	No	ND
Carbon disulfide	0/39	0.00404 - 1.3	-	-	-	-	5.00E-03	N/A	0/39	No	ND
Carbon tetrachloride	0/39	0.000808 - 1.3	-	-	-	-	5.00E-02	N/A	0/39	No	ND
Chlorobenzene	0/39	0.000808 - 1.3	-	-	-	-	2.40E+00	N/A	0/39	No	ND
Chloroethane	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	7/39	0.000808 - 1.3	03	1.02E-03	400S4-12	6.50E-01	5.00E-02	**13.0**	0/39	Yes	HQ>1
Chloromethane	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
cis -1,2-Dichloroethene	16/38	0.000808 - 1.3	02	8.35E-03	400S4-G03	6.50E-01	4.00E-02	**16.3**	1/38	Yes	HQ>1
cis -1,3-Dichloropropene	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	1/28	0.00147	03	1.69E-03	400S4-10	1.69E-03	4.00E-02	0.0	0/28	No	HQ<1
Cyclohexane	7/28	0.00147	02	7.61E-03	400S4-10	4.81E-02	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/28	0.00147	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	3/39	0.000808 - 1.3	02	8.19E-03	400S4-10	6.50E-01	2.70E-01	**2.4**	0/39	Yes	HQ>1
m,p-Xylene	3/39	0.00162 - 2.5	02	2.15E-02	400S4-10	1.25E+00	1.00E-01	**12.5**	0/39	Yes	HQ>1
Methyl acetate	1/28	0.00404 - 0.00735	02	1.88E-02	400S4-03	1.88E-02	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	12/28	0.00147	02	7.27E-03	400S4-10	6.34E-02	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	10/39	0.00404 - 1.3	03	4.69E-03	400S4-G07	6.50E-01	2.10E-01	**3.1**	0/39	Yes	HQ>1
Styrene	0/39	0.000808 - 1.3	-	-	-	-	1.20E+00	N/A	0/39	No	ND
Tetrachloroethene	1/39	0.000808 - 1.3	04	3.81E-04	400S4-G02	6.50E-01	6.00E-02	**10.8**	0/39	Yes	HQ>1
Toluene	17/39	0.000808 - 1.3	02	8.58E-03	400S4-10	6.50E-01	1.50E-01	**4.3**	0/39	Yes	HQ>1
Total Xylene	2/28	0.00242 - 0.00441	02	4.31E-02	400S4-10	8.50E-02	1.00E-01	0.9	0/28	No	HQ<1
trans -1,2-Dichloroethene	2/38	0.000808 - 1.3	03	8.57E-04	400S4-G03	6.50E-01	4.00E-02	**16.3**	0/38	Yes	HQ>1
trans -1,3-Dichloropropene	0/39	0.000808 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	33/39	0.000808 - 0.3	01	8.92E-02	400S4-99	6.02E-01	6.00E-02	**10.0**	10/39	Yes	HQ>1
Trichlorofluoromethane	0/28	0.00147	-	-	-	-	1.64E+01	N/A	0/28	No	ND
Vinyl acetate	0/11	0.01 - 1.3	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Vinyl chloride	1/39	0.000808 - 1.3	03	1.53E-03	400S4-G03	6.50E-01	3.00E-02	**21.7**	0/39	Yes	HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason

Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).

Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.

HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.

Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.

High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.

m,p-xylene uses NFA for Xylene (Total).

Plutonium-239/240 uses NFAs for Plutonium-239.

Uranium-233/234 uses NFAs for Uranium-234.

Uranium-235/236 uses NFAs for Uranium-235.

Table C2.5. Sector 5 Step 2 COPEC Screen

Analyte	FOD	Detected Concentration		Location of Max	Max Sector	NFA	Maximum	FOE	COPEC?	Reason
		Range	Average	Detected Conc.	Concentration		HQ	NFA		
Metals (mg/kg)										
Aluminum	32/32	6.84E+02 - 1.39E+04	8.51E+03	400S5-G03	1.39E+04	5.00E+01	**278.0**	32/32	Yes	HQ>1
Antimony	16/32	4.48E-01 - 3.94E+00	1.42E+00	400S5-07	1.10E+01	2.70E-01	**40.6**	16/32	Yes	HQ>1
Arsenic	31/32	2.28E+00 - 2.00E+01	5.61E+00	400S5-10	2.00E+01	1.80E+01	**1.1**	1/32	Yes	HQ>1
Barium	32/32	6.19E+00 - 3.66E+02	1.05E+02	400S5-06	3.66E+02	3.30E+02	**1.1**	1/32	Yes	HQ>1
Boron	26/32	1.01E+00 - 9.68E+00	3.02E+00	400S5-04	9.68E+00	7.50E+00	**1.3**	3/32	Yes	HQ>1
Cadmium	28/32	2.44E-02 - 6.06E-01	2.41E-01	400S5-07	6.06E-01	3.60E-01	**1.7**	6/32	Yes	HQ>1
Chromium	32/32	4.79E+00 - 4.24E+01	1.62E+01	400S5-01	4.24E+01	2.30E+01	**1.8**	5/32	Yes	HQ>1
Cobalt	32/32	4.18E-01 - 1.80E+01	7.08E+00	400S5-06	1.80E+01	1.30E+01	**1.4**	2/32	Yes	HQ>1
Copper	32/32	1.41E+00 - 3.50E+01	8.57E+00	400S5-04	3.50E+01	2.80E+01	**1.3**	1/32	Yes	HQ>1
Lead	32/32	9.07E-01 - 4.92E+01	1.10E+01	400S5-06	4.92E+01	1.10E+01	**4.5**	10/32	Yes	HQ>1
Manganese	32/32	3.79E+01 - 2.65E+03	5.85E+02	400S5-06	2.65E+03	2.20E+02	**12.0**	24/32	Yes	HQ>1
Mercury	26/32	9.05E-03 - 5.81E-02	2.09E-02	400S5-G09	5.81E-02	1.30E-02	**4.5**	20/32	Yes	HQ>1
Molybdenum	30/32	2.36E-01 - 2.53E+00	7.08E-01	400S5-G12	2.53E+00	2.00E+00	**1.3**	1/32	Yes	HQ>1
Selenium	24/32	4.26E-01 - 2.08E+00	9.90E-01	400S5-01	2.83E+00	5.20E-01	**5.4**	21/32	Yes	HQ>1
Thallium	10/32	1.60E-01 - 2.66E-01	1.86E-01	400S5-11	9.85E-01	5.00E-02	**19.7**	10/32	Yes	HQ>1
Uranium	32/32	8.16E-01 - 8.98E+01	1.21E+01	400S5-01	8.98E+01	2.50E+01	**3.6**	4/32	Yes	HQ>1
Vanadium	32/32	3.44E+00 - 5.37E+01	2.20E+01	400S5-10	5.37E+01	7.80E+00	**6.9**	29/32	Yes	HQ>1
Zinc	32/32	1.37E+01 - 2.75E+02	4.65E+01	400S5-G02	2.75E+02	4.60E+01	**6.0**	9/32	Yes	HQ>1
Total Dioxins and Furans (mg/kg)										
Total Dioxin/Furans	10/10	3.33E-06 - 1.06E-05	4.72E-06	400S5-G08	1.06E-05	3.15E-06	**3.4**	10/10	Yes	HQ>1
Total PCBs (mg/kg)										
Total PCBs	15/32	1.93E-03 - 7.40E-02	2.05E-02	400S5-G14	7.40E-02	4.10E-02	**1.8**	2/32	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)										
Carbazole	8/32	1.15E-02 - 7.23E-01	1.57E-01	400S5-01	7.23E-01	7.00E-02	**10.3**	2/32	Yes	HQ>1
Di-n-butyl phthalate	3/32	1.07E-02 - 1.81E-02	1.40E-02	400S5-09	1.98E-01	1.10E-02	**18.0**	2/32	Yes	HQ>1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)										
HMW PAHs	24/32	1.73E-01 - 4.64E+01	5.47E+00	400S5-G13	4.64E+01	1.10E+00	**42.2**	11/32	Yes	HQ>1
Radionuclides (pCi/g)										
Uranium-238	33/33	4.53E-01 - 3.00E+03	9.58E+01	400S5-GS1	3.00E+03	1.57E+03	**1.9**	1/33	Yes	HQ>1
Volatile Organic Compounds (mg/kg)										
1,1,1-Trichloroethane	0/32	-	-	-	-	4.00E-02	N/A	0/32	No	ND
1,1,2,2-Tetrachloroethane	0/32	-	-	-	-	1.27E-01	N/A	0/32	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	2/32	9.22E-04 - 2.41E-03	1.67E-03	400S5-10	1.81E-01	3.20E-01	0.6	0/32	No	HQ<1
1,1-Dichloroethane	0/32	-	-	-	-	1.40E-01	N/A	0/32	No	ND
1,1-Dichloroethene	3/32	9.45E-04 - 5.97E-03	3.90E-03	400S5-G04	1.81E-01	4.00E-02	**4.5**	0/32	Yes	HQ>1
1,2,3-Trichlorobenzene	0/32	-	-	-	-	2.00E+01	N/A	0/32	No	ND
1,2,4-Trichlorobenzene	0/32	-	-	-	-	2.70E-01	N/A	0/32	No	ND
1,2-Dibromo-3-chloropropane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/32	-	-	-	-	9.00E-02	N/A	0/32	No	ND
1,2-Dichloroethane	0/32	-	-	-	-	4.00E-01	N/A	0/32	No	ND
1,2-Dichloropropane	0/32	-	-	-	-	2.80E-01	N/A	0/32	No	ND
1,2-Dimethylbenzene	7/32	4.09E-04 - 1.71E-02	3.16E-03	400S5-G13	1.81E-01	N/A	N/A	N/A	Yes	No NFA

Table C2.5. Sector 5 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detected Concentration		Location of Max	Max Sector		Maximum	FOE		
		Range	Average	Detected Conc.	Concentration	NFA	HQ	NFA	COPEC?	Reason
1,3-Dichlorobenzene	0/32	-	-	-	-	8.00E-02	N/A	0/32	No	ND
1,4-Dichlorobenzene	0/32	-	-	-	-	8.80E-01	N/A	0/32	No	ND
1,4-Dioxane	0/28	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Butanone	10/32	1.84E-03 - 2.25E-01	2.76E-02	400S5-02	9.05E-01	1.00E+00	0.9	0/32	No	HQ<1
2-Chloroethyl vinyl ether	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/32	-	-	-	-	3.60E-01	N/A	0/32	No	ND
2-Methoxy-2-methylpropane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Acetone	20/32	2.88E-03 - 2.49E-01	3.17E-02	400S5-G04	9.05E-01	1.20E+00	0.8	0/32	No	HQ<1
Acrolein	0/32	-	-	-	-	3.00E-04	N/A	0/32	No	ND
Acrylonitrile	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzene	5/32	3.83E-04 - 8.47E-04	5.89E-04	400S5-G06	1.81E-01	1.20E-01	**1.5**	0/32	Yes	HQ>1
Bromochloromethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/32	-	-	-	-	7.00E-02	N/A	0/32	No	ND
Bromomethane	0/32	-	-	-	-	2.00E-03	N/A	0/32	No	ND
Carbon disulfide	1/32	1.62E-02 - 1.62E-02	1.62E-02	400S5-G05	9.05E-01	5.00E-03	**181.0**	1/32	Yes	HQ>1
Carbon tetrachloride	0/32	-	-	-	-	5.00E-02	N/A	0/32	No	ND
Chlorobenzene	0/32	-	-	-	-	2.40E+00	N/A	0/32	No	ND
Chloroethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	5/32	3.36E-04 - 6.58E-04	5.29E-04	400S5-12	1.81E-01	5.00E-02	**3.6**	0/32	Yes	HQ>1
Chloromethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
cis -1,2-Dichloroethene	9/32	4.55E-04 - 1.85E+00	4.98E-01	400S5-G05	1.85E+00	4.00E-02	**46.3**	5/32	Yes	HQ>1
cis -1,3-Dichloropropene	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	1/32	1.30E-03 - 1.30E-03	1.30E-03	400S5-07	1.81E-01	4.00E-02	**4.5**	0/32	Yes	HQ>1
Cyclohexane	6/32	4.66E-04 - 1.15E-03	7.59E-04	400S5-G06	1.81E-01	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	7/32	4.25E-04 - 1.03E-02	2.10E-03	400S5-G13	1.81E-01	2.70E-01	0.7	0/32	No	HQ<1
m,p-Xylene	8/32	7.77E-04 - 4.81E-02	7.92E-03	400S5-G13	3.62E-01	1.00E-01	**3.6**	0/32	Yes	HQ>1
Methyl acetate	1/32	2.33E-03 - 2.33E-03	2.33E-03	400S5-G06	9.05E-01	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	8/32	5.99E-04 - 2.34E-03	1.31E-03	400S5-G05	1.81E-01	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	14/32	1.66E-03 - 5.26E-03	3.39E-03	400S5-09	9.05E-01	2.10E-01	**4.3**	0/32	Yes	HQ>1
Styrene	1/32	1.18E-03 - 1.18E-03	1.18E-03	400S5-07	1.81E-01	1.20E+00	0.2	0/32	No	HQ<1
Tetrachloroethene	5/32	3.63E-04 - 8.35E-02	2.86E-02	400S5-02	1.81E-01	6.00E-02	**3.0**	1/32	Yes	HQ>1
Toluene	17/32	3.89E-04 - 1.40E-02	2.76E-03	400S5-04	1.81E-01	1.50E-01	**1.2**	0/32	Yes	HQ>1
Total Xylene	7/32	1.20E-03 - 6.53E-02	1.21E-02	400S5-G13	5.45E-01	1.00E-01	**5.5**	0/32	Yes	HQ>1
trans -1,2-Dichloroethene	4/32	5.80E-04 - 2.71E-02	1.39E-02	400S5-G05	1.81E-01	4.00E-02	**4.5**	0/32	Yes	HQ>1
trans -1,3-Dichloropropene	0/32	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	12/32	3.72E-04 - 2.36E+01	2.39E+00	400S5-08	2.36E+01	6.00E-02	**393.3**	6/32	Yes	HQ>1
Trichlorofluoromethane	0/32	-	-	-	-	1.64E+01	N/A	0/32	No	ND
Vinyl chloride	3/32	6.69E-04 - 2.21E-01	7.41E-02	400S5-G05	2.21E-01	3.00E-02	**7.4**	1/32	Yes	HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available

Table C2.5. Sector 5 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
		Range	Average							

Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.
HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.
Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.
High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.
m,p-xylene uses NFA for Xylene (Total).
Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

Table C2.6. Sector 6 Step 2 COPEC Screen

Analyte	FOD	Detection Limit Range	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
			Range	Average							
Metals (mg/kg)											
Aluminum	18/18	5 - 114	1.48E+04	8.84E+03	400S6-02	1.48E+04	5.00E+01	**296.0**	18/18	Yes	HQ>1
Antimony	11/19	2.01 - 30	6.98E+01	7.98E+00	SOU047-001	6.98E+01	2.70E-01	**258.5**	11/19	Yes	HQ>1
Arsenic	19/19	0.971 - 11	2.24E+01	7.05E+00	SOU047-001	2.24E+01	1.80E+01	**1.2**	1/19	Yes	HQ>1
Barium	18/19	0.777 - 100	3.25E+02	1.03E+02	SOU047-001	3.25E+02	3.30E+02	1.0	0/19	No	HQ<1
Beryllium	18/18	0.0971 - 0.114	01	4.46E-01	SOU047-001	7.00E-01	2.50E+00	0.3	0/18	No	HQ<1
Boron	17/17	2.91 - 3.42	4.05E+00	2.43E+00	400S6-07	4.05E+00	7.50E+00	0.5	0/17	No	HQ<1
Cadmium	18/19	0.05 - 12	1.60E+01	1.40E+00	400S6-08	1.60E+01	3.60E-01	**44.4**	9/19	Yes	HQ>1
Calcium	1/1	250 - 250	8.20E+04	8.20E+04	SOU047-001	8.20E+04	N/A	N/A	N/A	Yes	No NFA
Chromium	18/19	0.583 - 85	7.61E+01	2.22E+01	400S6-03	7.61E+01	2.30E+01	**3.3**	3/19	Yes	HQ>1
Cobalt	18/18	0.194 - 0.228	1.04E+02	1.16E+01	400S6-G08	1.04E+02	1.30E+01	**8.0**	1/18	Yes	HQ>1
Copper	18/19	0.389 - 35	3.05E+02	3.57E+01	400S6-08	3.05E+02	2.80E+01	**10.9**	3/19	Yes	HQ>1
Iron	19/19	5 - 228	2.95E+04	1.66E+04	SOU047-001	2.95E+04	N/A	N/A	0/19	Yes	No NFA
Lead	19/19	0.389 - 13	5.99E+01	2.03E+01	400S6-08	5.99E+01	1.10E+01	**5.4**	13/19	Yes	HQ>1
Magnesium	1/1	50 - 50	3.58E+03	3.58E+03	SOU047-001	3.58E+03	N/A	N/A	N/A	Yes	No NFA
Manganese	19/19	1.05 - 105	3.84E+03	5.09E+02	400S6-G08	3.84E+03	2.20E+02	**17.5**	13/19	Yes	HQ>1
Mercury	16/19	0.0225 - 10	01	3.28E-02	400S6-08	5.00E+00	1.30E-02	**384.6**	15/19	Yes	HQ>1
Molybdenum	18/19	0.194 - 15	1.88E+00	7.48E-01	400S6-08	7.50E+00	2.00E+00	3.8	0/19	Yes	HQ>1
Nickel	18/19	0.389 - 65	1.35E+02	3.31E+01	400S6-08	1.35E+02	3.80E+01	**3.6**	5/19	Yes	HQ>1
Selenium	15/19	0.5 - 20	1.57E+00	1.09E+00	400S6-07	1.00E+01	5.20E-01	**19.2**	15/19	Yes	HQ>1
Silver	8/19	0.2 - 10	6.91E+00	2.24E+00	400S6-08	6.91E+00	4.20E+00	**1.6**	2/19	Yes	HQ>1
Sodium	1/1	20 - 20	7.00E+01	7.00E+01	SOU047-001	7.00E+01	N/A	N/A	N/A	Yes	No NFA
Thallium	8/18	0.2 - 0.456	1.01E+00	2.88E-01	400S6-G08	1.01E+00	5.00E-02	**20.2**	8/18	Yes	HQ>1
Uranium	19/19	0.0401 - 20	3.00E+02	5.09E+01	400S6-01	3.00E+02	2.50E+01	**12.0**	9/19	Yes	HQ>1
Vanadium	18/19	1 - 70	3.28E+01	2.28E+01	SOU047-001	3.50E+01	7.80E+00	**4.5**	17/19	Yes	HQ>1
Zinc	19/19	2 - 44.4	6.96E+02	1.21E+02	400S6-G04	6.96E+02	4.60E+01	**15.1**	13/19	Yes	HQ>1
Fluoride	17/17	1.06 - 1.21	3.12E+01	1.49E+01	400S6-G04	3.12E+01	3.20E+01	1.0	0/17	No	HQ<1
Total PCBs (mg/kg)											
Total PCBs	9/19	0.00367 - 5	01	1.53E-01	400S6-01	2.50E+00	4.10E-02	**61.0**	2/19	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)											
1,1-biphenyl	0/17	0.361 - 14.5	-	-	-	-	2.00E-01	N/A	0/17	No	ND
2,4,5-Trichlorophenol	0/18	0.35 - 14.5	-	-	-	-	4.00E+00	N/A	0/18	No	ND
2,4,6-Trichlorophenol	0/18	0.35 - 14.5	-	-	-	-	9.94E+00	N/A	0/18	No	ND
2,4-Dichlorophenol	0/18	0.35 - 14.5	-	-	-	-	5.00E-02	N/A	0/18	No	ND
2,4-Dimethylphenol	0/18	0.35 - 14.5	-	-	-	-	4.00E-02	N/A	0/18	No	ND
2,4-Dinitrophenol	0/18	0.722 - 29	-	-	-	-	6.10E-02	N/A	0/18	No	ND
2,4-Dinitrotoluene	0/18	0.35 - 14.5	-	-	-	-	6.00E+00	N/A	0/18	No	ND
2,6-Dinitrotoluene	0/18	0.35 - 14.5	-	-	-	-	4.00E+00	N/A	0/18	No	ND
2-Chloronaphthalene	0/18	0.0361 - 1.45	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/18	0.35 - 14.5	-	-	-	-	6.00E-02	N/A	0/18	No	ND
2-Methyl-4,6-dinitrophenol	0/18	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylphenol	0/18	0.35 - 14.5	-	-	-	-	1.00E-01	N/A	0/18	No	ND
2-Nitrobenzenamine	0/18	0.361 - 14.5	-	-	-	-	2.00E-02	N/A	0/18	No	ND
2-Nitrophenol	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
3,3'-Dichlorobenzidine	0/18	0.361 - 14.5	-	-	-	-	3.00E-02	N/A	0/18	No	ND
3-Nitrobenzenamine	0/18	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Bromophenyl phenyl ether	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chloro-3-methylphenol	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chlorobenzenamine	0/18	0.35 - 14.5	-	-	-	-	1.00E+00	N/A	0/18	No	ND
4-Chlorophenyl phenyl ether	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/18	0.361 - 14.5	-	-	-	-	5.12E+00	N/A	0/18	No	ND
Acetophenone	0/17	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Atrazine	0/17	0.361 - 14.5	-	-	-	-	5.00E-05	N/A	0/17	No	ND
Benzaldehyde	0/17	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzenemethanol	0/1	0.35 - 0.35	-	-	-	-	2.00E-03	N/A	0/1	No	ND
Benzoic acid	0/1	1.7 - 1.7	-	-	-	-	1.00E-02	N/A	0/1	No	ND
Bis(2-chloroethoxy)methane	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/18	0.0069 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroisopropyl) ether	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	4/18	0.0361 - 1.45	7.00E+00	1.77E+00	SOU047-001	7.00E+00	2.00E-02	**350.0**	4/18	Yes	HQ>1
Butyl benzyl phthalate	0/18	0.0361 - 1.45	-	-	-	-	5.90E-01	N/A	0/18	No	ND
Caprolactam	0/17	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	6/17	0.0361 - 1.45	01	2.12E-01	400S6-05	7.73E-01	7.00E-02	**11.0**	2/17	Yes	HQ>1
Dibenzofuran	0/18	0.35 - 14.5	-	-	-	-	1.50E-01	N/A	0/18	No	ND
Diethyl phthalate	0/18	0.0361 - 1.45	-	-	-	-	2.50E-01	N/A	0/18	No	ND
Dimethyl phthalate	0/18	0.0361 - 1.45	-	-	-	-	3.50E-01	N/A	0/18	No	ND
Di-n-butyl phthalate	4/18	0.0361 - 1.45	02	2.15E-02	400S6-04	7.25E-01	1.10E-02	**65.9**	4/18	Yes	HQ>1
Di-n-octylphthalate	0/18	0.0361 - 1.45	-	-	-	-	9.10E-01	N/A	0/18	No	ND
Diphenylamine	0/17	0.361 - 14.5	-	-	-	-	1.01E+00	N/A	0/17	No	ND
Hexachlorobenzene	0/18	0.35 - 14.5	-	-	-	-	7.90E-02	N/A	0/18	No	ND
Hexachlorobutadiene	0/18	0.35 - 14.5	-	-	-	-	9.00E-03	N/A	0/18	No	ND
Hexachlorocyclopentadiene	0/18	0.361 - 14.5	-	-	-	-	1.00E-03	N/A	0/18	No	ND
Hexachloroethane	0/18	0.35 - 14.5	-	-	-	-	2.40E-02	N/A	0/18	No	ND
Isophorone	0/18	0.35 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m,p-Cresol	0/1	0.69 - 0.69	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m+p Methylphenol	0/17	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Nitrobenzene	0/18	0.361 - 14.5	-	-	-	-	2.20E+00	N/A	0/18	No	ND
N-Nitroso-di-n-propylamine	0/18	0.0069 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
N-Nitrosodiphenylamine	0/1	0.35 - 0.35	-	-	-	-	5.45E-01	N/A	0/1	No	ND
Pentachlorophenol	0/18	0.361 - 14.5	-	-	-	-	2.10E+00	N/A	0/18	No	ND
Phenol	0/18	0.35 - 14.5	-	-	-	-	7.90E-01	N/A	0/18	No	ND
p-Nitroaniline	0/18	0.361 - 14.5	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pyridine	0/1	0.69 - 0.69	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Low Molecular Weight Polycylic Aromatic Hydrocarbons [LMW-PAHs] (mg/kg)											
2-Methylnaphthalene	0/18	0.0361 - 1.45	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthene	6/18	0.0361 - 1.45	01	1.45E-01	400S6-05	7.25E-01	N/A	N/A	N/A	--	--
Acenaphthylene	0/18	0.0361 - 1.45	-	-	-	-	N/A	N/A	N/A	--	--
Anthracene	6/18	0.0361 - 1.45	1.06E+00	3.77E-01	400S6-05	1.06E+00	N/A	N/A	N/A	--	--

