



Department of Energy

Portsmouth/Paducah Project Office
1017 Majestic Drive, Suite 200
Lexington, Kentucky 40513
(859) 219-4000

April 26, 2023

Mr. Brian Begley
Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-10024207-23B

Ms. April Webb
Hazardous Waste Branch Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

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

Dear Mr. Begley, Ms. Webb, and Mr. Weeks:

**U.S. DEPARTMENT OF ENERGY PADUCAH GASEOUS DIFFUSION PLANT
FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT FOR THE
FIRST HALF OF FISCAL YEAR 2023 PADUCAH, KENTUCKY, DOE/LX/07-2493/V1**

References:

1. Letter from V. Weeks to T. Duncan, "RE: U.S. Environmental Protection Agency (EPA) Region 4 acknowledges receipt of; and has received the Department of Energy's (DOE's), Paducah Federal Facility Agreement Semiannual Progress Report for the Second Half of Fiscal Year 2022, DOE/LX/07-2478/V2, transmittal date of October 27, 2022," dated November 23, 2022
2. Letter from B. Begley to T. Duncan, "RE: KDWM Submittal of Comments to the U.S. DOE Paducah Gaseous Diffusion Plant Federal Facility Agreement Semiannual Progress Report for the Second Half of Fiscal Year 2022, (DOE/LX/07-2478/V2), Paducah Site, Paducah, McCracken County, Kentucky, KY8-890-008-982," dated November 23, 2022

Enclosed is the *U.S. Department of Energy Paducah Gaseous Diffusion Plant Federal Facility Agreement Semiannual Progress Report for the First Half of Fiscal Year 2023 Paducah,*

Kentucky, DOE/LX/07-2493/V1, and the associated certification page. This report is required by Sections XXIII and XXXII.F of the Federal Facility Agreement (FFA) and Part IV (Corrective Action) of the Hazardous Waste Management Facility Permit.

Comments received November 23, 2022, references above, have been incorporated. A comment response summary reflecting associated changes is included with this transmittal.

In accordance with Section XX of the FFA, the U.S. Environmental Protection Agency and the Kentucky Department for Environmental Protection have a 90-day review period. If the FFA Parties have no substantive comments, the U.S. Department of Energy requests a letter of concurrence.

If you have any questions or require additional information, please contact me at (270) 441-6843.

Sincerely,

APRIL LADD Digitally signed by APRIL
LADD
Date: 2023.04.26 15:25:32
-05'00'

April Ladd
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. FFA Semiannual Progress Report for the First Half of Fiscal Year 2023
3. KDEP Comment Response Summary

General Reference Compendium

cc w/enclosures:

abigail.parish@pppo.gov, PPPO
april.ladd@pppo.gov, PPPO
april.webb@ky.gov, KDEP
arcorrespondence@pad.pppo.gov
brian.begley@ky.gov, KDEP
bruce.ford@pad.pppo.gov, FRNP
bwhatton@tva.gov, TVA
dcnorman0@tva.gov, TVA
eric@pgdpcab.org, CAB
frnpcorrespondence@pad.pppo.gov
hjlawrence@tva.gov, TVA
joel.bradburne@pppo.gov, PPPO
kentuckyES@fws.gov
kristan.avedikian@TechLawInc.com, EPA
leanne.garner@pad.pppo.gov, FRNP
mac.mcrae@TechLawInc.com, EPA

megan.mulry@pad.pppo.gov, FRNP
myrna.redfield@pad.pppo.gov, FRNP
nathan.garner@ky.gov, KYRHB
nrepcdep-dwm-hwb-pgdp@ky.gov
pad.rmc@pad.pppo.gov
rebecca.goodman@ky.gov, KEEC
reinhard.knerr@pppo.gov, PPPO
richard.bonczek@pppo.gov, PPPO
robert.smith@pppo.gov, PPPO
sebenton@tva.gov, TVA
stephaniec.brock@ky.gov, KYRHB
testher@tva.gov, TVA
thhenry@tva.gov, TVA
todd.powers@pad.pppo.gov, FRNP
weeks.victor@epa.gov, EPA

CERTIFICATION

Document Identification: *U.S. Department of Energy Paducah Gaseous Diffusion Plant Federal Facility Agreement Semiannual Progress Report for the First Half of Fiscal Year 2023 Paducah, Kentucky, DOE/LX/07-2493/V1, April 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

JASON CASPER
(Affiliate)
Digitally signed by JASON CASPER (Affiliate)
Date: 2023.04.19 15:40:30 -05'00'

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

Date Signed

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

APRIL LADD
Digitally signed by APRIL LADD
Date: 2023.04.26 15:31:01 -05'00'

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

Date Signed

**DOE/LX/07-2493/V1
Secondary Document**

**U.S. Department of Energy
Paducah Gaseous Diffusion Plant
Federal Facility Agreement
Semiannual Progress Report for the
First Half of Fiscal Year 2023
Paducah, Kentucky**



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**DOE/LX/07-2493/V1
Secondary Document**

**U.S. Department of Energy
Paducah Gaseous Diffusion Plant
Federal Facility Agreement
Semiannual Progress Report for the
First Half of Fiscal Year 2023
Paducah, Kentucky**

Date Issued—April 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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ACRONYMS

AR	Administrative Record
BGOU	Burial Grounds Operable Unit
CAB	Citizens Advisory Board
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRP	community relations plan
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EIC	Environmental Information Center
EPA	U.S. Environmental Protection Agency
EW	extraction well
FFA	Federal Facility Agreement
FRNP	Four Rivers Nuclear Partnership, LLC
gpm	gallons per minute
GRC	general reference compendium
GWOU	Groundwater Operable Unit
IRA	interim remedial action
KDEP	Kentucky Department for Environmental Protection
LUCIP	land use control implementation plan
MCL	maximum contaminant level
MW	monitoring well
MWG	modeling working group
NEPCS	Northeast Plume Containment System
NTCRA	non-time-critical removal action
NTU	nephelometric turbidity unit
NWPGS	Northwest Plume Groundwater System
O&M	operation and maintenance
OU	operable unit
PD	post-decision
PEGASIS	PPPO Environmental Geographic Analytical Spatial Information System
PPPO	Portsmouth/Paducah Project Office
PVA	property valuation administrator
RMD	risk methods document
ROD	Record of Decision
SMP	site management plan
SST	Swift & Staley Team
SWMU	solid waste management unit
SWOU	Surface Water Operable Unit
TVA	Tennessee Valley Authority
VOC	volatile organic compound
WAG	waste area grouping

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FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT FIRST HALF OF FISCAL YEAR 2023

Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023

INTRODUCTION

The Paducah Gaseous Diffusion Plant was placed on the National Priorities List on May 31, 1994. In accordance with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the U.S. Department of Energy (DOE) entered into a Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and Kentucky Department for Environmental Protection (KDEP) on February 13, 1998. The FFA established one set of consistent requirements for achieving comprehensive site remediation in accordance with the Resource Conservation and Recovery Act and CERCLA, including stakeholder involvement.

Site cleanup activities are integrated into the following operable units (OUs).

- C-400 Complex OU
- Groundwater OU (GWOU)
- Surface Water OU (SWOU)
- Soils OU
- Burial Grounds OU (BGOU)
- Facility Decontamination and Decommissioning (D&D) OU
- Lagoons OU
- Depleted Uranium Hexafluoride (DUF₆) Footprint Underlying Soils OU
- Soils and Slabs OU
- CERCLA Waste Disposal Alternatives OU
- Comprehensive Site OU

Section XXIII of the FFA requires that DOE prepare a regulatory semiannual progress report that describes the actions that DOE has taken during the previous six months to implement FFA requirements, as well as the schedules¹ of activities to be taken during the upcoming six months. Activities that have taken place after the reporting period end date are not included in this report, but will be included in the reporting period in which they occur. Projects and activities reported in this update are grouped by the OUs listed in Table 1.

¹ Schedules are included for information and planning purposes only; enforceable schedules are established in the site management plan (SMP).

Table 1. Operable Units and Corresponding Report Topics

Operable Unit	Project/Activities
C-400 Complex Operable Unit	<ul style="list-style-type: none"> • C-400 D&D • C-400 Final Remedial Action
Groundwater Operable Unit	<ul style="list-style-type: none"> • C-400 Interim Remedial Action (IRA) • Southwest Plume Sources Remedial Action • Dissolved-Phase Plumes Remedial Action • Northeast Plume IRA • Northwest Plume IRA
Burial Grounds Operable Unit	<ul style="list-style-type: none"> • C-749 Uranium Burial Ground Solid Waste Management Unit (SWMU) 2
Surface Water Operable Unit	<ul style="list-style-type: none"> • Remedial Action
Water Policy	<ul style="list-style-type: none"> • Removal Action
Additional Reporting	<ul style="list-style-type: none"> • Waste Area Groupings (WAGs) 1 and 7 • Community Relations Plan (CRP) • SMP • CERCLA Five-Year Review • Plant Industrial Area Vapor Intrusion Assessment

Each section of this update has been divided into nine sections as follows.

- I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan)
- II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction)
- III. Identity and assigned tasks of DOE contractors for work to be performed for this project
- IV. Statement of the manner and extent to which the requirements and time schedules are being met
- V. Primary/Secondary Document Tracking System
 - A) Documents under review and/or preparation for this reporting period
 - B) Due dates for completion of review/modification tasks
- VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay)
- VII. Summary of all contacts with local community, public interest groups, or state government
- VIII. Changes in relevant personnel
- IX. Actual cost for operation and maintenance (O&M), if appropriate

Each section satisfies a reporting requirement for the FFA Semiannual Progress Report or the Hazardous Waste Management Facility Permit and has been formatted in accordance with the template found in Appendix D of the FFA.

This report includes five appendices as follows.

- Appendix A contains Northeast and Northwest Plumes Water Withdrawal Reports for the July 1, 2022, through December 31, 2022, reporting period.
- Appendix B contains Figures B.1 through B.30, as referenced in the Northeast and Northwest Plumes updates. All groundwater data are available in the Portsmouth/Paducah Project Office (PPPO) Environmental Geographic Analytical Spatial Information System (PEGASIS) and, therefore, have not been summarized in this semiannual report.
- Appendix C contains a map depicting monitoring well (MW) locations for the C-746-K Landfill and graphical presentations of trichloroethene (TCE) concentrations in these wells over time. These data are currently collected semiannually. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this semiannual report.
- Appendix D contains updates to the Administrative Record (AR) index since the last progress report. This is required by the Paducah FFA (Section XXXII.F). In October 2018, DOE began a comprehensive review of the Paducah Environmental Information Center (EIC) to ensure that the project document files were complete. As part of this effort, DOE reorganized the Paducah EIC to include the original three categories: 1) AR File, 2) Post-Decision (PD) File, and 3) General Reference Compendium (GRC); and added 4) AR Reference File and 5) AR Archive File. The AR Reference File contains programmatic documents that support the AR [e.g., SMP, Risk Methods Document (RMD)]. As a result of this reorganization of the EIC, Appendix D has been expanded to include updates to the AR index that include the AR File, PD File, and AR Reference File.

The AR Archive File contains documents for projects that originally were expected to have a decision document [i.e., Record of Decision (ROD) or Action Memorandum], but had been resequenced prior to a final decision. These documents have been archived within the AR Archive File to establish future AR files for projects and, as a result, are not included in Appendix D. The AR Archive File can be viewed on the EIC website.

The GRC, which supplements the Paducah AR, contains technical documents associated with the Paducah Site that do not meet the CERCLA criteria of an AR File or a PD File (e.g., CRP, CERCLA Five-Year Review, Annual Site Environmental Report); but are deemed important in understanding the Paducah Site environmental remedial efforts. Because the GRC is not part of the AR, it is not included as part of the update to Appendix D. The GRC can be viewed on the EIC website.

- Appendix E contains figures depicting the C-749 Uranium Burial Ground (SWMU 2) groundwater MW network and a summary of the SWMU 2 trends for TCE and technetium-99 (Tc-99) for a period of five years. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this semiannual report.

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**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

C-400 COMPLEX OPERABLE UNIT

The C-400 Complex OU was established in a *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (C-400 Complex OU MOA), signed August 8, 2017; the agreement then was incorporated into the SMP. The following two projects are included in the C-400 Complex OU.

- C-400 D&D
- C-400 Final Remedial Action

On September 16, 2022, the FFA parties executed an FFA milestone modification, which incorporated the C-400 D&D into the C-400 Final Remedial Action. Because the demolition of the C-400 Cleaning Building will be incorporated into the C-400 Final Remedial Action, milestones associated with the C-400 D&D, which was intended to be a non-time-critical removal action (NTCRA), will not be necessary. Per the Memorandum, *Suspension of D1 and D2 Comprehensive Environmental Response, Compensation, and Liability Act Documents Associated with the C-400 Cleaning Building Non-Time-Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (C-400 Building D&D MOA), dated October 2, 2019, the original NTCRA documents were not approved, and the NTCRA was suspended. With the FFA parties' execution of the FFA milestone modification, the C-400 Building D&D MOA is superseded, and the planning documents associated with the NTCRA and their associated milestones are no longer required because the C-400 Cleaning Building will be demolished as part of the remedial action. Additionally, under the FFA parties' FFA milestone modification, the milestone dates in the C-400 Complex OU MOA, which provided for enforceable milestones and planning dates and was later extended due to the force majeure related to COVID-19, are also superseded.

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**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

C-400 COMPLEX OPERABLE UNIT: C-400 Final Remedial Action

The C-400 Final Remedial Action will investigate the C-400 Complex OU and associated SWMUs, evaluate potential remedial alternatives, develop decision documents selecting an alternative(s), and design and implement the remedial alternative(s).

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Completed scoping of the *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, with EPA and KDEP.
- Finalized and submitted to EPA and KDEP the *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, on January 5, 2023.
- Received extension notification of 30 days for the *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, from EPA on March 22, 2023; extension resulted in a new deadline of May 5, 2023, for receipt of EPA and KDEP comments on the document.
- Initiated development of the *Proposed Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2487&D1.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Receive EPA and KDEP comments on the *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.
- Develop and submit the *Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2474&D2, to address EPA and KDEP comments.
- Receive EPA and KDEP approval of the *Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2474&D2.
- Finalize and submit the *Proposed Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2487&D1.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the C-400 Complex OU belongs to Four Rivers Nuclear Partnership, LLC (FRNP). FRNP also provides programmatic and technical support, analytical services, and business management services. Swift & Staley Team (SST) manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

Requirements for the C-400 Complex Remedial Action are being met consistent with the following documents:

- *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, signed August 8, 2017;
- *Memorandum of Agreement for Resolution of Formal Dispute Regarding the Non-Concurrence by EPA and KDEP on the DOE Milestone Modification Request for Submittal of the Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-2407&D1)*, signed September 28, 2017;
- *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*, signed August 1, 2019; and
- *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023, DOE/LX/07-2482&D2*.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- *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*, was under development, and the document was under EPA and KDEP review during this reporting period.
- *Proposed Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2487&D1*, was under development during this reporting period.

B) Due dates for completion of review/modification tasks:

- Comments from EPA and KDEP on the *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*, are due within 90 days of document issuance, or

April 5, 2023; a 30-day extension requested by EPA makes comments due no later than May 5, 2023.

- *Proposed Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2487&D1, is due within 45 days of EPA and KDEP approval of the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474&D2.*

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site Citizens Advisory Board (CAB), FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

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**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT

The scope of the GWOU includes performing investigations, conducting baseline risk assessments, evaluating removal/remedial alternatives, and selecting and implementing actions necessary to achieve protection of human health and the environment from exposure to groundwater contamination that could result in an unacceptable risk.

Within the GWOU are these projects: C-400 IRA, Southwest Plume Sources Remediation, Dissolved-Phase Plumes, Northeast Plume IRA, and Northwest Plume IRA.

The overall objective of the GWOU is to remove/mitigate ongoing sources and to remediate the groundwater to target contaminant concentrations. The predominant contaminant of concern in the groundwater plumes is TCE. Table 2 provides an overall picture of the TCE mass removed [TCE values may contain other volatile organic compounds (VOCs)] by various actions.

Table 2. Cumulative TCE* Removed at Paducah

Source Area	Cumulative TCE Removed (gal)*
Northwest Plume Pump-and-Treat	3,992**
Northeast Plume Pump-and-Treat	371**
C-400 Six-Phase Treatability Study	1,900
C-400 Phase I	535
C-400 Phase IIa	1,137
Southwest Plume (SWMU 1)	24***
Other sources (i.e., SWMU 91–LASAGNA™)	246
Total	8,205

*TCE values may contain other VOCs.

**Cumulative through December 31, 2022.

***Removed during deep soil mixing operations.

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**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT PROJECT: C-400 IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Continued long-term monitoring of the C-400 IRA groundwater monitoring network as required by 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, DOE/OR/07-2150&D2/R2.*

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue long-term monitoring for the C-400 IRA. Data from long-term monitoring for the C-400 IRA are available in PEGASIS.
- Conduct annual inspections in accordance with the *Land Use Control Implementation Plan: 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/07-2151&D2/R2.*

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the C-400 IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

The requirements for the C-400 IRA are being met consistent with the following documents:

- *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, signed August 8, 2017;*
- *Memorandum of Agreement for Resolution of Formal Dispute Regarding the Non-Concurrence by EPA and KDEP on the DOE Milestone Modification Request for Submittal of the Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-2407&D1), signed September 28, 2017;*

- *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; and*
- *Land Use Control Implementation Plan: 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/07-2151&D2/R2.*

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- None.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

.IX. Actual cost for O&M, if appropriate:

- Sampling of the C-400 IRA wells has been incorporated into the Environmental Monitoring Program. O&M cost for sampling for the C-400 IRA Project is not tracked separately.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT PROJECT: Southwest Plume Sources

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

SWMU 1

- Continued long-term monitoring of the SWMU 1 MW network as required by the *Remedial Action Work Plan for In Situ Source Treatment by Deep Soil Mixing of the Southwest Groundwater Plume Volatile Organic Source at the C-747-C Oil Landfarm (Solid Waste Management Unit 1) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1287&D2/A1/R1.*
- Conducted inspections of land use control implementation plan (LUCIP) warning signs at SWMU 1 and verified the Excavation/Penetration Permit program for the Southwest Plume area as required by the *Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365&D2/R1.*

SWMUs 211-A and 211-B

- Completed field implementation of the SWMU 211-A Enhanced *In Situ* Bioremediation Project as contained in the *Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435&D2,* and the *Remedial Action Work Plan for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2443&D2.*
- Performed sample collection of the performance MW network at SWMU 211-A on December 14, 2022 (first round), and March 28, 2023 (second round), as prescribed in the *Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435&D2.*²
- Developed and published the Public Notice announcing the availability of the approved *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest*

² Sampling for Dehalococcoides bacteria in the performance wells was not performed in the first and second rounds due to constraints with the contracted commercial laboratory. This laboratory is currently installing equipment to perform the needed analysis. Upon completion, special sampling events for Dehalococcoides will be performed to supplement the first and second rounds.

Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D1, on February 18, 2023.

- Received EPA and KDEP supplemental comments for the *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D1, on November 1, 2022.*
- Submitted a schedule notification on October 24, 2022, notifying EPA and KDEP of DOE's extension for submittal of the *D2 Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D2, to November 22, 2022.*
- Developed and submitted to EPA and KDEP the *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D2, on November 28, 2022.*
- Received EPA and KDEP concurrence of the *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D2, on December 2, 2022, and December 5, 2022, respectively.*
- Finalized and issued the *Interim Remedial Action Completion Report with Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483&D1, on February 10, 2023.*
- Conducted inspections of LUCIP warning signs at SWMU 211-A and SWMU 211-B and verified the Excavation/Penetration Permit Program for the Southwest Plume areas as required by the *Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365&D2/R1.*

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

SWMU 1

- Continue long-term monitoring of the SWMU 1 MW network as required by the *Remedial Action Work Plan for In Situ Source Treatment by Deep Soil Mixing of the Southwest Groundwater Plume Volatile Organic Source at the C-747-C Oil Landfarm (Solid Waste Management Unit 1) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1287&D2/A1/R1.*
- Conduct inspections of LUCIP warning signs at SWMU 1 and verify the Excavation/Penetration Permit Program for the Southwest Plume area as required by the *Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of*

102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365&D2/R1.

SWMUs 211-A and 211-B

- Develop and submit the *Interim Remedial Action Completion Report with Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483&D2*, to address EPA and KDEP comments.
- Perform third round sample collection of the performance and long-term MW networks at SWMU 211-A, as prescribed in the *Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435&D2*.
- Perform fourth round sample collection of the performance and long-term MW networks at SWMU 211-A, as prescribed in the *Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435&D2*.
- Conduct inspections of LUCIP warning signs at SWMU 211-A and SWMU 211-B and verify the Excavation/Penetration Permit Program for the Southwest Plume areas as required by the *Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365&D2/R1*.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Southwest Plume Sources belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements for the SWMU 1 portion of the Southwest Plume sources remedial action subproject are being met consistent with the SMP, the FFA, and as agreed to by the FFA parties.
- The requirements for the SWMU 211-A portion of the Southwest Plume subproject are being met consistent with the SMP, the FFA, and as agreed to by the FFA parties.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D2*, was under development and the document was under review and concurred on by EPA and KDEP during this reporting period.

- *Public Notification of the availability of the Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D2, was under development and was published during this reporting period.*
- *Interim Remedial Action Completion Report with Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483&D1, was under development, and the document was under review by EPA and KDEP during this reporting period.*

B) Due dates for completion of review/modification tasks:

- Comments from EPA and KDEP on the *Interim Remedial Action Completion Report With Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483&D1*, are due within 90 days of document issuance, or May 11, 2023.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff, as applicable.
- Published Public Notice announcing the availability of the approved *Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480&D1*, on February 18, 2023.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT PROJECT: Dissolved-Phase Plumes

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Met quarterly with the Modeling Working Group (MWG) during this reporting period on October 5, 2022, and January 18, 2023.
- Finalized and issued the *Detailed Correlations between Lithologic Units in the McNairy Formation across the Paducah Gaseous Diffusion Plant*, FRNP-RPT-0249, on January 13, 2023.
- Received EPA and KDEP acknowledgement and agreement that the *Detailed Correlations between Lithologic Units in the McNairy Formation across the Paducah Gaseous Diffusion Plant*, FRNP-RPT-0249, closes the corresponding action from the DOE CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2426&D2 (CY 2018 FYR), May 2019, FY on January 18, 2023.
- Developed and issued the *Compilation of Meeting Summaries and White Papers (Fiscal Year 2022) A Product of the Paducah Gaseous Diffusion Plant Site Groundwater Modeling Working Group*, DOE/LX/07-2485&D1, on February 1, 2023.
- Developed and issued the *Assessment of Northwest Plume Capture at the Paducah Gaseous Diffusion Plant, Paducah Kentucky*, FRNP-RPT-0274, from open issue from the DOE CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2426&D2 (CY 2018 FYR), May 2019, on February 8, 2023.
- Received KDEP comments on the *Comparison of Regional Groundwater Flow Pre- and Post-Construction and Operation of Olmsted Locks and Dam*, FRNP-RPT-0260, on February 2, 2023; EPA did not have any comments.
- Received EPA and KDEP acknowledgement and agreement that the *Assessment of Northwest Plume Capture at the Paducah Gaseous Diffusion Plant, Paducah Kentucky*, FRNP-RPT-0274, on February 8, 2023; closes the corresponding issue from the DOE CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2426&D2 (CY 2018 FYR), May 2019, FY on February 14, 2023, and February 15, 2023 respectively.
- Finalized the *Comparison of Regional Groundwater Flow Pre- and Post-Construction and Operation of Olmsted Locks and Dam*, FRNP-RPT-0260; the document will be included in the *Compilation of Meeting Summaries and White Papers (Fiscal Year 2023)*.

- Developed and submitted the white paper, *Degradation of Trichloroethene at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, FRNP-RPT-0282, to the MWG on March 1, 2023.
- Continued updates to the sitewide groundwater model.
- Initiated development of the *2023 Update of the Paducah Gaseous Diffusion Plant Sitewide Groundwater Flow Model*, DOE/LX/07-2488&D1.

II. Schedule of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Conduct quarterly meetings with the MWG, which are currently planned for April 5, 2023, and July 12, 2023.
- Finalize development of the *2023 Update of the Paducah Gaseous Diffusion Plant Sitewide Groundwater Flow Model*, DOE/LX/07-2488&D1.
- Finalize development of the white paper, *Degradation of Trichloroethene at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, FRNP-RPT-0282.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Dissolved-Phase Plume belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met. The MWG will continue to support Paducah Site projects.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff, as applicable.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

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**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT PROJECT: Northeast Plume IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Treated 46,103,034 gal of contaminated groundwater, with an average system treatment rate of 174 gallons per minute (gpm) during this reporting period. The system is designed so that continuous operation of the Northeast Plume Containment System (NEPCS) is possible when only one of the two extraction wells (EWs) is functional. The NEPCS achieved an average operational efficiency, as a whole, of 99.2%. Operational online efficiencies for the reporting period for C-765 were as follows: July 2022, 99.9%; August 2022, 99.6%; September 2022, 100%; October 2022, 99.2%; November 2022, 99.9%; and December 2022, 99.8%. The C-765-A operational online efficiencies for the reporting period were as follows: July 2022, 100%; August 2022, 99.8%; September 2022, 92.5%; October 2022, greater than 99.9%; November 2022, 99.9%; and December 2022, 100%.

A) Process Operations:

The NEPCS consists of two EWs (EW234 and EW235), transfer piping, two treatment units for air stripping and suspended solids removal, and MW network. The old EWs, EW331 and EW332, equalization tank, and old transfer piping have been placed in standby mode.

B) Process Testing:

Operation of the NEPCS began February 28, 1997. As of December 31, 2022, the NEPCS has processed a total of approximately 2,175,384,677 gal of water. The monthly withdrawal volumes for this reporting period are presented in Appendix A, Table A.1, of this report. This table includes a summary of the withdrawn water volumes and average daily rates.

C) NEPCS Influent, Effluent, and Extraction Well Testing:

Due to sample analysis time and the data assessment process, there is a three month lag in the analytical data and operational data. Graphs in this report present analytical data through December 31, 2022. Data are available in PEGASIS.

Influent TCE analytical data from 2017 through the end of December 2022 are presented in Appendix B. Environmental samples were collected monthly from the treatment system influent and weekly from the treatment system effluent for the period of July 1, 2022, through December 31, 2022. High, low, and average influent and effluent TCE concentrations for these months are presented in Table 3.

Table 3. TCE Concentrations for Northeast Plume

	TCE (µg/L)		
	High	Low	Average
Influent C-765 (EW234)	372	64.9	282
Influent C-765-A (EW235)	132	53.7	96.0
Effluent from C-765	< 1	< 1	< 1
Effluent from C-765-A	< 1	< 1	< 1
Effluent (CERCLA Outfall C001)	< 1	< 1	< 1

NOTE: Data rejected by validation or assessment are not included on the table.

