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FEB 25 2020

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Mr. Todd Hendricks
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
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Dear Ms. Green and Mr. Hendricks:

C-746-U CONTAINED LANDFILL FOURTH QUARTER CALENDAR YEAR 2019 (OCTOBER–DECEMBER) COMPLIANCE MONITORING REPORT, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0087/V4, PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID NO. 3059

Enclosed is the subject report for the fourth quarter calendar year (CY) 2019. This report is required in accordance with Permit Condition ACTV0006, Special Condition Number 3, of Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045 (Permit). The report includes groundwater analytical data, surface water analytical data, validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results.

The statistical analyses on the fourth quarter CY 2019 monitoring well data collected from the C-746-U Landfill were performed in accordance with Monitoring Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). This report also serves as the statistical exceedance notification for the fourth quarter CY 2019, in accordance with Monitoring Condition GSTR0001, Standard Requirement 5, of the Permit.

If you have any questions or require additional information, please contact David Dollins at (270) 441-6819.

Sincerely,

Jennifer Woodard

Jennifer Woodard
Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosure:
C-746-U Contained Landfill 4th Qtr. CY 2019 (Oct.–Dec.) Compliance Monitoring Report

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FRNP-RPT-0087/V3

C-746-U Contained Landfill
Third Quarter Calendar Year 2019
(July–September)
Compliance Monitoring Report
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

FOUR RIVERS
NUCLEAR PARTNERSHIP, LLC

This document is approved for public release per review by:

David Hayden — 11-21-19

FRNP Classification Support — Date

FRNP-RPT-0087/V3

C-746-U Contained Landfill
Third Quarter Calendar Year 2019
(July–September)
Compliance Monitoring Report
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

Date Issued—November 2019

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

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

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CONTENTS

FIGURES v

TABLES v

ACRONYMS vii

1. INTRODUCTION 1
   1.1 BACKGROUND 1
   1.2 MONITORING PERIOD ACTIVITIES 1
      1.2.1 Groundwater Monitoring 1
      1.2.2 Methane Monitoring 3
      1.2.3 Surface Water Monitoring 3
   1.3 KEY RESULTS 5

2. DATA EVALUATION/STATISTICAL SYNOPSIS 9
   2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA 10
      2.1.1 Upper Continental Recharge System 10
      2.1.2 Upper Regional Gravel Aquifer 10
      2.1.3 Lower Regional Gravel Aquifer 10
   2.2 DATA VERIFICATION AND VALIDATION 11

3. PROFESSIONAL GEOLOGIST AUTHORIZATION 13

4. REFERENCES 15

APPENDIX A: GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING 1 SAMPLE DATA REPORTING FORM A-1

APPENDIX B: FACILITY INFORMATION SHEET B-1

APPENDIX C: GROUNDWATER SAMPLE ANALYSES AND WRITTEN COMMENTS C-1

APPENDIX D: STATISTICAL ANALYSES AND QUALIFICATION STATEMENT D-1

APPENDIX E: GROUNDWATER FLOW RATE AND DIRECTION E-1

APPENDIX F: NOTIFICATIONS F-1

APPENDIX G: CHART OF MCL AND UTL EXCEEDANCES G-1

APPENDIX H: METHANE MONITORING DATA H-1

APPENDIX I: SURFACE WATER ANALYSES AND WRITTEN COMMENTS I-1

APPENDIX J: ANALYTICAL LABORATORY CERTIFICATION J-1

APPENDIX K: LABORATORY ANALYTICAL METHODS K-1

APPENDIX L: MICRO-PURGING STABILITY PARAMETERS L-1

FIGURES

1. C-746-U Landfill Groundwater Monitoring Well Network 2
2. C-746-U Landfill Surface Water Monitoring Locations 4

TABLES

1. Summary of MCL Exceedances 5
2. Exceedances of Statistically Derived Historical Background Concentrations 5
3. Exceedances of Current Background UTL in Downgradient Wells 6
4. C-746-U Landfill Downgradient Wells Trend Summary Utilizing the Previous Eight Quarters 7
5. Exceedances of Current Background UTL in Downgradient UCRS Wells* 7
6. Monitoring Wells Included in Statistical Analysis* 10