		Detection Limit	Detected Concentration		Location of Max	Max Sector		Maximum	FOE		
Analyte	FOD	Range	Range	Average	Detected Conc.	Concentration	NFA	HQ	NFA	COPEC?	Reason
Fluorene	5/18	0.0361 - 1.45	01	1.86E-01	400S6-08	7.25E-01	N/A	N/A	N/A	--	--
Naphthalene	0/18	0.0361 - 1.45	-	-	-	-	N/A	N/A	N/A	--	--
Phenanthrene	15/18	0.0361 - 1.45	5.27E+00	8.35E-01	400S6-05	5.27E+00	N/A	N/A	N/A	--	--
LMW PAHs	15/18	0.0361 - 1.45	7.63E+00	1.83E+00	400S6-05	7.63E+00	2.90E+01	0.3	0/18	No	HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)											
Benz(a)anthracene	17/18	0.0361 - 1.45	3.87E+00	6.63E-01	400S6-05	3.87E+00	N/A	N/A	N/A	--	--
Benzo(a)pyrene	15/18	0.0069 - 1.45	3.42E+00	6.59E-01	400S6-08	3.42E+00	N/A	N/A	N/A	--	--
Benzo(b)fluoranthene	16/18	0.0361 - 1.45	4.62E+00	8.92E-01	400S6-08	4.62E+00	N/A	N/A	N/A	--	--
Benzo(ghi)perylene	10/18	0.0361 - 1.45	1.81E+00	4.64E-01	400S6-08	1.81E+00	N/A	N/A	N/A	--	--
Benzo(k)fluoranthene	14/18	0.0361 - 1.45	1.73E+00	3.47E-01	400S6-08	1.73E+00	N/A	N/A	N/A	--	--
Chrysene	16/18	0.0361 - 1.45	3.96E+00	7.05E-01	400S6-08	3.96E+00	N/A	N/A	N/A	--	--
Dibenz(a,h)anthracene	6/18	0.0069 - 1.45	01	2.14E-01	400S6-05	7.25E-01	N/A	N/A	N/A	--	--
Fluoranthene	17/18	0.0361 - 1.45	9.06E+00	1.39E+00	400S6-05	9.06E+00	N/A	N/A	N/A	--	--
Indeno(1,2,3-cd)pyrene	11/18	0.0361 - 1.45	2.07E+00	5.10E-01	400S6-05	2.07E+00	N/A	N/A	N/A	--	--
Pyrene	17/18	0.0361 - 1.45	5.85E+00	1.04E+00	400S6-05	5.85E+00	N/A	N/A	N/A	--	--
HMW PAHs	17/18	0.0069 - 1.45	3.59E+01	6.71E+00	400S6-05	3.59E+01	1.10E+00	**32.6**	13/18	Yes	HQ>1
Radionuclides (pCi/g)											
Americium-241	5/19	0.016 - 0.797	3.93E+01	1.65E+01	400S6-01	3.93E+01	2.16E+03	0.0	0/19	No	HQ<1
Cesium-137	15/19	0.0295 - 0.287	3.42E+00	7.66E-01	400S6-GS1	3.42E+00	2.08E+01	0.2	0/19	No	HQ<1
Neptunium-237	5/19	0.011 - 1	1.86E+01	4.47E+00	400S6-01	1.86E+01	8.14E+02	0.0	0/19	No	HQ<1
Plutonium-238	3/19	0.015 - 1.37	3.51E+00	1.94E+00	400S6-GS1	3.51E+00	1.75E+03	0.0	0/19	No	HQ<1
Plutonium-239/240	7/19	0.01 - 1.33	2.39E+02	5.56E+01	400S6-GS1	2.39E+02	1.27E+03	0.2	0/19	No	HQ<1
Technetium-99	15/19	0.5 - 4.05	1.61E+03	1.75E+02	400S6-GS1	1.61E+03	2.19E+03	0.7	0/19	No	HQ<1
Thorium-228	1/1	0.04 - 0.04	01	7.70E-01	SOU047-001	7.70E-01	5.30E+02	0.0	0/1	No	HQ<1
Thorium-230	17/19	0.02 - 3.9	1.06E+04	7.50E+02	400S6-GS1	1.06E+04	9.98E+03	**1.1**	1/19	Yes	HQ>1
Thorium-232	1/1	0.02 - 0.02	01	8.60E-01	SOU047-001	8.60E-01	1.52E+03	0.0	0/1	No	HQ<1
Uranium-233/234	18/18	0.45 - 1.8	4.13E+02	4.72E+01	400S6-GS1	4.13E+02	5.14E+03	0.1	0/18	No	HQ<1
Uranium-234	1/1	0.02 - 0.02	6.85E+00	6.85E+00	SOU047-001	6.85E+00	5.14E+03	0.0	0/1	No	HQ<1
Uranium-235/236	8/19	0.01 - 1.49	2.80E+01	7.08E+00	400S6-GS1	2.80E+01	2.75E+03	0.0	0/19	No	HQ<1
Uranium-238	19/19	0.02 - 1.46	4.40E+02	4.93E+01	400S6-GS1	4.40E+02	1.57E+03	0.3	0/19	No	HQ<1
Volatile Organic Compounds (mg/kg)											
1,1,1-Trichloroethane	0/17	0.000929 - 0.113	-	-	-	-	4.00E-02	N/A	0/17	No	ND
1,1,2,2-Tetrachloroethane	0/17	0.000929 - 0.113	-	-	-	-	1.27E-01	N/A	0/17	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/17	0.00465 - 0.564	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	0/17	0.000929 - 0.113	-	-	-	-	3.20E-01	N/A	0/17	No	ND
1,1-Dichloroethane	0/17	0.000929 - 0.113	-	-	-	-	1.40E-01	N/A	0/17	No	ND
1,1-Dichloroethene	0/17	0.000929 - 0.113	-	-	-	-	4.00E-02	N/A	0/17	No	ND
1,2,3-Trichlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	2.00E+01	N/A	0/17	No	ND
1,2,4-Trichlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	2.70E-01	N/A	0/17	No	ND
1,2-Dibromo-3-chloropropane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	9.00E-02	N/A	0/17	No	ND
1,2-Dichloroethane	0/17	0.000929 - 0.113	-	-	-	-	4.00E-01	N/A	0/17	No	ND
1,2-Dichloropropane	0/17	0.000929 - 0.113	-	-	-	-	2.80E-01	N/A	0/17	No	ND
1,2-Dimethylbenzene	1/17	0.000929 - 0.113	04	3.74E-04	400S6-01	5.65E-02	N/A	N/A	N/A	Yes	No NFA

Table C2.6. Sector 6 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
1,3-Dichlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	8.00E-02	N/A	0/17	No	ND
1,4-Dichlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	8.80E-01	N/A	0/17	No	ND
1,4-Dioxane	0/17	0.0465 - 5.64	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Butanone	3/17	0.00465 - 0.564	01	8.79E-02	400S6-G05	2.82E-01	1.00E+00	0.3	0/17	No	HQ<1
2-Chloroethyl vinyl ether	0/17	0.00465 - 0.564	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/17	0.00465 - 0.564	-	-	-	-	3.60E-01	N/A	0/17	No	ND
2-Methoxy-2-methylpropane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	0/17	0.00465 - 0.564	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Acetone	5/17	0.00465 - 0.564	02	1.13E-02	400S6-08	2.82E-01	1.20E+00	0.2	0/17	No	HQ<1
Acrolein	0/17	0.00465 - 0.564	-	-	-	-	3.00E-04	N/A	0/17	No	ND
Acrylonitrile	0/17	0.00465 - 0.564	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzene	2/17	0.000929 - 0.113	04	5.93E-04	400S6-01	5.65E-02	1.20E-01	0.5	0/17	No	HQ<1
Bromochloromethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/17	0.000929 - 0.113	-	-	-	-	7.00E-02	N/A	0/17	No	ND
Bromomethane	0/17	0.000929 - 0.113	-	-	-	-	2.00E-03	N/A	0/17	No	ND
Carbon disulfide	0/17	0.00465 - 0.564	-	-	-	-	5.00E-03	N/A	0/17	No	ND
Carbon tetrachloride	0/17	0.000929 - 0.113	-	-	-	-	5.00E-02	N/A	0/17	No	ND
Chlorobenzene	0/17	0.000929 - 0.113	-	-	-	-	2.40E+00	N/A	0/17	No	ND
Chloroethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	**N/A**	N/A	Yes	No NFA
Chloroform	1/17	0.000929 - 0.113	04	8.88E-04	400S6-08	5.65E-02	5.00E-02	**1.1**	0/17	Yes	HQ>1
Chloromethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
cis -1,2-Dichloroethene	1/17	0.000929 - 0.113	04	9.29E-04	400S6-06	5.65E-02	4.00E-02	**1.4**	0/17	Yes	HQ>1
cis -1,3-Dichloropropene	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	0/17	0.000929 - 0.113	-	-	-	-	4.00E-02	N/A	0/17	No	ND
Cyclohexane	2/17	0.000929 - 0.113	03	1.11E-03	400S6-01	5.65E-02	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	1/17	0.000929 - 0.113	04	3.83E-04	400S6-01	5.65E-02	2.70E-01	0.2	0/17	No	HQ<1
m,p-Xylene	2/17	0.00186 - 0.226	04	7.79E-04	400S6-01	1.13E-01	1.00E-01	**1.1**	0/17	Yes	HQ>1
Methyl acetate	0/17	0.00465 - 0.564	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	4/17	0.000929 - 0.113	03	1.06E-03	400S6-01	5.65E-02	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	5/17	0.00465 - 0.564	01	4.82E-02	400S6-G05	2.82E-01	2.10E-01	**1.3**	1/17	Yes	HQ>1
Styrene	0/17	0.000929 - 0.113	-	-	-	-	1.20E+00	N/A	0/17	No	ND
Tetrachloroethene	0/17	0.000929 - 0.113	-	-	-	-	6.00E-02	N/A	0/17	No	ND
Toluene	7/17	0.000929 - 0.113	03	8.27E-04	400S6-01	5.65E-02	1.50E-01	0.4	0/17	No	HQ<1
Total Xylene	1/17	0.00279 - 0.338	03	1.29E-03	400S6-01	1.69E-01	1.00E-01	**1.7**	0/17	Yes	HQ>1
trans -1,2-Dichloroethene	0/17	0.000929 - 0.113	-	-	-	-	4.00E-02	N/A	0/17	No	ND
trans -1,3-Dichloropropene	0/17	0.000929 - 0.113	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	4/17	0.000929 - 0.121	02	3.07E-03	400S6-03	6.05E-02	6.00E-02	1.0	0/17	Yes	HQ>1
Trichlorofluoromethane	0/17	0.000929 - 0.113	-	-	-	-	1.64E+01	N/A	0/17	No	ND
Vinyl chloride	0/17	0.000929 - 0.113	-	-	-	-	3.00E-02	N/A	0/17	No	ND

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available

Table C2.6. Sector 6 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
			Range	Average							

Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.
HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.
Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.
High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.
m,p-xylene uses NFA for Xylene (Total).
Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

Table C2.7. Sector 7 Step 2 COPEC Screen

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Metals (mg/kg)											
Aluminum	19/19	9.87 - 114	3.16E+03 - 1.45E+04	9.27E+03	400S7-G04	1.45E+04	5.00E+01	**290.0**	19/19	Yes	HQ>1
Antimony	14/19	1.92 - 2.46	3.56E-01 - 1.27E+00	8.55E-01	400S7-07	1.27E+00	2.70E-01	**4.7**	14/19	Yes	HQ>1
Arsenic	19/19	1.01 - 4.94	3.24E+00 - 9.00E+00	5.47E+00	400S7-04	9.00E+00	1.80E+01	0.5	0/19	No	HQ<1
Barium	19/19	0.79 - 0.993	1.10E+01 - 1.06E+02	7.10E+01	400S7-G01	1.06E+02	3.30E+02	0.3	0/19	No	HQ<1
Beryllium	19/19	0.0987 - 0.124	1.22E-01 - 7.44E-01	4.34E-01	400S7-G04	7.44E-01	2.50E+00	0.3	0/19	No	HQ<1
Boron	17/19	2.96 - 3.72	1.12E+00 - 4.26E+00	1.97E+00	400S7-09	4.26E+00	7.50E+00	0.6	0/19	No	HQ<1
Cadmium	16/19	0.202 - 0.987	5.45E-02 - 1.70E+00	2.97E-01	400S7-01	1.70E+00	3.60E-01	**4.7**	3/19	Yes	HQ>1
Chromium	19/19	0.592 - 0.745	9.08E+00 - 4.01E+01	1.82E+01	400S7-06	4.01E+01	2.30E+01	**1.7**	4/19	Yes	HQ>1
Cobalt	19/19	0.197 - 0.248	1.88E+00 - 9.63E+00	6.53E+00	400S7-G07	9.63E+00	1.30E+01	0.7	0/19	No	HQ<1
Copper	19/19	0.395 - 4.23	2.84E+00 - 2.61E+02	2.41E+01	400S7-01	2.61E+02	2.80E+01	**9.3**	2/19	Yes	HQ>1
Iron	19/19	19.7 - 248	3.88E+03 - 2.51E+04	1.58E+04	400S7-04	2.51E+04	N/A	N/A	N/A	Yes	No NFA
Lead	19/19	0.395 - 0.496	3.58E+00 - 5.65E+01	1.24E+01	400S7-01	5.65E+01	1.10E+01	**5.1**	8/19	Yes	HQ>1
Manganese	19/19	0.987 - 12.4	1.07E+02 - 5.81E+02	3.14E+02	400S7-04	5.81E+02	2.20E+02	**2.6**	17/19	Yes	HQ>1
Mercury	18/19	0.0223 - 0.446	1.19E-02 - 7.55E+00	6.02E-01	400S7-03	7.55E+00	1.30E-02	**580.8**	17/19	Yes	HQ>1
Molybdenum	19/19	0.202 - 0.987	2.52E-01 - 1.62E+00	5.34E-01	400S7-01	1.62E+00	2.00E+00	0.8	0/19	No	HQ<1
Nickel	19/19	0.395 - 0.496	4.85E+00 - 1.32E+02	1.98E+01	400S7-01	1.32E+02	3.80E+01	**3.5**	2/19	Yes	HQ>1
Selenium	17/19	1.01 - 4.94	4.75E-01 - 1.67E+00	1.00E+00	400S7-02	2.47E+00	5.20E-01	**4.8**	16/19	Yes	HQ>1
Silver	10/19	0.48 - 5.63	1.24E-01 - 1.25E+00	4.75E-01	400S7-03	2.82E+00	4.20E+00	0.7	0/19	No	HQ<1
Thallium	5/19	0.395 - 0.496	1.45E-01 - 1.92E-01	1.67E-01	400S7-07	2.48E-01	5.00E-02	**5.0**	5/19	Yes	HQ>1
Uranium	19/19	0.0395 - 0.0496	7.52E-01 - 8.39E+01	1.78E+01	400S7-01	8.39E+01	2.50E+01	**3.4**	3/19	Yes	HQ>1
Vanadium	19/19	3.95 - 4.96	8.44E+00 - 3.76E+01	2.28E+01	400S7-G04	3.76E+01	7.80E+00	**4.8**	19/19	Yes	HQ>1
Zinc	19/19	4.05 - 21.4	1.25E+01 - 1.38E+02	4.74E+01	400S7-G08	1.38E+02	4.60E+01	**3.0**	5/19	Yes	HQ>1
Fluoride	19/19	1.06 - 1.26	4.81E-01 - 3.68E+01	1.39E+01	400S7-01	3.68E+01	3.20E+01	1.2	1/19	Yes	HQ>1
Total Dioxins and Furans (mg/kg)											
Total Dioxin/Furans	1/1	-	5.80E-06 - 5.80E-06	5.80E-06	400S7-03	5.80E-06	3.15E-06	**1.8**	1/1	Yes	HQ>1
Total PCBs (mg/kg)											
Total PCBs	3/19	0.00351 - 0.733	4.23E-03 - 8.60E-03	7.03E-03	400S7-01	3.67E-01	4.10E-02	9.0	0/19	Yes	HQ>1
Semivolatile Organic Compounds (mg/kg)											
1,1-biphenyl	0/19	0.346 - 4.15	-	-	-	-	2.00E-01	N/A	0/19	No	ND
2,4,5-Trichlorophenol	0/19	0.346 - 4.15	-	-	-	-	4.00E+00	N/A	0/19	No	ND
2,4,6-Trichlorophenol	0/19	0.346 - 4.15	-	-	-	-	9.94E+00	N/A	0/19	No	ND
2,4-Dichlorophenol	0/19	0.346 - 4.15	-	-	-	-	5.00E-02	N/A	0/19	No	ND
2,4-Dimethylphenol	0/19	0.346 - 4.15	-	-	-	-	4.00E-02	N/A	0/19	No	ND
2,4-Dinitrophenol	0/19	0.693 - 8.29	-	-	-	-	6.10E-02	N/A	0/19	No	ND
2,4-Dinitrotoluene	0/19	0.346 - 4.15	-	-	-	-	6.00E+00	N/A	0/19	No	ND
2,6-Dinitrotoluene	0/19	0.346 - 4.15	-	-	-	-	4.00E+00	N/A	0/19	No	ND
2-Chloronaphthalene	0/19	0.0346 - 0.415	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/19	0.346 - 4.15	-	-	-	-	6.00E-02	N/A	0/19	No	ND
2-Methyl-4,6-dinitrophenol	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylphenol	0/19	0.346 - 4.15	-	-	-	-	1.00E-01	N/A	0/19	No	ND
2-Nitrobenzenamine	0/19	0.346 - 4.15	-	-	-	-	2.00E-02	N/A	0/19	No	ND
2-Nitrophenol	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
3,3'-Dichlorobenzidine	0/19	0.346 - 4.15	-	-	-	-	3.00E-02	N/A	0/19	No	ND
3-Nitrobenzenamine	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA

Table C2.7. Sector 7 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
4-Bromophenyl phenyl ether	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chloro-3-methylphenol	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Chlorobenzenamine	0/19	0.346 - 4.15	-	-	-	-	1.00E+00	N/A	0/19	No	ND
4-Chlorophenyl phenyl ether	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/19	0.346 - 4.15	-	-	-	-	5.12E+00	N/A	0/19	No	ND
Acetophenone	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Atrazine	0/19	0.346 - 4.15	-	-	-	-	5.00E-05	N/A	0/19	No	ND
Benzaldehyde	0/18	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethoxy)methane	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroisopropyl) ether	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	4/19	0.0346 - 0.415	1.15E-02 - 1.11E-01	3.97E-02	400S7-03	2.08E-01	2.00E-02	10.4	2/19	Yes	HQ>1
Butyl benzyl phthalate	2/19	0.0346 - 0.415	2.13E-01 - 6.17E+00	3.19E+00	400S7-07	6.17E+00	5.90E-01	10.5	1/19	Yes	HQ>1
Caprolactam	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	3/19	0.0346 - 0.415	1.21E-01 - 5.72E-01	2.81E-01	400S7-10	5.72E-01	7.00E-02	**8.2**	3/19	Yes	HQ>1
Dibenzofuran	0/19	0.346 - 4.15	-	-	-	-	1.50E-01	N/A	0/19	No	ND
Diethyl phthalate	0/19	0.0346 - 0.415	-	-	-	-	2.50E-01	N/A	0/19	No	ND
Dimethyl phthalate	0/19	0.0346 - 0.415	-	-	-	-	3.50E-01	N/A	0/19	No	ND
Di-n-butyl phthalate	3/19	0.0346 - 0.415	1.34E-02 - 2.84E-02	1.97E-02	400S7-09	2.08E-01	1.10E-02	**18.9**	3/19	Yes	HQ>1
Di-n-octylphthalate	0/19	0.0346 - 0.415	-	-	-	-	9.10E-01	N/A	0/19	No	ND
Diphenylamine	0/19	0.346 - 4.15	-	-	-	-	1.01E+00	N/A	0/19	No	ND
Hexachlorobenzene	0/19	0.346 - 4.15	-	-	-	-	7.90E-02	N/A	0/19	No	ND
Hexachlorobutadiene	0/19	0.346 - 4.15	-	-	-	-	9.00E-03	N/A	0/19	No	ND
Hexachlorocyclopentadiene	0/19	0.346 - 4.15	-	-	-	-	1.00E-03	N/A	0/19	No	ND
Hexachloroethane	0/19	0.346 - 4.15	-	-	-	-	2.40E-02	N/A	0/19	No	ND
Isophorone	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m+p Methylphenol	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Nitrobenzene	0/19	0.346 - 4.15	-	-	-	-	2.20E+00	N/A	0/19	No	ND
N-Nitroso-di-n-propylamine	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pentachlorophenol	0/19	0.346 - 4.15	-	-	-	-	2.10E+00	N/A	0/19	No	ND
Phenol	0/19	0.346 - 4.15	-	-	-	-	7.90E-01	N/A	0/19	No	ND
p-Nitroaniline	0/19	0.346 - 4.15	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Low Molecular Weight Polycyclic Aromatic Hydrocarbons [LMW-PAHs] (mg/kg)											
2-Methylnaphthalene	0/19	0.0346 - 0.415	-	-	-	-	N/A	N/A	N/A	--	--
Acenaphthene	5/19	0.0346 - 0.415	9.15E-02 - 6.32E-01	2.53E-01	400S7-10	6.32E-01	N/A	N/A	N/A	--	--
Acenaphthylene	0/19	0.0346 - 0.415	-	-	-	-	N/A	N/A	N/A	--	--
Anthracene	6/19	0.0346 - 0.415	1.40E-01 - 9.96E-01	4.23E-01	400S7-10	9.96E-01	N/A	N/A	N/A	--	--
Fluorene	4/19	0.0346 - 0.415	6.50E-02 - 4.88E-01	2.19E-01	400S7-10	4.88E-01	N/A	N/A	N/A	--	--
Naphthalene	1/19	0.0346 - 0.415	1.40E-01 - 1.40E-01	1.40E-01	400S7-10	2.08E-01	N/A	N/A	N/A	--	--
Phenanthrene	9/19	0.0346 - 0.415	5.64E-02 - 5.33E+00	1.47E+00	400S7-10	5.33E+00	N/A	N/A	N/A	--	--
LMW PAHs	9/19	0.0346 - 0.415	1.68E-01 - 7.97E+00	2.61E+00	400S7-10	7.97E+00	2.90E+01	0.3	0/19	No	HQ<1
High Molecular Weight Polycyclic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)											
Benz(a)anthracene	10/19	0.0346 - 0.415	3.78E-02 - 2.54E+00	8.20E-01	400S7-10	2.54E+00	N/A	N/A	N/A	--	--
Benzo(a)pyrene	9/19	0.0346 - 0.415	3.52E-02 - 2.38E+00	8.94E-01	400S7-G08	2.38E+00	N/A	N/A	N/A	--	--
Benzo(b)fluoranthene	10/19	0.0346 - 0.415	5.01E-02 - 3.75E+00	1.10E+00	400S7-G08	3.75E+00	N/A	N/A	N/A	--	--

Table C2.7. Sector 7 Step 2 COPEC Screen (Continued)

		Detection Limit	Detected Concentration		Location of Max	Max Sector		Maximum	FOE		
Analyte	FOD	Range	Range	Average	Detected Conc.	Concentration	NFA	HQ	NFA	COPEC?	Reason
Benzo(ghi)perylene	6/19	0.0346 - 0.415	3.15E-02 - 1.52E+00	7.26E-01	400S7-10	1.52E+00	N/A	N/A	N/A	--	--
Benzo(k)fluoranthene	8/19	0.0346 - 0.415	2.00E-02 - 1.19E+00	4.89E-01	400S7-G08	1.19E+00	N/A	N/A	N/A	--	--
Chrysene	9/19	0.0346 - 0.415	4.12E-02 - 2.63E+00	8.85E-01	400S7-10	2.63E+00	N/A	N/A	N/A	--	--
Dibenz(a,h)anthracene	3/19	0.0346 - 0.415	2.23E-01 - 4.28E-01	2.95E-01	400S7-10	4.28E-01	N/A	N/A	N/A	--	--
Fluoranthene	10/19	0.0346 - 0.415	8.07E-02 - 6.37E+00	1.98E+00	400S7-10	6.37E+00	N/A	N/A	N/A	--	--
Indeno(1,2,3-cd)pyrene	6/19	0.0346 - 0.415	3.64E-02 - 1.62E+00	6.83E-01	400S7-10	1.62E+00	N/A	N/A	N/A	--	--
Pyrene	10/19	0.0346 - 0.415	6.46E-02 - 5.66E+00	1.55E+00	400S7-10	5.66E+00	N/A	N/A	N/A	--	--
HMW PAHs	10/19	0.0346 - 0.415	4.28E-01 - 2.68E+01	8.64E+00	400S7-10	2.68E+01	1.10E+00	**24.4**	8/19	Yes	HQ>1
Radionuclides (pCi/g)											
Actinium-227	0/1	0.316 - 0.316	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Americium-241	1/20	0.373 - 1.07	3.99E+00 - 3.99E+00	3.99E+00	400S7-GS1	3.99E+00	2.16E+03	0.0	0/20	No	HQ<1
Cesium-137	14/20	0.0292 - 0.117	6.07E-02 - 2.93E+00	8.44E-01	400S7-G04	2.93E+00	2.08E+01	0.1	0/20	No	HQ<1
Cobalt-60	0/1	0.0435 - 0.0435	-	-	-	-	6.13E+02	N/A	0/1	No	ND
Lead-210	0/1	7.71 - 7.71	-	-	-	-	1.29E+03	N/A	0/1	No	ND
Neptunium-237	3/20	0.337 - 1.03	9.74E-01 - 6.50E+00	3.60E+00	400S7-GS1	6.50E+00	8.14E+02	0.0	0/20	No	HQ<1
Plutonium-238	1/20	0.178 - 1.34	4.56E-01 - 4.56E-01	4.56E-01	400S7-GS1	6.70E-01	1.75E+03	0.0	0/20	No	HQ<1
Plutonium-239/240	7/20	0.302 - 0.849	1.39E+00 - 1.50E+01	3.84E+00	400S7-GS1	1.50E+01	1.27E+03	0.0	0/20	No	HQ<1
Radium-226	1/1	0.76 - 0.76	1.33E+00 - 1.33E+00	1.33E+00	400S7-03	1.33E+00	2.88E+01	0.0	0/1	No	HQ<1
Strontium-90	0/1	1.67 - 1.67	-	-	-	-	2.25E+01	N/A	0/1	No	ND
Technetium-99	14/20	2.35 - 4.21	3.18E+00 - 1.63E+02	5.11E+01	400S7-01	1.63E+02	2.19E+03	0.1	0/20	No	HQ<1
Thorium-228	0/1	0.712 - 0.712	-	-	-	-	5.30E+02	N/A	0/1	No	ND
Thorium-230	20/20	0.394 - 1.13	7.01E-01 - 1.52E+02	1.14E+01	400S7-GS1	1.52E+02	9.98E+03	0.0	0/20	No	HQ<1
Thorium-232	1/1	0.472 - 0.472	9.16E-01 - 9.16E-01	9.16E-01	400S7-03	9.16E-01	1.52E+03	0.0	0/1	No	HQ<1
Uranium-233/234	10/12	0.453 - 0.896	9.11E-01 - 2.79E+01	8.28E+00	400S7-01	2.79E+01	5.14E+03	0.0	0/12	No	HQ<1
Uranium-234	8/8	0.659 - 0.863	2.24E+00 - 8.67E+00	6.16E+00	400S7-G01	8.67E+00	5.14E+03	0.0	0/8	No	HQ<1
Uranium-235	2/8	0.24 - 0.608	7.77E-01 - 8.25E-01	8.01E-01	400S7-G03	8.25E-01	2.75E+03	0.0	0/8	No	HQ<1
Uranium-235/236	4/12	0.296 - 0.663	5.63E-01 - 1.12E+00	8.48E-01	400S7-GS1	1.12E+00	2.75E+03	0.0	0/12	No	HQ<1
Uranium-238	19/20	0.247 - 0.802	1.10E+00 - 3.36E+01	8.93E+00	400S7-01	3.36E+01	1.57E+03	0.0	0/20	No	HQ<1
Volatile Organic Compounds (mg/kg)											
1,1,1-Trichloroethane	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-02	N/A	0/19	No	ND
1,1,2,2-Tetrachloroethane	0/19	0.000887 - 0.00129	-	-	-	-	1.27E-01	N/A	0/19	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0/19	0.00444 - 0.00647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	0/19	0.000887 - 0.00129	-	-	-	-	3.20E-01	N/A	0/19	No	ND
1,1-Dichloroethane	0/19	0.000887 - 0.00129	-	-	-	-	1.40E-01	N/A	0/19	No	ND
1,1-Dichloroethene	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-02	N/A	0/19	No	ND
1,2,3-Trichlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	2.00E+01	N/A	0/19	No	ND
1,2,4-Trichlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	2.70E-01	N/A	0/19	No	ND
1,2-Dibromo-3-chloropropane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	9.00E-02	N/A	0/19	No	ND
1,2-Dichloroethane	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-01	N/A	0/19	No	ND
1,2-Dichloropropane	0/19	0.000887 - 0.00129	-	-	-	-	2.80E-01	N/A	0/19	No	ND
1,2-Dimethylbenzene	1/19	0.000887 - 0.00129	4.74E-03 - 4.74E-03	4.74E-03	400S7-G02	4.74E-03	N/A	N/A	N/A	Yes	No NFA
1,3-Dichlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	8.00E-02	N/A	0/19	No	ND
1,4-Dichlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	8.80E-01	N/A	0/19	No	ND

Table C2.7. Sector 7 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
1,4-Dioxane	0/19	0.0444 - 0.0647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Butanone	2/19	0.00444 - 0.00647	1.89E-03 - 2.96E-03	2.43E-03	400S7-07	3.24E-03	1.00E+00	0.0	0/19	No	HQ<1
2-Chloroethyl vinyl ether	0/19	0.00444 - 0.00647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Hexanone	0/19	0.00444 - 0.00647	-	-	-	-	3.60E-01	N/A	0/19	No	ND
2-Methoxy-2-methylpropane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Methyl-2-pentanone	0/19	0.00444 - 0.00647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Acetone	12/19	0.00444 - 0.00647	1.84E-03 - 2.02E-02	6.31E-03	400S7-07	2.02E-02	1.20E+00	0.0	0/19	No	HQ<1
Acrolein	0/19	0.00444 - 0.00647	-	-	-	-	3.00E-04	N/A	0/19	No	ND
Acrylonitrile	0/19	0.00444 - 0.00647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Benzene	0/19	0.000887 - 0.00129	-	-	-	-	1.20E-01	N/A	0/19	No	ND
Bromochloromethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromoform	0/19	0.000887 - 0.00129	-	-	-	-	7.00E-02	N/A	0/19	No	ND
Bromomethane	0/19	0.000887 - 0.00129	-	-	-	-	2.00E-03	N/A	0/19	No	ND
Carbon disulfide	0/19	0.00444 - 0.00647	-	-	-	-	5.00E-03	N/A	0/19	No	ND
Carbon tetrachloride	0/19	0.000887 - 0.00129	-	-	-	-	5.00E-02	N/A	0/19	No	ND
Chlorobenzene	0/19	0.000887 - 0.00129	-	-	-	-	2.40E+00	N/A	0/19	No	ND
Chloroethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	4/19	0.000887 - 0.00129	3.94E-04 - 8.72E-04	6.17E-04	400S7-04	8.72E-04	5.00E-02	0.0	0/19	No	HQ<1
Chloromethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
cis -1,2-Dichloroethene	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-02	N/A	0/19	No	ND
cis -1,3-Dichloropropene	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-02	N/A	0/19	No	ND
Cyclohexane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dibromochloromethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Dichlorodifluoromethane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	1/19	0.000887 - 0.00129	2.32E-03 - 2.32E-03	2.32E-03	400S7-G02	2.32E-03	2.70E-01	0.0	0/19	No	HQ<1
m,p-Xylene	1/19	0.00177 - 0.00259	1.09E-02 - 1.09E-02	1.09E-02	400S7-G02	1.09E-02	1.00E-01	0.1	0/19	No	HQ<1
Methyl acetate	0/19	0.00444 - 0.00647	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylene chloride	7/19	0.00444 - 0.00647	2.46E-03 - 4.22E-03	3.01E-03	400S7-G07	4.22E-03	2.10E-01	0.0	0/19	No	HQ<1
Styrene	0/19	0.000887 - 0.00129	-	-	-	-	1.20E+00	N/A	0/19	No	ND
Tetrachloroethene	0/19	0.000887 - 0.00129	-	-	-	-	6.00E-02	N/A	0/19	No	ND
Toluene	3/19	0.000887 - 0.00129	5.00E-04 - 8.26E-03	3.16E-03	400S7-G07	8.26E-03	1.50E-01	0.1	0/19	No	HQ<1
Total Xylene	1/19	0.00266 - 0.00388	1.56E-02 - 1.56E-02	1.56E-02	400S7-G02	1.56E-02	1.00E-01	0.2	0/19	No	HQ<1
trans -1,2-Dichloroethene	0/19	0.000887 - 0.00129	-	-	-	-	4.00E-02	N/A	0/19	No	ND
trans -1,3-Dichloropropene	0/19	0.000887 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	1/19	0.000887 - 0.00129	3.40E-03 - 3.40E-03	3.40E-03	400S7-09	3.40E-03	6.00E-02	0.1	0/19	No	HQ<1
Trichlorofluoromethane	0/19	0.000887 - 0.00129	-	-	-	-	1.64E+01	N/A	0/19	No	ND
Vinyl chloride	0/19	0.000887 - 0.00129	-	-	-	-	3.00E-02	N/A	0/19	No	ND

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.
HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.
Low molecular weight PAHs are the sum of the detected results for Acenaphthene; Acenaphthylene; Anthracene; Fluorene; 1-Methyl naphthalene; 2-Methyl naphthalene; 2,6-Dimethyl naphthalene; 2,3,5-Trimethylnaphthalene; Naphthalene; 1-Methyl phenanthrene; and Phenanthrene; if available.