As presented in Table 3, the NEPCS continued to remove TCE effectively. The systems operated with an average removal efficiency of 99.6% for EW234 and 99.0% for EW235 for TCE.

The EWs were sampled monthly during this reporting period. For the period of July 1, 2022, through December 31, 2022, EW234 had an average TCE concentration of 282 µg/L, while EW235 had an average concentration of 96.0 µg/L.

Treated groundwater for the Northeast Plume is discharged to a CERCLA outfall, and data associated with the CERCLA outfall are included as part of Appendix B of this report.

D) Maintenance Activities:

Routine Maintenance Activities:

Daily, monthly, quarterly, and annual routine maintenance activities were conducted in accordance with the *Northwest/Northeast Plume Daily Operational Data Collection and Maintenance*, CP4-ER-0017.

- C-765 system was shut down for 0.5 hours for planned maintenance during this reporting period.
- C-765-A system was shut down for 4.75 hours for planned maintenance during this reporting period.

Non-routine Maintenance Activities:

- C-765 system was unexpectedly shut down for 11.25 hours due to repairs on failed system components during this reporting period.
- C-765-A system was unexpectedly shut down for 51.5 hours due to repairs on failed system components during this reporting period.

E) Effectiveness Monitoring—Monitoring Well Results:

Figure B.1, included in Appendix B, shows locations of the MWs and EWs. Figure B.2 shows system influent TCE concentrations, and Figure B.3 includes a summary of the Tc-99 activities in the Northeast Plume EWs. Figure B.4 shows the estimated cumulative amount of TCE removed since the NEPCS began operations in 1997. Figures B.5 through B.14, presented in Appendix B, show TCE concentrations and Tc-99 activities in upgradient transect wells, MWs near the EWs, downgradient wells, distal downgradient wells, and wells near the C-400 Complex. The EWs are working well to increase TCE mass removal and to enhance control of the plume. This is shown in Figure B.4 in Appendix B with an increase in mass removal beginning in October 2017, with initiation of pumping from the optimized EWs.

During this reporting period, the FFA parties reviewed and assessed the Northeast Plume TCE and Tc-99 transect well results on a quarterly basis. The analytical results can be found in Appendix B, along with analytical results for other NEPCS MWs. This information is used by the FFA parties when considering if additional adjustments are needed to minimize undesirable expansion of high concentrations of Tc-99 and TCE within the Northeast Plume. As agreed to by the FFA parties, 100 gpm and 75 gpm are the target flowrates for EW234 and EW235, respectively. The NEPCS continues to operate under Condition #3 of the *Memorandum of Agreement for Resolution of Formal Dispute of the Explanation of Significant Differences to the Record of Decision for the Interim Remedial Action of the Northeast Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1291&D2)*, and *Remedial Action Work Plan for Optimization of the Northeast Plume Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1280&D2)*.

F) Modification of the NEPCS Operations or Configuration:

- None.

G) See Section V for work related to document preparation and review.

II. Schedule of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue to conduct and document the necessary tasks required for equipment maintenance, calibration, and operation as specified in the *Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470&D1*.
- Provide TCE and Tc-99 transect MW sampling results to EPA and KDEP on a quarterly basis.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Northeast Plume IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The effluent concentration goal of 30 µg/L for TCE was met during the reporting period. The NEPCS remained operational 99.2% of the time during this reporting period.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- Actual costs for O&M of the Northwest and Northeast Plume facilities are tracked jointly. The total operating cost for the reporting period was approximately \$695,000.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

GROUNDWATER OPERABLE UNIT PROJECT: Northwest Plume IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Treated 43,192,598 gal of contaminated groundwater, with an average monthly operational efficiency of 98.9% during this reporting period. The average system treatment rate for the reporting period was approximately 163 gpm. Operational efficiencies for the reporting period were as follows: July 2022, 97.5%; August 2022, 99.9%; September 2022, 99.5%; October 2022, 100%; November 2022, 97.8%; and December 2022, 98.7%.

A) Process Operations:

The Northwest Plume Groundwater System (NWPGS) consists of two EWs (EW232 and EW233), located just north of the Paducah Site, and underground transfer pipeline for moving comingled groundwater from the EWs to the C-612 treatment facility. The treatment facility has an operational capacity of 220 gpm and utilizes air stripping for removal of TCE in groundwater, ion exchange for removal of Tc-99 in groundwater, and vapor phase carbon for capturing TCE from the exhaust of the air stripper. Treated groundwater is released to a tributary that flows to Kentucky Pollutant Discharge Elimination System Outfall 001. A MW network is used to evaluate performance and effectiveness of the optimized EWs.

B) Process Testing:

Operation of the NWPGS began on August 28, 1995. As of December 31, 2022, the NWPGS has processed a total of approximately 2,728,368,258 gal of water. The monthly withdrawal volumes for the reporting period are presented in Appendix A, Table A.2, of this report. This table includes a summary of the withdrawn water volumes and average daily rates.

C) NWPGS Influent, Effluent, and Extraction Well Testing:

Due to sample analysis time and the data assessment process, there is a three month lag in the analytical data and operational data. Graphs in this report present data through December 2022. Data are available in PEGASIS.

Figure B.15, included in Appendix B, shows locations of the Northwest Plume MWs. Influent TCE and Tc-99 analytical data are presented in Appendix B on Figures B.16 and B.17. Figures B.18 and B.19 include a summary of the TCE and Tc-99 concentrations of the effluent versus time at the NWPGS. Figure B.20 shows the cumulative estimated amount of TCE removed since the NWPGS began operations in 1995. The influent sample results, compared to the NWPGS effluent results, indicated that the NWPGS continues to remove TCE and Tc-99 effectively.

For radionuclides, all reported values, including negative values, are used to derive averages. Negative Tc-99 results may be reported due to a statistical determination of the counts seen by a detector, minus a background count. High, low, and average treatment facility influent and effluent TCE and Tc-99 concentrations from July 1, 2022, through December 31, 2022, are presented in Table 4.

Table 4. TCE and Tc-99 Concentrations at the C-612 Treatment Facility for Northwest Plume (July 1, 2022, through December 31, 2022)

	TCE (µg/L)			Tc-99 (pCi/L)		
	High	Low	Average	High	Low	Average
Influent from EW232 and EW233 (combined)	1,400	712	1,063	391	232	303
Effluent from C-612 NW Plume treatment facility	1.16	< 1*	< 1*	44.9	6.90	29.0

*The values denoted are below the detection limit.

The treatment system influent was sampled monthly. The effluent was sampled weekly. These sampling frequencies were conducted in accordance with the *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2469&D2. As presented in Table 4, the NWPGS continued to remove TCE and Tc-99 effectively. The system operated with an average removal efficiency of 99.9% for TCE and 90.4% for Tc-99.

The average TCE effluent concentration for this reporting period was less than 1 µg/L, which is less than the treatment goal of 5 µg/L. The average Tc-99 effluent value was 29.0 pCi/L, which is less than the operational goal of 900 pCi/L, during the reporting period.

High, low, and average sample results for this reporting period at the EWs are shown in Table 5. EW232 and EW233 were sampled quarterly in accordance with the *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2469&D2.

Table 5. TCE and Tc-99 Concentrations for Northwest Plume Extraction Wells (July 1, 2022, through December 31, 2022)

	TCE (µg/L)			Tc-99 (pCi/L)		
	High	Low	Average	High	Low	Average
EW232	388	344	360	184	113	141
EW233	1,350	978	1,206	451	352	389

D) Treatment Media:

Ion Exchange Resins:

The NWPGS is equipped with four ion exchange columns used for Tc-99 removal. Purolite® A520E resin is used in the columns, which are arranged in a lead/lag configuration in a trailer.

Activated Carbon Media:

The NWPGS is equipped with two carbon columns that contain granular activated carbon for absorption of VOCs from the vapor-phase effluent of the air stripper unit. The *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2469&D2, requires that spent carbon be replaced every 6 months. The last carbon changeout was completed on March 28, 2023. The next carbon changeout is projected for September 2023.

E) Maintenance Activities:

Routine Maintenance Activities:

Daily, monthly, quarterly, and annual routine maintenance activities were conducted in accordance with the *Northwest/Northeast Plume Daily Operational Data Collection and Maintenance*, CP4-ER-0017, and *Monthly, Quarterly, and Annual Maintenance at the C-612 Northwest Plume Groundwater System*, CP4-ER-0016.

- The NWPGS was shut down for a total of 17.5 hours for planned maintenance activities.

Non-routine Maintenance Activities:

- The NWPGS was unexpectedly shut down for a total of 30.75 hours for the repair of failed components and one instance of a power surge that took the system offline.

Effectiveness Monitoring—Monitoring Well Results:

Figures B.21 through B.30 presented in Appendix B, show TCE and Tc-99 concentrations in EWs and nearby MWs from 2018 through December 2022.

G) Modification of the NWPGS Operations or Configuration:

- None.

H) See Section V for work related to document preparation and review.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue to conduct and document the necessary tasks required for equipment maintenance, calibration, and operation, as specified in the *Operation and Maintenance Plan for the*

Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469&D2.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Northwest Plume IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The average NWPGS water effluent concentrations met the operational goals of 5 µg/L for TCE and 900 pCi/L for Tc-99 during the reporting period. The NWPGS has maintained an average monthly operational efficiency of 98.9% during this reporting period.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, and reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- Actual costs for O&M of the Northwest and Northeast Plume facilities are tracked jointly. The total operating cost for the reporting period was approximately \$695,000.

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BURIAL GROUNDS OPERABLE UNIT

The scope of the BGOU includes an RI, baseline human health risk assessment, evaluation of remedial alternatives, remedy selection, and implementation of actions, as necessary, for protection of human health and the environment for the following burial grounds: C-749 (SWMU 2); C-404 (SWMU 3); C-747/C-748-B (SWMU 4); C-746-F (SWMU 5); C-747-B (SWMU 6); C-747-A (SWMUs 7 and 30), which includes the area beneath C-747-A (SWMU 12); the residential/inert borrow area (SWMU 145); and the C-746-S&T Landfills (SWMUs 9 and 10, respectively).

This section also includes information on the sampling activities being conducted at the C-749 Uranium Burial Ground, as required in the *Record of Decision for Interim Remedial Action at Solid Waste Management Units 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/06-1351&D1, signed in 1995.

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BURIAL GROUNDS OPERABLE UNIT PROJECT: C-749 Uranium Burial Ground (SWMU 2)

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Continued groundwater monitoring at the C-749 Uranium Burial Ground, as required by the *Record of Decision for Interim Remedial Action at Solid Waste Management Unit 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1351&D1*. Appendix E contains figures depicting the C-749 Uranium Burial Ground (SWMU 2) groundwater MW locations and a summary of the SWMU 2 trends for TCE and Tc-99 for a period of five years. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this report.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue groundwater monitoring at the C-749 Uranium Burial Ground, as required by the *Record of Decision for Interim Remedial Action at Solid Waste Management Unit 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, DOE/OR/06-1351&D1*.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the C-749 Uranium Burial Ground belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE and maintains existing burial ground cover.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation during this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- None.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- Sampling of the C-749 Uranium Burial Ground has been incorporated into the Environmental Monitoring Program. O&M cost for this project is not tracked separately.

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SURFACE WATER OPERABLE UNIT

The SWOU includes the Surface Water Removal Action and Surface Water Remedial Action projects. O&M is performed on North-South Diversion Ditch Sections 1 and 2 and institutional controls, as required by the *Operation and Maintenance Plan for Sections 1 and 2 of the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2057&D2*, and *Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1904&D1/R2*; and O&M activities for the C-613 Sedimentation Basin are maintained in accordance with the *Operation and Maintenance Plan for the Northwest Storm Water Control Facility at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2044&D1/R4*, respectively.

Per the *Operation and Maintenance Plan for the Northwest Storm Water Control Facility at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2044&D1/R4*, the relationship of turbidity to total suspended solids is compared on a quarterly basis. An update to the existing linear regression model was performed in January 2023, and the current maximum discharge limit for turbidity is 96 nephelometric turbidity units (NTUs), with a 30-day average not to exceed 46 NTUs.

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SURFACE WATER OPERABLE UNIT PROJECT: Remedial Action

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Conducted inspections in accordance with the *Land Use Control Implementation Plan for the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1949&D2/R2.
- Conducted inspections for Environmental Indicator signs in October 2022 and Institutional Control measures in November and December 2022 in accordance with the *Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1904&D1/R2.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Conduct inspections in accordance with the *Land Use Control Implementation Plan for the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1949&D2/R2.
- Conduct inspections for Environmental Indicator signs and Institutional Control measures in accordance with the *Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1904&D1/R2.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the SWOU Remedial Action belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met for the SWOU consistent with the SMP and as agreed to by the FFA parties.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- O&M activities have been incorporated into the Environmental Monitoring Program. O&M cost for this project is not tracked separately.

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WATER POLICY

Pursuant to the June 1994 *Action Memorandum for the Water Policy at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/06-1201&D2, that was approved by EPA in August 1994, municipal water service was offered at no cost to all existing private residences and businesses within the Water Policy affected area. The affected area is defined as follows:

The affected area is generally bounded by the Ohio River to the north, DOE property boundary to the south, Metropolis Lake Road to the east, and Bethel Church Road to the west. Specifically, on the west side, the boundary follows the DOE property boundary northwest to the intersection with Big Bayou Creek. At that point, it moves west to the intersection of Bethel Church Road and the centerline of a powerline easement just south of Bobo Lane. Property fronting the north end of Bethel Church Road is included in the affected area north of the intersection with the powerline easement to the Ohio River. Specifically, on the east side, the boundary follows the DOE property boundary northwest to the southern point of private property that fronts Ogden Landing Road (identified in McCracken County Property Valuation Office records as #20-27-1A). At that point, it moves east along the southern edge of properties that front the south side of Ogden Landing Road to the intersection of Ogden Landing Road with Metropolis Lake Road. Property fronting on both sides of Metropolis Lake Road is included in the affected area north of this intersection of the roads to the Ohio River.

There are 680.5 acres within the Water Policy affected area (i.e., excluding DOE property) that lie over the 2020 TCE groundwater plume above the 5 µg/L maximum contaminant level (MCL); 522.5 acres are owned by either West Kentucky Wildlife Management Area or the Tennessee Valley Authority (TVA), and 158 acres are owned by private residents or businesses. DOE has implemented various water policy activities that ensure proper management of the Water Policy and assist in DOE's long-term protectiveness of residents and businesses located within the Water Policy affected area. These activities include the following: (1) update water policy area information by maintaining an annual subscription to the online McCracken County Property Valuation Administrator (PVA) office and verifying land ownership with the PVA office; (2) review the monthly billing register, ensuring water bill payments and assessing trends; (3) manage license agreements; (4) provide sampling results; (5) provide an annual water policy educational fact sheet to all residents and businesses within the affected area; (6) perform annual cap and lock inspections; and (7) demonstrate, on an annual basis, that residents and businesses located over the groundwater plume are not utilizing the groundwater.

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PROJECT: Water Policy

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

License Agreements:

- Offered four license agreements during this reporting period. Three license agreements are pending landowner signature. Two license agreements that were sent during the previous reporting period were signed by the landowner during this reporting period. One license agreement offered during this period has been signed. As of March 31, 2023, 112 of 124 parcels within the Water Policy affected area are inhabitable (i.e., house or mobile/manufactured home with active municipal water). A total of 90.2% of the inhabitable parcels are covered by a license agreement. There are 10 parcels that overlie the plumes. Ninety percent of these parcels are under a license agreement, and the one unlicensed parcel is vacant.
- All parcel owners have been offered license agreements.

Water Bills:

- Reviewed all water bills for properties that DOE pays and noted no significant trends during this reporting period.

Water Policy Educational Fact Sheet Mailer:

- Developed and submitted the *Water Policy Educational Fact Sheet* mailer to EPA and KDEP on January 17, 2023.
- Received EPA approval and KDEP comment on the *Water Policy Educational Fact Sheet* mailer on January 17, 2023.
- Issued the *Water Policy Educational Fact Sheet* mailer to area residents on March 10, 2023.
- Published the *Water Policy Educational Fact Sheet* and made it available to the public on the Paducah EIC on March 14, 2023.

Demonstration that Residents in the Water Policy Affected Area Are Protected:

- Completed the annual demonstration that residents, including parcels located over the contaminated groundwater plume, are not accessing groundwater from any residential well located within the Water Policy area. This demonstration included the following:

- Continued monthly review of the Water Policy affected area water bills and ensure no downward trends in usage that could indicate that property owners are using groundwater instead of municipal water. This review includes the 10 parcels that lie over the 5 µg/L or greater portion of the TCE groundwater plumes. No issues were identified during this review.
- Reviewed the Kentucky Geological Survey water well database and ensured that no additional groundwater wells have been installed in the Water Policy affected area, which included the area over the 5 µg/L or greater portion of the TCE groundwater plumes, as delineated for 2020. No issues were identified during this review.
- Received and reviewed the Kentucky Division of Water weekly report, which includes scans for newly submitted drilling logs for any water wells drilled within the Water Policy area. No issues were identified during this review.
- Conducted visual assessments (i.e., drive-bys, Google Earth images) of parcels overlying or immediately adjacent to the 5 µg/L or greater portion of the TCE groundwater plumes, as delineated for 2020. No issues were identified during these assessments.
- Verified land ownership by reviewing the PVA website. No issues were identified during this assessment.

Cap and Lock Inspection:

- Conducted the annual inspection of the caps and locks installed on residential wells located on parcels with current license agreements. During the cap and lock inspection, one residential well had a crack across the top of its cap. The lock was present with the cap, and the well was not accessible; however, the cracked cap will be replaced to prevent further damage.

Monitoring:

- Routine monitoring was conducted in accordance with the following documents:
 - *Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470&D1; and*
 - *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469&D2.*
- Data collected in support of water policy monitoring will be made available in PEGASIS once data have been reported to the landowners.

Northeast:

- Nine MWs and seven residential wells are monitored routinely in accordance with the *Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470&D1.*

- Sampled seven residential wells during this reporting period. All seven were sampled in November 2022. None of the MWs sampled in September 2022 during the previous reporting period, nor the residential wells sampled in November 2022 exhibited detections greater than the MCL for TCE (5 µg/L).

Northwest:

- Thirteen MWs and five residential wells are monitored routinely in accordance with the *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2469&D2. (Note: Tc-99 was added as a result of the *Memorandum of Agreement for Resolution of Informal Dispute Concerning U.S. Environmental Protection Agency and Kentucky Department for Environmental Protection Requirements for Additional Actions or Modifications Regarding the CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2426&D2, dated June 22, 2020.)
- Sampled MWs and residential wells in November 2022 and February 2023, during this reporting period, in accordance with the Water Policy Boundary Monitoring Program per the Environmental Monitoring Plan. Analytical data for MWs and residential wells sampled in August 2022 were not available for reporting in the previous reporting period; the analytical data have been included in this report. All MWs and residential wells sampled in August 2022 and November 2022 were below the MCL for TCE. None of the MWs or residential wells sampled exhibited detections of Tc-99. Analytical data are pending for samples collected in February 2023.
- Sampled residential well R40 in November 2022, December 2022, and February 2023. Analytical data for R40 sampled in July 2022 and August 2022 were not available for reporting in the previous reporting period; the analytical data are summarized in this report. The samples collected in July 2022, November 2022, and December 2022 had results less than the MCL for vinyl chloride and TCE. The sample collected in August 2022 had results for TCE less than the MCL (it was not analyzed for vinyl chloride). Analytical data are pending for the sample collected in February 2023.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue routine monitoring and reporting in accordance with the *Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2470&D1; and the *Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2469&D2.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Water Policy belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- None.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- Water bill payments are included in DOE's annual operating budget for the Paducah Site.

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ADDITIONAL REPORTING

Presented in this Additional Reporting section are updates for the following:

- WAGs 1 and 7 (C-746-K Landfill, TCE Spill Sites, Underground Storage Tanks, and Kentucky Ordnance Works sites);
- CRP;
- SMP;
- CERCLA Five-Year Review; and
- Plant Industrial Area Vapor Intrusion Assessment.

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**PROJECT: WAGs 1 and 7 (C-746-K Landfill, TCE Spill Sites,
Underground Storage Tanks, and Kentucky Ordnance Works Sites)**

- I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):**
- Continued monitoring around the C-746-K Landfill, as required by the *Record of Decision for Waste Area Groups 1 and 7 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/06-1470&D3. WAGs 1 and 7 ROD requires these data to be submitted semiannually. The results of the groundwater monitoring data for the previous five years are presented graphically in Appendix C.
- II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):**
- Monitoring will continue around C-746-K Landfill, as required by the ROD. This monitoring is conducted and reported in accordance with other site programs, such as the Environmental Monitoring Program.
- III. Identity and assigned tasks of DOE contractors for work to be performed for this project:**
- Reporting responsibility for the work to be performed in support of WAGs 1 and 7 belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
- IV. Statement of the manner and extent to which the requirements and time schedules are being met:**
- The requirements and time schedules are being met.
- V. Primary/Secondary Document Tracking System:**
- A) Documents under review and/or preparation for this reporting period:**
- None.
- B) Due dates for completion of review/modification tasks:**
- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- None.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- Sampling activities for the C-746-K Landfill have been incorporated into the Environmental Monitoring Program. O&M cost for this project is not tracked separately.

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PROJECT: Community Relations Plan

- I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):**
- No activities were performed for this project during this reporting period.
- II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):**
- No activities are scheduled for this project during the upcoming reporting period.
- III. Identity and assigned tasks of DOE contractors for work to be performed for this project:**
- Reporting responsibility for the work to be performed in support of the CRP belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
- IV. Statement of the manner and extent to which the requirements and time schedules are being met:**
- The requirements and time schedules are being met.
- V. Primary/Secondary Document Tracking System:**
- A) Documents under review and/or preparation for this reporting period:**
- None.
- B) Due dates for completion of review/modification tasks:**
- None.
- VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):**
- None.
- VII. Summary of all contacts with local community, public interest groups, or state government:**
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

PROJECT: Site Management Plan

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Consulted with EPA and KDEP regarding the C-631 Pumphouse and Cooling Tower on January 9, 2023.
- Finalized and submitted the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023*, DOE/LX/07-2482&D1, to EPA and KDEP on November 15, 2022.
- Received EPA acknowledgement of receipt documentation of no significant comment on the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023*, DOE/LX/07-2482&D1, on November 25, 2022.
- Received KDEP comments on the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023*, DOE/LX/07-2482&D1, on December 5, 2022.
- Developed and submitted the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023*, DOE/LX/07-2482&D2, to address KDEP comments to EPA on December 13, 2022.
- Received EPA and KDEP concurrence with the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023*, DOE/LX/07-2482&D2, on December 13, 2022.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Consult with EPA and KDEP regarding the remaining cooling tower facilities.
- Begin scoping meetings for the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2024* with EPA and KDEP in July 2023.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the SMP belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023, DOE/LX/07-2482&D1*, was under development, and the document was under review by EPA and KDEP during this reporting period.
- *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2023, DOE/LX/07-2482&D2*, was under development, and the document was under review and approved by EPA and KDEP during this reporting period.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- The requirements and time schedules are being met.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

PROJECT: CERCLA Five-Year Review

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Developed and published the Public Notice announcing the commencement of the 2023 CERCLA Five-Year Review on December 10, 2022.
- Completed scoping of the 2023 CERCLA Five-Year Review with EPA and KDEP in December 2022.
- Conducted site inspections in support of the development of the 2023 CERCLA Five-Year Review in December 2022.
- Conducted interviews for inclusion in the 2023 CERCLA Five-Year Review during January and February 2023.
- Initiated development of the *CY 2023 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2492&D1.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Initiate discussions with EPA and KDEP regarding the *CY 2023 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2492&D1, in advance of submittal in July 2023.
- Submit D1 2023 CERCLA Five-Year review DOE/LX/07-2492&D1 to EPA and KDEP by, July 16, 2023.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Five-Year Review belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules are being met.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- *CY 2023 CERCLA Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2492&D1*, was under development during this reporting period.

B) Due dates for completion of review/modification tasks:

- None.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- Published Public Notice announcing the commencement of the 2023 CERCLA Five-Year Review on December 10, 2022.
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

**FEDERAL FACILITY AGREEMENT
SEMIANNUAL PROGRESS REPORT
FIRST HALF OF FISCAL YEAR 2023**

**Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 10/1/2022–3/31/2023**

PROJECT: Plant Industrial Area Vapor Intrusion Assessment

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Performed the second round of vapor intrusion sampling at select locations in C-310, C-409, and C-720, as recommended in the *Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2471&D2, March 1–3, 2023.

II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Evaluate the results of the second round of sampling.
- Prepare and submit an addendum (D2/A1) to the *Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2471&D2, to document the results of the recommended additional vapor intrusion sampling at select locations in C-310, C-409, and C-720.
- Evaluate the vapor intrusion pathway to a building or proposed building if or when the use of an occupiable building at the Paducah Site changes, a new building is constructed, or a parcel of land is transferred for a different use, consistent with the requirements in the RMD.

III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Plant Industrial Area Vapor Intrusion Assessment subproject belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.

IV. Statement of the manner and extent to which the requirements and time schedules are being met:

- The requirements and time schedules related to the Plant Industrial Area Vapor Intrusion subproject are being met.

V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- Documentation of the results for the second round of vapor intrusion sampling at select locations in C-310, C-409, and C 720, as recommended in the *Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2471&D2, was under development during this reporting period.

B) Due dates for completion of review/modification tasks:

- Results for the second round of vapor intrusion sampling at select locations in C-310, C-409, and C-720, as recommended in the *Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2471&D2, are due to EPA and KDEP on July 20, 2023.

VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):

- None.

VII. Summary of all contacts with local community, public interest groups, or state government:

- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.

VIII. Changes in relevant personnel:

- DOE appointed the Paducah Site Lead to serve as the DOE FFA Project Manager, effective March 3, 2023. April Ladd is acting in that role.
- DOE designated the PPPO Deputy Manager to the Dispute Resolution Committee effective March 3, 2023. Reinhard Knerr was appointed to the position of PPPO Deputy Manager on January 29, 2023.

IX. Actual cost for O&M, if appropriate:

- None.