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ACRONYMS

CFR	*Code of Federal Regulations*
CY	calendar year
KAR	*Kentucky Administrative Regulations*
KDWM	Kentucky Division of Waste Management
KRS	*Kentucky Revised Statutes*
LEL	lower explosive limit
LRGA	Lower Regional Gravel Aquifer
LTL	lower tolerance limit
MCL	maximum contaminant level
MW	monitoring well
RGA	Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
UTL	upper tolerance limit

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1. INTRODUCTION

This report, *C-746-U Contained Landfill Third Quarter Calendar Year 2019 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Permit Number SW07300014, SW07300015, SW07300045.

The Groundwater, Surface Water, Leachate, and Methane Monitoring Sample Data Reporting Form is provided in Appendix A. The facility information sheet is provided in Appendix B. Groundwater analytical results are recorded on the Kentucky Division of Waste Management (KDWM) Groundwater Sample Analyses forms, which are presented in Appendix C. The statistical analyses and qualification statement are provided in Appendix D. The groundwater flow rate and direction determinations are provided in Appendix E. Appendix F contains the notifications for all permit required parameters whose concentrations exceed the maximum contaminant level (MCL) for Kentucky solid waste facilities provided in 401 *KAR* 47:030 § 6 and for all permit required parameters listed in 40 *CFR* § 302.4, Appendix A, that do not have an MCL and whose concentrations exceed the historical background concentrations [upper tolerance limit (UTL), or both UTL and lower tolerance limit (LTL) for pH, as established at a 95% confidence]. Appendix G provides a chart of MCL exceedances and exceedances of the historical background UTL that have occurred, beginning in the fourth quarter calendar year (CY) 2002. Methane monitoring results are documented on the approved C-746-U Landfill Methane Monitoring Report form provided in Appendix H. The form includes pertinent remarks/observations as required by 401 *KAR* 48:090 § 5. Surface water results are provided in Appendix I. Analytical laboratory certification is provided in Appendix J. Laboratory analytical methods used to analyze the included data set are provided in Appendix K. Micro-purging stability parameter results are provided in Appendix L.

1.1 BACKGROUND

The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Site and north of the C-746-S&T Landfills. Construction and operation of the C-746-U Landfill were permitted in November 1996. The operation is regulated under Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045. The permitted C-746-U Landfill area covers about 60 acres and includes a liner and leachate collection system. The C-746-U Landfill currently is operating in Phases 4 and 5, with Phases 6 and 7 approved for receipt of waste as of September 27, 2019. Phases 1, 2, and 3 have long-term cover. Phases 8 through 23 have not been constructed.

1.2 MONITORING PERIOD ACTIVITIES

1.2.1 Groundwater Monitoring

Three zones are monitored at the site: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). There are 21 monitoring wells (MWs) under permit for the C-746-U Landfill: 9 UCRS wells, 6 URGA wells, and 6 LRGA wells. A map of the MW locations is presented in Figure 1. All MWs were sampled this quarter except MW376 and MW377 (both screened in the UCRS), which had an insufficient amount of water to obtain samples; therefore, there are no laboratory analysis results for these locations.

Consistent with the approved *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (Groundwater Monitoring Plan) UCRS wells are included