Table C2.7. Sector 7 Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
			Range	Average							

High molecular weight PAHs are the sum of the detected results for Benzo(a)anthracene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(ghi)perylene; Benzo(a)pyrene; Benzo(e)pyrene; Chrysene; Dibenzo(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Perylene; and Pyrene; if available.
m,p-xylene uses NFA for Xylene (Total).
Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

Table C2.8. RGA Groundwater Step 2 COPEC Screen

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Metals (mg/L)											
Aluminum	130/258	0.05 - 0.2	1.94E-02 - 4.17E+00	4.46E-01	MW405-PRT5	4.17E+00	8.70E-02	**47.9**	67/258	Yes	HQ>1
Antimony	24/258	0.003 - 0.005	1.02E-03 - 1.47E-03	1.14E-03	MW405-PRT3	2.50E-03	1.90E-01	0.0	0/258	No	HQ<1
Arsenic	89/258	0.001 - 0.005	1.47E-03 - 8.97E-03	3.06E-03	MW405-PRT3	8.97E-03	1.50E-01	0.1	0/258	No	HQ<1
Barium	258/258	0.002 - 0.005	3.62E-02 - 9.11E-01	2.61E-01	MW557	9.11E-01	2.20E-01	**4.1**	150/258	Yes	HQ>1
Beryllium	21/258	0.0005 - 0.001	2.00E-04 - 8.91E-04	3.54E-04	MW178	8.91E-04	1.10E-02	0.1	0/258	No	HQ<1
Boron	256/256	0.015 - 0.015	7.11E-03 - 5.61E-02	1.80E-02	MW408-PRT4	5.61E-02	7.20E+00	0.0	0/256	No	HQ<1
Cadmium	11/258	0.001 - 0.001	3.06E-04 - 6.84E-04	3.81E-04	MW405-PRT5	6.84E-04	4.50E-04	**1.5**	1/258	Yes	HQ>1
Calcium	64/64	0.2 - 2	1.08E+01 - 7.28E+01	3.68E+01	MW422-PRT1	7.28E+01	1.16E+02	0.6	0/64	No	HQ<1
Chromium	160/258	0.01 - 0.1	3.10E-03 - 2.72E+00	1.11E-01	MW71	2.72E+00	1.10E-02	**64.8**	72/258	Yes	HQ>1
Chromium	160/258	0.01 - 0.1	3.10E-03 - 2.72E+00	1.11E-01	MW71	2.72E+00	4.20E-02	**247.3**	120/258	Yes	HQ>1
Cobalt	181/258	0.001 - 0.001	3.17E-04 - 2.68E-02	3.07E-03	MW408-PRT3	2.68E-02	1.90E-02	**1.4**	2/258	Yes	HQ>1
Copper	246/258	0.001 - 0.02	3.29E-04 - 3.30E-02	3.76E-03	MW405-PRT3	3.30E-02	4.95E-03	**6.7**	46/258	Yes	HQ>1
Iron	237/258	0.1 - 1	3.34E-02 - 2.76E+01	2.07E+00	MW557	2.76E+01	1.00E+00	**27.6**	87/258	Yes	HQ>1
Lead	63/258	0.0013 - 0.002	5.15E-04 - 1.80E-02	1.98E-03	MW405-PRT5	1.80E-02	1.25E-03	**14.4**	29/258	Yes	HQ>1
Magnesium	64/64	0.025 - 0.03	3.88E+00 - 2.95E+01	1.39E+01	MW423-PRT1	2.95E+01	8.20E+01	0.4	0/64	No	HQ<1
Manganese	251/258	0.005 - 0.1	1.19E-03 - 7.29E+00	2.73E-01	MW557	7.29E+00	9.30E-02	**78.4**	99/258	Yes	HQ>1
Mercury	22/256	0.0002 - 0.0002	7.00E-05 - 2.59E-04	1.31E-04	MW572	2.59E-04	1.30E-06	**199.2**	22/256	Yes	HQ>1
Molybdenum	169/258	0.0005 - 0.001	2.06E-04 - 6.04E-02	5.46E-03	MW71	6.04E-02	8.00E-01	0.1	0/258	No	HQ<1
Nickel	258/258	0.002 - 0.005	7.13E-04 - 4.30E-01	4.82E-02	MW569	4.30E-01	2.89E-02	**14.9**	111/258	Yes	HQ>1
Potassium	64/64	0.2 - 0.3	8.20E-01 - 3.36E+00	2.22E+00	MW423-PRT3	3.36E+00	5.30E+01	0.1	0/64	No	HQ<1
Selenium	25/258	0.005 - 0.005	1.61E-03 - 5.28E-03	2.39E-03	MW566	5.28E-03	5.00E-03	**1.1**	1/258	Yes	HQ>1
Silver	14/258	0.001 - 0.001	3.26E-04 - 5.34E-03	1.20E-03	MW405-PRT3	5.34E-03	6.00E-05	**89.0**	14/258	Yes	HQ>1
Sodium	64/64	0.25 - 2.5	1.27E+01 - 1.14E+02	4.91E+01	MW569	1.14E+02	6.80E+02	0.2	0/64	No	HQ<1
Thallium	4/256	0.002 - 0.002	6.01E-04 - 6.99E-04	6.45E-04	MW566	1.00E-03	6.00E-03	0.2	0/256	No	HQ<1
Uranium	107/303	0.0002 - 0.005	6.90E-05 - 3.12E-02	1.37E-03	MW571	3.12E-02	2.60E-03	**12.0**	13/303	Yes	HQ>1
Vanadium	54/256	0.02 - 0.02	3.30E-03 - 2.97E-02	7.79E-03	MW405-PRT3	2.97E-02	2.70E-02	**1.1**	1/256	Yes	HQ>1
Zinc	213/258	0.01 - 0.02	3.30E-03 - 2.02E-01	1.56E-02	MW68	2.02E-01	6.60E-02	**3.1**	8/258	Yes	HQ>1
Chloride	474/474	0.2 - 20	3.25E+00 - 2.19E+02	7.02E+01	MW569	2.19E+02	2.30E+02	1.0	0/474	No	HQ<1
Fluoride	256/258	0.1 - 0.2	3.45E-02 - 2.49E+00	2.20E-01	MW178	2.49E+00	2.70E+00	0.9	0/258	No	HQ<1
Nitrate as Nitrogen	59/64	0.1 - 5	5.02E-02 - 8.35E+01	1.04E+01	MW423-PRT1	8.35E+01	N/A	N/A	N/A	Yes	No NFA
Sulfate	64/64	0.4 - 20	3.94E+00 - 8.18E+01	2.20E+01	MW178	8.18E+01	N/A	N/A	N/A	Yes	No NFA
Total PCBs (mg/L)											
Total PCBs	5/256	0.0000938 - 0.000497	6.08E-05 - 4.73E-04	2.03E-04	MW407-PRT4	4.73E-04	1.20E-07	**3941.7**	5/256	Yes	HQ>1
Semivolatile Organic Compounds (mg/L)											
1,1-biphenyl	0/256	0.00909 - 0.0129	-	-	-	-	6.50E-03	N/A	0/256	No	ND
2,4,5-Trichlorophenol	0/256	0.00909 - 0.0129	-	-	-	-	1.90E-03	N/A	0/256	No	ND
2,4,6-Trichlorophenol	0/256	0.00909 - 0.0129	-	-	-	-	4.90E-03	N/A	0/256	No	ND
2,4-Dichlorophenol	0/256	0.00909 - 0.0129	-	-	-	-	1.10E-02	N/A	0/256	No	ND
2,4-Dimethylphenol	0/256	0.00909 - 0.0129	-	-	-	-	1.50E-02	N/A	0/256	No	ND
2,4-Dinitrophenol	0/256	0.0182 - 0.0257	-	-	-	-	7.10E-02	N/A	0/256	No	ND
2,4-Dinitrotoluene	0/256	0.00909 - 0.0129	-	-	-	-	4.40E-02	N/A	0/256	No	ND
2,6-Dinitrotoluene	0/256	0.00909 - 0.0129	-	-	-	-	8.10E-02	N/A	0/256	No	ND
2-Chloronaphthalene	0/256	0.000909 - 0.00129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Chlorophenol	0/256	0.00909 - 0.0129	-	-	-	-	1.80E-02	N/A	0/256	No	ND

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
2-Methyl-4,6-dinitrophenol	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
2-Methylnaphthalene	0/256	0.000909 - 0.00129	-	-	-	-	4.70E-03	N/A	0/256	No	ND
2-Methylphenol	0/256	0.00909 - 0.0129	-	-	-	-	6.70E-02	N/A	0/256	No	ND
2-Nitrobenzenamine	0/256	0.00909 - 0.0129	-	-	-	-	1.70E-02	N/A	0/256	No	ND
2-Nitrophenol	0/256	0.00909 - 0.0129	-	-	-	-	7.30E-02	N/A	0/256	No	ND
3,3'-Dichlorobenzidine	0/256	0.00909 - 0.0129	-	-	-	-	4.50E-03	N/A	0/256	No	ND
3-Nitrobenzenamine	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Bromophenyl phenyl ether	0/256	0.00909 - 0.0129	-	-	-	-	1.50E-03	N/A	0/256	No	ND
4-Chloro-3-methylphenol	0/256	0.00909 - 0.0129	-	-	-	-	1.00E-03	N/A	0/256	No	ND
4-Chlorobenzenamine	0/256	0.00909 - 0.0129	-	-	-	-	8.00E-04	N/A	0/256	No	ND
4-Chlorophenyl phenyl ether	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
4-Nitrophenol	0/256	0.00909 - 0.0129	-	-	-	-	5.80E-02	N/A	0/256	No	ND
Acenaphthene	0/256	0.000909 - 0.00129	-	-	-	-	1.50E-02	N/A	0/256	No	ND
Acenaphthylene	0/256	0.000909 - 0.00129	-	-	-	-	1.30E-02	N/A	0/256	No	ND
Acetophenone	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Anthracene	0/256	0.000909 - 0.00129	-	-	-	-	2.00E-05	N/A	0/256	No	ND
Atrazine	0/256	0.00909 - 0.0129	-	-	-	-	3.00E-05	N/A	0/256	No	ND
Benz(a)anthracene	4/256	0.000909 - 0.00129	3.07E-04 - 7.55E-04	4.83E-04	MW506	7.55E-04	4.70E-03	0.2	0/256	No	HQ<1
Benzaldehyde	0/256	0.00909 - 0.0129	-	-	-	-	1.43E-01	N/A	0/256	No	ND
Benzo(a)pyrene	1/256	0.000909 - 0.00129	5.64E-04 - 5.64E-04	5.64E-04	MW506	6.45E-04	6.00E-05	**10.8**	1/256	Yes	HQ>1
Benzo(b)fluoranthene	2/256	0.000909 - 0.00129	4.90E-04 - 7.65E-04	6.28E-04	MW506	7.65E-04	2.60E-03	0.3	0/256	No	HQ<1
Benzo(ghi)perylene	3/256	0.000909 - 0.00129	4.52E-04 - 9.26E-04	7.34E-04	MW506	9.26E-04	1.20E-05	**77.2**	3/256	Yes	HQ>1
Benzo(k)fluoranthene	3/256	0.000909 - 0.00129	4.16E-04 - 7.25E-04	5.81E-04	MW506	7.25E-04	6.00E-05	**12.1**	3/256	Yes	HQ>1
Bis(2-chloroethoxy)methane	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-chloroethyl) ether	0/256	0.00909 - 0.0129	-	-	-	-	2.38E+00	N/A	0/256	No	ND
Bis(2-chloroisopropyl) ether	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bis(2-ethylhexyl)phthalate	41/256	0.000909 - 0.00129	3.08E-04 - 7.01E-02	2.53E-03	MW408-PRT5	7.01E-02	8.00E-03	**8.8**	1/256	Yes	HQ>1
Butyl benzyl phthalate	5/256	0.00909 - 0.0129	3.51E-04 - 5.85E-04	5.11E-04	MW407-PRT3	6.45E-03	1.80E-02	0.4	0/256	No	HQ<1
Caprolactam	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Carbazole	0/256	0.000909 - 0.00129	-	-	-	-	4.00E-03	N/A	0/256	No	ND
Chrysene	4/256	0.000909 - 0.00129	3.62E-04 - 8.15E-04	5.22E-04	MW506	8.15E-04	4.70E-03	0.2	0/256	No	HQ<1
Dibenz(a,h)anthracene	5/256	0.000909 - 0.00129	4.33E-04 - 8.88E-04	7.34E-04	MW407-PRT3	8.88E-04	1.20E-05	**74.0**	5/256	Yes	HQ>1
Dibenzofuran	0/256	0.00909 - 0.0129	-	-	-	-	4.00E-03	N/A	0/256	No	ND
Diethyl phthalate	2/256	0.00909 - 0.0129	4.17E-04 - 4.50E-04	4.34E-04	MW407-PRT3	6.45E-03	2.20E-01	0.0	0/256	No	HQ<1
Dimethyl phthalate	1/256	0.00909 - 0.0129	3.51E-04 - 3.51E-04	3.51E-04	MW407-PRT3	6.45E-03	1.10E+00	0.0	0/256	No	HQ<1
Di-n-butyl phthalate	12/256	0.00909 - 0.0129	3.20E-04 - 2.71E-03	6.87E-04	MW408-PRT5	6.45E-03	1.90E-02	0.3	0/256	No	HQ<1
Di-n-octylphthalate	14/256	0.00909 - 0.0129	3.23E-04 - 1.56E-03	7.95E-04	MW506	6.45E-03	2.15E-01	0.0	0/256	No	HQ<1
Diphenylamine	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Fluoranthene	2/256	0.000909 - 0.00129	3.51E-04 - 5.54E-04	4.53E-04	MW506	6.45E-04	8.00E-04	0.8	0/256	No	HQ<1
Fluorene	0/256	0.000909 - 0.00129	-	-	-	-	1.90E-02	N/A	0/256	No	ND
Hexachlorobenzene	0/256	0.00909 - 0.0129	-	-	-	-	3.00E-07	N/A	0/256	No	ND
Hexachlorobutadiene	0/256	0.00909 - 0.0129	-	-	-	-	1.00E-03	N/A	0/256	No	ND
Hexachlorocyclopentadiene	2/256	0.00909 - 0.0129	4.44E-03 - 4.74E-03	4.59E-03	MW567	6.45E-03	4.50E-04	**14.3**	2/256	Yes	HQ>1
Hexachloroethane	0/256	0.00909 - 0.0129	-	-	-	-	1.20E-02	N/A	0/256	No	ND
Indeno(1,2,3-cd)pyrene	4/256	0.000909 - 0.00129	4.05E-04 - 7.92E-04	6.85E-04	MW405-PRT3	7.92E-04	1.20E-05	**66.0**	4/256	Yes	HQ>1

Table C2.8. RGA Groundwater Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Isophorone	0/256	0.00909 - 0.0129	-	-	-	-	9.20E-01	N/A	0/256	No	ND
m+p Methylphenol	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Naphthalene	0/256	0.000909 - 0.00129	-	-	-	-	2.10E-02	N/A	0/256	No	ND
Nitrobenzene	0/256	0.00909 - 0.0129	-	-	-	-	2.30E-01	N/A	0/256	No	ND
N-Nitroso-di-n-propylamine	0/256	0.00909 - 0.0129	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Pentachlorophenol	2/256	0.00909 - 0.0129	6.10E-03 - 6.41E-03	6.26E-03	MW408-PRT3	6.45E-03	1.50E-02	0.4	0/256	No	HQ<1
Phenanthrene	1/256	0.000909 - 0.00129	3.95E-04 - 3.95E-04	3.95E-04	MW407-PRT3	6.45E-04	2.30E-03	0.3	0/256	No	HQ<1
Phenol	0/256	0.00909 - 0.0129	-	-	-	-	1.60E-01	N/A	0/256	No	ND
p-Nitroaniline	8/256	0.00909 - 0.0129	3.69E-03 - 5.45E-03	4.64E-03	MW407-PRT2	6.45E-03	N/A	N/A	N/A	Yes	No NFA
Pyrene	2/256	0.000909 - 0.00129	3.51E-04 - 4.13E-04	3.82E-04	MW506	6.45E-04	4.60E-03	0.1	0/256	No	HQ<1
Radionuclides (pCi/L)											
Americium-241	0/256	0.211 - 1.41	-	-	-	-	4.38E+01	N/A	0/256	No	ND
Cesium-137	0/255	4.22 - 14.3	-	-	-	-	1.05E+02	N/A	0/255	No	ND
Neptunium-237	8/256	0.253 - 1.42	9.23E-01 - 3.85E+00	1.91E+00	MW425-PRT1	3.85E+00	6.85E+00	0.6	0/256	No	HQ<1
Plutonium-238	0/256	0.181 - 1.42	-	-	-	-	1.76E+01	N/A	N/A	No	ND
Plutonium-239/240	0/256	0.293 - 1.38	-	-	-	-	1.87E+0.1	N/A	N/A	No	ND
Technetium-99	697/805	1.82 - 46.9	3.12E+00 - 3.17E+04	2.05E+03	MW423-PRT1	3.17E+04	2.47E+05	0.1	0/805	No	HQ<1
Thorium-230	1/256	0.315 - 1.44	6.58E-01 - 6.58E-01	6.58E-01	MW407-PRT4	7.20E-01	2.57E+02	0.0	0/256	No	HQ<1
Uranium-233/234	5/256	0.222 - 1.42	4.29E-01 - 8.10E+01	1.74E+01	MW570	8.10E+01	2.02E+01	**4.01**	1/256	Yes	HQ>1
Uranium-235/236	2/256	0.127 - 1.26	3.88E-01 - 4.68E+00	2.53E+00	MW570	4.68E+00	2.18E+01	0.21	0/256	No	HQ<1
Uranium-238	22/256	0.102 - 1.25	2.09E-01 - 8.51E+01	5.43E+00	MW570	8.51E+01	2.24E+01	**3.8**	1/256	Yes	HQ>1
Volatile Organic Compounds (mg/L)											
1,1,1-Trichloroethane	11/271	0.001 - 2	3.90E-04 - 2.61E-03	1.27E-03	MW423-PRT1	1.00E+00	7.60E-02	**13.2**	0/271	Yes	HQ>1
1,1,2,2-Tetrachloroethane	0/256	0.001 - 2	-	-	-	-	2.00E-01	N/A	0/256	No	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	37/256	0.005 - 10	3.02E-03 - 6.25E-02	1.35E-02	MW574	5.00E+00	N/A	N/A	N/A	Yes	No NFA
1,1,2-Trichloroethane	78/271	0.001 - 2	3.40E-04 - 9.70E-03	1.66E-03	MW421-PRT3	1.00E+00	7.30E-01	**1.4**	0/271	Yes	HQ>1
1,1-Dichloroethane	19/271	0.001 - 2	3.30E-04 - 3.02E-03	9.53E-04	MW574	1.00E+00	4.10E-01	**2.4**	0/271	Yes	HQ>1
1,1-Dichloroethene	142/827	0.001 - 20	1.80E-04 - 1.70E-01	1.74E-02	MW574 & MW156	1.00E+01	1.30E-01	**76.9**	6/827	Yes	HQ>1
1,2,3-Trichlorobenzene	0/256	0.001 - 2	-	-	-	-	8.00E-03	N/A	0/256	No	ND
1,2,4-Trichlorobenzene	0/256	0.001 - 2	-	-	-	-	3.50E-02	N/A	0/256	No	ND
1,2-Dibromo-3-chloropropane	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dibromoethane	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,2-Dichlorobenzene	3/256	0.001 - 2	3.50E-04 - 4.40E-04	3.97E-04	MW506	1.00E+00	2.30E-02	**43.5**	0/256	Yes	HQ>1
1,2-Dichloroethane	7/271	0.001 - 2	3.50E-04 - 1.46E-03	7.86E-04	MW562	1.00E+00	2.00E+00	0.5	0/271	No	HQ<1
1,2-Dichloropropane	0/256	0.001 - 2	-	-	-	-	5.20E-01	N/A	0/256	No	ND
1,2-Dimethylbenzene	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
1,3-Dichlorobenzene	0/256	0.001 - 2	-	-	-	-	2.20E-02	N/A	0/256	No	ND
1,4-Dichlorobenzene	0/256	0.001 - 2	-	-	-	-	9.40E-03	N/A	0/256	No	ND
1,4-Dioxane	1/191	0.05 - 50	3.94E+00 - 3.94E+00	3.94E+00	MW408-PRT5	2.50E+01	2.20E+01	**1.1**	0/191	Yes	HQ>1
2-Butanone	31/391	0.001 - 10	1.10E-03 - 1.12E-01	1.28E-02	MW563	5.00E+00	2.20E+01	0.2	0/391	No	HQ<1
2-Chloroethyl vinyl ether	0/256	0.005 - 10	-	-	-	-	3.54E+00	N/A	0/256	No	ND
2-Hexanone	0/256	0.005 - 10	-	-	-	-	9.90E-02	N/A	0/256	No	ND
2-Methoxy-2-methylpropane	0/256	0.001 - 2	-	-	-	-	7.30E-01	N/A	0/256	No	ND
4-Methyl-2-pentanone	0/256	0.005 - 10	-	-	-	-	1.70E-01	N/A	0/256	No	ND
Acetone	3/256	0.005 - 10	2.00E-03 - 6.41E-03	3.63E-03	MW408-PRT5	5.00E+00	1.70E+00	**2.9**	0/256	Yes	HQ>1