APPENDIX A

**NORTHEAST AND NORTHWEST PLUME
WATER WITHDRAWAL REPORTS**

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**Table A.1. Northeast Plume Containment System Water Withdrawal Reporting Form
(Gallons of Water Pumped)**

Day	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022
1	252,134	252,794	249,776	250,327	252,354	254,432
2	252,134	254,967	250,898	250,327	249,523	251,392
3	252,134	249,442	250,898	250,325	252,150	251,392
4	252,134	252,570	250,898	251,865	252,757	251,392
5	252,134	252,399	250,898	251,340	252,757	251,392
6	252,097	252,399	250,898	251,610	252,757	250,550
7	252,759	252,399	248,606	250,601	252,758	250,953
8	252,095	252,395	254,141	250,601	250,848	252,520
9	252,095	248,348	201,748	250,601	251,889	252,562
10	252,095	249,092	201,748	250,599	254,190	252,562
11	252,092	252,961	201,748	250,340	251,556	252,562
12	252,067	248,530	201,750	252,526	251,556	252,561
13	251,169	248,530	207,233	225,064	251,556	248,955
14	253,457	248,530	265,878	257,439	251,556	254,216
15	252,318	248,527	263,247	257,439	250,189	260,962
16	252,318	251,619	265,350	257,439	253,192	249,854
17	252,318	250,940	265,350	257,437	245,496	249,854
18	252,316	254,744	265,350	235,168	252,500	249,854
19	252,093	248,635	265,349	245,794	252,500	249,852
20	248,304	248,635	266,024	252,632	252,500	247,425
21	253,457	248,635	264,435	252,128	252,500	252,645
22	253,410	248,634	264,622	252,128	250,158	242,580
23	253,410	251,810	252,916	252,128	252,143	242,580
24	253,410	252,147	252,916	252,127	252,143	242,580
25	253,410	251,646	252,916	250,176	252,143	242,580
26	251,325	251,972	252,913	252,380	252,143	242,580
27	247,202	251,972	248,928	251,826	252,143	242,577
28	245,632	251,972	255,970	252,289	252,146	251,528
29	252,797	251,970	258,166	252,289	250,228	252,121
30	252,797	252,314	250,327	252,289	252,382	252,137
31	252,797	254,176		252,289		252,137
Monthly Total	7,809,910	7,785,704	7,431,897	7,771,523	7,552,713	7,751,287
Daily Average	251,933	251,152	247,730	250,694	251,757	250,042

Total (July 2022–December 2022) =	46,103,034 gal
Average (July 2022–December 2022) =	250,560 gallons per day (gpd)

**Table A.2. Northwest Plume Groundwater System Water Withdrawal Reporting Form
(Gallons of Water Pumped)**

Day	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022
1	287,442	151,250	156,160	158,290	287,660	285,560
2	287,442	160,060	159,768	158,290	279,910	283,313
3	287,442	154,060	159,768	158,290	285,880	283,313
4	287,442	158,180	159,768	241,610	285,738	283,313
5	287,442	159,825	159,768	288,140	285,738	283,311
6	288,570	159,825	159,768	290,720	285,738	256,955
7	288,660	159,825	153,210	300,670	270,656	258,800
8	280,776	159,825	162,230	300,670	268,740	280,960
9	280,776	157,300	157,978	300,670	284,620	283,353
10	280,776	158,400	157,978	219,108	287,460	283,353
11	280,772	159,110	157,978	287,740	284,025	283,353
12	291,550	158,853	157,976	286,470	284,025	283,351
13	288,680	158,853	153,190	283,820	284,025	276,480
14	288,110	158,853	160,960	292,638	284,025	257,980
15	286,728	158,851	155,870	292,638	272,065	294,200
16	286,728	158,770	158,500	292,638	275,230	282,560
17	286,728	157,770	158,500	292,636	283,880	282,560
18	286,726	160,940	158,500	263,320	285,015	282,560
19	285,230	158,950	158,500	277,240	285,015	282,560
20	288,370	158,950	147,320	285,910	285,015	260,680
21	280,120	158,950	157,590	282,488	285,015	275,640
22	285,348	158,950	157,630	282,488	104,835	283,547
23	285,348	157,620	157,843	282,488	278,887	283,547
24	285,348	160,080	157,843	282,486	278,887	283,547
25	285,346	158,090	157,843	285,240	278,887	283,547
26	283,720	158,520	157,841	288,000	278,887	283,547
27	275,810	158,520	156,380	282,800	278,887	283,545
28	160,090	158,520	151,620	285,245	278,885	282,460
29	151,250	158,520	153,560	285,245	282,780	283,180
30	151,250	159,150	158,290	285,245	285,260	295,862
31	151,250	160,860		285,245		153,883
Monthly Total	8,321,270	4,916,230	4,720,130	8,398,478	8,275,670	8,560,820
Daily Average	268,428	158,588	157,338	270,919	275,856	276,155

Total (July 2022–December 2022) =	43,192,598 gal
Average (July 2022–December 2022) =	234,742gpd

APPENDIX B

NORTHEAST PLUME AND NORTHWEST PLUME GRAPHS, DATA, AND MAPS (FIGURES B.1 THROUGH B.30)

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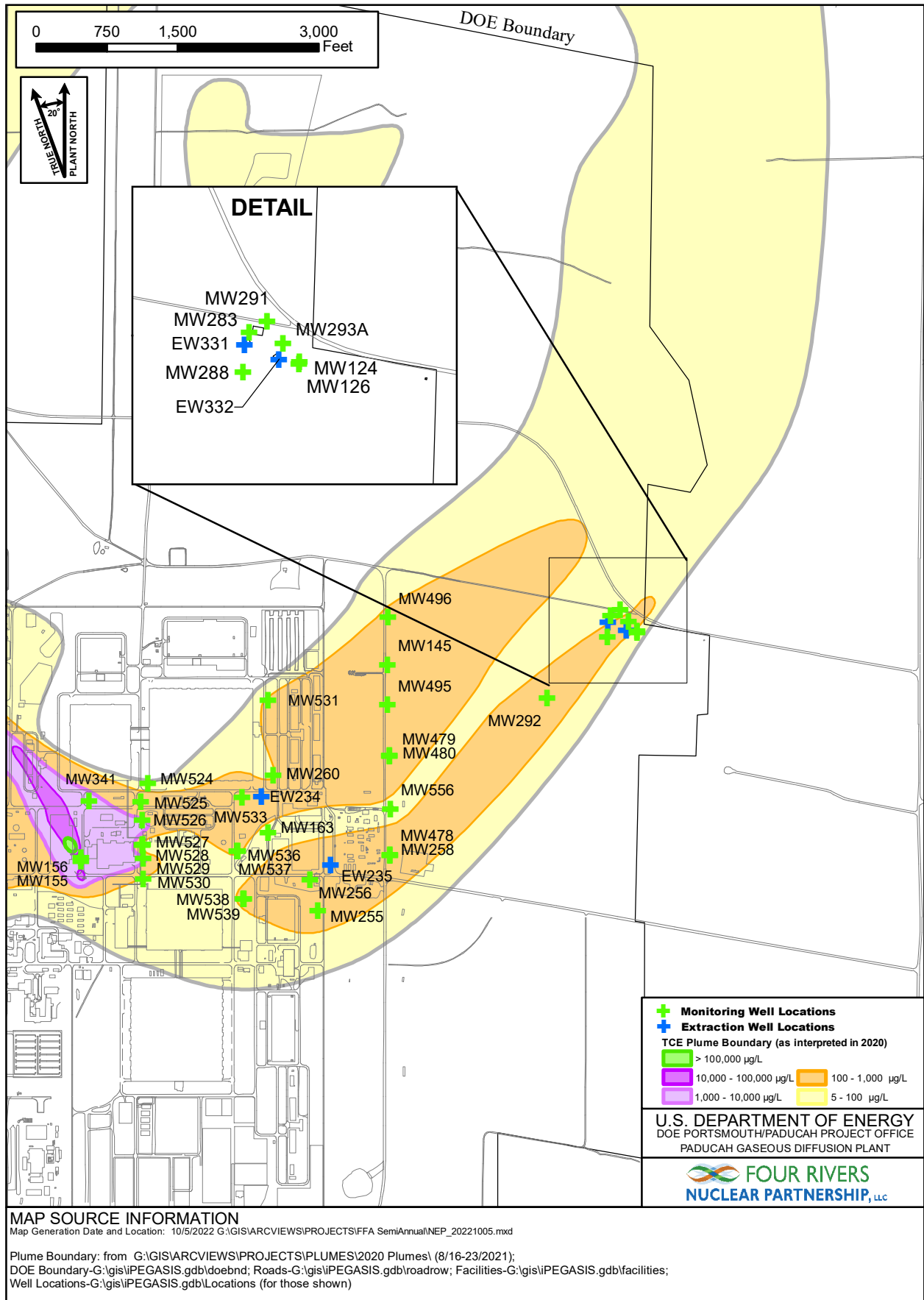
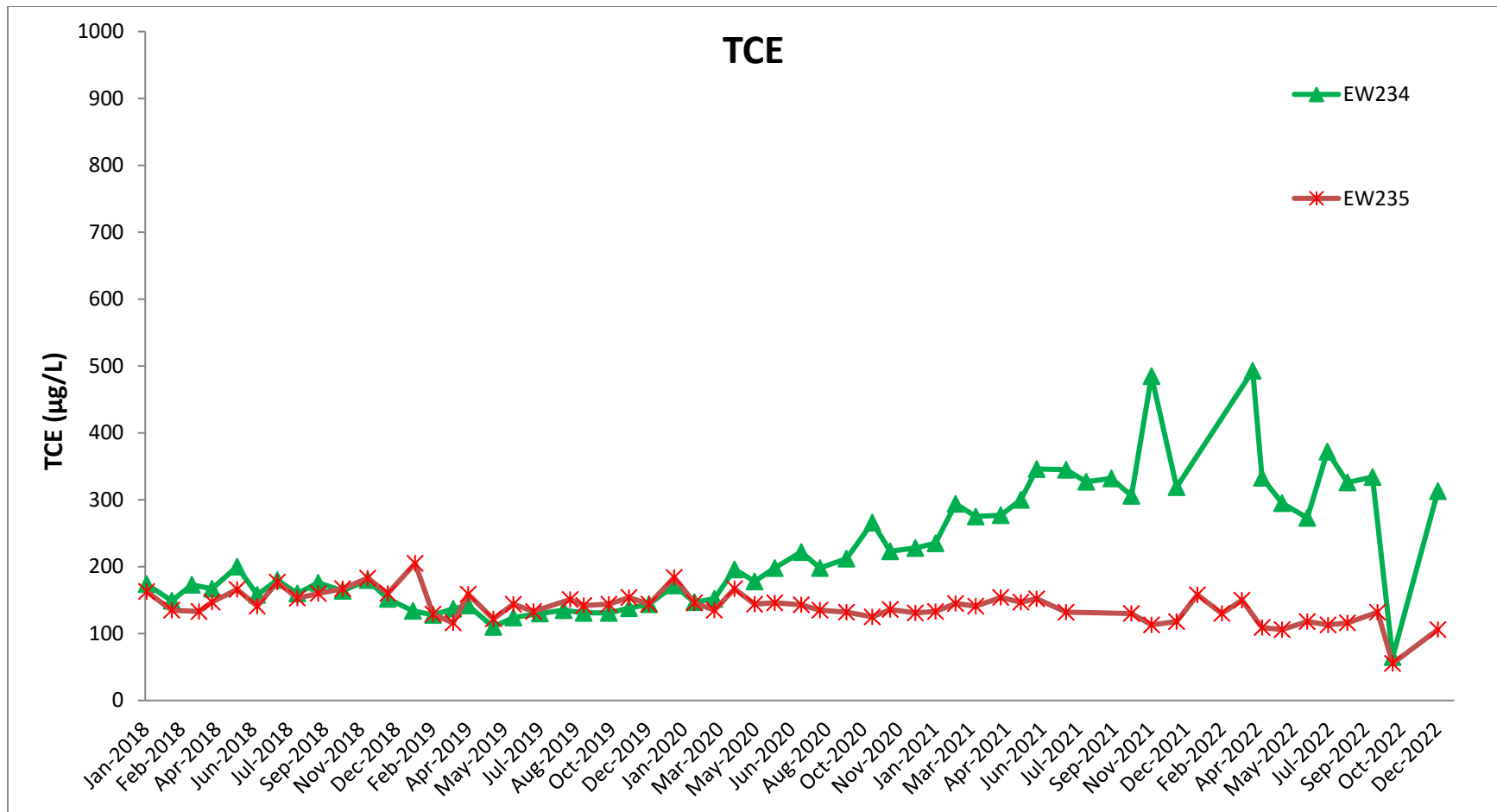


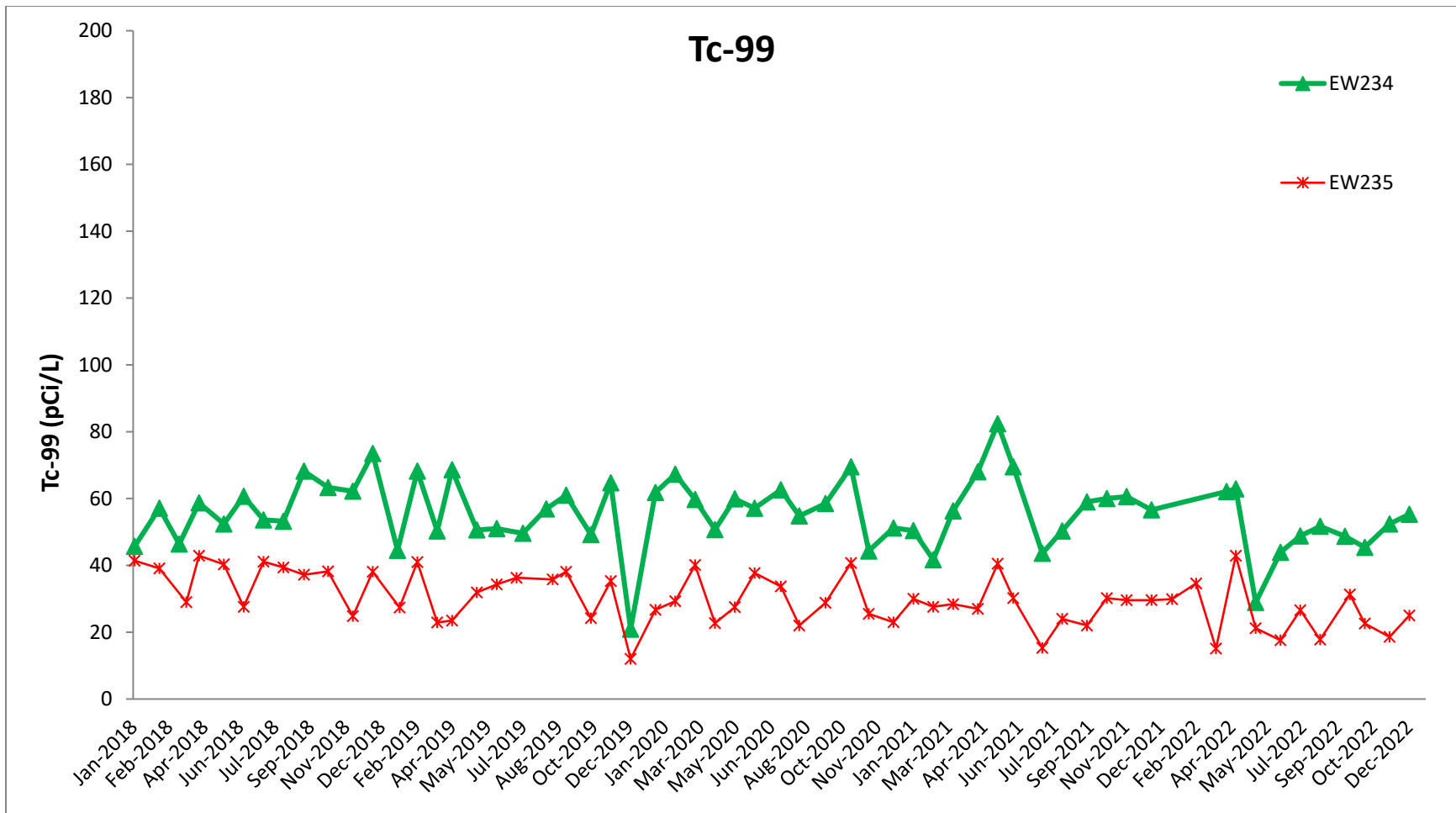
Figure B.1. Northeast Plume Groundwater Wells and Extraction Wells



NOTE: Data rejected by validation or assessment have not been graphed.

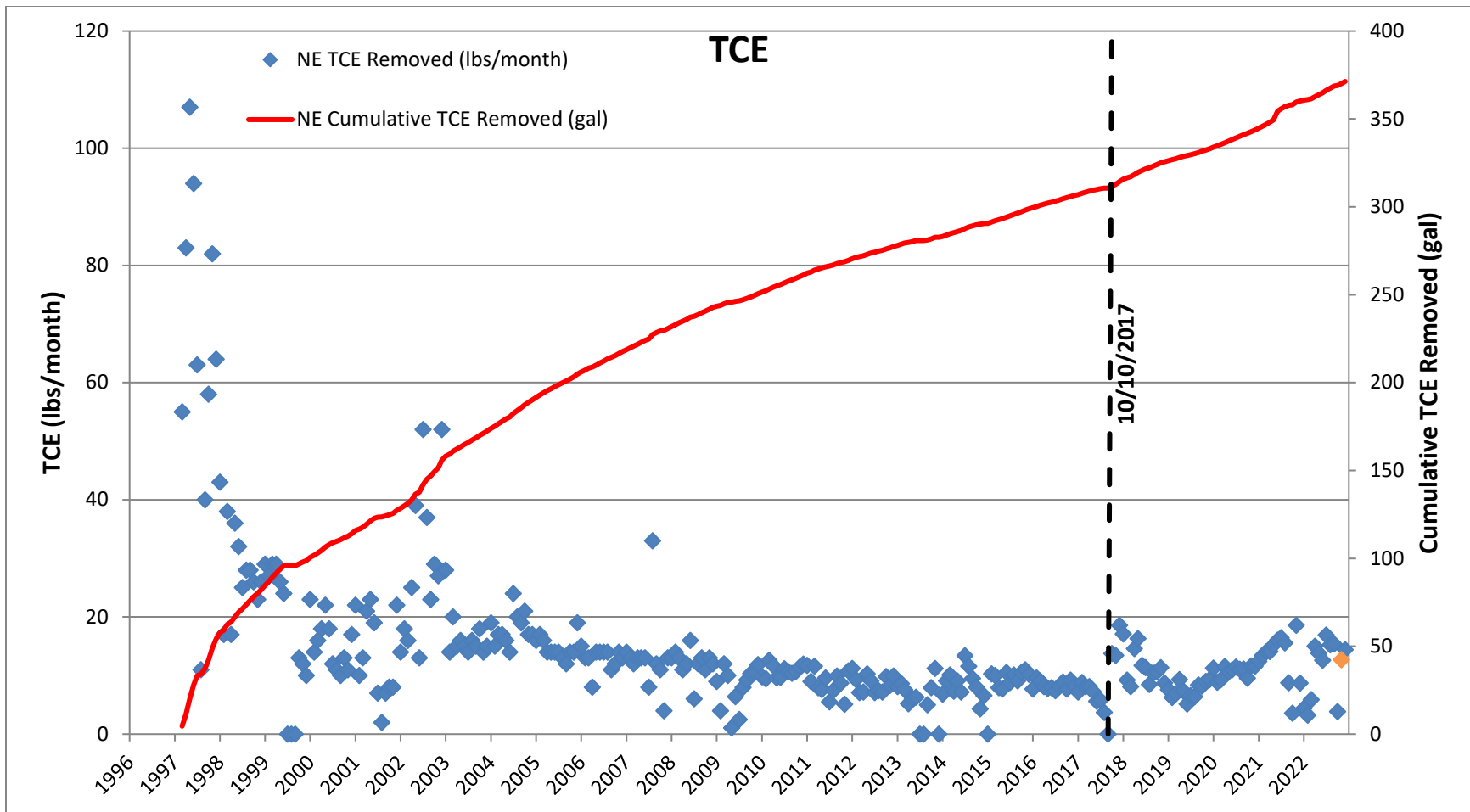
*TCE influent data was not collected from EW234 and EW235 for November 2022.

Figure B.2. Northeast Plume Containment System Influent TCE Concentrations



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.3. Northeast Plume—Tc-99 Activities in Extraction Wells



NOTE: Data rejected by validation or assessment are not included on the graph.

◆ TCE influent data was not collected from EW234 and EW235 for November 2022. The average useable data for the rest of the reporting period (282 ug/L) was used to calculate lbs of TCE removed.

Figure B.4. Northeast Plume Containment System TCE Removed

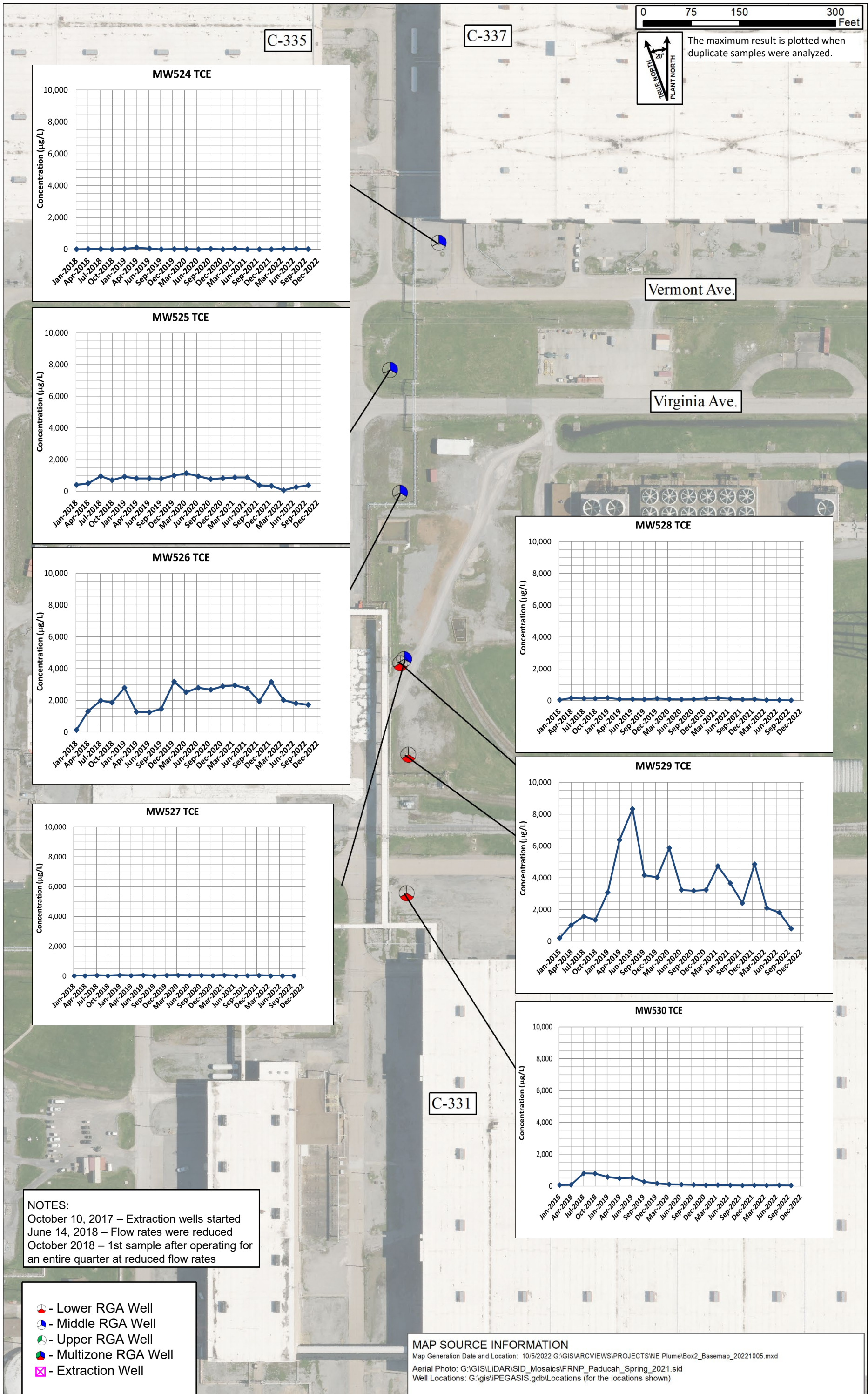
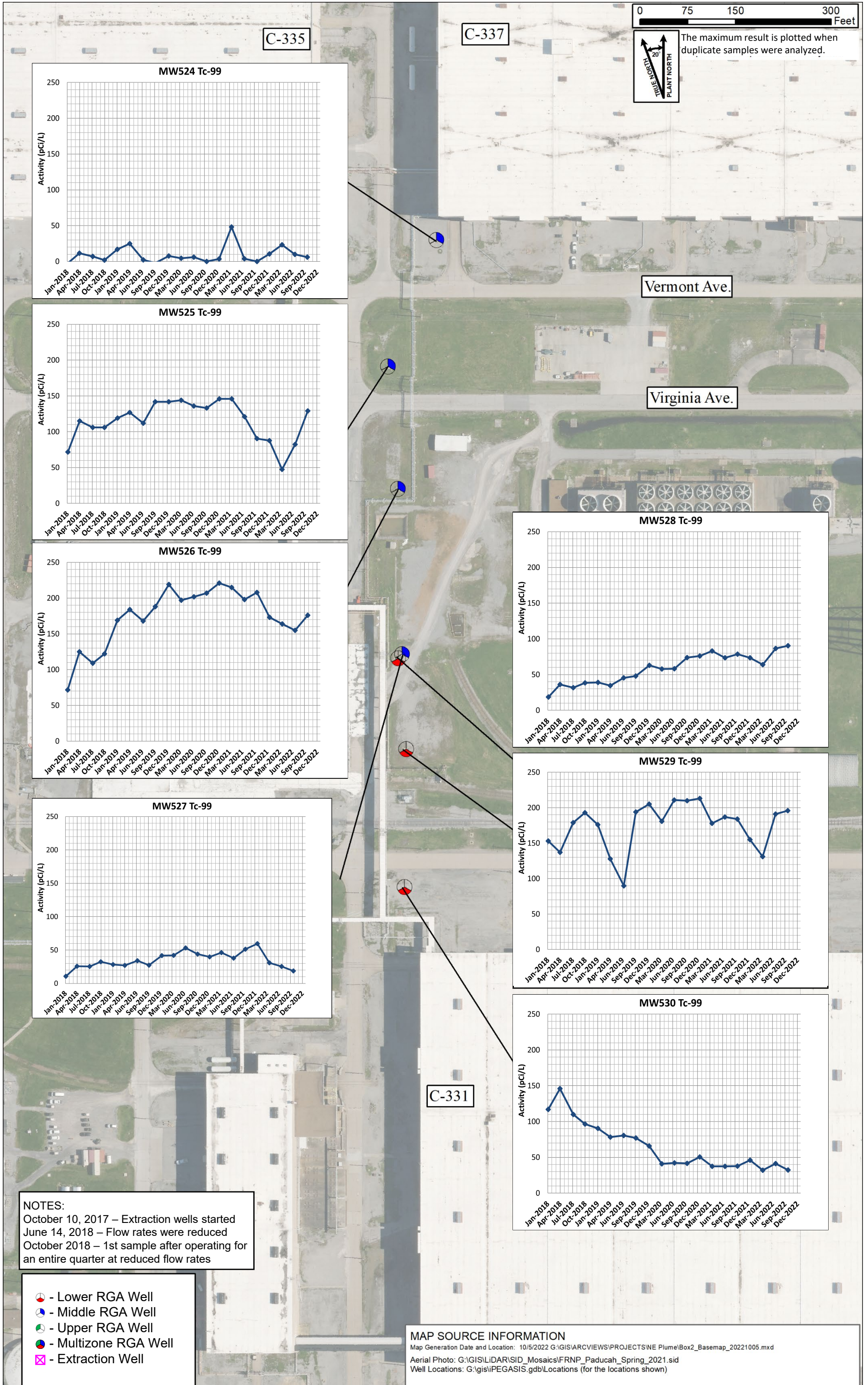