Table C2.8. RGA Groundwater Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration Range	Detected Concentration Average	Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
Acrolein	0/256	0.005 - 10	-	-	-	-	3.00E-03	N/A	0/256	No	ND
Acrylonitrile	0/256	0.005 - 10	-	-	-	-	7.80E-02	N/A	0/256	No	ND
Benzene	5/406	0.001 - 10	4.70E-04 - 6.90E-04	5.34E-04	MW156	5.00E+00	1.60E-01	**31.3**	0/406	Yes	HQ>1
Bromochloromethane	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Bromodichloromethane	10/271	0.001 - 2	4.30E-04 - 1.79E-03	8.73E-04	MW421-PRT3	1.00E+00	3.40E-01	**2.9**	0/271	Yes	HQ>1
Bromoform	0/256	0.001 - 2	-	-	-	-	2.30E-01	N/A	0/256	No	ND
Bromomethane	0/256	0.001 - 2	-	-	-	-	1.60E-02	N/A	0/256	No	ND
Carbon disulfide	0/256	0.005 - 10	-	-	-	-	1.50E-02	N/A	0/256	No	ND
Carbon tetrachloride	56/406	0.001 - 10	4.30E-04 - 8.80E-02	7.91E-03	MW341	5.00E+00	7.70E-02	**64.9**	1/406	Yes	HQ>1
Chlorobenzene	0/391	0.001 - 10	-	-	-	-	2.50E-02	N/A	0/391	No	ND
Chloroethane	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Chloroform	105/271	0.001 - 2	3.40E-04 - 8.28E-03	2.78E-03	MW421-PRT3	1.00E+00	1.40E-01	**7.1**	0/271	Yes	HQ>1
Chloromethane	0/256	0.001 - 2	-	-	-	-	5.50E+00	N/A	0/256	No	ND
cis-1,2-Dichloroethene	667/816	0.001 - 10	3.80E-04 - 7.50E+01	1.94E+00	MW156	7.50E+01	6.20E-01	**121.0**	98/816	Yes	HQ>1
cis-1,3-Dichloropropene	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Cumene	0/256	0.001 - 2	-	-	-	-	4.80E-03	N/A	0/256	No	ND
Cyclohexane	0/256	0.001 - 2	-	-	-	-	1.58E-01	N/A	0/256	No	ND
Dibromochloromethane	0/256	0.001 - 2	-	-	-	-	3.20E-01	N/A	0/256	No	ND
Dichlorodifluoromethane	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethane	0/2	0.025 - 0.025	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Ethylbenzene	0/271	0.001 - 2	-	-	-	-	6.10E-02	N/A	0/271	No	ND
Ethylene	0/2	0.025 - 0.025	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
m,p-Xylene	0/256	0.002 - 4	-	-	-	-	2.70E-02	N/A	0/256	No	ND
Methane	0/2	0.025 - 0.025	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methyl acetate	0/256	0.005 - 10	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Methylcyclohexane	0/256	0.001 - 2	-	-	-	-	5.20E-02	N/A	0/256	No	ND
Methylene chloride	43/256	0.005 - 10	6.00E-04 - 2.60E-01	3.74E-02	MW557	5.00E+00	1.50E+00	**3.3**	0/256	Yes	HQ>1
Styrene	0/256	0.001 - 2	-	-	-	-	3.20E-02	N/A	0/256	No	ND
Tetrachloroethene	110/406	0.001 - 10	3.00E-04 - 8.60E-02	4.47E-03	MW407-PRT2	5.00E+00	5.30E-02	**94.3**	1/406	Yes	HQ>1
Toluene	7/271	0.001 - 2	3.50E-04 - 1.25E-03	7.37E-04	MW557	1.00E+00	6.20E-02	**16.1**	0/271	Yes	HQ>1
Total Xylene	0/271	0.003 - 6	-	-	-	-	2.70E-02	N/A	0/271	No	ND
trans-1,2-Dichloroethene	90/816	0.001 - 10	1.20E-04 - 1.05E-02	1.31E-03	MW343	5.00E+00	5.58E-01	**9.0**	0/816	Yes	HQ>1
trans-1,3-Dichloropropene	0/256	0.001 - 2	-	-	-	-	N/A	N/A	N/A	Yes	No NFA
Trichloroethene	825/827	0.001 - 20	3.60E-04 - 1.40E+03	1.76E+01	MW408-PRT5	1.40E+03	2.20E-01	**6363.6**	737/827	Yes	HQ>1
Trichlorofluoromethane	4/256	0.001 - 2	4.20E-04 - 1.09E-03	7.70E-04	MW574	1.00E+00	N/A	N/A	N/A	Yes	No NFA
Vinyl chloride	28/816	0.001 - 20	1.20E-04 - 1.80E-01	2.49E-02	X216	1.00E+01	9.30E-01	**10.8**	0/816	Yes	HQ>1

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

Notes:

Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value was counted).

Analytes are screened against the narcotic mode of action, since it is lower than the non-narcotic mode of action.

Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.

HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.

Chromium III values are shown for information purposes.

Chromium uses NFAs for Chromium IV.

Table C2.8. RGA Groundwater Step 2 COPEC Screen (Continued)

Analyte	FOD	Detection Limit Range	Detected Concentration		Location of Max Detected Conc.	Max Sector Concentration	NFA	Maximum HQ	FOE NFA	COPEC?	Reason
			Range	Average							

m,p-xylene uses NFA for Xylene (Total).

Plutonium-239/240 uses NFAs for Plutonium-239.

Uranium-233/234 uses NFAs for Uranium-234.

Uranium-235/236 uses NFAs for Uranium-235.

Table C2.9. Sector 2 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background?	Direct Contact NFA	Receptor Basis	Average DC HQ	Bioaccumualtive?	Bioaccumulative NFA	Receptor Basis	Bioaccumualtive HQ	COPEC?	Reason
Metals (mg/kg)															
Aluminum	16/16	16/16	100%	9.91E+03	1.30E+04	No	--		N/A	No	--		N/A	No	Average Below Bkgd
Antimony	6/16	6/16	38%	9.94E-01	2.10E-01	Average Exceed	5.00E+00	Plants	0.20	No	--		N/A	No	DC HQ<1
Cadmium	12/16	3/16	19%	2.92E-01	2.10E-01	Average Exceed	3.20E+01	Plants	0.01	No	--		N/A	No	DC HQ<1
Chromium	16/16	3/16	19%	1.91E+01	1.60E+01	Average Exceed	2.60E+01	Mammals, Avian	0.73	No	--		N/A	No	DC HQ<1
Copper	16/16	2/16	13%	6.55E+01	1.90E+01	Average Exceed	7.00E+01	Plants	0.94	No	--		N/A	No	DC HQ<1
Lead	16/16	7/16	44%	1.10E+01	3.60E+01	No	1.20E+02	Plants	0.09	No	--		N/A	No	Average Below Bkgd
Manganese	16/16	13/16	81%	4.51E+02	1.50E+03	No	2.20E+02	Plants	2.05	No	--		N/A	No	Average Below Bkgd
Mercury	13/16	13/16	81%	2.82E-02	2.00E-01	No	5.00E-02	Soil Invertebrates	0.56	Yes	1.30E-02	Avian	2.17	No	Average Below Bkgd
Nickel	16/16	1/16	6%	9.93E+01	2.10E+01	Average Exceed	3.80E+01	Plants	2.61	No	--		N/A	Yes	DC HQ>1
Selenium	12/16	11/16	69%	9.92E-01	8.00E-01	Average Exceed	5.20E-01	Plants	1.91	Yes	6.30E-01	Mammals	1.57	Yes	DC HQ>1; B HQ>1
Thallium	8/16	8/16	50%	1.98E-01	2.10E-01	No	5.00E-02	Plants	3.96	No	--		N/A	No	Average Below Bkgd
Uranium	16/16	2/16	13%	6.56E+01	4.90E+00	Average Exceed	2.50E+01	Plants	2.62	No	--		N/A	Yes	DC HQ>1
Vanadium	16/16	15/16	94%	2.45E+01	3.80E+01	No	6.00E+01	Plants	0.41	No	--		N/A	No	Average Below Bkgd
Zinc	16/16	3/16	19%	4.10E+01	6.50E+01	No	1.20E+02	Soil Invertebrates	0.34	No	--		N/A	No	Average Below Bkgd
Total PCBs (mg/kg)															
Total PCBs	6/16	3/16	19%	3.90E-02	N/A	N/A	3.30E-01	Soil Invertebrates	0.12	Yes	4.10E-02	Avian	0.95	No	DC HQ<1; B HQ<1
Semivolatile Organic Compounds (mg/kg)															
Carbazole	3/16	1/16	6%	7.96E-02	N/A	N/A	7.00E-02	Plants	1.14	No	--		N/A	Yes	DC HQ>1
Di-n-butyl phthalate	4/16	4/16	25%	1.67E-02	N/A	N/A	2.20E-01	Soil Invertebrates	0.08	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)															
HMW PAHs	8/16	4/16	25%	1.70E+00	N/A	N/A	1.80E+01	Soil Invertebrates	0.09	Yes	1.10E+00	Mammals	1.55	Yes	DC HQ<1; B HQ>1
Volatile Organic Compounds (mg/kg)															
Toluene	6/16	1/16	6%	6.60E-01	N/A	N/A	1.50E-01	Soil Invertebrates	4.40	No	--		N/A	Yes	DC HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
The average concentration consisted of the average of detected concentrations.
m,p-xylene uses NFA for Xylene (Total).

Table C2.10. Sector 3 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA	Average Sector Concentration	Provisional Background Value	Average Exceed Background?	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumulative?	Bioaccumualtive NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Metals (mg/kg)														
Aluminum	12/12	12/12 100%	1.11E+04	1.30E+04	No	--		N/A	No	--		N/A	No	Below Bkgd
Antimony	6/12	6/12 50%	1.22E+00	2.10E-01	Average Exceed	5.00E+00	Plants	0.24	No	--		N/A	No	DC HQ<1
Lead	12/12	7/12 58%	1.11E+01	3.60E+01	No	1.20E+02	Plants	0.09	No	--		N/A	No	Below Bkgd
Manganese	12/12	11/12 92%	3.65E+02	1.50E+03	No	2.20E+02	Plants	1.66	No	--		N/A	No	Below Bkgd
Mercury	11/12	9/12 75%	2.64E-02	2.00E-01	No	5.00E-02	Soil Invertebrates	0.53	Yes	1.30E-02	Avian	N/A	No	Below Bkgd
Selenium	12/12	12/12 100%	9.65E-01	8.00E-01	Average Exceed	5.20E-01	Plants	1.86	Yes	6.30E-01	Mammals	N/A	Yes	B HQ>1
Thallium	7/12	7/12 58%	2.01E-01	2.10E-01	No	5.00E-02	Plants	4.02	No	--		N/A	No	Below Bkgd
Uranium	12/12	1/12 8%	9.31E+00	4.90E+00	Average Exceed	2.50E+01	Plants	0.37	No	--		N/A	No	DC HQ<1
Vanadium	12/12	12/12 100%	2.59E+01	3.80E+01	No	6.00E+01	Plants	0.43	No	--		N/A	No	Below Bkgd
Zinc	12/12	6/12 50%	6.78E+01	6.50E+01	Average Exceed	1.20E+02	Soil Invertebrates	0.57	No	--		N/A	No	DC HQ<1
Fluoride	12/12	3/12 25%	2.03E+01	N/A	--	3.20E+01	Mammal, Avian	0.63	No	--		N/A	No	DC HQ<1
Total Dioxins and Furans (mg/kg)														
Total Dioxin/Furans	1/1	1/1 100%	3.33E-06	N/A	--	5.00E+00	Soil Invertebrates	0.000001	Yes	3.15E-06	Mammal	1.1	Yes	B HQ>1
Total PCBs (mg/kg)														
Polychlorinated biphenyl	10/11	5/11 45%	5.94E-02	N/A	--	3.30E-01	Soil Invertebrates	0.18	Yes	4.10E-02	Avian	1.4	Yes	B HQ>1
Semivolatile Organic Compounds (mg/kg)														
Carbazole	1/11	1/11 9%	7.77E-02	N/A	--	7.00E-02	Plants	1.11	No	--		N/A	Yes	DC HQ>1
Di-n-butyl phthalate	2/11	2/11 18%	1.62E-02	N/A	--	2.20E-01	Soil Invertebrates	0.07	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)														
HMW PAHs	11/11	3/11 27%	2.20E+00	N/A	--	1.80E+01	Soil Invertebrates	0.12	Yes	1.10E+00	Mammals	2.0	Yes	B HQ>1
Volatile Organic Compounds (mg/kg)														
cis -1,2-Dichloroethene	2/11	1/11 9%	3.86E-02	N/A	--	4.00E-02	Soil Invertebrates	0.97	No	--		N/A	No	DC HQ<1
Methylene chloride	3/11	0/11 0%	2.21E-03	N/A	--	2.10E-01	Soil Invertebrates	0.01	No	--		N/A	No	DC HQ<1
Trichloroethene	7/11	1/11 9%	4.32E-01	N/A	--	6.00E-02	Soil Invertebrates	7.20	No	--		N/A	Yes	DC HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
The average concentration consisted of the average of detected concentrations.
m,p-xylene uses NFA for Xylene (Total).

Table C2.11. Sector 4 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumualtive?	Bioaccumulative NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Metals (mg/kg)															
Aluminum	45/45	45/45	100%	7.86E+03	1.30E+04	No	--		N/A	No	--		N/A	No	Average Below Bkgd
Antimony	17/27	17/27	63%	1.30E+00	2.10E-01	Average Exceed	5.00E+00	Plants	0.3	No	--		N/A	No	DC HQ<1
Cadmium	25/27	5/27	19%	2.94E-01	2.10E-01	Average Exceed	3.20E+01	Plants	0.0	No	--		N/A	No	DC HQ<1
Chromium	46/46	10/46	22%	1.86E+01	1.60E+01	Average Exceed	2.60E+01	Mammals, Avian	0.7	No	--		N/A	No	DC HQ<1
Copper	27/27	1/27	4%	8.70E+00	1.90E+01	No	7.00E+01	Plants	0.1	No	--		N/A	No	Average Below Bkgd
Lead	27/46	10/46	22%	1.08E+01	3.60E+01	No	1.20E+02	Plants	0.1	No	--		N/A	No	Average Below Bkgd
Manganese	45/45	21/45	47%	2.58E+02	1.50E+03	No	2.20E+02	Plants	1.2	No	--		N/A	No	Average Below Bkgd
Mercury	22/46	15/46	33%	3.26E-02	2.00E-01	No	5.00E-02	Soil Invertebrates	0.7	Yes	1.30E-02	Avian	2.51E+00	No	Average Below Bkgd
Molybdenum	26/26	1/26	4%	8.78E-01	N/A	--	2.00E+00	Plants	0.4	No	--		N/A	No	DC HQ<1
Nickel	42/46	1/46	2%	1.05E+01	2.10E+01	No	3.80E+01	Plants	0.3	No	--		N/A	No	Average Below Bkgd
Selenium	21/45	18/45	40%	7.61E-01	8.00E-01	No	5.20E-01	Plants	1.5	Yes	6.30E-01	Mammals	**1.2**	No	Average Below Bkgd
Silver	11/27	3/27	11%	2.51E+00	2.30E+00	Average Exceed	5.60E+02	Plants	0.0	No	--		N/A	No	DC HQ<1
Thallium	3/27	3/27	11%	1.83E-01	2.10E-01	No	5.00E-02	Plants	3.7	No	--		N/A	No	Average Below Bkgd
Uranium	30/45	7/45	16%	3.95E+01	4.90E+00	Average Exceed	2.50E+01	Plants	1.6	No	--		N/A	Yes	DC HQ>1
Vanadium	45/45	44/45	98%	2.08E+01	3.80E+01	No	6.00E+01	Plants	0.3	No	--		N/A	No	Average Below Bkgd
Zinc	27/27	9/27	33%	8.89E+01	6.50E+01	Average Exceed	1.20E+02	Soil Invertebrates	0.7	No	--		N/A	No	DC HQ<1
Fluoride	26/26	1/26	4%	9.59E+00	N/A	--	3.20E+01	Mammal, Avian	0.3	No	--		N/A	No	DC HQ<1
Total Dioxins and Furans (mg/kg)															
Total Dioxin/Furans	8/8	7/8	88%	4.14E-06	N/A	--	5.00E+00	Soil Invertebrates	0.0000008	Yes	3.15E-06	Mammal	1.3	Yes	DC HQ<1; B HQ>1
Total PCBs (mg/kg)															
Total PCBs	20/27	7/27	26%	1.04E-01	N/A	--	3.30E-01	Soil Invertebrates	0.3	Yes	4.10E-02	Avian	2.5	Yes	DC HQ<1; B HQ>1
Semivolatile Organic Compounds (mg/kg)															
Bis(2-ethylhexyl)phthalate	5/26	1/26	4%	1.72E-02	N/A	--	8.40E+00	Soil Invertebrates	0.002	Yes	2.00E-02	Avian	0.9	No	DC HQ<1; B HQ<1
Carbazole	3/26	0/26	0%	3.12E-02	N/A	--	7.00E-02	Plants	0.4	No	--		N/A	No	DC HQ<1
Di-n-butyl phthalate	6/26	6/26	23%	2.01E-02	N/A	--	2.20E-01	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)															
HMW PAHs	16/26	7/26	26.92%	1.34E+00	N/A	--	1.80E+01	Soil Invertebrates	0.1	Yes	1.10E+00	Mammals	1.2	Yes	DC HQ<1; B HQ>1
Volatile Organic Compounds (mg/kg)															
Benzene	4/39	0/39	0%	1.59E-03	N/A	--	1.20E-01	Soil Invertebrates	0.01	No	--		N/A	No	DC HQ<1
Chloroform	7/39	0/39	0%	1.02E-03	N/A	--	5.00E-02	Soil Invertebrates	0.02	No	--		N/A	No	DC HQ<1
cis -1,2-Dichloroethene	16/38	1/38	3%	8.35E-03	N/A	--	4.00E-02	Soil Invertebrates	0.2	No	--		N/A	No	DC HQ<1
Ethylbenzene	3/39	0/39	0%	8.19E-03	N/A	--	2.70E-01	Soil Invertebrates	0.03	No	--		N/A	No	DC HQ<1
m,p-Xylene	3/39	0/39	0%	2.15E-02	N/A	--	#N/A	#N/A	#N/A	No	#N/A	#N/A	#N/A	#N/A	#N/A
Methylene chloride	10/39	0/39	0%	4.69E-03	N/A	--	2.10E-01	Soil Invertebrates	0.02	No	--		N/A	No	DC HQ<1
Tetrachloroethene	1/39	0/39	0%	3.81E-04	N/A	--	6.00E-02	Soil Invertebrates	0.01	No	--		N/A	No	DC HQ<1
Toluene	17/39	0/39	0%	8.58E-03	N/A	--	1.50E-01	Soil Invertebrates	0.06	No	--		N/A	No	DC HQ<1
trans -1,2-Dichloroethene	2/38	0/38	0%	8.57E-04	N/A	--	4.00E-02	Soil Invertebrates	0.02	No	--		N/A	No	DC HQ<1
Trichloroethene	33/39	10/39	26%	8.92E-02	N/A	--	6.00E-02	Soil Invertebrates	1.5	No	--		N/A	Yes	DC HQ>1
Vinyl chloride	1/39	0/39	0%	1.53E-03	N/A	--	3.00E-02	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available

Table C2.11. Sector 4 Refined COPEC Screen (Continued)

Analyte	FOD	FOE of Step 2 NFA	Average Sector Concentration	Provisional Background Value	Average Exceed Background	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumualtive?	Bioaccumulative NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason

Notes:

Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).

The average concentration consisted of the average of detected concentrations.

m,p-xylene uses NFA for Xylene (Total).