Figure B.5. Northeast Plume—Upgradient Transect Wells - TCE Trends



NOTES:
 October 10, 2017 – Extraction wells started
 June 14, 2018 – Flow rates were reduced
 October 2018 – 1st sample after operating for
 an entire quarter at reduced flow rates

- - Lower RGA Well
- - Middle RGA Well
- - Upper RGA Well
- - Multizone RGA Well
- - Extraction Well

MAP SOURCE INFORMATION
 Map Generation Date and Location: 10/5/2022 G:\GIS\ARCVIEWS\PROJECTS\NE Plume\Box2_Basemap_20221005.mxd
 Aerial Photo: G:\GIS\LiDAR\SID_Mosaics\FRNP_Paducah_Spring_2021.sid
 Well Locations: G:\gis\PEGASIS.gdb\Locations (for the locations shown)

Figure B.6. Northeast Plume—Upgradient Transect Wells – Tc-99 Trends

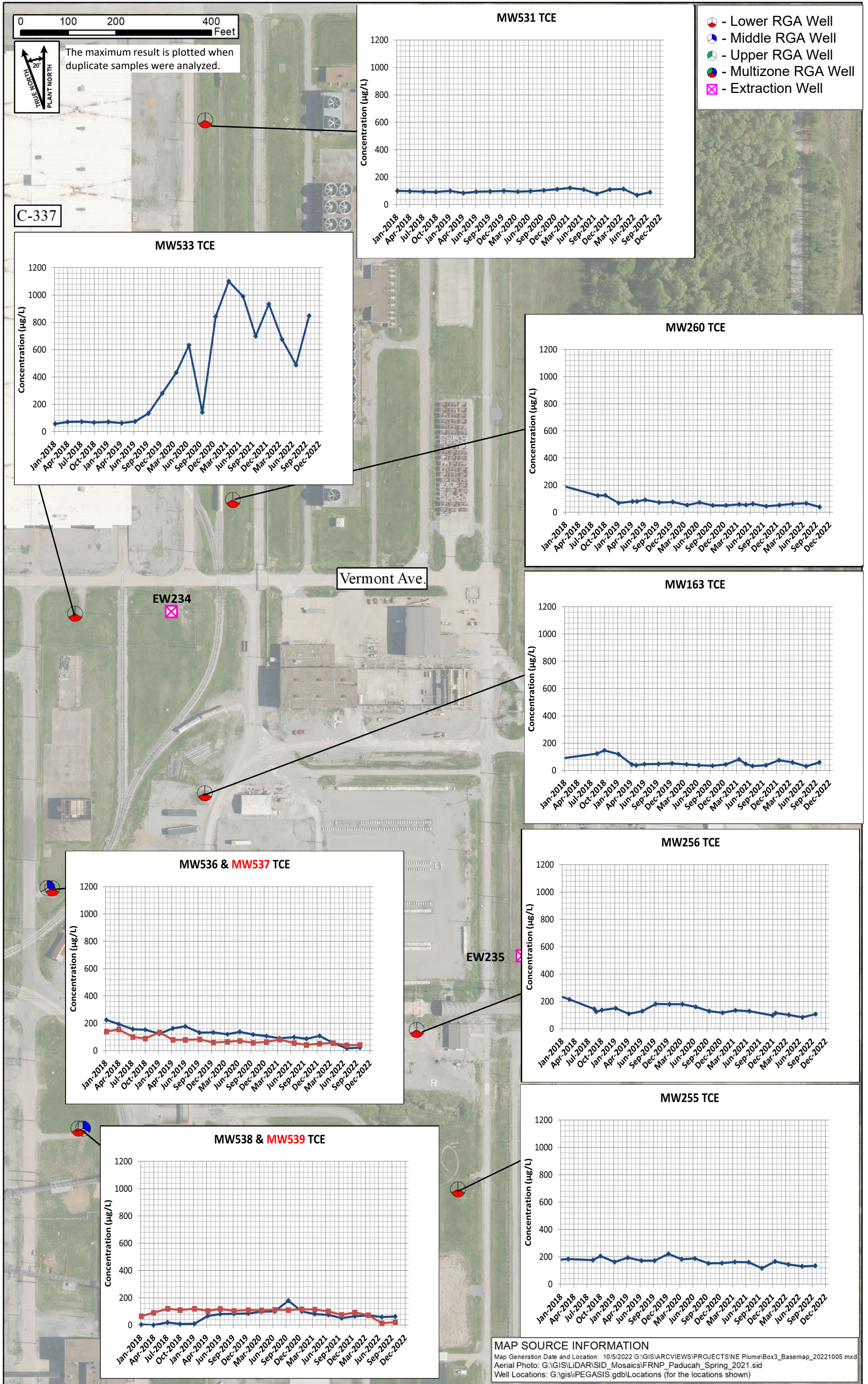


Figure B.7. Northeast Plume—Monitoring Wells near Extraction Wells—TCE Trends

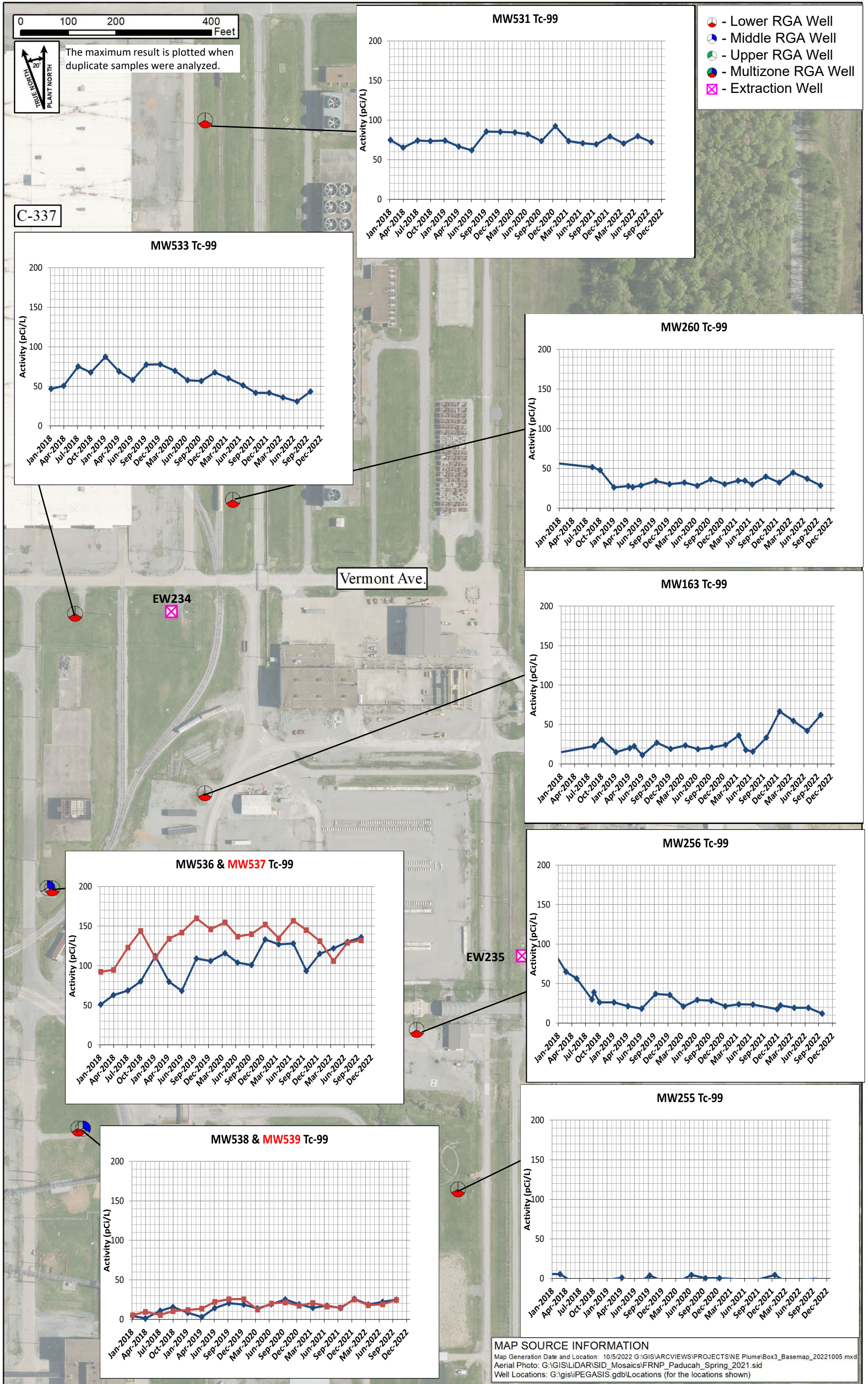
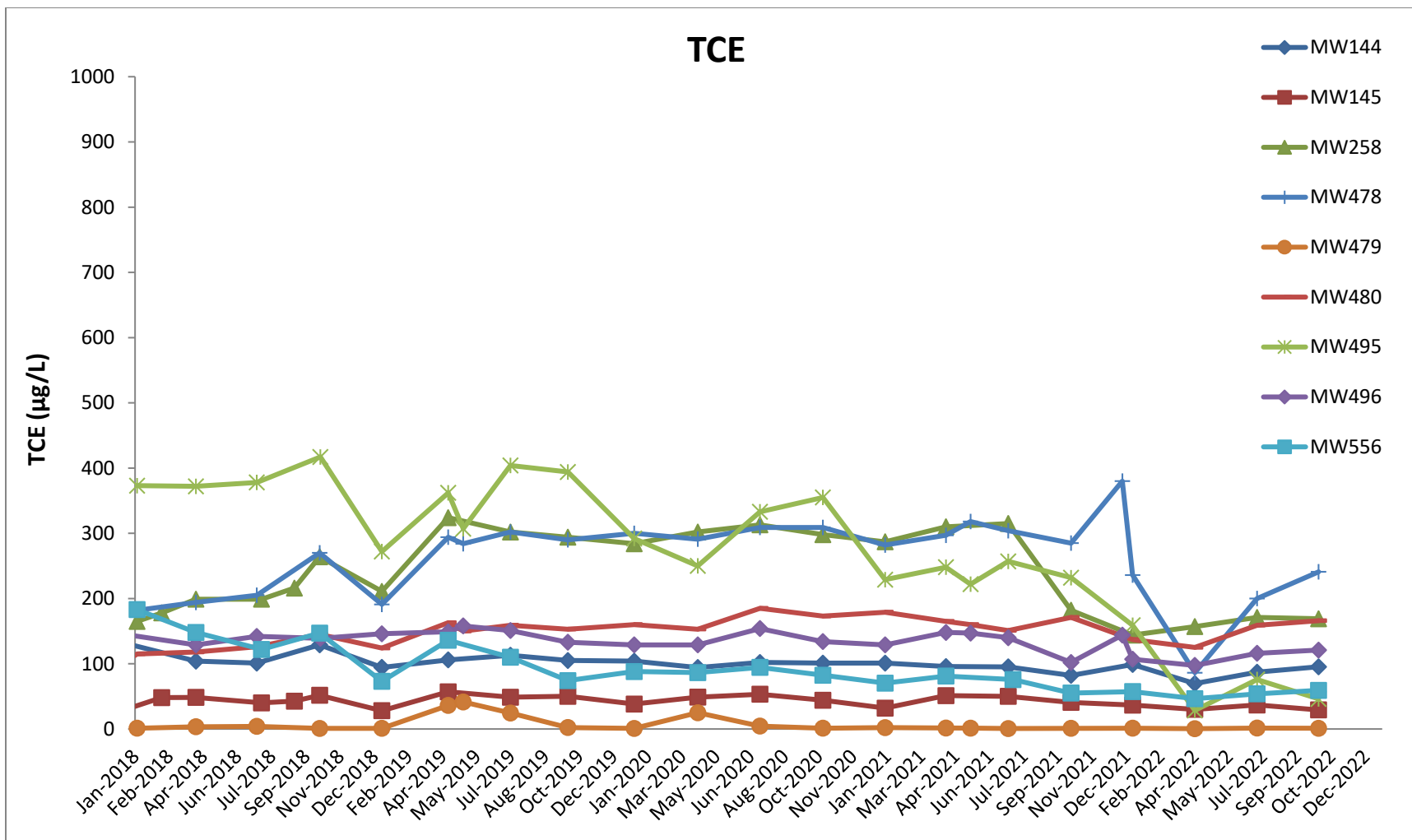
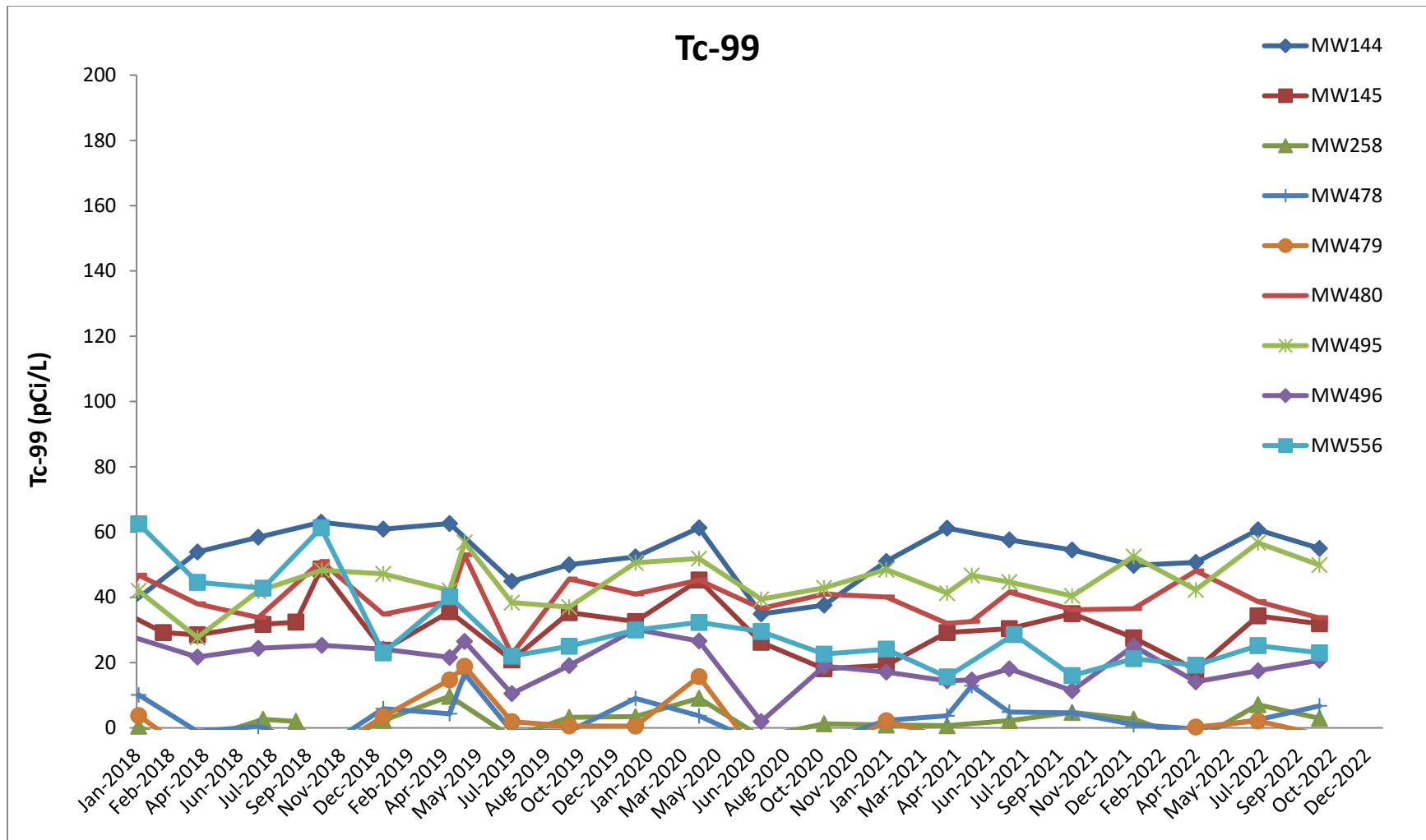


Figure B.8. Northeast Plume—Monitoring Wells near Extraction Wells—Tc-99 Trends



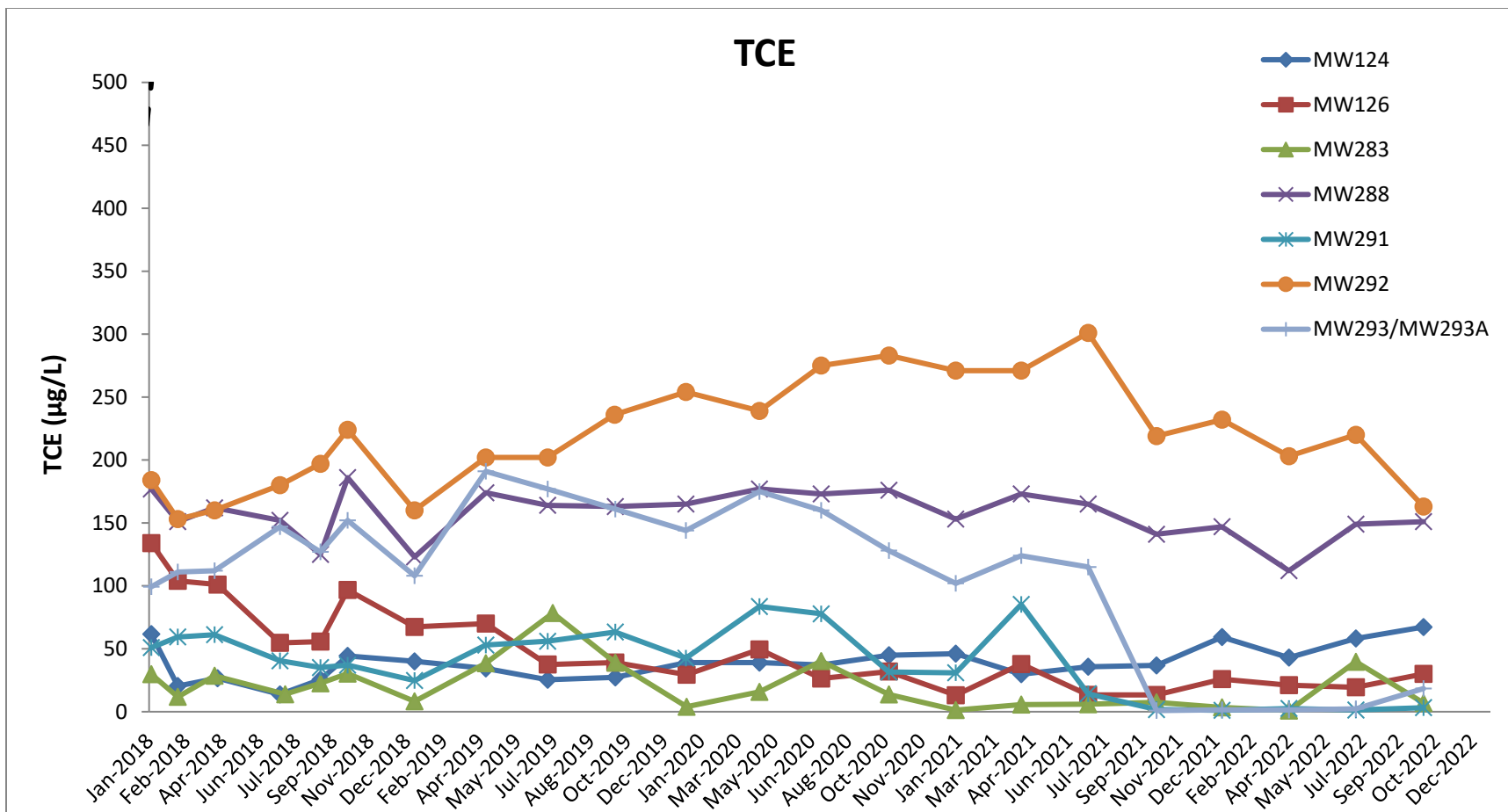
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.9. Northeast Plume—TCE Concentrations in Downgradient Wells



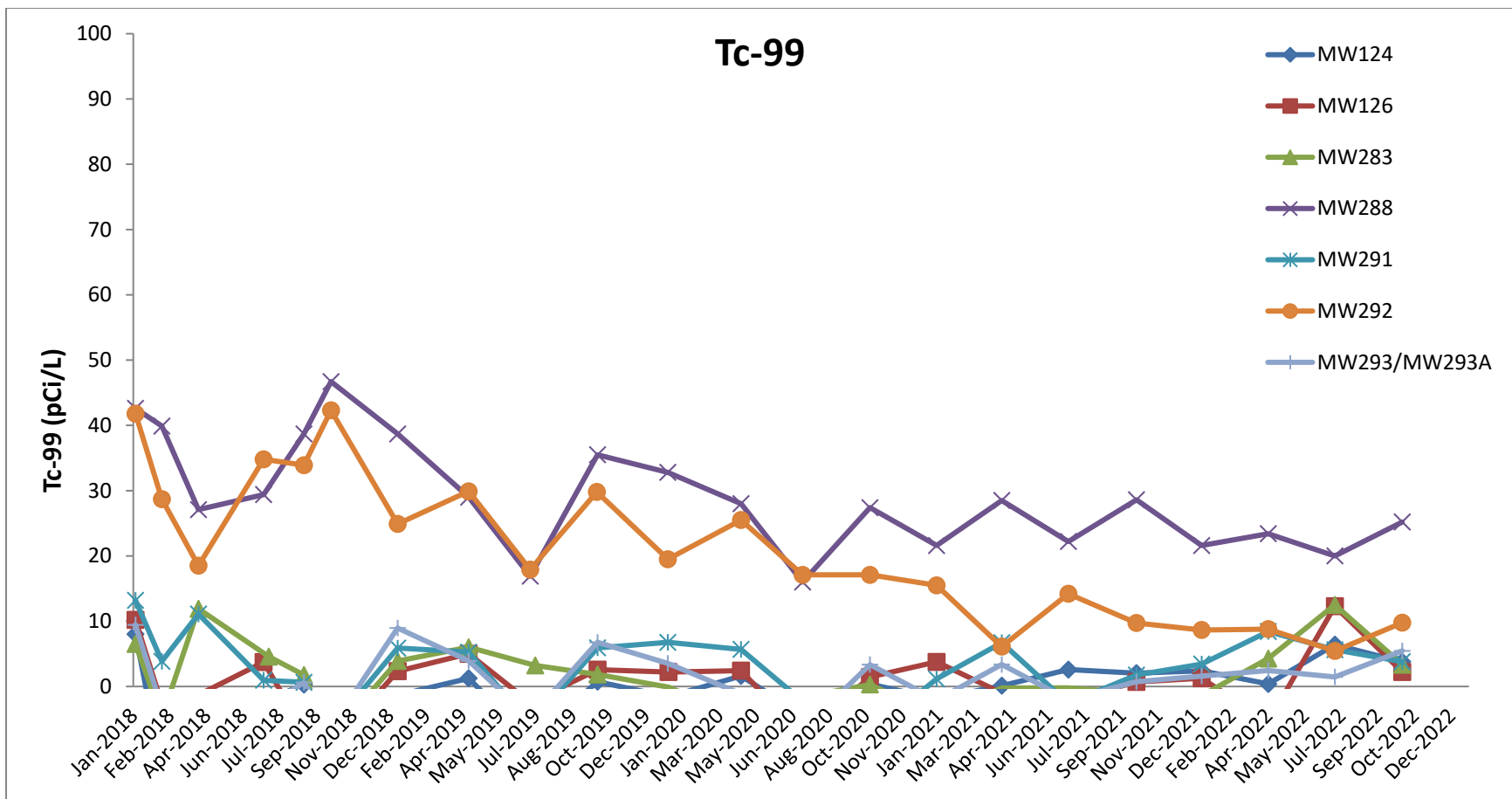
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.10. Northeast Plume—Tc-99 Activities in Downgradient Wells



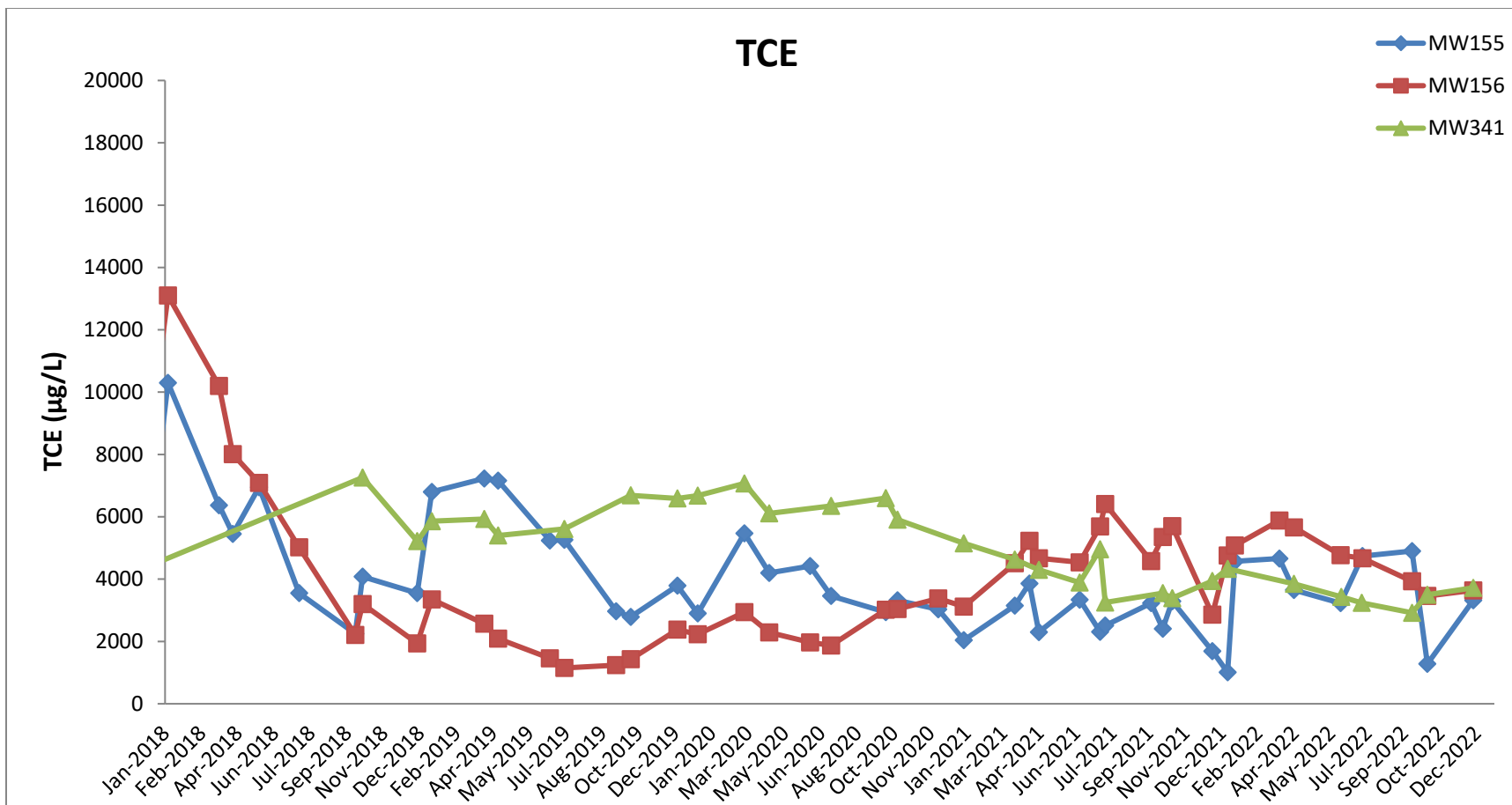
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.11. Northeast Plume—TCE Concentrations in Distal Downgradient Wells



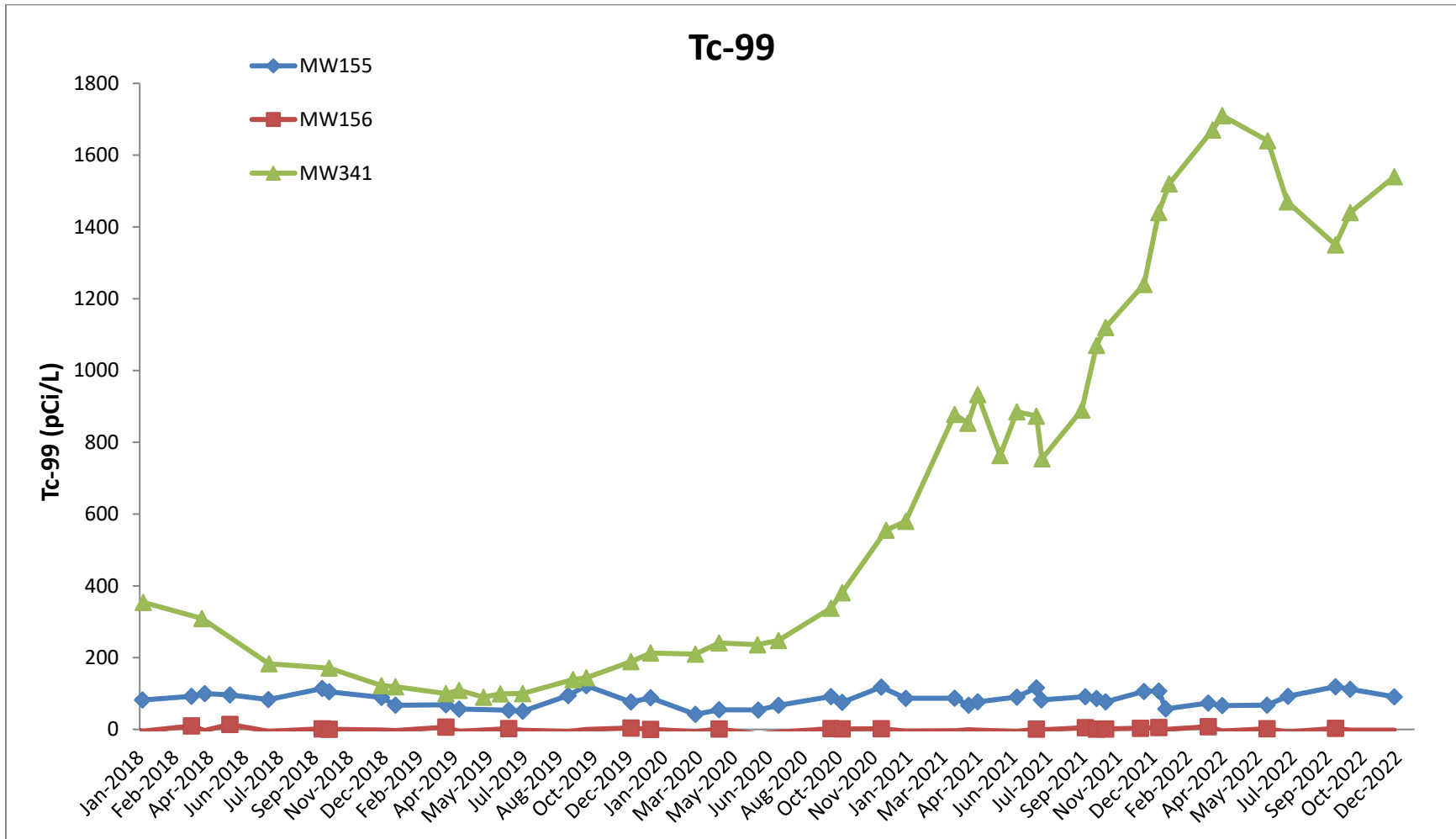
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.12. Northeast Plume—Tc-99 Activities in Distal Downgradient Wells



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.13. Northeast Plume—TCE Activities in Wells near C-400 Complex



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.14. Northeast Plume—Tc-99 Activities in Wells near C-400 Complex

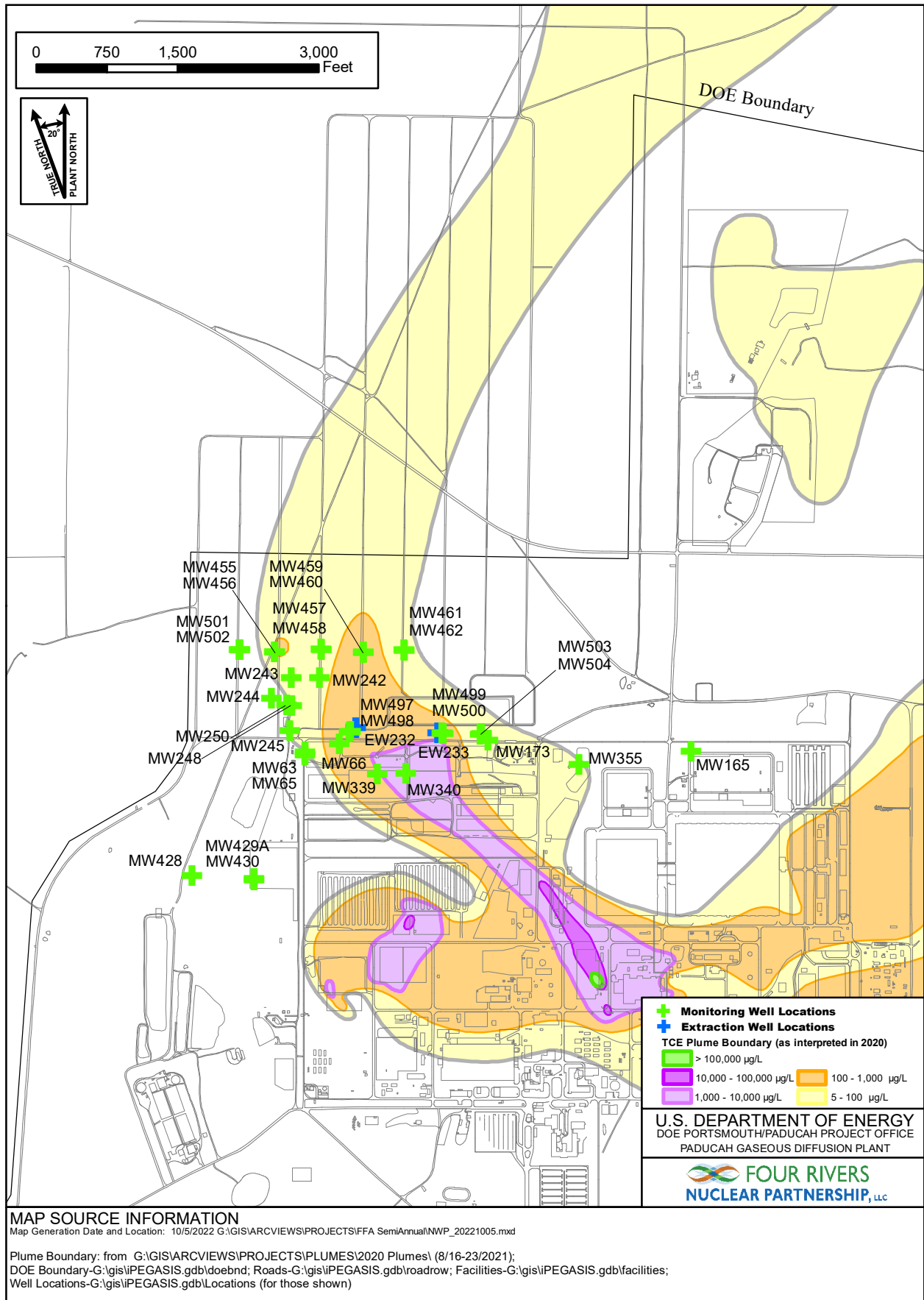
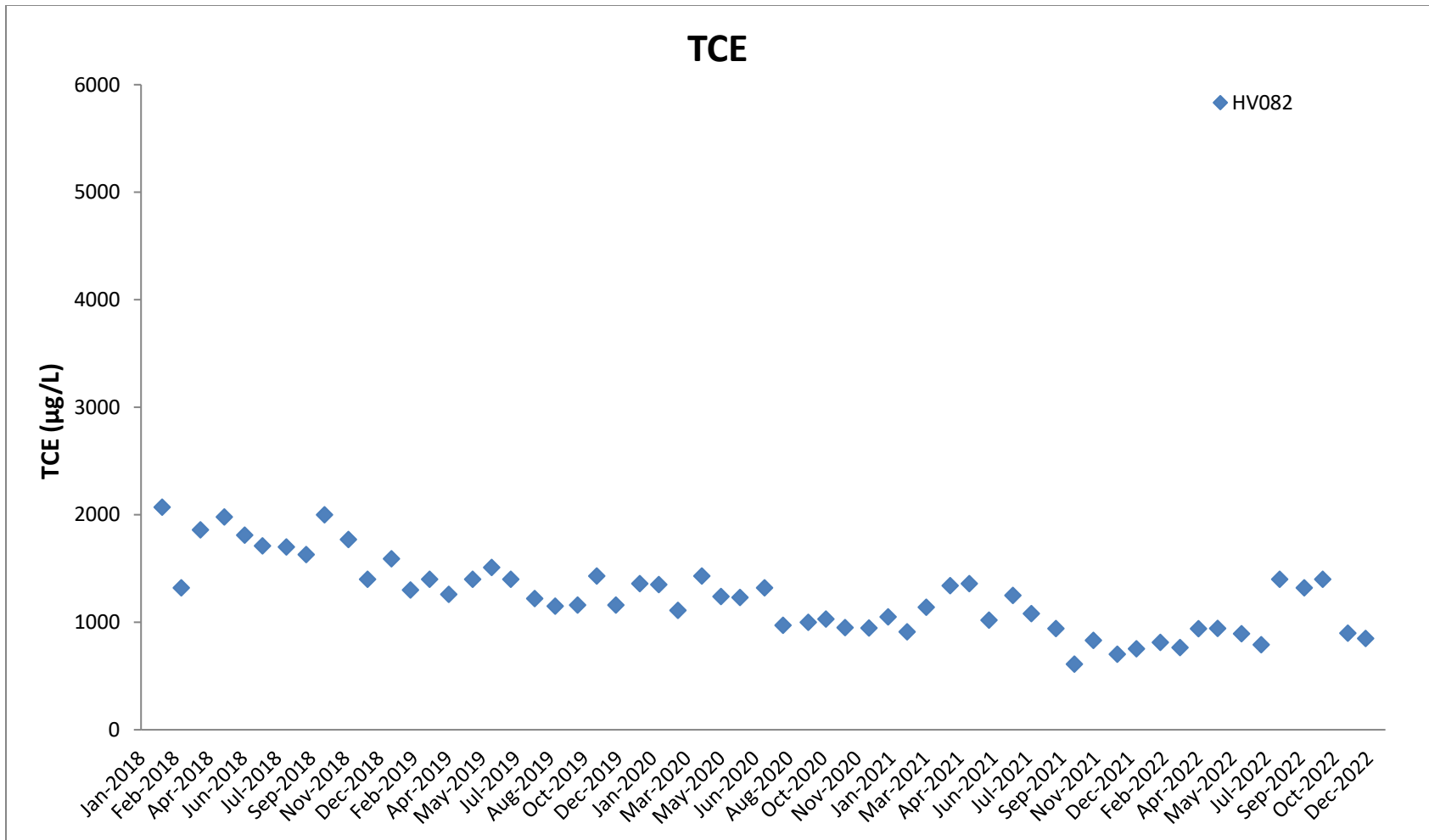
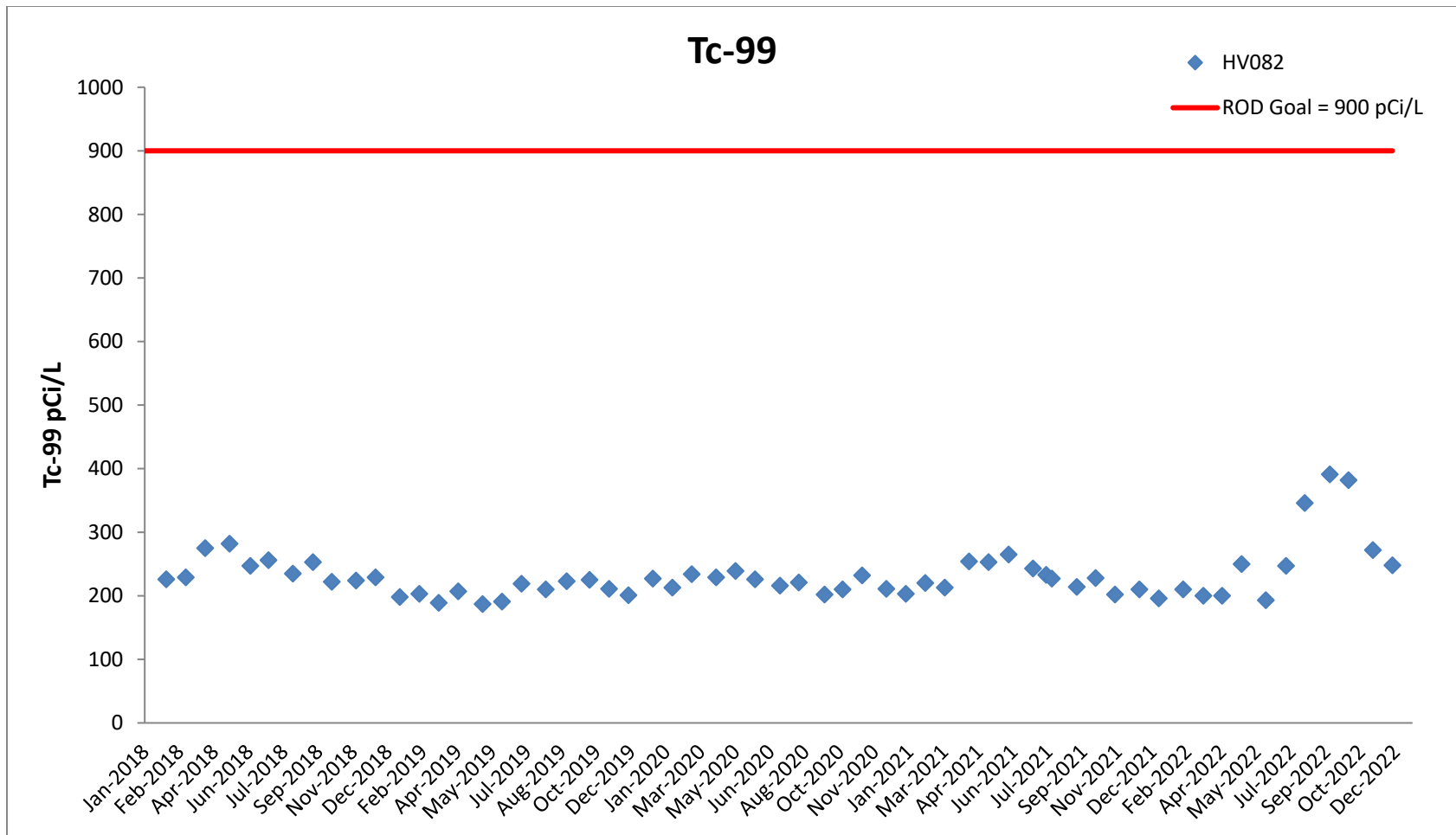


Figure B.15. Northwest Plume Groundwater Wells



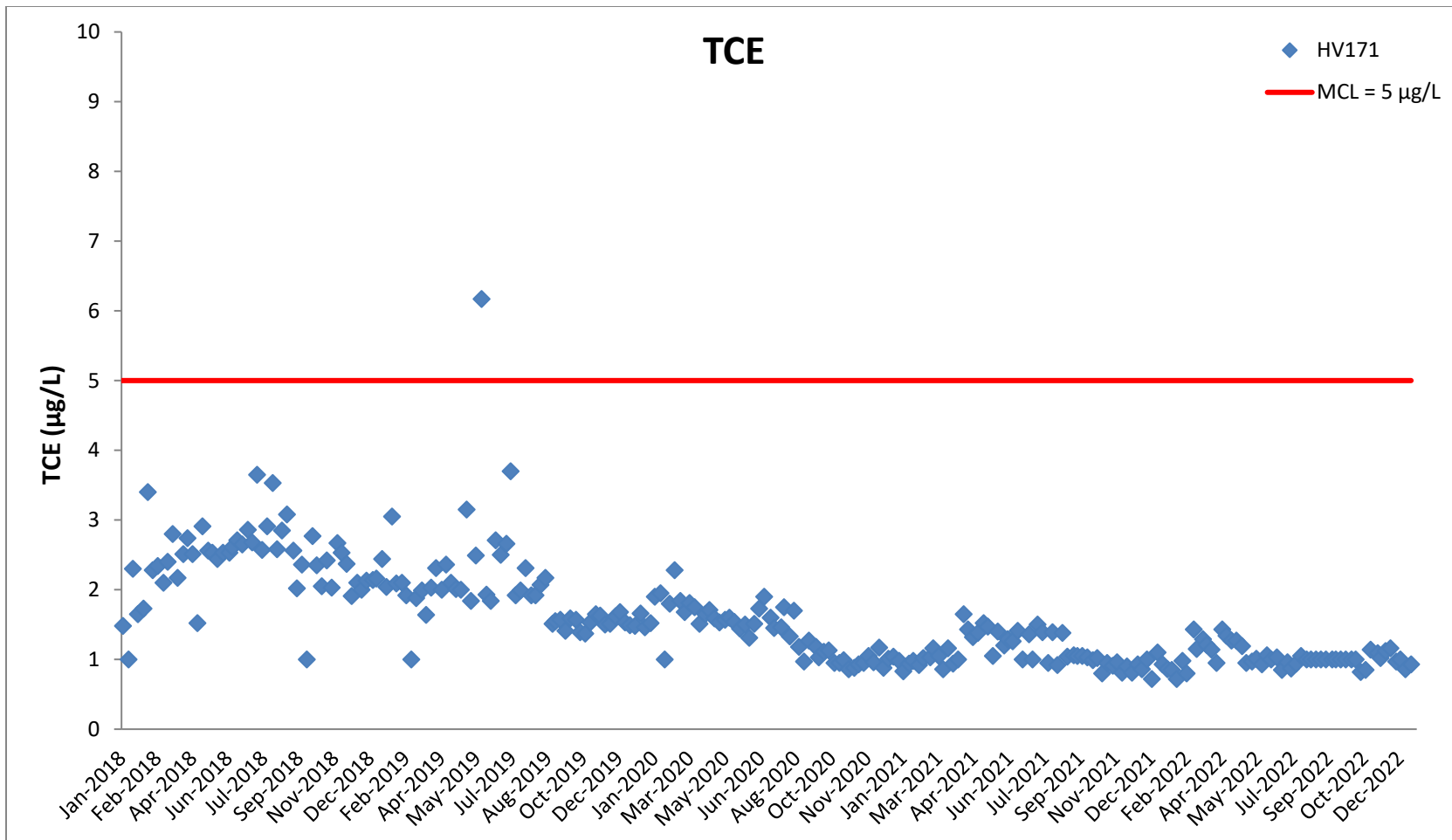
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.16. Northwest Plume Groundwater System Influent TCE Concentrations



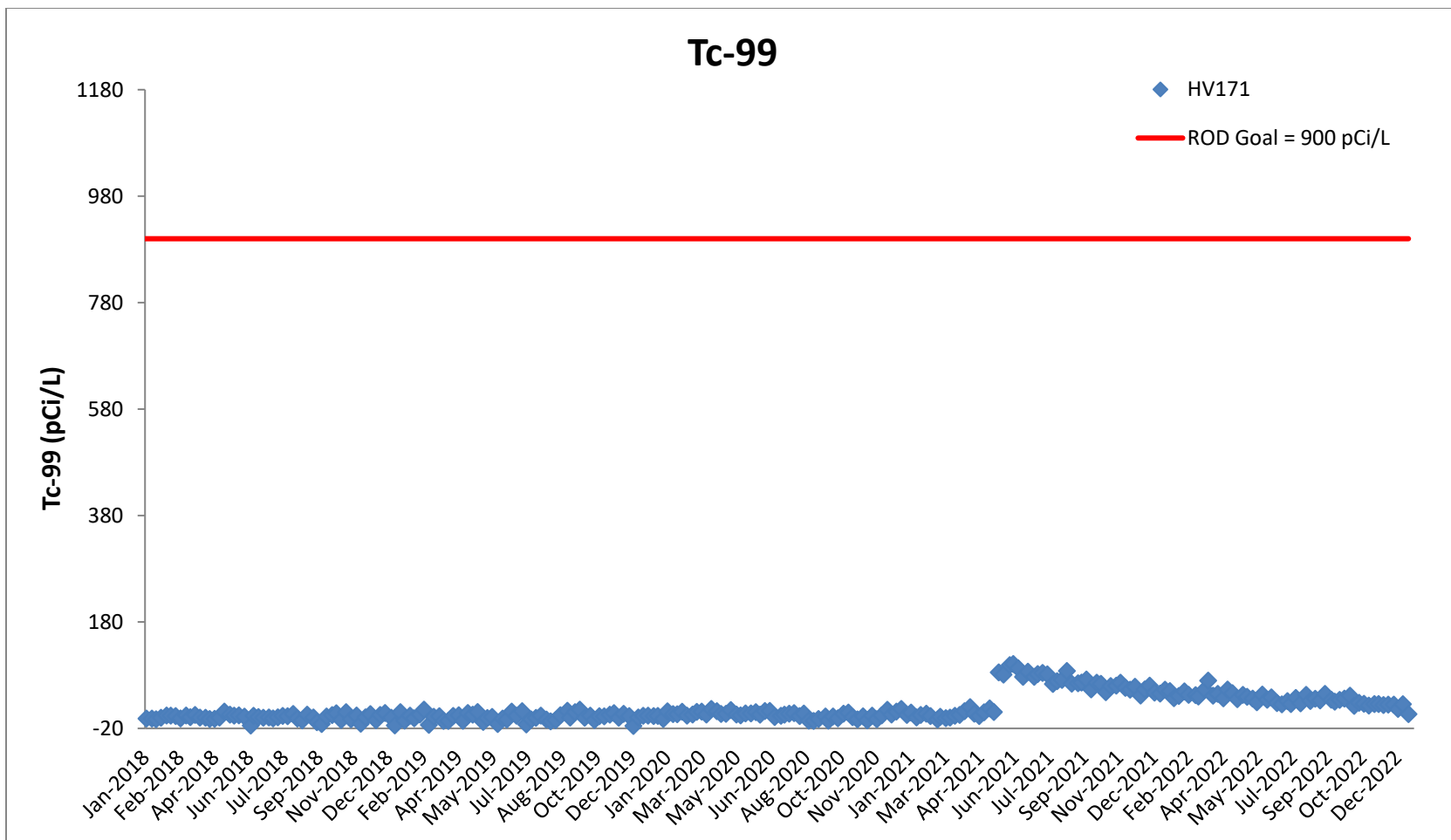
NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.17. Northwest Plume Groundwater System Influent Tc-99 Activities



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.18. Northwest Plume Groundwater System Effluent TCE Concentrations



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.19. Northwest Plume Groundwater System Effluent Tc-99 Activities