Table C2.12. Sector 5 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumulative?	Bioaccumualtive NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Metals (mg/kg)															
Aluminum	32/32	32/32	100%	8.51E+03	1.30E+04	No	--		N/A	No	--		N/A	No	Below Bkgd
Antimony	16/32	16/32	50%	1.42E+00	2.10E-01	Average Exceed	5.00E+00	Plants	0.3	No	--		N/A	No	DC HQ<1
Arsenic	31/32	1/32	3%	5.61E+00	1.20E+01	No	6.80E+00	Soil Invertebrates	0.8	No	--		N/A	No	Below Bkgd
Barium	32/32	1/32	3%	1.05E+02	2.00E+02	No	1.10E+02	Plants	1.0	No	--		N/A	No	Below Bkgd
Boron	26/32	3/32	9%	3.02E+00	N/A	--	3.60E+01	Plants	0.1	No	--		N/A	No	DC HQ<1
Cadmium	28/32	6/32	19%	2.41E-01	2.10E-01	Average Exceed	3.20E+01	Plants	0.0	No	--		N/A	No	DC HQ<1
Chromium	32/32	5/32	16%	1.62E+01	1.60E+01	Average Exceed	2.60E+01	Mammals, Avian	0.6	No	--		N/A	No	DC HQ<1
Cobalt	32/32	2/32	6%	7.08E+00	1.40E+01	No	1.30E+01	Plants	0.5	No	--		N/A	No	Below Bkgd
Copper	32/32	1/32	3%	8.57E+00	1.90E+01	No	7.00E+01	Plants	0.1	No	--		N/A	No	Below Bkgd
Lead	32/32	10/32	31%	1.10E+01	3.60E+01	No	1.20E+02	Plants	0.1	No	--		N/A	No	Below Bkgd
Manganese	32/32	24/32	75%	5.85E+02	1.50E+03	No	2.20E+02	Plants	2.7	No	--		N/A	No	Below Bkgd
Mercury	26/32	20/32	63%	2.09E-02	2.00E-01	No	5.00E-02	Soil Invertebrates	0.4	Yes	1.30E-02	Avian	1.61E+00	No	Below Bkgd
Molybdenum	30/32	1/32	3%	7.08E-01	N/A	--	2.00E+00	Plants	0.4	No	--		N/A	No	DC HQ<1
Selenium	24/32	21/32	66%	9.90E-01	8.00E-01	Average Exceed	5.20E-01	Plants	1.9	Yes	6.30E-01	Mammals	1.57E+00	Yes	B HQ>1
Thallium	10/32	10/32	31%	1.86E-01	2.10E-01	No	5.00E-02	Plants	3.7	No	--		N/A	No	Below Bkgd
Uranium	32/32	4/32	13%	1.21E+01	4.90E+00	Average Exceed	2.50E+01	Plants	0.5	No	--		N/A	No	DC HQ<1
Vanadium	32/32	29/32	91%	2.20E+01	3.80E+01	No	6.00E+01	Plants	0.4	No	--		N/A	No	Below Bkgd
Zinc	32/32	9/32	28%	4.65E+01	6.50E+01	No	1.20E+02	Soil Invertebrates	0.4	No	--		N/A	No	Below Bkgd
Total Dioxins and Furans (mg/kg)															
Total Dioxin/Furans	10/10	10/10	100%	4.72E-06	N/A	--	5.00E+00	Soil Invertebrates	0.0000009	Yes	3.15E-06	Mammal	1.50E+00	Yes	B HQ>1
Total PCBs (mg/kg)															
Total PCBs	15/32	2/32	6%	2.05E-02	N/A	--	3.30E-01	Soil Invertebrates	0.1	Yes	4.10E-02	Avian	5.00E-01	No	B HQ<1
Semivolatile Organic Compounds (mg/kg)															
Carbazole	8/32	2/32	6%	1.57E-01	N/A	--	7.00E-02	Plants	2.2	No	--		N/A	Yes	DC HQ>1
Di-n-butyl phthalate	3/32	2/32	6%	1.40E-02	N/A	--	2.20E-01	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)															
HMW PAHs	24/32	11/32	34%	5.47E+00	N/A	--	1.80E+01	Soil Invertebrates	0.3	Yes	1.10E+00	Mammals	4.97E+00	Yes	B HQ>1
Radionuclides (pCi/g)															
Uranium-238	33/33	1/33	3%	9.58E+01	1.20E+00	Average Exceed	1.57E+03		0.1	No	--		N/A	No	DC HQ<1
Volatile Organic Compounds (mg/kg)															
1,1-Dichloroethene	3/32	0/32	0%	3.90E-03	N/A	--	4.00E-02	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
Benzene	5/32	0/32	0%	5.89E-04	N/A	--	1.20E-01	Soil Invertebrates	0.0	No	--		N/A	No	DC HQ<1
Carbon disulfide	1/32	1/32	3%	1.62E-02	N/A	--	5.00E-02	Soil Invertebrates	0.3	No	--		N/A	No	DC HQ<1
Chloroform	5/32	0/32	0%	5.29E-04	N/A	--	5.00E-02	Soil Invertebrates	0.0	No	--		N/A	No	DC HQ<1
cis -1,2-Dichloroethene	9/32	5/32	16%	4.98E-01	N/A	--	4.00E-02	Soil Invertebrates	12.5	No	--		N/A	Yes	DC HQ>1
Cumene	1/32	0/32	0%	1.30E-03	N/A	--	1.80E-01	Soil Invertebrates	0.0	No	--		N/A	No	DC HQ<1
m,p-Xylene	8/32	0/32	0%	7.92E-03	N/A	--	#N/A	#N/A	#N/A	No	#N/A	#N/A	#N/A	#N/A	#N/A
Methylene chloride	14/32	0/32	0%	3.39E-03	N/A	--	2.10E-01	Soil Invertebrates	0.0	No	--		N/A	No	DC HQ<1
Tetrachloroethene	5/32	1/32	3%	2.86E-02	N/A	--	6.00E-02	Soil Invertebrates	0.5	No	--		N/A	No	DC HQ<1
Toluene	17/32	0/32	0%	2.76E-03	N/A	--	1.50E-01	Soil Invertebrates	0.0	No	--		N/A	No	DC HQ<1
Total Xylene	7/32	0/32	0%	1.21E-02	N/A	--	1.00E-01	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
trans -1,2-Dichloroethene	4/32	0/32	0%	1.39E-02	N/A	--	4.00E-02	Soil Invertebrates	0.3	No	--		N/A	No	DC HQ<1
Trichloroethene	12/32	6/32	19%	2.39E+00	N/A	--	6.00E-02	Soil Invertebrates	39.8	No	--		N/A	Yes	DC HQ>1

Table C2.12. Sector 5 Refined COPEC Screen (Continued)

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumulative?	Bioaccumualtive NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Vinyl chloride	3/32	1/32	3%	7.41E-02	N/A	--	3.00E-02	Soil Invertebrates	2.5	No	--		N/A	Yes	DC HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
The average concentration consisted of the average of detected concentrations.
m,p-xylene uses NFA for Xylene (Total).

Table C2.13. Sector 6 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background?	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumulative?	Bioaccumualtive NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Metals (mg/kg)															
Aluminum	18/18	18/18	100%	8.84E+03	1.30E+04	No	--		N/A	No	--		N/A	No	Below Bkgd
Antimony	11/19	11/19	58%	7.98E+00	2.10E-01	Average Exceed	5.00E+00	Plants	1.6	No	--		N/A	Yes	DC HQ>1
Arsenic	19/19	1/19	5%	7.05E+00	1.20E+01	No	6.80E+00	Soil Invertebrates	1.0	No	--		N/A	No	Below Bkgd
Cadmium	18/19	9/19	47%	1.40E+00	2.10E-01	Average Exceed	3.20E+01	Plants	0.04	No	--		N/A	No	DC HQ<1
Chromium	18/19	3/19	16%	2.22E+01	1.60E+01	Average Exceed	2.60E+01	Mammals, Avian	0.9	No	--		N/A	No	DC HQ<1
Cobalt	18/18	1/18	6%	1.16E+01	1.40E+01	No	1.30E+01	Plants	0.9	No	--		N/A	No	Below Bkgd
Copper	18/19	3/19	16%	3.57E+01	1.90E+01	Average Exceed	7.00E+01	Plants	0.5	No	--		N/A	No	DC HQ<1
Lead	19/19	13/19	68%	2.03E+01	3.60E+01	No	1.20E+02	Plants	0.2	No	--		N/A	No	Below Bkgd
Manganese	19/19	13/19	68%	5.09E+02	1.50E+03	No	2.20E+02	Plants	2.3	No	--		N/A	No	Below Bkgd
Mercury	16/19	15/19	79%	3.28E-02	2.00E-01	No	5.00E-02	Soil Invertebrates	0.7	Yes	1.30E-02	Avian	2.5	No	Below Bkgd
Molybdenum	18/19	0/19	0%	7.48E-01	N/A	--	2.00E+00	Plants	0.4	No	--		N/A	No	DC HQ<1
Nickel	18/19	5/19	26%	3.31E+01	2.10E+01	Average Exceed	3.80E+01	Plants	0.9	No	--		N/A	No	DC HQ<1
Selenium	15/19	15/19	79%	1.09E+00	8.00E-01	Average Exceed	5.20E-01	Plants	2.1	Yes	6.30E-01	Mammals	1.7	Yes	B HQ>1
Silver	8/19	2/19	11%	2.24E+00	2.30E+00	No	5.60E+02	Plants	0.004	No	--		N/A	No	Below Bkgd
Thallium	8/18	8/18	44%	2.88E-01	2.10E-01	Average Exceed	5.00E-02	Plants	5.8	No	--		N/A	Yes	DC HQ>1
Uranium	19/19	9/19	47%	5.09E+01	4.90E+00	Average Exceed	2.50E+01	Plants	2.0	No	--		N/A	Yes	DC HQ>1
Vanadium	18/19	17/19	89%	2.28E+01	3.80E+01	No	6.00E+01	Plants	0.4	No	--		N/A	No	Below Bkgd
Zinc	19/19	13/19	68%	1.21E+02	6.50E+01	Average Exceed	1.20E+02	Soil Invertebrates	1.0	No	--		N/A	Yes	DC HQ>1
Total PCBs (mg/kg)															
Total PCBs	9/19	2/19	11%	1.53E-01	N/A	--	3.30E-01	Soil Invertebrates	0.5	Yes	4.10E-02	Avian	3.7	Yes	B HQ>1
Semivolatile Organic Compounds (mg/kg)															
Bis(2-ethylhexyl)phthalate	4/18	4/18	22%	1.77E+00	N/A	--	8.40E+00	Soil Invertebrates	0.2	Yes	2.00E-02	Avian	89	Yes	B HQ>1
Carbazole	6/17	2/17	12%	2.12E-01	N/A	--	7.00E-02	Plants	3.0	No	--		N/A	Yes	DC HQ>1
Di-n-butyl phthalate	4/18	4/18	22%	2.15E-02	N/A	--	2.20E-01	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)															
HMW PAHs	17/18	13/18	72%	6.71E+00	N/A	--	1.80E+01	Soil Invertebrates	0.4	Yes	1.10E+00	Mammals	6.1	Yes	B HQ>1
Radionuclides (pCi/g)															
Thorium-230	17/19	1/19	5%	7.50E+02	1.50E+00	Average Exceed	9.98E+03		0.1	No	--		N/A	No	DC HQ<1
Volatile Organic Compounds (mg/kg)															
Chloroform	1/17	0/17	0%	8.88E-04	N/A	--	5.00E-02	Soil Invertebrates	0.02	No	--		N/A	No	DC HQ<1
cis -1,2-Dichloroethene	1/17	0/17	0%	9.29E-04	N/A	--	4.00E-02	Soil Invertebrates	0.02	No	--		N/A	No	DC HQ<1
m,p-Xylene	2/17	0/17	0%	7.79E-04	N/A	--	#N/A	#N/A	#N/A	No	#N/A	#N/A	#N/A	#N/A	#N/A
Methylene chloride	5/17	1/17	6%	4.82E-02	N/A	--	2.10E-01	Soil Invertebrates	0.2	No	--		N/A	No	DC HQ<1
Total Xylene	1/17	0/17	0%	1.29E-03	N/A	--	1.00E-01	Soil Invertebrates	0.01	No	--		N/A	No	DC HQ<1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
The average concentration consisted of the average of detected concentrations.
m,p-xylene uses NFA for Xylene (Total).

Table C2.14. Sector 7 Refined COPEC Screen

Analyte	FOD	FOE of Step 2 NFA		Average Sector Concentration	Provisional Background Value	Average Exceed Background?	Direct Contact NFA	Receptor Basis	Average Direct Contact HQ	Bioaccumulative?	Bioaccumualtive NFA	Receptor Basis	Bioaccumulative HQ	COPEC?	Reason
Metals (mg/kg)															
Aluminum	19/19	19/19	100%	9.27E+03	1.30E+04	No	--		N/A	No	--		N/A	No	Average Below Bkgd
Antimony	14/19	14/19	74%	8.55E-01	2.10E-01	Average Exceed	5.00E+00	Plants	0.2	No	--		N/A	No	DC HQ<1
Cadmium	16/19	3/19	16%	2.97E-01	2.10E-01	Average Exceed	3.20E+01	Plants	0.0	No	--		N/A	No	DC HQ<1
Chromium	19/19	4/19	21%	1.82E+01	1.60E+01	Average Exceed	2.60E+01	Mammals, Avian	0.7	No	--		N/A	No	DC HQ<1
Copper	19/19	2/19	11%	2.41E+01	1.90E+01	Average Exceed	7.00E+01	Plants	0.3	No	--		N/A	No	DC HQ<1
Lead	19/19	8/19	42%	1.24E+01	3.60E+01	No	1.20E+02	Plants	0.1	No	--		N/A	No	Average Below Bkgd
Manganese	19/19	17/19	89%	3.14E+02	1.50E+03	No	2.20E+02	Plants	1.4	No	--		N/A	No	Average Below Bkgd
Mercury	18/19	17/19	89%	6.02E-01	2.00E-01	Average Exceed	5.00E-02	Soil Invertebrates	12.0	Yes	1.30E-02	Avian	46.3	Yes	DC HQ>1; B HQ>1
Nickel	19/19	2/19	11%	1.98E+01	2.10E+01	No	3.80E+01	Plants	0.5	No	--		N/A	No	Average Below Bkgd
Selenium	17/19	16/19	84%	1.00E+00	8.00E-01	Average Exceed	5.20E-01	Plants	1.9	Yes	6.30E-01	Mammals	1.6	Yes	DC HQ>1; B HQ>1
Thallium	5/19	5/19	26%	1.67E-01	2.10E-01	No	5.00E-02	Plants	3.3	No	--		N/A	No	Average Below Bkgd
Uranium	19/19	3/19	16%	1.78E+01	4.90E+00	Average Exceed	2.50E+01	Plants	0.7	No	--		N/A	No	DC HQ<1
Vanadium	19/19	19/19	100%	2.28E+01	3.80E+01	No	6.00E+01	Plants	0.4	No	--		N/A	No	Average Below Bkgd
Zinc	19/19	5/19	26%	4.74E+01	6.50E+01	No	1.20E+02	Soil Invertebrates	0.4	No	--		N/A	No	Average Below Bkgd
Fluoride	19/19	1/19	5%	1.39E+01	N/A	--	3.20E+01	Mammal, Avian	0.4	No	--		N/A	No	DC HQ<1
Total Dioxins and Furans (mg/kg)															
Total Dioxin/Furans	1/1	1/1	100%	5.80E-06	N/A	--	5.00E+00	Soil Invertebrates	0.000001	Yes	3.15E-06	Mammal	1.8	Yes	DC HQ<1; B HQ>1
Total PCBs (mg/kg)															
Total PCBs	3/19	0/19	0%	7.03E-03	N/A	--	3.30E-01	Soil Invertebrates	0.0	Yes	4.10E-02	Avian	0.2	No	DC HQ<1; B HQ<1
Semivolatile Organic Compounds (mg/kg)															
Bis(2-ethylhexyl)phthalate	4/19	2/19	11%	3.97E-02	N/A	--	8.40E+00	Soil Invertebrates	0.005	Yes	2.00E-02	Avian	2.0	Yes	DC HQ<1; B HQ>1
Butyl benzyl phthalate	2/19	1/19	5%	3.19E+00	N/A	--	5.90E-01	Soil Invertebrates	5.4	No	--		N/A	Yes	DC HQ>1
Carbazole	3/19	3/19	16%	2.81E-01	N/A	--	7.00E-02	Plants	4.0	No	--		N/A	Yes	DC HQ>1
Di-n-butyl phthalate	3/19	3/19	16%	1.97E-02	N/A	--	2.20E-01	Soil Invertebrates	0.1	No	--		N/A	No	DC HQ<1
High Molecular Weight Polycylic Aromatic Hydrocarbons [HMW-PAHs] (mg/kg)															
HMW PAHs	10/19	8/19	42%	8.64E+00	N/A	--	18.0	Soil Invertebrates	0.5	Yes	1.10E+00	Mammals	7.9	Yes	DC HQ<1; B HQ>1

FOD = Frequency of Detection
FOE = Frequency of Exceedance
N/A = Not Available
Notes:
Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).
The average concentration consisted of the average of detected concentrations.
m,p-xylene uses NFA for Xylene (Total).

Table C2.15. RGA Groundwater Refined COPEC Screen

Analyte	FOD	FOE Exceed NFA		Average RGA Concentration	Provisional Background	Average Exceed Background?	NFA	Average HQ	COPEC?	Reason
Metals (mg/L)										
Aluminum	130/258	67/258	26%	4.46E-01	2.19E+00	No	8.70E-02	5.1	No	Average Below Bkgd
Barium	258/258	150/258	58%	2.61E-01	2.35E-01	Average Exceed	2.20E-01	1.2	Yes	HQ>1
Cadmium	11/258	1/258	0%	3.81E-04	1.00E-02	No	4.50E-04	0.8	No	Average Below Bkgd
Chromium	160/258	72/258	28%	1.11E-01	1.44E-01	No	1.10E-02	10	No	Average Below Bkgd
Chromium	160/258	120/258	47%	1.11E-01	N/A	--	4.20E-02	2.6	Yes	HQ>1
Cobalt	181/258	2/258	1%	3.07E-03	4.50E-02	No	1.90E-02	0.2	No	Average Below Bkgd
Copper	246/258	46/258	18%	3.76E-03	3.60E-02	No	4.95E-03	0.8	No	Average Below Bkgd
Iron	237/258	87/258	34%	2.07E+00	5.03E+00	No	1.00E+00	2.1	No	Average Below Bkgd
Lead	63/258	29/258	11%	1.98E-03	1.29E-01	No	1.25E-03	1.6	No	Average Below Bkgd
Manganese	251/258	99/258	38%	2.73E-01	1.19E-01	Average Exceed	9.30E-02	2.9	Yes	HQ>1
Mercury	22/256	22/256	9%	1.31E-04	2.00E-04	No	1.30E-06	101	No	Average Below Bkgd
Molybdenum	169/258	0/258	0%	5.46E-03	N/A	--	8.00E-01	0.007	No	HQ<1
Nickel	258/258	111/258	43%	4.82E-02	6.82E-01	No	2.89E-02	1.7	No	Average Below Bkgd
Potassium	64/64	0/64	0%	2.22E+00	5.20E+00	No	5.30E+01	0.04	No	Average Below Bkgd
Selenium	25/258	1/258	0%	2.39E-03	5.00E-03	No	5.00E-03	0.5	No	Average Below Bkgd
Silver	14/258	14/258	5%	1.20E-03	1.10E-02	No	6.00E-05	20	No	Average Below Bkgd
Uranium	107/303	13/303	4%	1.37E-03	N/A	--	2.60E-03	0.5	No	HQ<1
Vanadium	54/256	1/256	0%	7.79E-03	1.34E-01	No	2.70E-02	0.3	No	Average Below Bkgd
Zinc	213/258	8/258	3%	1.56E-02	5.40E-02	No	6.60E-02	0.2	No	Average Below Bkgd
Total PCBs (mg/L)										
Total PCBs	5/256	5/256	2%	2.03E-04	N/A	--	1.20E-07	1692	Yes	HQ>1
Semivolatile Organic Compounds (mg/L)										
Benzo(a)pyrene	1/256	1/256	0%	5.64E-04	N/A	--	6.00E-05	9	Yes	HQ>1
Benzo(ghi)perylene	3/256	3/256	1%	7.34E-04	N/A	--	1.20E-05	61	Yes	HQ>1
Benzo(k)fluoranthene	3/256	3/256	1%	5.81E-04	N/A	--	6.00E-05	10	Yes	HQ>1
Bis(2-ethylhexyl)phthalate	41/256	1/256	0%	2.53E-03	N/A	--	8.00E-03	0.3	No	HQ<1
Dibenz(a,h)anthracene	5/256	5/256	2%	7.34E-04	N/A	--	1.20E-05	61	Yes	HQ>1
Hexachlorocyclopentadiene	2/256	2/256	1%	4.59E-03	N/A	--	4.50E-04	10	Yes	HQ>1
Indeno(1,2,3-cd)pyrene	4/256	4/256	2%	6.85E-04	N/A	--	1.20E-05	57	Yes	HQ>1
Radionuclides (pCi/L)										
Uranium-233/234	5/256	1/256	0%	1.74E+01	N/A	--	2.02E+01	0.9	No	HQ<1
Uranium-238	22/256	1/256	0%	5.43E+00	7.00E-01	Average Exceed	2.24E+01	0.2	No	HQ<1
Volatile Organic Compounds (mg/L)										
1,1,1-Trichloroethane	11/271	0/271	0%	1.27E-03	N/A	--	7.60E-02	0.02	No	HQ<1
1,1,2-Trichloroethane	78/271	0/271	0%	1.66E-03	N/A	--	7.30E-01	0.002	No	HQ<1
1,1-Dichloroethane	19/271	0/271	0%	9.53E-04	N/A	--	4.10E-01	0.002	No	HQ<1
1,1-Dichloroethene	142/827	6/827	1%	1.74E-02	N/A	--	1.30E-01	0.1	No	HQ<1
1,2-Dichlorobenzene	3/256	0/256	0%	3.97E-04	N/A	--	2.30E-02	0.02	No	HQ<1
1,4-Dioxane	1/191	0/191	0%	3.94E+00	N/A	--	2.20E+01	0.2	No	HQ<1
Acetone	3/256	0/256	0%	3.63E-03	N/A	--	1.70E+00	0.002	No	HQ<1
Benzene	5/406	0/406	0%	5.34E-04	N/A	--	1.60E-01	0.003	No	HQ<1
Bromodichloromethane	10/271	0/271	0%	8.73E-04	N/A	--	3.40E-01	0.003	No	HQ<1
Carbon tetrachloride	56/406	1/406	0%	7.91E-03	N/A	--	7.70E-02	0.1	No	HQ<1
Chloroform	105/271	0/271	0%	2.78E-03	N/A	--	1.40E-01	0.02	No	HQ<1