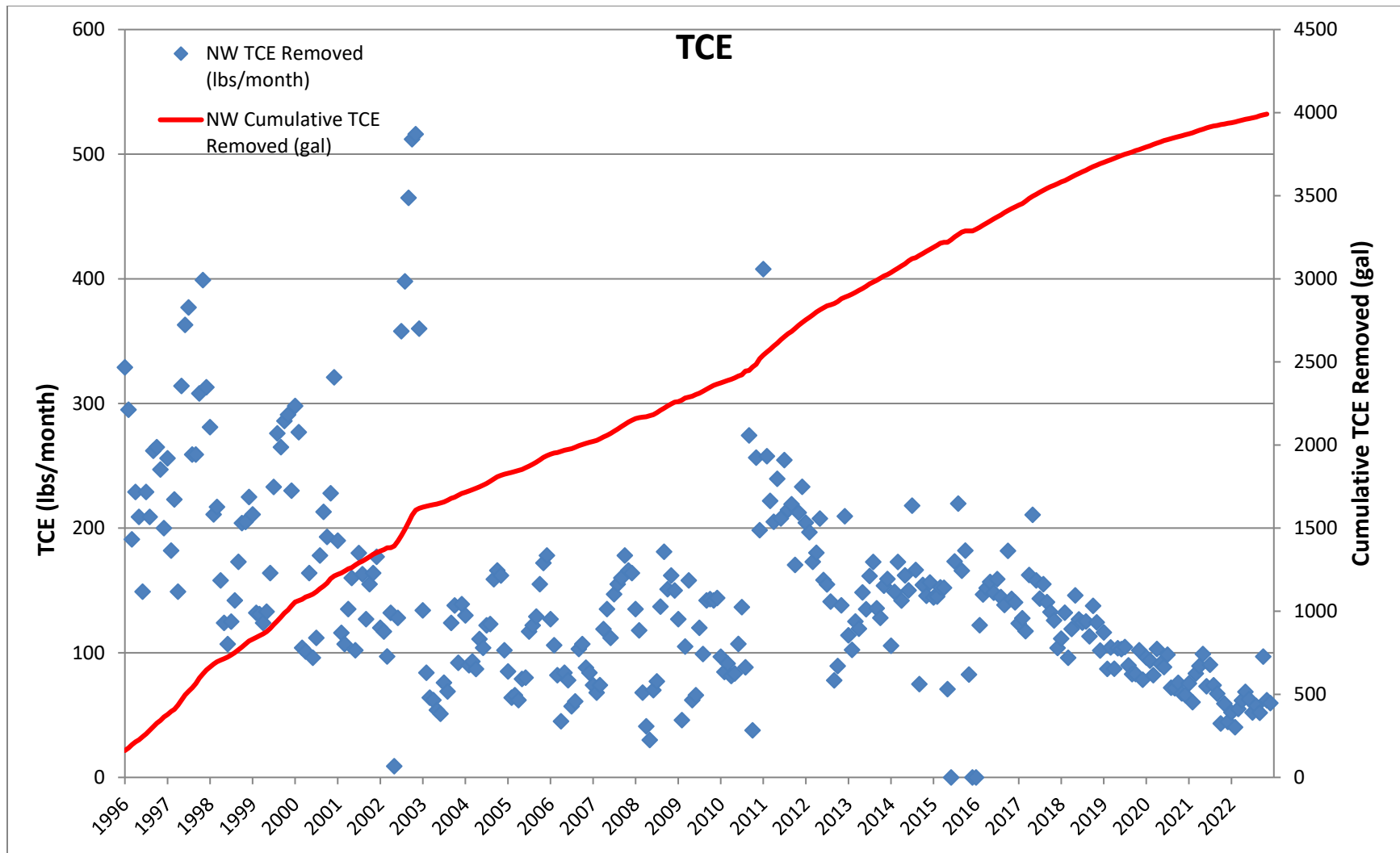


Figure B.20. Northwest Plume Groundwater System TCE Removed

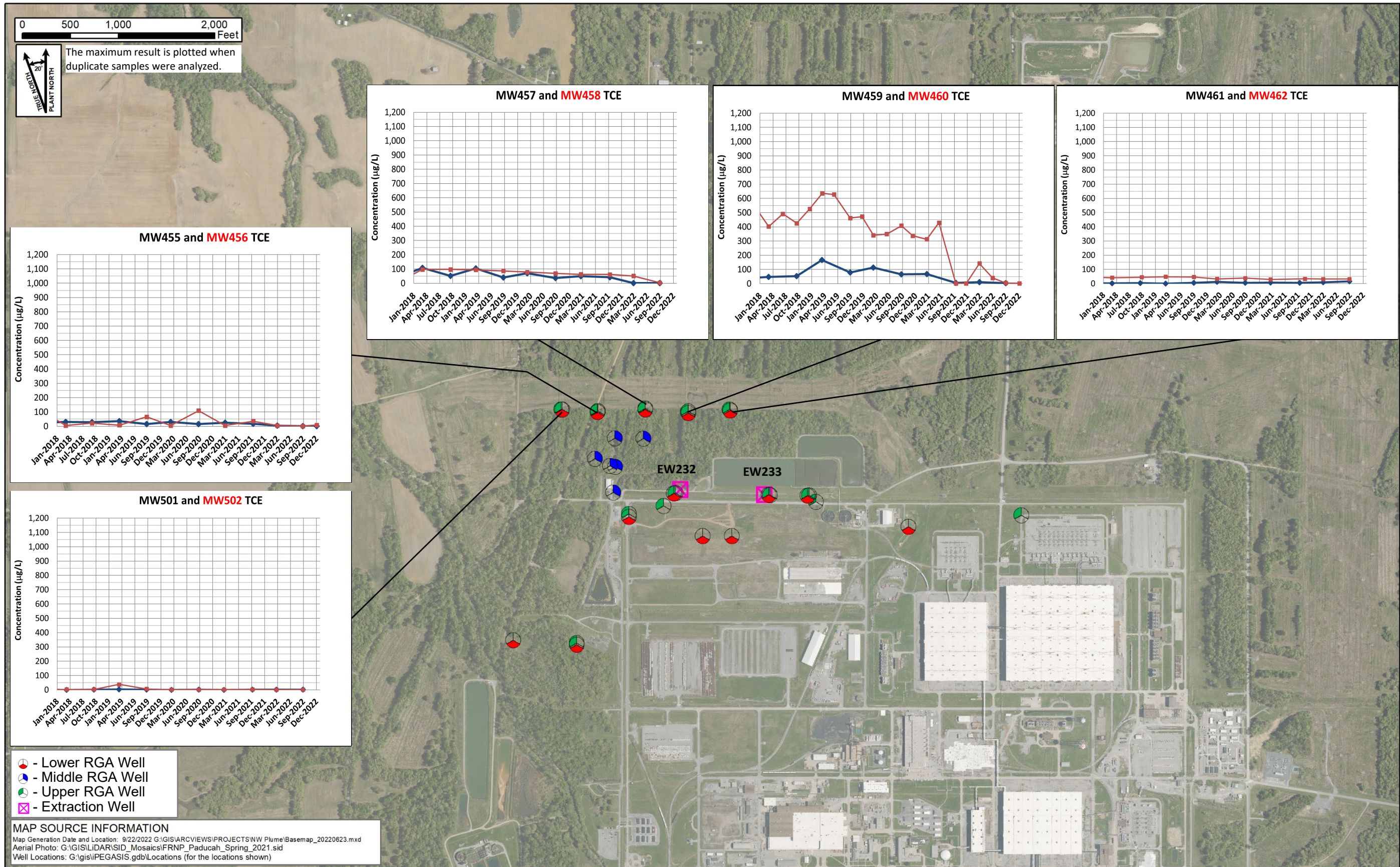


Figure B.21. Northwest Plume—Downgradient of New Well Field—TCE Trends

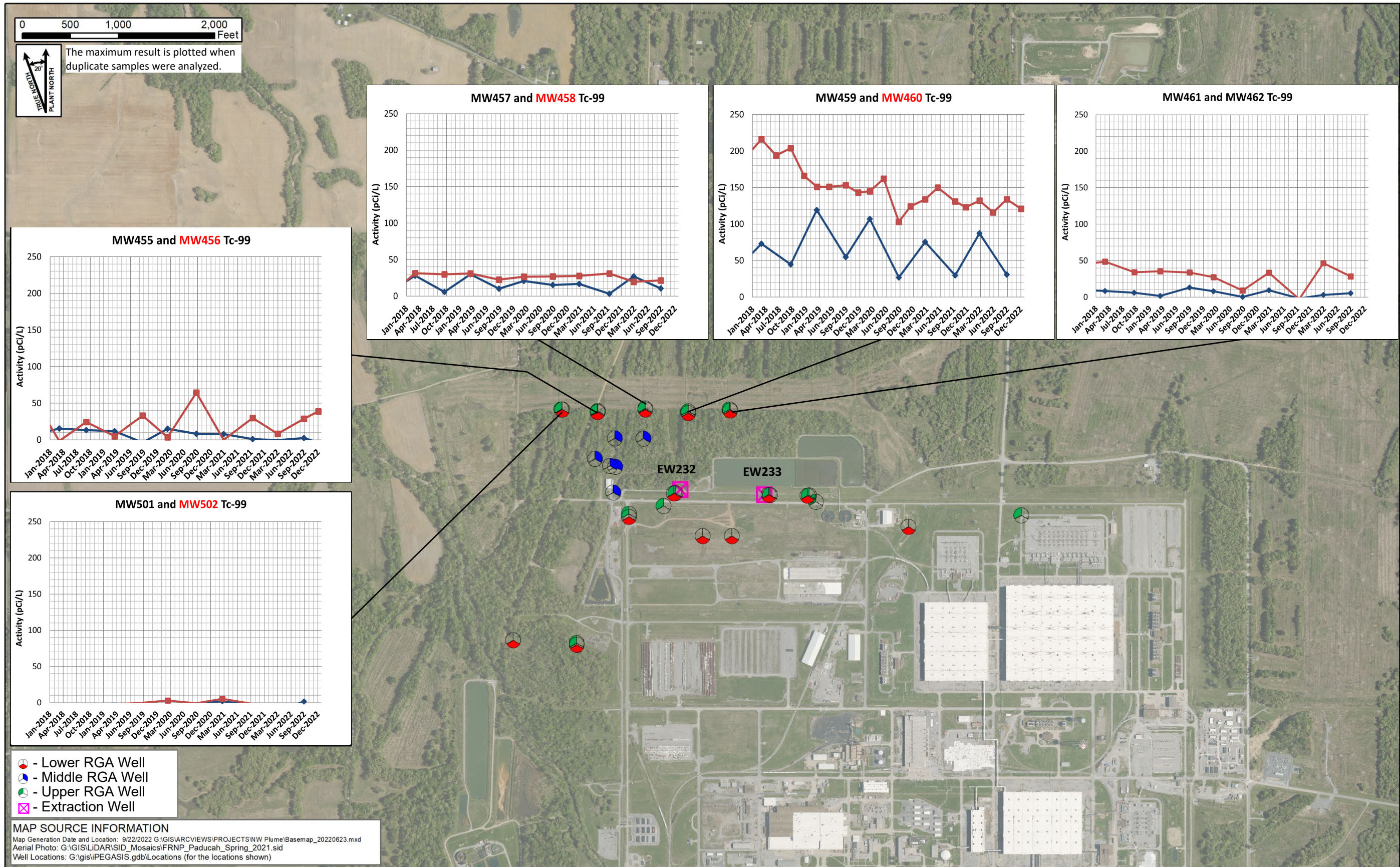


Figure B.22. Northwest Plume—Downgradient of New Well Field—Tc-99 Trends

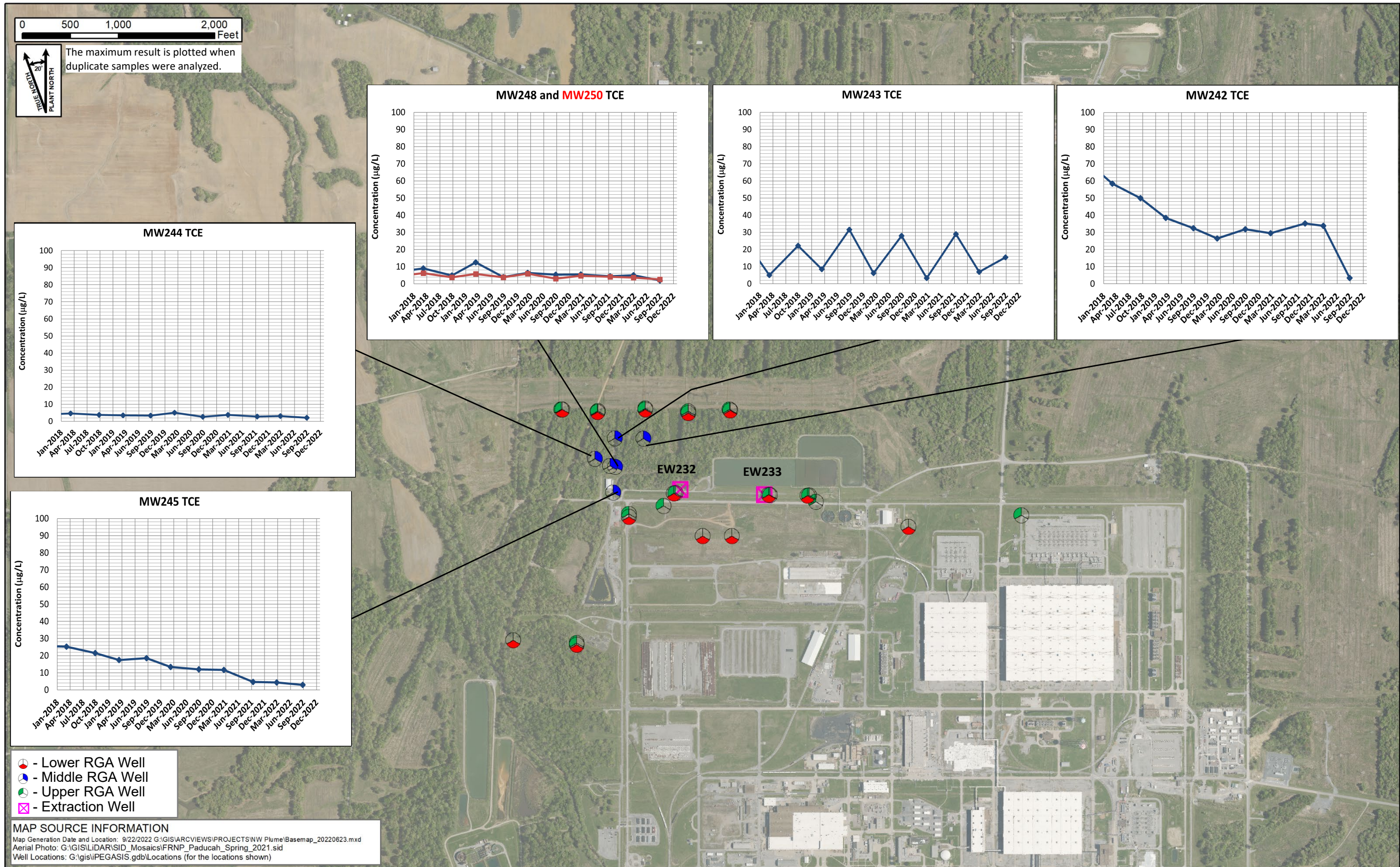


Figure B.23. Northwest Plume—South Well Field TCE Trends

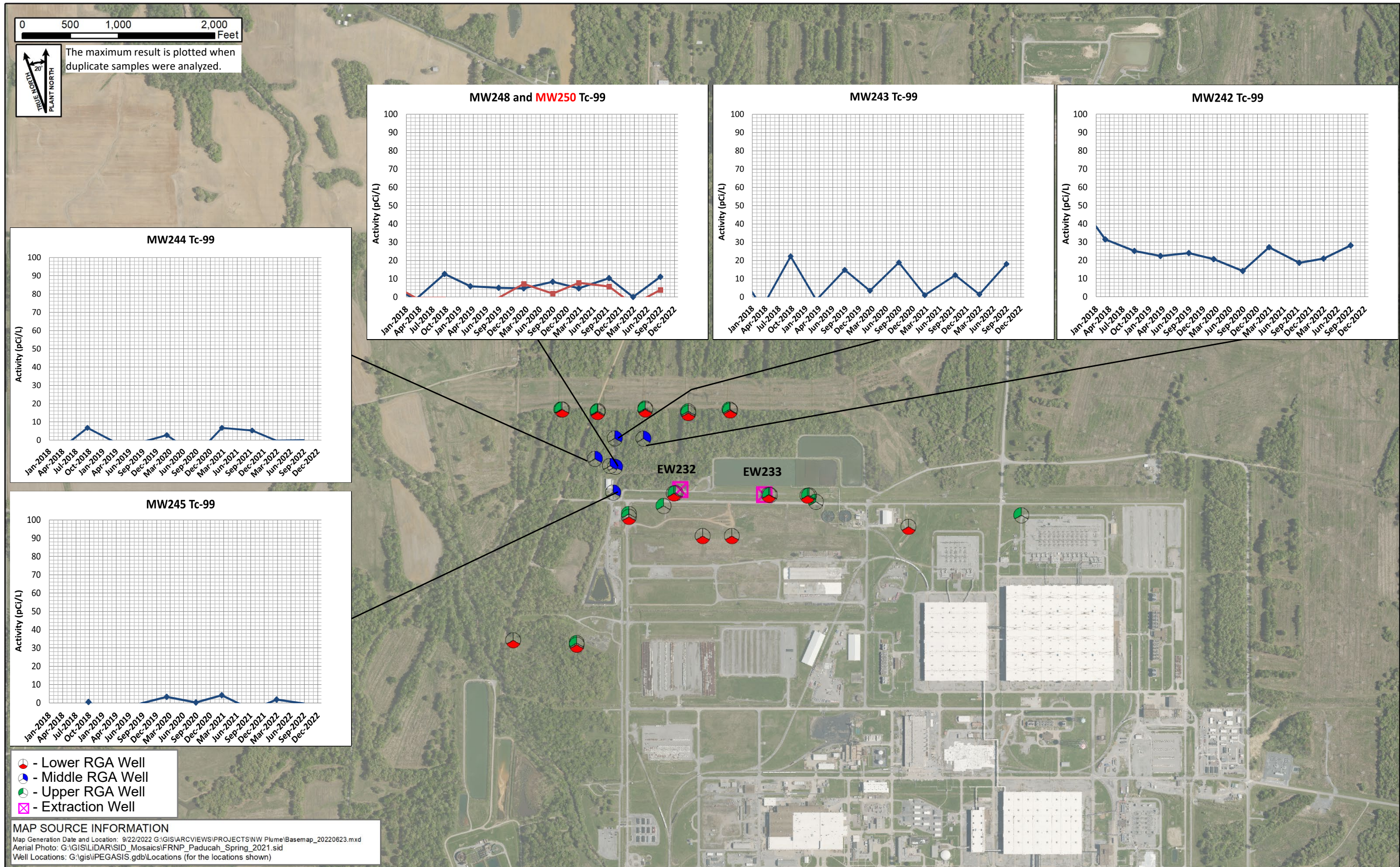


Figure B.24. Northwest Plume—South Well Field—Tc-99 Trends

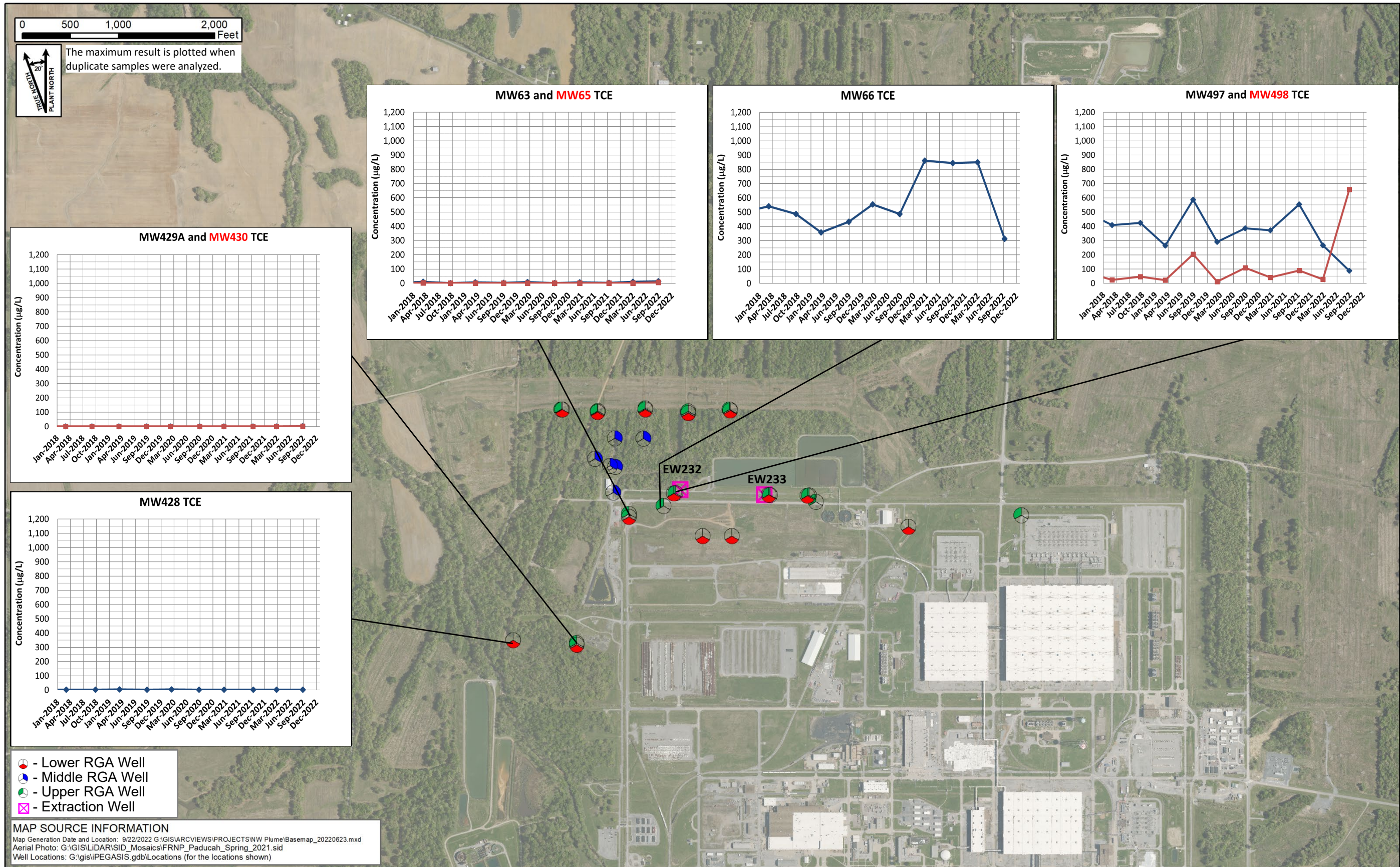


Figure B.25. Northwest Plume—New Well Field—TCE Trends

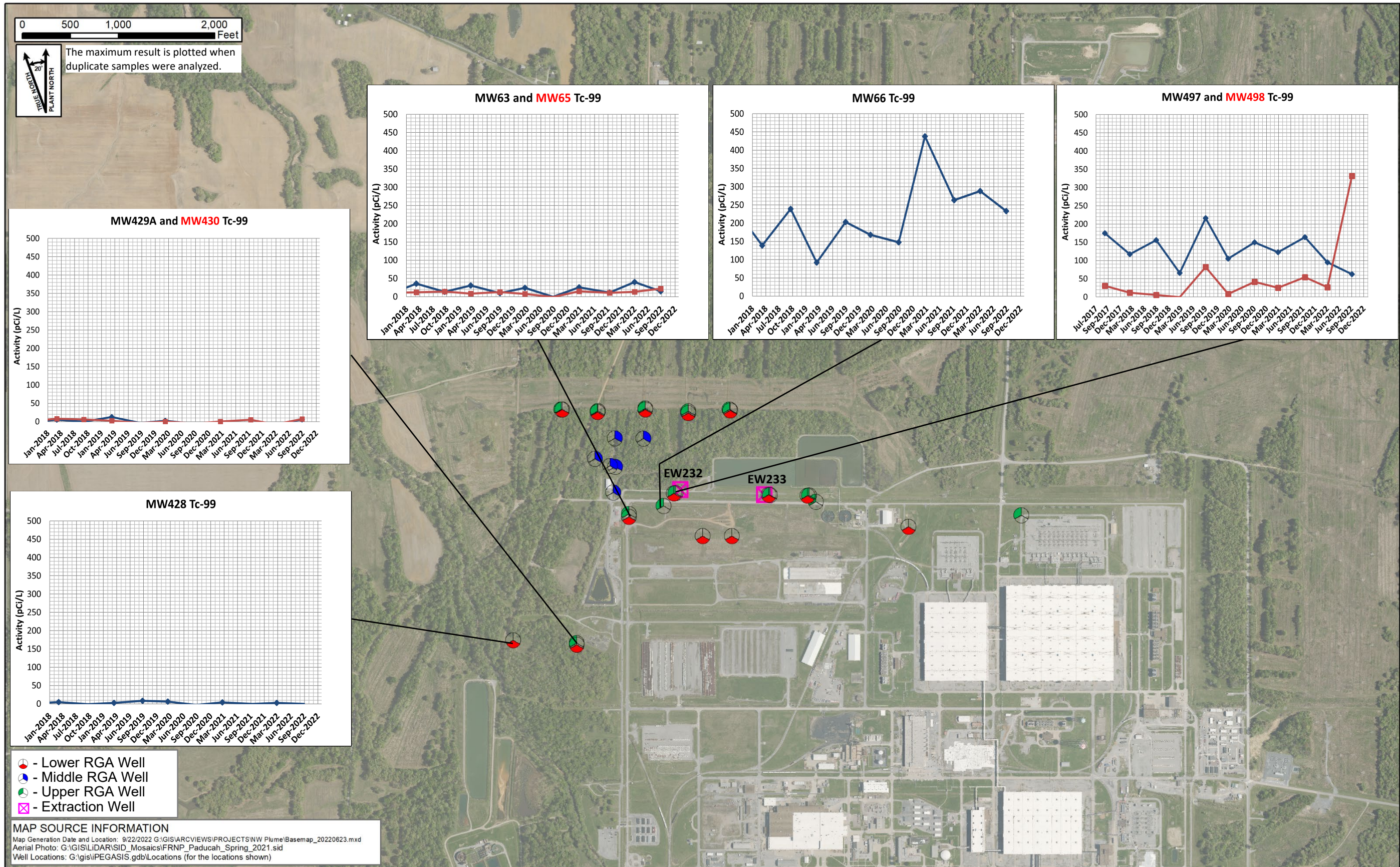


Figure B.26. Northeast Plume—New Well Field—Tc-99 Trends

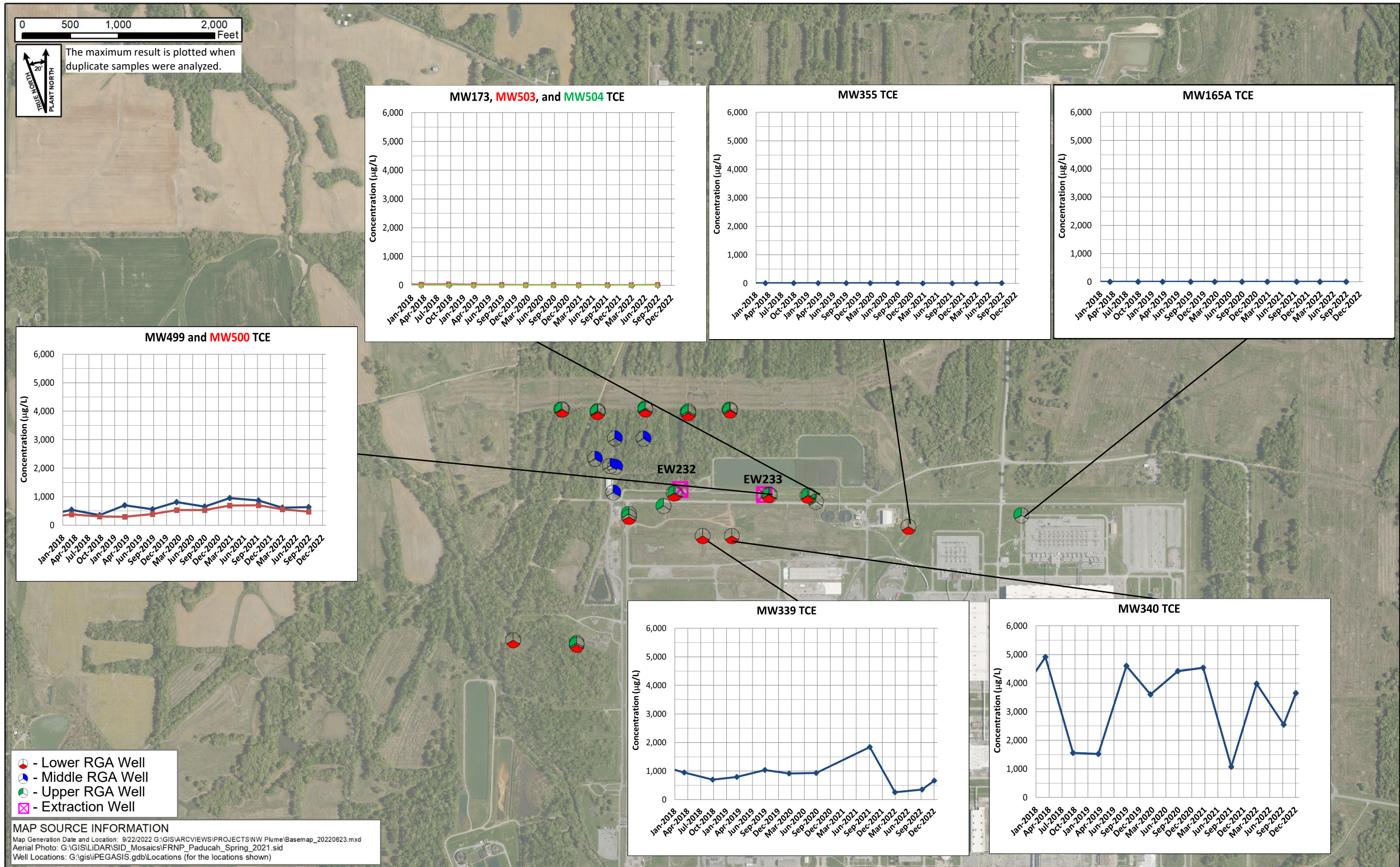


Figure B.27. Northwest Plume—Upgradient of Extraction Wells—TCE Trends

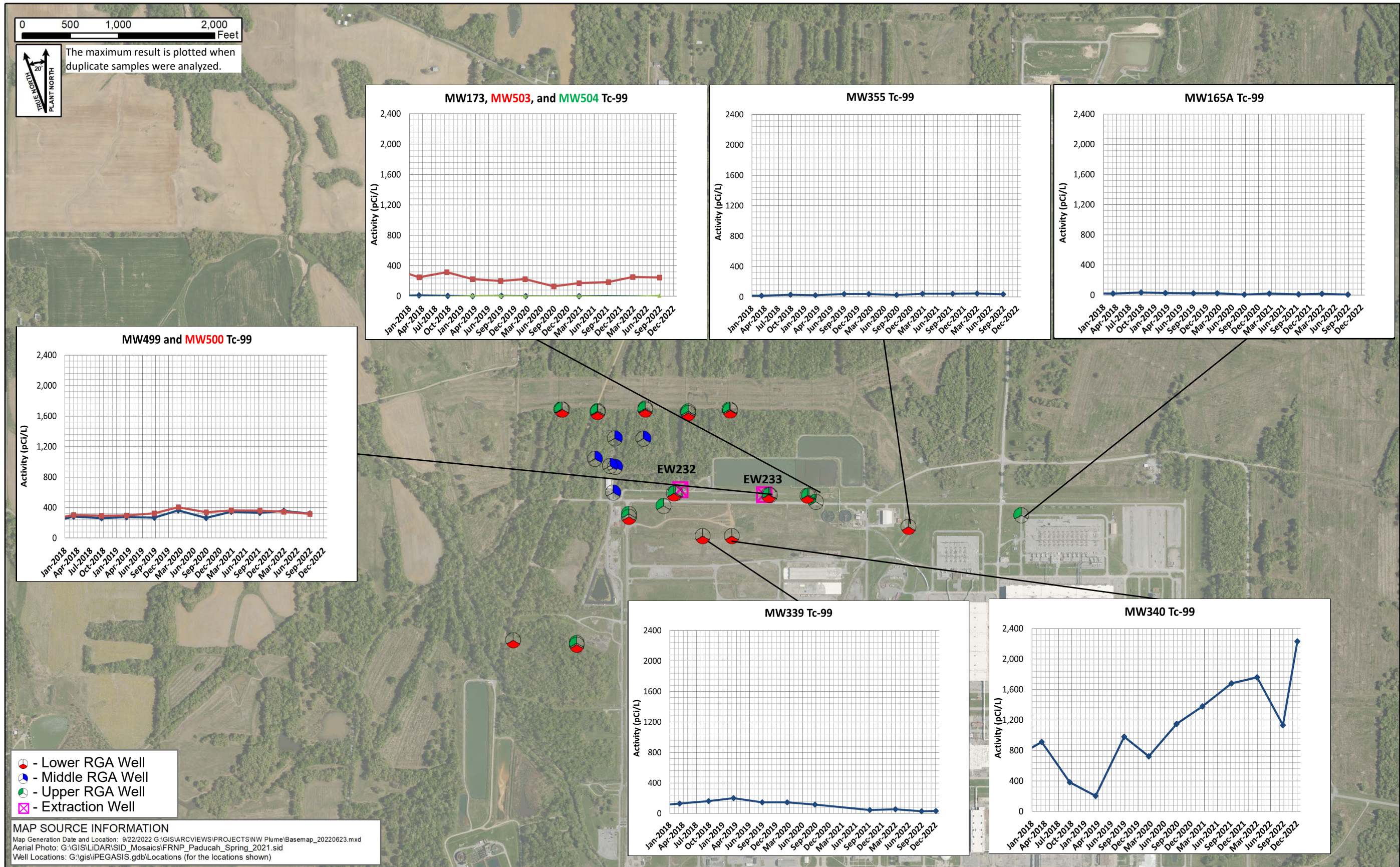
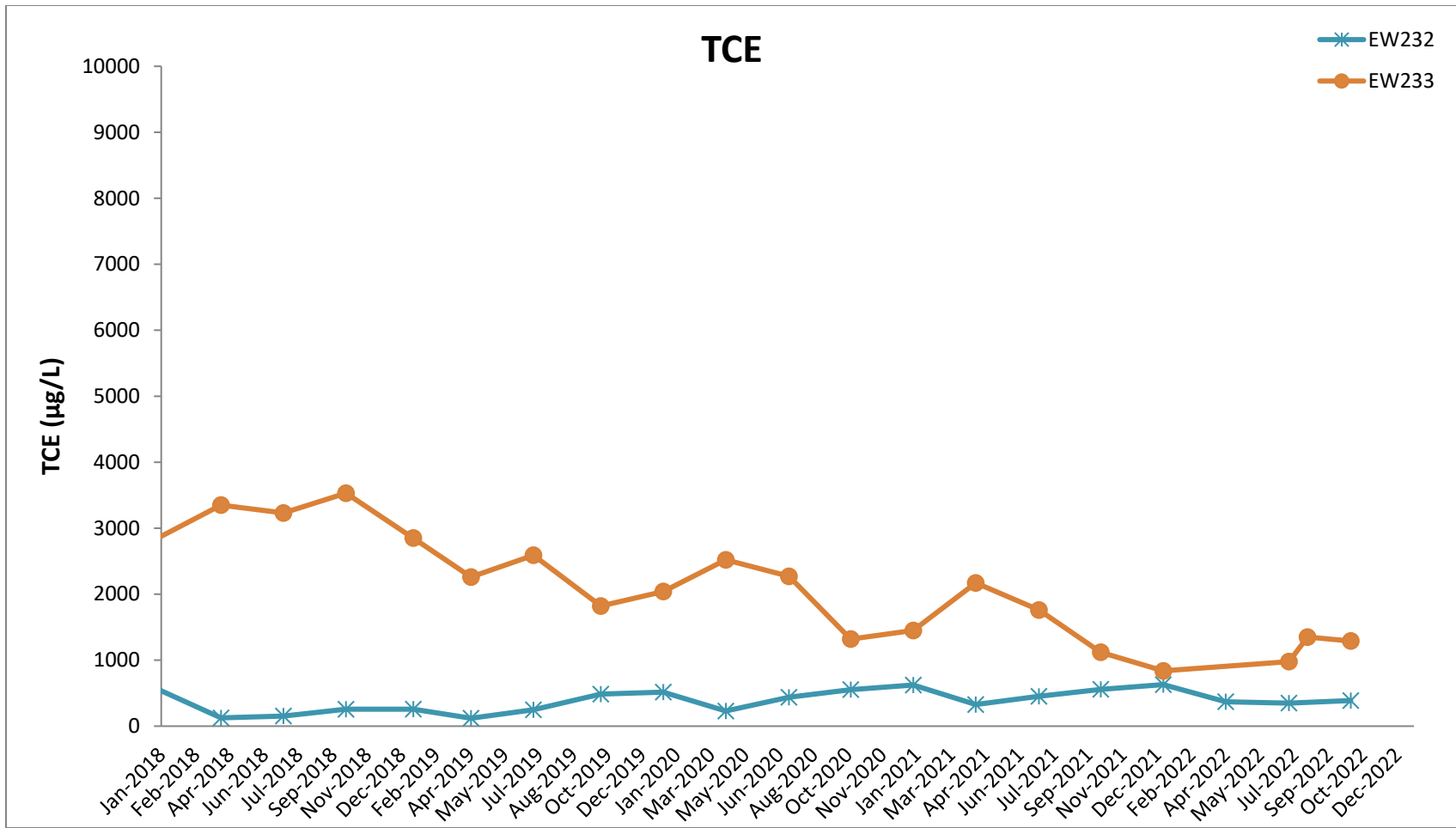
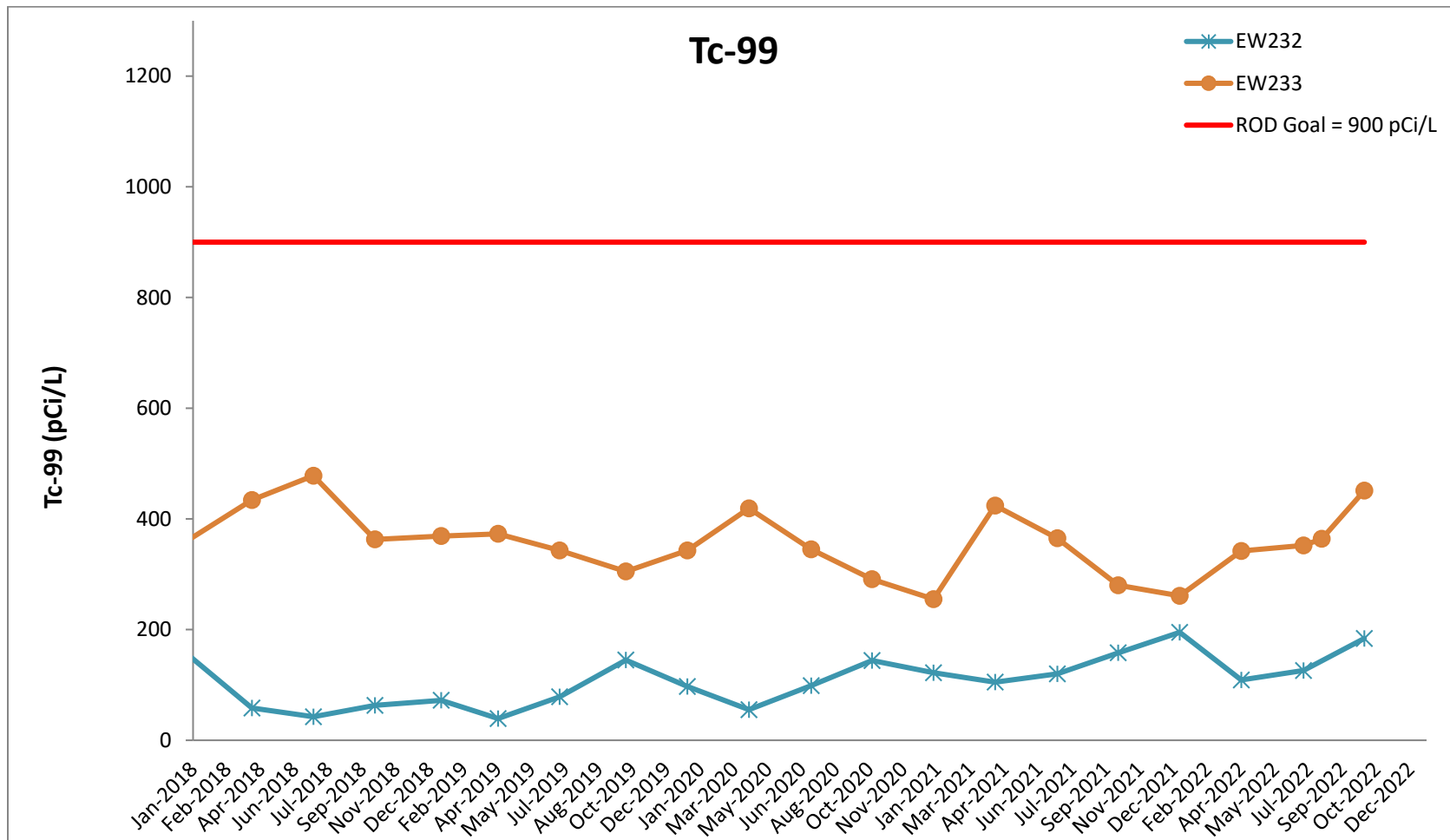


Figure B.28. Northwest Plume—Upgradient of Extraction Wells—Tc-99 Trends



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.29. Northwest Plume—TCE Concentrations in Extraction Wells



NOTE: Data rejected by validation or assessment have not been graphed.

Figure B.30. Northwest Plume—Tc-99 Activities in Extraction Wells

APPENDIX C

C-746-K LANDFILL (SWMU 8) DATA

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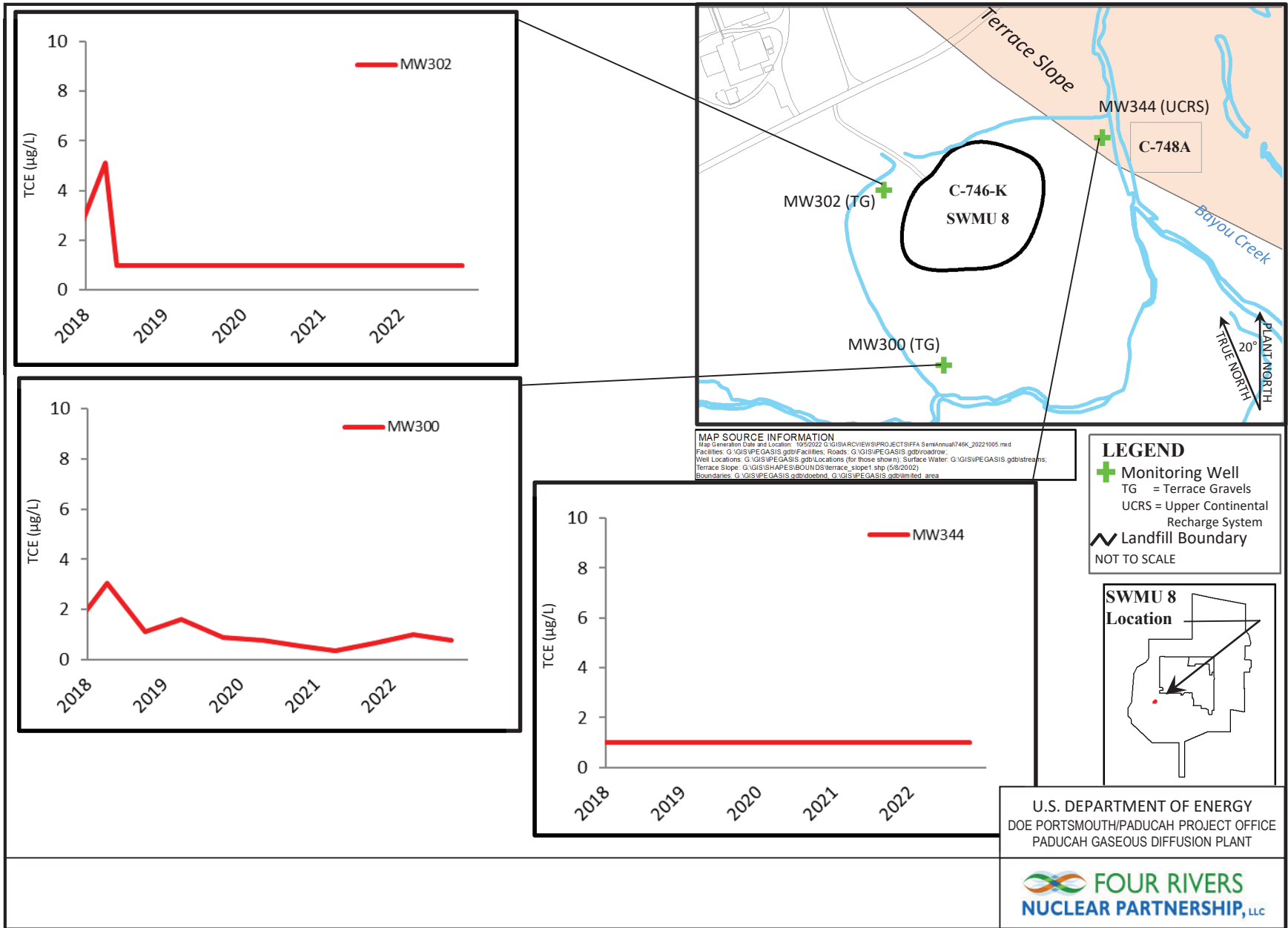


Figure C.1. TCE Trends in SWMU 8 Wells

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APPENDIX D

**ADMINISTRATIVE RECORD,
POST-DECISION RECORD, AND ADMINISTRATIVE RECORD
REFERENCE INDICES**

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Paducah Documents Added to the Administrative Record Files-Fourth Quarter CY2022

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF 400OUREMEDIAL	09/16/22	PPPO-02-10022425-22	PADUCAH FEDERAL FACILITY AGREEMENT-MILESTONE MODIFICATION FOR THE C-400 COMPLEX OPERABLE UNIT DOCUMENTS	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022425-22-FFA MOD C400 OP UNIT DOCS-2022-09-16	10/13/2022
ARF 400OUREMEDIAL	09/28/22	PPPO-02-10022494-22	PADUCAH FEDERAL FACILITY AGREEMENT-SIGNED MILESTONE MODIFICATION FOR THE C-400 COMPLEX OPERABLE UNIT DOCUMENTS	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022494-22-FFA MOD C400 OP UNIT-2022-09-28	10/13/2022
ARF 400OUREMOVAL	09/16/22	PPPO-02-10022425-22	PADUCAH FEDERAL FACILITY AGREEMENT-MILESTONE MODIFICATION FOR THE C-400 COMPLEX OPERABLE UNIT DOCUMENTS	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022425-22-FFA MOD C400 OP UNIT DOCS-2022-09-16	10/13/2022
ARF 400OUREMOVAL	09/28/22	PPPO-02-10022494-22	PADUCAH FEDERAL FACILITY AGREEMENT-SIGNED MILESTONE MODIFICATION FOR THE C-400 COMPLEX OPERABLE UNIT DOCUMENTS	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022494-22-FFA MOD C400 OP UNIT-2022-09-28	10/13/2022

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Paducah Documents Added to the Post-Decision Files-Fourth Quarter CY2022

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
NSDD-PD	09/28/22	CP4-ES-0041-F03	WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) - SEPTEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F03-N-S WEEKLY CHECKLIST-2022-09-28	10/13/2022
NSDD-PD	9/8/2022	CP4-ES-0041-F06	WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (ANNUAL)	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F06-N-S CHECKLIST ANNUAL-2022-09-08	10/13/2022
NSDD-PD	10/25/2022	CP4-ES-0041-F07	CP4-ES-0041-F07 -WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (STORM EVENT) - OCTOBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F07 -CHECKLIST N S OCTOBER-2022-10-25	11/30/2022
NSDD-PD	10/26/2022	CP4-ES-0041-F20	CP4-ES-0041-F20-WINTERIZATION CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-OCTOBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F20-CHECKLIST N S WEEKLY-2022-10-26	11/30/2022
NSDD-PD	10/27/2022	CP4-ES-0041-F03	CP4-ES-0041-F03 -WALKTHROUGH CHECKLIST- NORTH-SOUTH DIVERSION DITCH (WEEKLY) - OCTOBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-WLK THRU CHK LST-2022-10-27	11/30/2022
NSDD-PD	11/11/2022	CP4-ES-0041-F03	CP4-ES-0041-F03 -WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-NOVEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F03-WLK THRU CHK LST-2022-11-22	12/27/2022
NSDD-PD	11/29/22	CP4-ES-0041-F04	CP4-ES-0041-F04-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (QUARTERLY)-NOVEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F04-WLK THRU CHK LST-2022-11-29	12/27/2022
NSDD-PD	11/07/22	CP4-ES-0041-F07	CP4-ES-0041-F07-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (STORM EVENT)-NOVEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F07-WLK THRU CHK LST-2022-11-07	12/27/2022
NSDD-PD	11/22/2022	CP4-ES-0041-F17	CP4-ES-0041-F17-QUARTERLY SOUTHWEST (SW) PLUME SOLID WASTE MANAGEMENT UNIT (SWMU) INSPECTIONS-NOVEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F17-QRTLTY SW SWMU INSPECT-2022-11-22	12/27/2022
SWP-PD	9/29/2022	CP4-ES-0041-F17	QUARTERLY SOUTHWEST (SW) PLUME SOLID WASTE MANAGEMENT UNIT (SWMU) INSPECTIONS - SEPTEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F17-SW PLUME INSPECTION SEPT-2022-09-29	10/13/2022

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Paducah Documents Added to the Post-Decision Files-Fourth Quarter CY2022

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
SWP-PD	9/23/2022	FR-22-0743, DOE/LX/07-2480&D1	KENTUCKY DIVISION OF WASTE MANAGEMENT SUPPORT OF ENVIRONMENTAL PROTECTION AGENCY LEGAL COUNSEL'S COMMENTS TO THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST PLUME (DOE/LX-07-2480&D1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-22-0743-KY SUPPORT EPA COMMENTS ESD-2022-09-23	10/13/2022
SWP-PD	11/1/2022	FR-23-0757, DOE/LX/07-2480&D1	U.S. ENVIRONMENTAL PROTECTION AGENCY SUPPLEMENTAL COMMENTS FOR THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2480&D1, TRANSMITTAL DATE OF JULY 15, 2022	USEPA-4	DOE	INF-RECMGMT-FR-23-0757-EPA COMMENTS FOR ESD-2022-11-01	11/30/2022
SWP-PD	10/24/2022	PPPO-02-10022539-23A, DOE/LX/07-2480&D2	NOTIFICATION OF SCHEDULE EXTENSION FOR SUBMITTAL OF THE D2 EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST PLUME, DOE/LX/07-2480&D2	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022539-23A-ROD FOR SWM UNITS -2022-10-24	11/30/2022
SWP-PD	12/5/2022	FR-23-0776, DOE/LX/07-2480&D2	CONCURRENCE WITH THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME (DOE/LX/07-2480&D2) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0776-ROD FOR SWM UNITS-2022-12-05	12/28/2022
SWP-PD	11/28/2022	PPPO-02-10022539-23B, DOE/LX/07-2480&D2	TRANSMITTAL OF THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2480&D2	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022539-23B-ROD FOR SWM-2022-11-28	12/28/2022

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Paducah Documents Added to the Administrative Record Reference Files-Fourth Quarter CY2022

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF ARR	11/1/1995	DOE/OR/07-1207&D1	[ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON] SITE MANAGEMENT PLAN PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KY (DOE/OR/07-1207&D1)	USEPA-4	DOE, MMES	INF-RECMGMT-EPA COMMENTS SMP-1995-11-01	10/13/2022
ARF ARR	11/22/1995	DOE/OR/07-1207&D1	[KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION COMMENTS ON] SITE MANAGEMENT PLAN, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KY (DOE/OR/07-1207&D1)	KDEP	DOE, LMES	INF-RECMGMT-KY COMMENTS SMP-1995-11-22	10/13/2022
ARF ARR	9/29/2022	PPPO-02-1002237122B, DOE/LX/07-0112&D1/R1	C-747-A BURIAL GROUND, SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT FOR SOLID WASTE MANAGEMENT UNIT 7-HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022371-22B-C747A SAR SWMU 7-2022-09-29	10/13/2022
ARF ARR	12/28/2010	PPPO-02-971003-11B, DOE/LX/07-0337	REVISED SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT FOR SOLID WASTE MANAGEMENT UNIT 193	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-971003-11B-REV SWM RPT U 193-2010-12-28	11/30/2022
ARF ARR	10/13/2022	FR-23-0746, DOE/LX/07-0112&D1/R1	COMMENTS ON THE REVISED SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR SOLID WASTE MANAGEMENT UNIT (SWMU) 7 (0112&D1/R1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0746-KY COMMENTS SWM SAR-2022-10-13	11/30/2022
ARF ARR	10/18/2022	PPPO-02-1002233523	PADUCAH FEDERAL FACILITY AGREEMENT BUDGET NOTIFICATION-CONTINUING RESOLUTION	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022335-23-FFA BUDGET NOTE-2022-10-18	11/30/2022
ARF ARR	11/25/2022	FR-23-0771, DOE/LX/07-2482&D1	U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) REGION 4 ACKNOWLEDGEMENT OF RECEIPT AND REVIEW FOR THE DEPARTMENT OF ENERGY'S (DOE'S), PADUCAH SITE FISCAL YEAR 2023 SITE MANAGEMENT PLAN, DOE/LX/07-2482&D1	USEPA-4	DOE	INF-RECMGMT-FR-23-0771-SITE MANAGEMENT PLAN-2022-11-25	12/27/2022
ARF ARR	12/5/2022	FR-23-0775, DOE/LX/07-2482&D1	KENTUCKY DEPARTMENT OF WASTE MANAGEMENT SUBMITTAL OF COMMENTS TO THE FISCAL YEAR 2023 SITE MANAGEMENT PLAN (DOE/LX/07-2482&D1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0775-FY 2023 SMP-2022-12-05	12/28/2022
ARF ARR	11/28/2022	PPPO-02-1002274923, DOE/LX/07-2482&D1	TRANSMITTAL OF THE D1 SITE MANAGEMENT PLAN, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, ANNUAL REVISION - FY 2023, DOE/LX/07-2482&D1	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022749-23-SMP AN REV FY 2023-2022-11-15	12/28/2022
ARF ARR	11/17/2022	PPPO-02-1002276123B, DOE/LX/07-0112&D1/R2	C-747-A BURIAL GROUND, SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT FOR SOLID WASTE MANAGEMENT UNIT 7-HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022761-23B-C-747 BG RPT FOR SWMU 7-2022-11-17	12/28/2022