Table C2.15. RGA Groundwater Refined COPEC Screen (Continued)

Analyte	FOD	FOE Exceed NFA		Average RGA Concentration	Provisional Background	Average Exceed Background?	NFA	Average HQ	COPEC?	Reason
cis -1,2-Dichloroethene	667/816	98/816	12%	1.94E+00	N/A	--	6.20E-01	3	Yes	HQ>1
Methylene chloride	43/256	0/256	0%	3.74E-02	N/A	--	1.50E+00	0.02	No	HQ<1
Tetrachloroethene	110/406	1/406	0%	4.47E-03	N/A	--	5.30E-02	0.08	No	HQ<1
Toluene	7/271	0/271	0%	7.37E-04	N/A	--	6.20E-02	0.01	No	HQ<1
trans -1,2-Dichloroethene	90/816	0/816	0%	1.31E-03	N/A	--	5.58E-01	0.002	No	HQ<1
Trichloroethene	825/827	737/827	89%	1.76E+01	N/A	--	2.20E-01	80	Yes	HQ>1

NOTES:

FOD = Frequency of Detection

FOE = Frequency of Exceedance

N/A = Not Available

Notes:

Counts of analyses are based on the maximum detected result from a sample and its field replicate, if applicable (i.e., if a sample has analytical results from two different labs, only the maximum value is counted).

Analytes are screened against the narcotic mode of action, since it is lower than the non-narcotic mode of action.

Max Site Concentration is the greater of the maximum detected result and ½ the maximum detection limit.

HQs that exceed a value of 1.0 are shown in bold italics and are identified as COPECs for further evaluation.

Chromium III values are shown for information purposes.

Chromium uses NFAs for Chromium IV.

m,p-xylene uses NFA for Xylene (Total).

Plutonium-239/240 uses NFAs for Plutonium-239.
Uranium-233/234 uses NFAs for Uranium-234.
Uranium-235/236 uses NFAs for Uranium-235.

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Table C2.16. Refined COPEC List

Sector/Exposure Unit	Media	Refined COPEC
Sector 5	Surface Soil	*cis* -1,2-Dichloroethene
Sector 5	Surface Soil	Trichloroethene
Sector 6	Surface Soil	bis(2-ethylhexyl)phthalate
Sector 6	Surface Soil	High Molecular Weight PAHs
Sector 6	Surface Soil	Total PCBs
Sector 6	Surface Soil	Thallium
Sector 7	Surface Soil	Carbazole
Sector 7	Surface Soil	High Molecular Weight PAHs
Sector 7	Surface Soil	Mercury
Regional Gravel Aquifer	Groundwater	Trichloroethene

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ATTACHMENT C3

PROUCL INPUT AND OUTPUT FILES

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ATTACHMENT C3

PROUCL INPUT AND OUTPUT FILES (CD)

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APPENDIX D

DRILLING LOGS/SUBSURFACE PROFILES (CD)

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APPENDIX D

DRILLING LOGS/SUBSURFACE PROFILES (CD)

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APPENDIX E

ANALYTICAL DATA (CD)

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APPENDIX E

ANALYTICAL DATA [INCLUDING QUALITY ASSURANCE (QA) EVALUATION] AND GEOTECHNICAL DATA

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APPENDIX F

C-400 COMPLEX BIBLIOGRAPHY

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CONTENTS

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ACRONYMS

AM	Action Memorandum
AOC	area of concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
D&D	Decontamination and Decommissioning
DNAPL	dense nonaqueous-phase liquid
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ERH	electrical resistance heating
FFA	Federal Facility Agreement
FS	feasibility study
FY	fiscal year
IRA	Interim Remedial Action
KDEP	Kentucky Department for Environmental Protection
MOA	Memorandum of Agreement
NTCRA	non-time critical removal action
OU	operable unit
PAL	project action level
PGDP	Paducah Gaseous Diffusion Plant
QAPP	quality assurance project plan
RAO	remedial action objective
RAWP	remedial action work plan
RCRA	Resource Conservation and Recovery Act
RDSI	remedial design support investigation
RGA	Regional Gravel Aquifer
RI	remedial investigation
ROD	Record of Decision
SAP	sampling and analysis plan
SEC	Senior Executive Committee
SMP	site management plan
SPH	six-phase heating
SWMU	solid waste management unit
TS	treatability study
UCRS	Upper Continental Recharge System
VI	vapor intrusion
VOC	volatile organic compound
WAG	waste area grouping

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F.1. INTRODUCTION

This appendix summarizes the Paducah Site regulatory documents that were reviewed for information relevant to the C-400 Complex Operable Unit (OU) remedial investigation (RI).

F.2. PADUCAH SITE DOCUMENTS

Regulatory documents containing information specific to the C-400 Complex OU area are summarized below.

RCRA Facility Investigation, C-400 Trichloroethylene Spill Site, Paducah Gaseous Diffusion Plant (1988):

On June 18, 1986, trichloroethene (TCE) was discovered in an excavation to the southeast of the C-400 Cleaning Building. The excavation was in the vicinity of an underground storm sewer line. Subsequent investigations revealed that TCE had leaked through joints in the concrete sewer line and into the soil. The sewer line at that point was approximately 12 ft below grade. The source of the TCE was the floor drain system in the vicinity of a vapor degreaser in the C-400 building. In the past, spills from the degreaser had drained to a floor sump from which the material was pumped to the storm sewer system. The situation had existed since the early 1950s.

As part of this Resource Conservation and Recovery Act (RCRA) facility investigation, soil samples were taken in the excavation upon the discovery of the TCE. Analyses indicated that TCE levels were as high as 7,000 mg/kg near the sewer line. Excavation and containerization of contaminated soil generated 40 55-gal drums of waste which were disposed of off-site as hazardous waste. Additional soil samples were taken following the excavation work. Analyses of these samples indicated the presence of significant levels of TCE persisted below the level of the sewer line.

Since the existing storm sewer line adjacent to the C-400 Cleaning Building was thought to be the most direct means by which TCE contamination spread, this RCRA facility investigation focused on obtaining and analyzing samples surrounding the section of storm sewer line downstream from the junction box into which TCE was known to have been pumped. This document provides information in regard to the early discovery of the TCE leak and subsequent excavation.

C-400 Process and Structure Review, KY/ERWM-38 (1995):

The C-400 Cleaning Building was one of the first buildings constructed at the Paducah Gaseous Diffusion Plant (PGDP). The building and adjacent structures had been used in a wide variety of functions to support operations at the plant and outside contractual work. This document provided an overview of the function and processes that occurred within the C-400 Cleaning Building. The primary functions of C-400 included cleaning, metal etching and plating, radioactive materials stabilization and recovery, metals recovery, uranium trioxide production, diffusion process equipment testing, and uranium tetrafluoride (green salt) pulverization. During these processes, large quantities of materials were discharged or otherwise removed from the building. The scope of the structural and process review was to identify, describe, and locate utilities, pieces of equipment, and processes that had occurred within C-400; identify potential effluent types generated during C-400 operations; and identify the disposal flowpaths from C-400. This report was based on document reviews, interviews, and site inspections. When possible, information given was verified by multiple identifiable sources (i.e., either by interviews or by documents). Items and processes contained in this report, unless otherwise noted, describe activities or procedures that predate current regulations.

Remedial Investigation Report for Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1727&D2 (1999):

This RI report contained information about the regulatory framework under which the fieldwork was conducted; described the investigative methods used to sample the various media and analytical sampling parameters; presented a physical description of each unit investigated, which included topography, surface-water hydrology, geology, and hydrogeology; defined the nature and extent of contamination at each unit as concluded from analyses of the data; discussed the fate and transport of the contamination identified at each unit; and provided estimates of the baseline risks to human health and the environment associated with the detected contaminants.

Contamination of the soil and groundwater at Waste Area Grouping (WAG) 6 was found to be extensive. High concentrations of TCE that occur over large areas in the vadose zone, especially in Sectors 4 and 5, indicated that multiple releases of TCE have occurred around the C-400 Cleaning Building. TCE in the shallow soils indicated that a dense nonaqueous-phase liquid (DNAPL) of TCE exists at the southeast corner of the C-400 building. The primary sources of contaminants have been identified as the C-400 Trichloroethylene Leak Site [Solid Waste Management Unit (SWMU) 11] and a TCE off-loading pump station located in Sector 4. Smaller areas of soil contaminated by volatile organic compounds (VOCs), semivolatile organic compounds, metals, polychlorinated biphenyls, and radionuclides have also been impacted by releases from other identified SWMUs and associated utility lines.

Contaminants of concern (COCs) for future off-site residential groundwater users identified in the WAG 6 RI report are 1,1-dichloroethene, 1,2-dichloroethene, 2,4-dinitrotoluene, carbon tetrachloride, n-nitrosodi-n-propylamine, tetrachloroethene, *trans*-1,2-dichloroethene, TCE, vinyl chloride, antimony, copper, iron, and manganese. There were no radionuclide COCs that migrated from the WAG 6 area based upon risk estimates derived from the fate and transport modeling; however, technetium-99 was not modeled and was assumed, without quantitation, to be a COC.

Surfactant Enhanced Subsurface Remediation Treatability Study Report for Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1787&D1 (1999):

This report presented the results of the surfactant/cosolvent flushing bench-scale treatability study (TS) for WAG 6 at PGDP. The purpose of this study was to select the best surfactant/cosolvent system for DNAPL remediation of the Regional Gravel Aquifer (RGA) at the WAG 6 site. This study also included the design for a pilot testing and potential full-scale implementation of the system.

The results of the TS were positive and surfactant enhanced subsurface remediation has the potential to remove a high percentage of TCE mass from the RGA. These analyses did not take into account field scale heterogeneity, which would play a major role in the effectiveness of any remediation technology.

Bench Scale In Situ Chemical Oxidation Studies of Trichloroethene in Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1788&D1/R1 (1999):

This report summarized an investigation at the bench scale of TCE removal from WAG 6 saturated sediments obtained from the RGA at PGDP. The objective of these treatability experiments was to evaluate *in situ* chemical oxidation treatment parameters quickly and cost effectively.

The results of the bench scale tests indicated that in order to effectively treat TCE via *in situ* oxidation, the oxidant should be introduced at a rapid rate until the reaction temperature reaches the TCE boiling point. This should be followed by a metered oxidant addition phase, so as to keep the reaction temperature near the TCE boiling point and affect thermal stripping. Once the concentrations of TCE approach the solubility of TCE in water (i.e., 1,000 ppm), a slow oxidant addition phase should be instituted to remove the solubilized TCE via *in situ* chemical oxidation.

Based on the results of the thermal acceleration tests, batch tests, and column tests, it was evident that *in situ* chemical oxidation of TCE impacted WAG 6 soils and groundwater is achievable and should be investigated further for full-scale implementation in the field.

Treatability Study Work Plan for Six-Phase Heating, Groundwater Operable Unit, at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1889&D2 (2001):

This TS work plan described a six-phase heating (SPH) TS that was conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The primary objective of the SPH TS was to demonstrate the implementability of the SPH technology in the unsaturated and saturated zones of the Upper Continental Recharge System (UCRS) and in the underlying RGA at C-400. Implementation of the TS would demonstrate whether SPH could cost effectively heat soil and groundwater in both the UCRS and RGA, recover steam and the target contaminant vapors (i.e., TCE in this case), and treat the recovered contaminant vapors.

The TS included the design, installation, and operation of one SPH array. A single SPH array consists of six power electrodes, a center neutral electrode, an electrical power control unit, a steam and contaminant vapor recovery system, temperature and pressure monitoring systems, and contaminant vapor and water treatment systems. The SPH system operated by applying electricity to electrodes that are placed at specified depths in the subsurface. As power is applied to the electrodes, the soil matrix resists the flow of electricity among the electrodes, which causes the subsurface to be heated. Subsurface temperatures are increased to the boiling point of groundwater and targeted contaminants are volatilized. Steam and volatilized contaminants migrate upward to be collected in the vadose zone by vapor recovery wells. Steam is then condensed to water and contaminant vapors are processed by the vapor treatment system. Electrodes were planned to be installed to a total depth of 97 ft below ground surface (bgs), which is slightly below the base of the RGA.

Feasibility Study for the Groundwater Operable Unit at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1857&D2 (2001):

The intent of the FS report was to evaluate technologies, which included the cost and benefit characteristics of viable alternatives to allow the selection of an appropriate remedy for incorporation into a Groundwater OU proposed remedial action plan. This FS report was prepared in accordance with CERCLA, but it also fulfilled the RCRA requirements for a corrective measures study.

In August 1998, the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and the Kentucky Department for Environmental Protection (KDEP) agreed to restructure the remedial strategy for PGDP. This restructuring would reflect the accomplishment of sitewide remedial objectives as opposed to the original strategy, which emphasized a SWMU-by-SWMU approach. The basis for the revised strategy was to ensure the protection of human health and the environment through implementation of actions focused on the accomplishment of the following remedial objectives.

- Protection of off-site residents from consumption of contaminated groundwater and a return of groundwater to beneficial use;

- Protection of recreational users associated with Bayou/Little Bayou Creeks and the West Kentucky Wildlife Management Area;

- Protection of industrial workers; and

- Protection of ecosystems.

To accomplish those objectives, four remedial action OUs were defined, with each having a specific emphasis that corresponded to the above remedial objectives. The role of the Groundwater OU was to develop and implement a remedial alternative for COCs associated with the groundwater beneath and near PGDP.

The Federal Facility Agreement (FFA) parties determined the scope of this FS would be the following target contaminants.

- TCE
- TCE DNAPL
- TCE degradation products
- Technetium-99

The detailed analysis for this FS was performed on alternatives that contained a single applicable technology. The technologies that received complete detailed analyses were those contained within eight alternatives that were combined into treatment trains in the FS. These technologies were further broken down to applicable areas, which included primary source areas, secondary source areas, and dissolved phase plume areas. The technologies that were evaluated included vapor extraction, direct heating, excavation, steam extraction, pump-and-treat, oxidation, ozonation, bioremediation, and permeable treatment technologies.

Final Report Six-Phase Heating Treatability Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2113&D2 (2004):

The SPH TS report was prepared to document results from the SPH TS implemented adjacent to the C-400 Cleaning Building. The SPH TS was conducted under CERCLA. The SPH TS was intended to test the constructability, remedial effectiveness, and cost effectiveness of full-scale deployment of the technology in the area adjacent to the southeast comer of the C-400 Cleaning Building at PGDP. There is an area near the southeast corner of C-400 where two significant leaks and spills of VOCs had been previously identified. This was an area where a drain line from the degreaser sump was connected to a storm sewer and also where transfer pumps and piping delivered solvents to and from storage to processes in the building.

The TS included the installation and operation of one SPH treatment array. The SPH system was operated by applying electricity to electrodes that were constructed to a total depth of 99 ft bgs, which is slightly below the base of the RGA. The SPH TS began on February 14, 2003, and was originally scheduled to operate for 130 days; however, a 45-day extension was implemented due to positive TCE extraction and the desire to increase temperatures at the base of the RGA. Active heating was discontinued on September 6, 2003, which marked the end of the 45-day operational extension. The vapor recovery system was allowed to continue purging the treatment area of steam for three additional days.

The primary objective as outlined in the SPH TS work plan was to demonstrate the implementability of the SPH technology in the unsaturated and saturated soils of the UCRS and in the groundwater of the underlying RGA. The successful implementation of the TS demonstrated that SPH can effectively heat soil in the UCRS and groundwater in the RGA. Data produced during the SPH TS indicated that the system can successfully recover and treat steam and the target contaminant vapors.

The removal of TCE in the groundwater of the RGA was assessed by a comparison of the baseline groundwater sample results (i.e., pre-treatment) to post-treatment groundwater sampling results. The post-treatment groundwater sample results as compared to the baseline groundwater sample results indicated a 99.1% reduction in TCE concentration in groundwater, which met the removal efficiency criteria.

Two subsequent rounds of groundwater sampling were performed following the post treatment sampling event on September 8, 2003. A two-week post treatment sampling event was completed on September 22, 2003 and a four-week post-treatment sampling event was completed on October 7, 2003. The analytical results from these two sampling events indicated slight fluctuations in the reduction percentages, with the two-week concentrations indicating 99.2%, and the four-week concentrations indicating 99% reduction in groundwater TCE concentrations.

The removal of TCE in the soil was also assessed by a comparison of the baseline soil sample results to the post-treatment soil sample results. This comparison indicated an average TCE concentration reduction in soil of 98%, from an average of 125,111 ppb pre-treatment to an average of 2,493 ppb post-treatment.

Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2150&D2/R2 (2005):

This Record of Decision (ROD) presented the selected interim remedial action (IRA) for the Groundwater OU VOC source zone, comprised primarily of TCE, at the C-400 Cleaning Building at PGDP near Paducah, Kentucky. The ROD included discussion of the contribution that this IRA would make toward the final decision for the Groundwater OU at PGDP. This IRA was chosen in accordance with CERCLA.

Consistent with the results of the Groundwater OU FS and the subsequent successful SPH TS, this ROD focused on reducing the concentration of TCE and other VOCs in the source soils in the UCRS and RGA at the C-400 Cleaning Building area, which has been identified as the major source of groundwater contamination by TCE and other VOCs at PGDP. This IRA used treatment to permanently reduce the toxicity, mobility, and volume of principal threat source material associated with the VOC contamination in the area of the C-400 Cleaning Building.

The primary objectives for the IRA were as follows:

- Reduce exposure to contaminated groundwater by reducing the source concentrations of TCE and other VOCs in the RGA in the C-400 Cleaning Building area, and thereby reducing the migration of these contaminants to off-site points of exposure;

- Prevent exposure to contaminated groundwater by on-site industrial workers through institutional controls (e.g., excavation/penetration permit program); and

- Reduce contamination comprised of TCE and other VOCs in UCRS soil in the C-400 Cleaning Building area to minimize the migration of these contaminants to RGA groundwater and to off-site points of exposure.