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Paducah Documents Added to the Administrative Record Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-Q-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-P-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-O-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-N-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-M-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-L-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-K-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-J-2023-01-05	2/28/2023

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Paducah Documents Added to the Administrative Record Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-I-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-H-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-G-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	1/5/2023	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-F-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	1/5/2023	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-E-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-D-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	1/5/2023	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-C-2023-01-05	2/28/2023
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-B-2023-01-05	2/28/2023

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Paducah Documents Added to the Administrative Record Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF 400OUREMEDIAL	01/05/23	PPPO-02-10021638-23C, DOE/LX/07-2474&D1	TRANSMITTAL OF THE 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	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10021638-23C-STUDY RPT FOR C400-A-2023-01-05	2/28/2023

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Paducah Documents Added to the Post-Decision Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
C400SOURCE-PD	9/21/2022	SA-FY22-0102	SELF-ASSESSMENT REPORT-C-400 AND NORTH-SOUTH DIVERSION DITCH (NSDD) LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP) IMPLEMENTATION-SITE MANAGEMENT PLAN	FRNP	DOE	INF-RECMGMT-SA-FY22-0102-NSDD LUCIP SITE MGMT PLN-2022-09-14	3/27/2023
NSDD-PD	12/28/2022	CP4-ES-0041-F03	CP4-ES-0041-F03-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-DECEMBER-2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F03-CHECKLIST N-S DECEMBER-2022-12-28	1/18/2023
NSDD-PD	12/14/2022	CP4-ES-0041-F07	CP4-ES-0041-F07-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (STORM EVENT)- DECEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F07-CHECKLIST N-S DECEMBER-2022-12-14	1/18/2023
NSDD-PD	12/28/2022	CP4-ES-0041-F20	CP4-ES-0041-F20-WINTERIZATION CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-DECEMBER 2022	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F20-CHECKLIST N-S WEEKLY- DECEMBER-2022-12-28	1/18/2023
NSDD-PD	1/25/2023	CP4-ES-0041-F03	CP4-ES-0041-F03-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-JANUARY 2023	FRNP	DOE	INF-RECMGMT-CPE-ES-0041-F03-WALKTHROUGH CHECKLIST-2023-01-25	2/20/2023
NSDD-PD	1/25/2023	CP4-ES-0041-F20	CP4-ES-0041-F20 - WINTERIZATION CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) - JANUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F20-WINTERIZATION CHECKLIST-2023-01-15	2/20/2023
NSDD-PD	1/25/2023	CP4-ES-0041-F07	CP4-ES-0041-F07 - WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) - JANUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F07-WALKTHROUGH CHECKLIST NS DITCH-2023-01-25	2/21/2023
NSDD-PD	2/22/2023	CP4-ES-0041-F03	CP4-ES-0041-F03-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F03-WLK THRU CHK LST NS DITCH-2023-02-22	3/27/2023
NSDD-PD	2/16/2023	CP4-ES-0041-F04	CP4-ES-0041-F04-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (QUARTERLY)-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F04-WLK THRU CHK LST NS DITCH-2023-02-16	3/27/2023

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Paducah Documents Added to the Post-Decision Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
NSDD-PD	02/15/23	CP4-ES-0041-F05	CP4-ES-0041-F05-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH SURGE BASIN/CONCRETE DITCH (SEMI-ANNUAL)-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F05-WLK THRU CHK LST NS DITCH-2023-02-15	3/27/2023
NSDD-PD	9/21/2022	SA-FY22-0102	SELF-ASSESSMENT REPORT-C-400 AND NORTH-SOUTH DIVERSION DITCH (NSDD) LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP) IMPLEMENTATION-SITE MANAGEMENT PLAN	FRNP	DOE	INF-RECMGMT-SA-FY22-0102-NSDD LUCIP SITE MGMT PLN-2022-09-14	3/27/2023
NSDD-PD	2/23/2023	CP4-ES-0041-F07	CP4-ES-0041-F07-WALKTHROUGH CHECKLIST-NORTH-SOUTH DIVERSION DITCH (STORM EVENT)-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F07-WLK THRU CHK LST NS DITCH-2023-02-23	3/28/2023
NSDD-PD	02/22/23	CP4-ES-0041-F20	CP4-ES-0041-F20-WINTERIZATION CHECKLIST-NORTH-SOUTH DIVERSION DITCH (WEEKLY)-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F20-WLK THRU CHK LST NS DITCH-2023-02-22	3/28/2023
SWP-PD	12/29/22	PPPO-02-10022539-23C, DOE/LX/07-2480&D2	SIGNED EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2480&D2	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10022539-23C-REC OF DECISION FOR SWMU-2022-12-29	1/18/2023
SWP-PD	1/10/2023	PPPO-02-10023078-23C	TRANSMITTAL OF THE INTERIM REMEDIAL ACTION COMPLETION REPORT WITH POST CONSTRUCTION REPORT ELEMENTS FOR SOLID WASTE MANAGEMENT UNIT (SWMU) 211-A FOR VOLATILE ORGANIC COMPOUND SOURCES TO THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2483&D1	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023078-23C-POST CONSTRUCT RPT SWMU 211-2023-01-10	2/20/2023
SWP-PD	02/16/23	CP4-ES-0041-F17	CP4-ES-0041-F17-QUARTERLY SOUTHWEST (SW) PLUME SOLID WASTE MANAGEMENT UNIT (SWMU) INSPECTIONS-FEBRUARY 2023	FRNP	DOE	INF-RECMGMT-CP4-ES-0041-F017-SWMU INSPECTION SW PLUME-2023-02-23	3/27/2023
SWP-PD	3/21/2023	SA-FY22-0103	SELF-ASSESSMENT REPORT-SOUTHWEST PLUME LAND USE CONTROL (LUC) IMPLEMENTATION-SITE MANAGEMENT PLAN	FRNP	DOE	INF-RECMGMT-SA-FY22-0103-SW PLUME LUC MGMT PLN-2022-09-14	3/27/2023
SWP-PD	2/19/2023	N/A	2023-2-18 DEPARTMENT OF ENERGY (DOE) PUBLIC NOTICE EXPLANATION OF SIGNIFICANT DIFFERENCES FOR SOLID WASTE MANAGEMENT UNIT 211-A OF THE SOUTHWEST PLUME SOURCES AT THE PADUCAH GASEOUS DIFFUSION PLANT-THE PADUCAH SUN, 2/19/2023	DOE	RESIDENT	INF-RECMGMT-SWMU 211 IN THE PADUCAH SUN-2023-02-19	3/27/2023

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Paducah Documents Added to the Administrative Record Reference Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF ARR	12/5/2022	FR-23-0775, DOE/LX/07-2482&D1	KENTUCKY DEPARTMENT OF WASTE MANAGEMENT SUBMITTAL OF COMMENTS TO THE FISCAL YEAR 2023 SITE MANAGEMENT PLAN (DOE/LX/07-2482&D1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0775-KDWM FY 22 SMP-2022-12-05	1/18/2023
ARF ARR	12/13/2022	FR-23-0778, DOE/LX/07-2482&D2	U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) REGION 4 CONCURRENCE FOR THE DEPARTMENT OF ENERGY'S (DOE'S), PADUCAH SITE FISCAL YEAR 2023 SITE MANAGEMENT PLAN, DOE/LX/07-2482&D2	USEPA-4	DOE	INF-RECMGMT-FR-23-0778-PAD FY 2023 SITE MGMT PLN-2022-12-13	1/18/2023
ARF ARR	12/13/2022	FR-23-0779, DOE/LX/07-2482&D2	APPROVAL OF THE FISCAL YEAR 2023 SITE MANAGEMENT PLAN (DOE/LX/07-2482&D2) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0779-FY 2023 SITE MGMT PLN-2022-12-13	1/18/2023
ARF ARR	1/12/2023	PPPO-02-1002312823	PADUCAH FEDERAL FACILITY AGREEMENT FISCAL YEAR 2023 BUDGET NOTIFICATION	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023128-23-FY 2023 BUDGET NOTE-2023-01-12	1/18/2023
ARF ARR	12/13/2022	PPPO-02-1002319123, DOE/LX/07-2482&D2	TRANSMITTAL OF THE D2 SITE MANAGEMENT PLAN, PADUCAH GASEOUS DIFFUSION PLANT PADUCAH, KENTUCKY, ANNUAL REVISION-FY 2023, DOE/LX/07-2482&D2	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023191-23-D2 SITE MGMT PLAN 2022-12-13	1/18/2023
ARF ARR	12/23/2022	PPPO-02-1002322523B, DOE/LX/07-2486&D1	C-635 PUMPHOUSE AND COOLING TOWER SLABS AND ASSOCIATED SOILS, SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORT FOR AREA OF CONCERN 88-HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NO. 3059	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023225-23B-ASSESSMENT REPORT-2022-12-23	1/18/2023
ARF ARR	12/12/2022	FR-23-0777, DOE/LX/07-0112&D1/R2	APPROVAL OF THE RE-REVISED SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR SOLID WASTE MANAGEMENT UNIT 7 (0112&D1/R2) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0777-SWMU7 RPT-2022-12-12	1/18/2023
ARF ARR	1/23/2023	FR-23-0801, DOE/LX/07-2486&D1	APPROVAL OF THE REVISED SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR AREA OF CONCERN 88 (2486&D1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0801-APPROVAL OF SAR FOR AREA 88-2023-01-23	2/20/2023
ARF ARR	1/31/2023	DOE/OR/07-1707, PRS-035	FEDERAL FACILITY AGREEMENT FOR THE PADUCAH GASEOUS DIFFUSION PLANT	DOE, USEPA-4, KDEP	DOE, USEPA-4, KDEP	INF-RECMGMT-FED FACILITY AGREEMENT-2023-01-31	2/20/2023
ARF ARR	1/13/2023	PPPO-02-1002344723	PADUCAH FEDERAL FACILITY AGREEMENT MODIFICATION-FISCAL YEAR 2023 SITE MANAGEMENT PLAN, ENFORCEABLE COMMITMENTS, AND LIST OF SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023447-23-FFA FY2023 ENFORCE COMMITMENT-2023-01-13	2/20/2023
ARF ARR	2/7/2023	PPPO-02-1002349223B, DOE/LX/07-2489&D1; DOE/LX/07-0337&D1/R2	MCGRAW CONSTRUCTION FACILITIES (SOUTH SIDE CYLINDER YARD AREA, EAST OF HOBBS ROAD) SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORT FOR SWMU 193 AND MCGRAW CONSTRUCTION FACILITIES SOUTH SIDE LEACH FIELD AREA (WEST OF AND INCLUDING HOBBS ROAD) SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORT FOR SWMU 194-HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023492-23B-ASSESS RPT SWMU 193 AND 194-2023-02-07	2/21/2023

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Paducah Documents Added to the Administrative Record Reference Files-First Quarter CY2023

Document Status	Document Date	Document ID	Title	Author Affiliation	To Affiliation	Name	Date Added
ARF ARR	2/6/2023	PPPO-02-1002351523	PADUCAH FEDERAL FACILITY AGREEMENT DRAFT INTEGRATED PRIORITY LIST AND ASSESSMENT OF BUDGET TARGETS ON SITE PRIORITIES-FISCAL YEAR 2025	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023515-23-BUDGET TARGET PRIORITIES-2023-02-06	2/21/2023
ARF ARR	2/13/2023	FR-23-0818, DOE/LX/07-2489&D1, DOE/LX/07-0337&D1/R2	APPROVAL OF THE REVISED SOLID WASTE MANAGEMENT UNIT (SWMU) SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR SWMU 193 (DOE/LX/07-2489&D1) AND SUBMITTING COMMENTS TO THE REVISED SAR FOR SWMU 194 (DOE/LX/07-0337&D1/R2) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0818-SWMU SAR 193 AND 194-2023-02-13	3/27/2023
ARF ARR	2/22/2023	FR-23-0821	PADUCAH FEDERAL FACILITY AGREEMENT DRAFT INTEGRATED PRIORITY LIST AND ASSESSMENT OF BUDGET TARGETS ON SITE PRIORITIES-FISCAL YEAR 2025 PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0821-ASSESSMENT OF BUDGET FY 2025-2023-02-22	3/27/2023
ARF ARR	2/22/2023	FR-23-0822	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 4 REVIEW AND COMMENT ON THE DEPARTMENT OF ENERGY'S NOTIFICATION LETTER DATED FEBRUARY 15, 2023, FOR THE PADUCAH SITE'S INTEGRATED PRIORITY LIST AND ASSESSMENT OF BUDGET TARGETS ON SITE PRIORITIES-FISCAL YEAR 2025	USEPA-4	DOE	INF-RECMGMT-FR-23-0822-INTEGRATED PRIORITY LIST FY 2025-2023-02-22	3/27/2023
ARF ARR	3/3/2023	FR-23-0823, DOE/LX/07-0337&D1/R2	APPROVAL OF THE REVISED SOLID WASTE MANAGEMENT UNIT (SWMU) SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR SWMU 194 (DOE/LX/07-0337&D1/R2) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982	KDEP	DOE	INF-RECMGMT-FR-23-0823-SWMU SAR 194-2023-03-03	3/27/2023
ARF ARR	3/3/2023	PPPO-01-1002319423A	NOTIFICATION OF DESIGNATION FOR THE UNITED STATES DEPARTMENT OF ENERGY'S PROJECT MANAGER UNDER THE FEDERAL FACILITY AGREEMENT FOR THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-01-10023194-23A-DOE PROJECT MGR-2023-03-03	3/27/2023
ARF ARR	2/15/2023	PPPO-02-1002351623	FEDERAL FACILITY AGREEMENT BUDGET REPORTING-FISCAL YEAR 2025 BUDGET TARGET FUNDING GUIDANCE NOTIFICATION	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023516-23-BUDGET REPORTING-FY 2025-2023-02-15	3/27/2023
ARF ARR	3/1/2023	PPPO-02-1002372023, DOE/LX/07-0337&D1/R2	MCGRAW CONSTRUCTION FACILITIES SOUTH SIDE LEACH FIELD AREA (WEST OF AND INCLUDING HOBBS ROAD) SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORT FOR SWMU 194-HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023720-23-SWMU 194 HAZ WASTE MGMT PERMIT-2023-03-01	3/27/2023
ARF ARR	2/22/2023	PPPO-02-1002376123	PADUCAH FEDERAL FACILITY AGREEMENT SIGNED MODIFICATION-FISCAL YEAR 2023 SITE MANAGEMENT PLAN, ENFORCEABLE COMMITMENTS, AND LIST OF SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN	DOE	KDEP, USEPA-4	INF-RECMGMT-PPPO-02-10023761-23-SITE MGMT PLN OF SWMU FY 23-2023-02-22	3/27/2023

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APPENDIX E

**C-749 URANIUM BURIAL GROUND (SWMU 2)
GROUNDWATER MONITORING WELL DATA**

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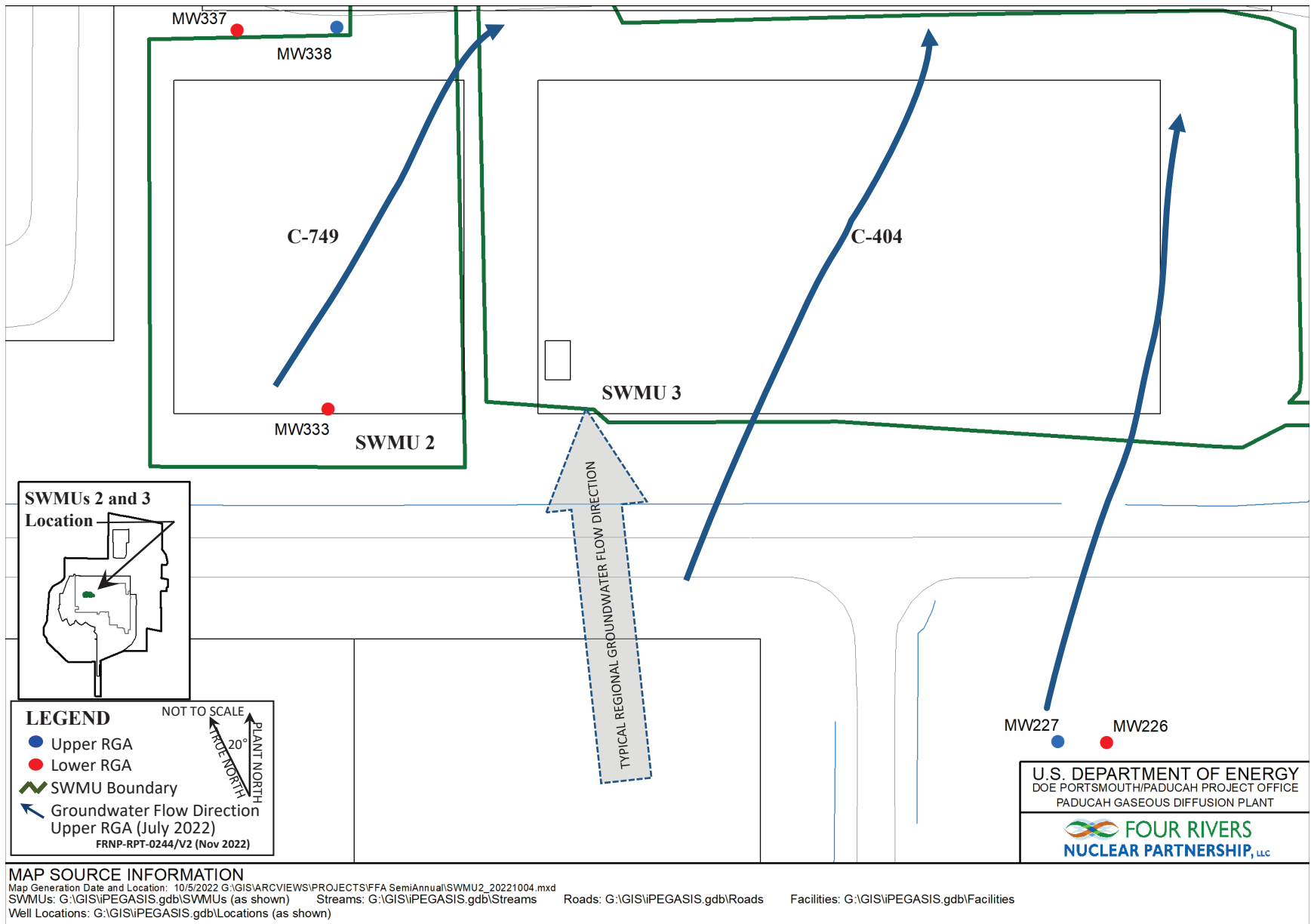


Figure E.1. SWMU 2 Wells Location

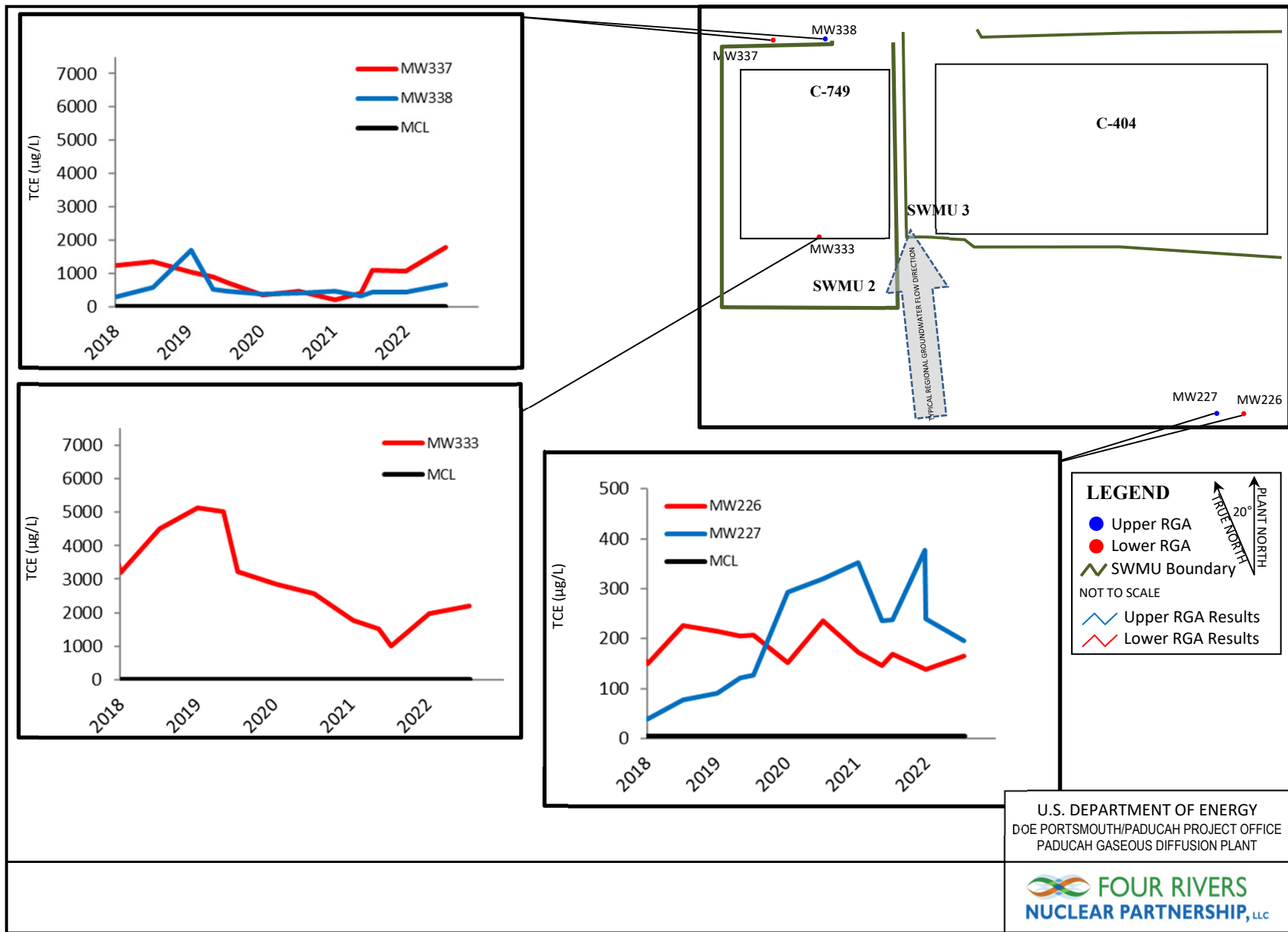


Figure E.2. TCE Trends in SWMU 2 Wells

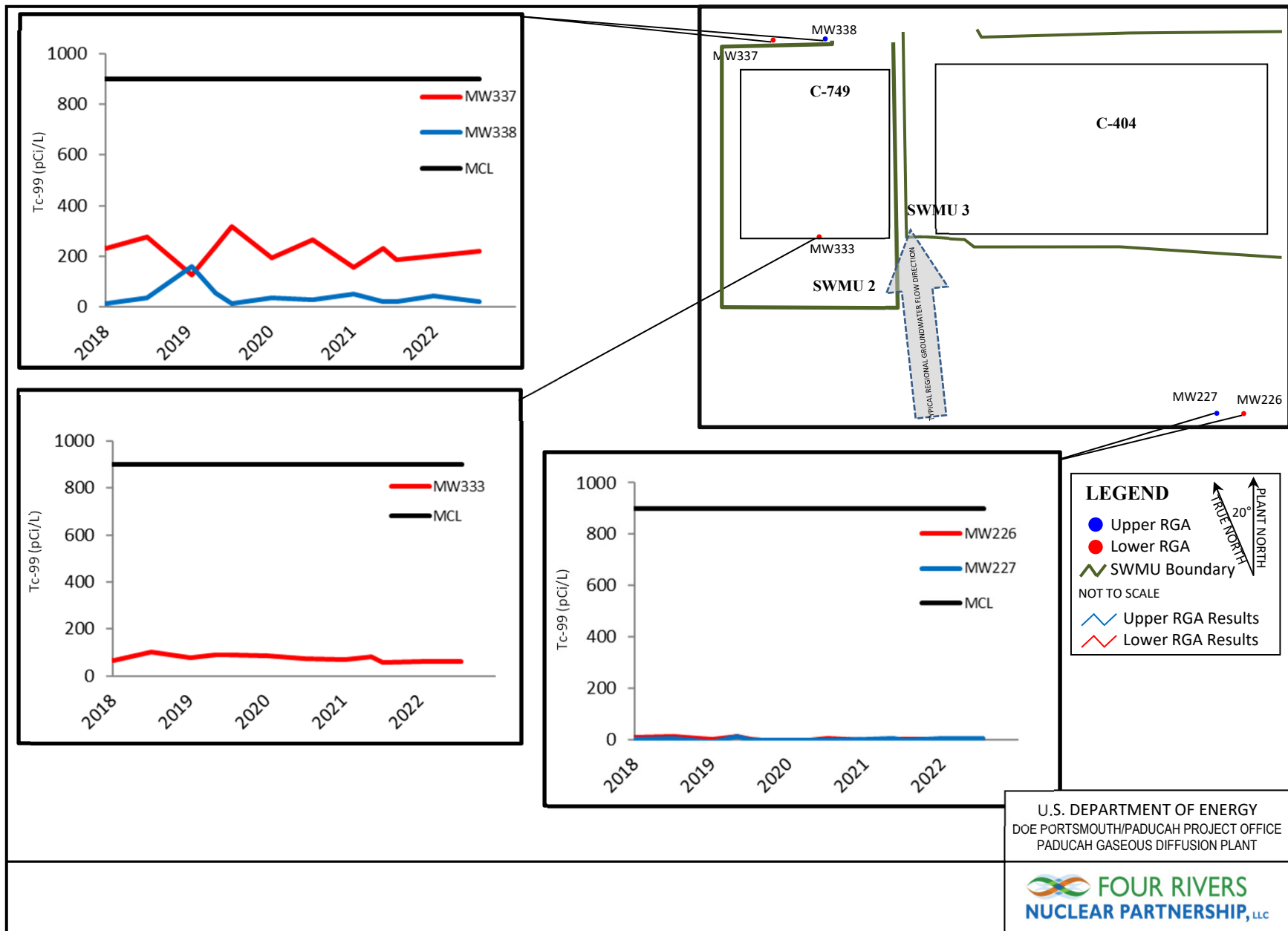


Figure E.3. Tc-99 Trends in SWMU 2 Wells

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