The major components of the selected remedy included the following:

- Reduction of the concentration of TCE and other VOCs in the soils in the C-400 Cleaning Building area through removal and treatment using electrical resistance heating (ERH) in both the UCRS and RGA;

- Collection of post-action sampling results; and

- A remedial design investigation to further determine areal and vertical extent of TCE and other VOC contamination in the C-400 Cleaning Building area to determine optimum placement of the remediation system.

After completion of the interim action described in this ROD, the impacts that any other contamination may have on human health and the environment will be assessed as part of the Groundwater OU and/or OU at PGDP.

Remedial Design Support Investigation Characterization Plan for the Interim Remedial Action for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2211&D2 (2005):

Elevated concentrations of VOCs in subsurface soils and groundwater indicate that DNAPL source areas exist within the UCRS and the RGA, which are southeast and southwest of the C-400 Cleaning Building at PGDP. TCE and its breakdown products are the primary VOCs present. The ROD, *Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, documented the selection of ERH as the IRA and the need for a remedial design support investigation (RDSI). The purpose of the RDSI was to refine the known areal and vertical extent of contamination in the C-400 Cleaning Building area to determine optimum placement of the remediation system.

This investigation characterization plan presented the basic strategies and procedures for fieldwork conducted as part of the RDSI and specified use of a membrane interface probe (MIP) to provide real-time, qualitative characterization of VOC levels in the UCRS and RGA. The plan evaluated pre-existing data in relation to a conceptual model of the location of DNAPL zones at the south end of the C 400 Cleaning Building, and identified 46 locations for soil borings to provide additional characterization of UCRS VOC levels and 29 locations for soil borings for additional characterization of RGA VOC levels.

Removal Action Report for the C-402 Lime House at the Environmental Remediation Project, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0010&D1 (2007):

This removal action report was prepared to document completion of activities described in the *Action Memorandum for the Removal of the C-402 Lime House, the C-405 Incinerator, and the C-746-A West End Smelter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE/OR/07-2237&D2); its basis document, *Engineering Evaluation/Cost Analysis for the C-402 Lime House, C-405 Incinerator, and C-746-A West End Smelter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE/OR/07-2227&D2); and the *Removal Action Work Plan for the C-402 Lime House Inactive Facility D&D Project at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE/OR/07-2247&D2R1). These documents outlined the activities and requirements for the infrastructure and structure removal phases for the C-402 facility. The facility structure was demolished to the first floor concrete slab. A permanent safety barrier surrounds the perimeter of the concrete slab. The concrete slab is posted as a fixed contamination area.

The C-402 Lime House was located in the central portion of PGDP immediately east of C-400 Cleaning Building and south of C-403. This facility was placed in the Decontamination and Decommissioning (D&D) OU in the 2004 Site Management Plan (SMP). The D&D of the C-402 facility was performed as a non-time critical removal action (NTCRA) under the Paducah Site FFA.

The alternative selected for the C-402 facility was the removal and disposal of the building contents and structure to the first floor concrete slab. The alternative met the removal action objectives and was performed in a safe and expeditious manner. The C-402 D&D field activities began on March 21 2006, and the field completion date was August 17, 2006.

Action Memorandum for the Soils Operable Unit Inactive Facilities at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0121&D2/R1 (2009):

The purpose of this Action Memorandum (AM) was to document selection and approval of the NTCRA for contamination at three units at PGDP, which included the C-403 Neutralization Tank (SWMU 40) near C-400. For C-403, this removal action was limited to the removal of contamination within the respective SWMU boundaries.

The selected removal action is described in Alternative 3 in the engineering evaluation/cost analysis for the Soils OU Inactive Facilities and was described in this AM. The removal action called for excavation of soil/sediment and removal of accumulated rainwater from the areas of known contamination to eliminate the risk of human receptors coming in contact with contaminated soil/sediment and accumulated rainwater.

Remedial Action Work Plan for the Interim Remedial Action for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0004&D2/R2/A1 (2010):

This remedial action work plan (RAWP) defined the scope of activities and approach to implement the ERH alternative for the IRA in the ROD. This RAWP provided project background information, presented a summary of RDSI results, defined the project organization, and presented a project planning schedule. In addition, this RAWP addressed waste management and disposition, project health and safety, quality assurance and data management, and environmental compliance.

Technical Performance Evaluation for Phase I of the C-400 Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1260&D1 (2011):

The technical performance evaluation report for the C-400 IRA at PGDP was prepared in support of DOE's environmental remediation efforts at C-400. The report presented a summary of performance results and observations compiled from Phase I of the C-400 IRA. ERH was implemented as the C-400 IRA remedy to remove VOC contamination, primarily TCE, from subsurface soils in the vicinity of the C-400 Cleaning Building. This decision was documented in a ROD that was signed in August 2005.

The C-400 IRA was being implemented in phases to mitigate the risks/uncertainties associated with full-scale deployment of such a complex remedy in a complicated setting like the C-400 Cleaning Building area. Phase I implemented the ERH design presented in the remedial design report (RDR) in the southwest and east treatment areas of the C-400 Cleaning Building complex. In addition to removing VOCs from these areas, another important objective of Phase I was to evaluate the heating performance of the design through the RGA down to the contact with the McNairy Formation in the southwest treatment area. In addition to evaluating heating performance in the RGA, operation of Phase I provided the opportunity to evaluate the radius of influence of the vapor recovery system, assess hydraulic containment, and optimize the aboveground vapor/liquid treatment system. Treatment in the east treatment area addressed only contamination in the UCRS. Phase II of the project focused on the southeast treatment area. Phase II was further subdivided into (1) a UCRS/upper RGA action (i.e., Phase IIa), and (2) a lower RGA action (i.e., Phase IIb).

The project site is immediately adjacent to a support facility (i.e., C-400) located in the middle of the industrial complex. The ERH technology was deployed at depths and in geologic/hydrogeologic conditions that combined to provide a unique challenge for this technology. The phased deployment strategy was developed to remove VOC contamination from UCRS soils in the east and southwest areas and to evaluate the adequacy of the ERH design for heating the lithologic components of the highly permeable and electrically resistive RGA.

Phase I construction began in December 2008 and was substantially complete in December 2009; at that time, start-up and shakedown testing began. Testing was complete and operations commenced at the end of March 2010. Heating operations ceased (though soil vapor extraction continued) at the end of October 2010, and all system operations ended on December 4, 2010.

This performance assessment report presented a summary of Phase I installation, operating experiences, and performance results. Data presented support the conclusion that remedial action objectives (RAOs) as documented in the ROD, were achieved for the UCRS and upper RGA in the Phase I treatment areas. Post operational soil sample results show average percent reductions in TCE concentrations of 95% and 99% in the Phase I east and southwest treatment areas. Groundwater analytical results from post operational samples show average reductions of 76% and 99% in the east and southwest areas, respectively.

Target temperatures were attained in treatment areas and depths targeted for VOC removal, which indicated that the ERH design was adequate for thermal treatment of UCRS soils. Target temperatures were not attained in the deep RGA. Key factors that affected attainment of target temperature in the deep RGA include groundwater flow velocity, formation resistivity, and heat loss due to convective flow. These parameters have the potential to impact thermal performance significantly.

Observed maximum formation temperatures attained during Phase I operations in the lower RGA fell short of target temperature by over 100°F. Contingency thermal engineering techniques identified in the RAWP to boost formation heating were implemented during Phase I in attempts to attain target temperatures. These techniques included injection of saline solutions and maximizing the delivery of electrical power to the electrodes in the lower RGA. Phase I operating experience in the southwest treatment area and subsequent modeling results using a groundwater velocity of 3.0 ft per day indicate that in order to achieve target temperatures in the RGA, the ERH configuration developed for Phase I would require significant scale-up. This design simulations for heating the RGA in Phase II calls for 35 additional electrode borings (76% increase), 103 additional electrodes (76% increase), an estimated increase in total energy for Phase II operations of almost 5,000 MW-Hr (100% increase), and associated additional costs of approximately $7.3M. The design also would require upgradient electrode borings for preheating and upgradient groundwater extraction to reduce the flux of groundwater that requires heating through the target volume. Additionally, the ERH technology subcontractor suggested the augmentation of heating by providing hot water injection at the electrodes.

One of the key questions this document intended to address is, "What recommendations can be made regarding implementation of Phase II of the IRA?" Based on the Phase I experience and results, ERH should be deployed in the UCRS soils of the southeast treatment area. Lessons learned during Phase I relative to RGA heating identified the following uncertainties.

- The range of groundwater velocity in the formation is considered to be a substantial contributing factor in the inability to attain target temperature in the RGA;

- Utility and building operations avoidance posed more significant coordination challenges than originally assumed, and additional logistical challenges would be posed as part of Phase II based on the greater boring density that would be necessary for heating the RGA;

- RGA formation electrical resistivity characteristics are high, leading to difficulty in attaining target temperatures and requiring contingency actions such as additional power and salt injection to improve conductivity;

- The viability of continuous saltwater injection to increase formation electrical conductivity; and

- Attainment of higher target temperatures (up to 50ºF higher in the bottom of the RGA versus the top) when Phase I was more than 100°F below target temperatures in the deep RGA.

Consequently, this report recommended that alternate technologies, or combinations of technologies, be evaluated to take advantage of increased knowledge of RGA characteristics to develop a refined technical strategy for successful attainment of the RAOs for the C-400 IRA.

Soils Operable Unit Remedial Investigation Report at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0358&D1 (2011):

This RI report for the Soils OU was developed to present the results of the field investigation that was conducted in the summer of 2010 and risk assessment that was developed using data collected during that effort.

The 86 Soils OU SWMUs and areas of concern (AOCs) were divided into three groups, which are, in turn, divided into seven divisions. These groups are divisions of the SWMUs/AOCs developed with the agreement of the regulatory agencies during work plan development. Use of these divisions simplified the reporting of RI results because the types and locations of contamination found at SWMUs/AOCs within each division were expected to be similar.

Three SWMUs in the C-400 Complex OU were evaluated in the RI report, which included SWMUs 11, 40, and 47. SWMU 11 was not sampled during the Soils OU investigation and a baseline risk assessment or modeling was not performed because of ongoing C-400 treatment of the UCRS and RGA. All three SWMUs will be addressed by the C-400 Complex OU.

Remedial Design Report, Certified for Construction Design Drawings and Technical Specifications Package, for the Groundwater Operable Unit for the Phase IIa Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1272&D2/R1 (2012):

This RDR was prepared for the C-400 Cleaning Building IRA at PGDP. The IRA selected in the ROD was ERH technology. A phased deployment of ERH was implemented. The first phase (i.e., Phase I) that was completed in December 2010 implemented the base design in the southwest and east treatment areas of the C-400 Cleaning Building. In addition to removing VOCs from these areas, another important objective of Phase I was to evaluate the heating performance of the base design through the RGA down to the McNairy Formation interface in the southwest treatment area.

Based on the evaluation of the lessons learned from the Phase I operations and performance, it was determined that with minor adjustments to the base design, ERH would be utilized to remove contaminants in the UCRS and upper RGA. Lessons learned, however, indicated that without extensive changes to the base design, ERH would not be effective in the lower RGA. Based on the conclusions, Phase II was divided into two separate actions: (1) a UCRS/upper RGA action (i.e., Phase IIa); and (2) a lower RGA action (i.e., Phase IIb). Revision 1 of the RDR addressed changes in the Phase I base design that was necessary to implement the ERH technology for Phase IIa in the C-400 southeast treatment area. The RDR revision did not address the implementation of Phase IIb.

Treatability Study Report for the C-400 Interim Remedial Action Phase IIb Steam Injection Treatability Study at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2202&D2 (2016):

The objective of this report was to present the results/interpretation of data collected during the C-400 IRA Phase IIb steam injection TS. The TS was designed to obtain data specific to understanding the behavior of steam injected into the RGA under variable injection scenarios. Two principal study questions were developed during data quality objectives for the study. The first was, "Under what conditions can steam be injected into the RGA to develop a technically effective steam front as a basis for preliminary technology design and cost estimation?" The second was, "How does steam injection using two injection intervals (middle and lower RGA) differ from injection using a single, deep injection interval?" The TS results provided information to the regulatory decision process for determining the technical implementability and cost-effectiveness of steam injection as a potential technology for the heating of the RGA in the Phase IIb treatment area of the C-400 Cleaning Building. The TS was conducted to address uncertainty regarding hydrogeological conditions in the middle and lower RGA; to assess the use of steam injection as a heating technology; and to facilitate an evaluation of the requirements for a full-scale implementation of steam injection throughout the RGA in the Phase IIb treatment area.

Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (2017):

In August 2017, the *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (MOA) was signed by DOE, EPA, and KDEP. The C-400 MOA included the following:

- Resequenced the approved fiscal year (FY) 2015 SMP milestones;
- Established the C-400 Complex OU and the requirement to conduct an RI/FS to support remedy selection for a final remedial action; and
- Required integration of the Phase IIb interim action source area into the final action for the C-400 Complex OU with a remedial action start date of 2023 (i.e., the first quarter of FY 2024). NOTE: the current approved SMP includes a revised remedial action start date of second quarter FY 2025 that supersedes the date listed above from the C-400 MOA.

The C-400 Complex OU (i.e., the C-400 Cleaning Building and area bounded by adjacent streets) contains numerous SWMUs and contaminated environmental media/debris (e.g., groundwater, soils, concrete slabs) and is the primary source of off-site TCE groundwater contamination at the Paducah Site. The C-400 Complex OU is intended to characterize fully the nature and extent of contamination and take the necessary actions to address all environmental contamination in order to achieve a final remedial action for the entire C-400 Complex OU. The C-400 Complex OU final remedial action will address all sources of contamination within the defined footprint of the C-400 Complex OU which includes, but is not limited to, principal threat waste (e.g., TCE DNAPL, high concentration TCE contamination).

Scoping Document for the C-400 Complex Remedial Investigation/Feasibility Study at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2424&D1 (2018):

This RI/FS scoping document was developed to assist in preparation of the RI/FS work plan for the investigation and subsequent remediation of the C-400 Complex OU. The C-400 Complex OU contains numerous SWMUs and contaminated environmental media/debris (e.g., groundwater, soils, slab) and is the largest source of off-site TCE groundwater contamination at PGDP. The C-400 Complex OU project is intended to evaluate fully and take the necessary actions to address all environmental contamination in order to achieve a final remedial action for the entire C-400 Complex OU. This scoping document was based upon a compilation of sampling information collected within the C-400 Complex OU since 1990.

C-400 Vapor Intrusion Study Addendum (Appendix D) to the Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1289&D2/R1/A3/R1 (2018):

This report presents the results of a vapor intrusion (VI) study conducted as an additional action subsequent to the *Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*. This additional action was requested in a letter from the EPA to DOE dated September 30, 2014. As part of the VI study, vapor samples were collected at eight indoor and four ambient (i.e., outdoor) locations. Seven of the eight indoor sampling locations were co-located with sub-slab sampling locations that were collected concurrently to the indoor and ambient vapor samples. One of the indoor air sampling locations was accessed via a sample port installed within an operational exhaust fan and had no corresponding sub-slab sampling. Canister samples were collected as 10-hour integrated samples during normal work hours to mirror the exposure duration of a typical worker within C-400 Cleaning Building.

TCE is the only detected compound that exceeded its project action level (PAL) in indoor air or screening level in sub-slab soil gas at any location. Exceedances of the indoor air PAL were observed only under closed door scenarios. TCE was detected at low concentrations in outdoor air, but only at levels well below its PAL. The spatial association between elevated indoor air and sub-slab soil gas concentrations was consistent with a conclusion that the VI pathway is complete, particularly in the southern portion of the building. The presence of *cis*-1,2-DCE in sub-slab vapor in some locations shows there is an underlying groundwater source of TCE.

The groundwater under C-400 Cleaning Building contains the highest concentrations of TCE at the Paducah Site. The VOC concentrations in the C-400 Cleaning Building have been shown through this VI study not to pose an unacceptable risk to workers.

Paducah Gaseous Diffusion Plant C-400 Cleaning Building Slab and Subsurface Structures Sampling and Analysis Plan, DOE/LX/07-2430&D1 (2018):

This sampling and analysis plan (SAP) for the C-400 Cleaning Building basement slab and subsurface structures and the quality assurance project plan (QAPP) were intended to provide information to the C-400 Complex OU RI/FS at PGDP. The purpose of the SAP/QAPP was to document the approach for the collection of various sample media (e.g., concrete floors and walls; stained areas; surface coatings on walls and floors; caulk; sludges in floor drains, where present; residual floor material); and the collection of field parameters, sampling methodologies, and analytical methods prior to initiating demolition of C-400 Cleaning Building at PGDP. This SAP/QAPP was specific to the C-400 Cleaning Building basement slab and subsurface structures that had been identified. The primary intent of this sampling was to support requirements for deactivation under DOE's Atomic Energy Act authority; however, samples were collected consistent with the procedures and protocols required by CERCLA to provide data that inform the nature and extent of contamination within the C 400 Complex and to help support decisions in a future FS. The analytical data and other information developed from implementation of the SAP were intended to be used in a FS to support decisions for the areas sampled and the areas to which contaminants might have migrated. The data collected from the implementation of this SAP were included in a data summary report (Appendix D of the C-400 Complex OU RI/FS Work Plan).

Memorandum of Agreement for Resolution of Formal Disputes on EPA Conditional Concurrence on the Removal Notification for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2420&D2 and the Engineering

Evaluation/Cost Analysis for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2425&D2 (2019):

In August 2019, this MOA was finalized by DOE, EPA, and KDEP. The following are the terms and conditions of the dispute resolution in the MOA.

1. The FFA parties agree that physical demolition of the C-400 building down to slab as a NTCRA will not be completed prior to the C-400 Complex OU RI field start date.

2. The FFA parties agree to proceed with the C-400 Complex OU RI/FS project.

3. The FFA parties agree that a revision to the *Removal Notification for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07/2420&D2, (Removal Notification) submitted on March 8, 2018, to address the EPA conditions is not required at this time because the NTCRA is suspended per this July 2019 Senior Executive Committee (SEC) Formal Dispute MOA. The parties acknowledge that this MOA does not resolve EPA conditions on the Removal Notification.

4. The FFA parties agree that a revision to the *Engineering Evaluation/Cost Analysis for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-2425&D2, C-400 building Engineering Evaluation/Cost Analysis (EE/CA)] submitted on July 26, 2018, is not required at this time because the NTCRA is suspended per this July 2019 SEC Formal Dispute MOA. Informal dispute agreements reached by the FFA parties on the EPA Conditions shall be addressed in the Primary Documents for the NTCRA when the NTCRA proceeds. The parties acknowledge that this MOA does not resolve four EPA conditions on the EE/CA.

5. The FFA parties agree that a Memorandum to File will be added to the Administrative Record documenting the D1 and D2 CERCLA process Primary Documents (Removal Notification, EE/CA, AM, RAWP) related to the C-400 Cleaning Building NTCRA are not approved and the NTCRA was suspended per this July 2019 SEC Formal Dispute MOA. In this one instance, EPA and KDEP will review and approve the *Memorandum to File* prior to DOE placement in the Administrative Record file.

6. The FFA parties agree that, to avoid delays in finalizing the C-400 Complex D2 RI/FS Work Plan, reporting of the C-400 Deactivation data will be merged with the D2 RI/FS Work Plan to accelerate the documentation process consistent with FFA Section XX.C. DOE will submit, concurrent with submittal of the D2 RI/FS Work Plan, an Appendix to document the sampling results (available at the time of submittal) from the implementation of the Four Rivers Nuclear Partnership, LLC, July 2018 C-400 Cleaning Building Deactivation Basement Slab and Subsurface Structures, Sampling and Analysis Plan/Quality Assurance Project Plan [i.e., *Paducah Gaseous Diffusion Plant C-400 Cleaning Building Basement Slab and Subsurface Structures Sampling and Analysis Plan*, DOE/LX/07-2430&D1]. The appendix will follow the Preliminary Characterization Summary Report outline in Appendix D of the Paducah FFA. The FFA parties will use the information in the appendix for determining if additional RI/FS sampling associated with the basement areas, subsurface structures, and subgrade environmental media is needed to finalize the C-400 Complex RI/FS Work Plan.