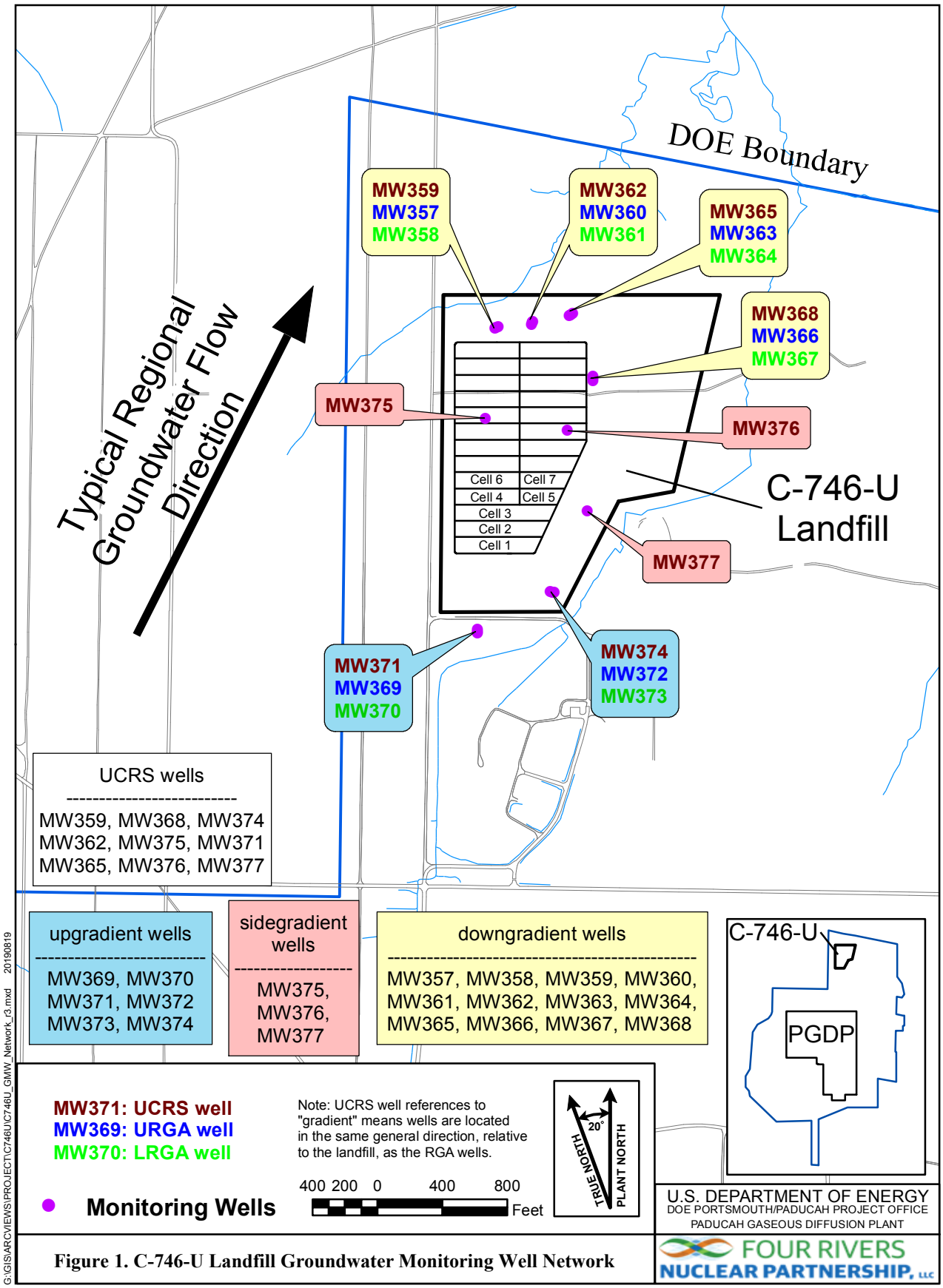

Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

in the monitoring program (LATA Kentucky 2014). Groundwater flow gradients are downward through the UCRS, but flow in the underlying Regional Gravel Aquifer (RGA) is lateral. Groundwater flow in the RGA typically is in a northeasterly direction in the vicinity of the C-746-U Landfill. The Ohio River and lower reaches of Little Bayou Creek are the discharge areas for the RGA flow system from the vicinity of the landfills.

Consistent with the conceptual site model, the constituent concentrations in UCRS wells are considered to be representative only of the conditions local to the well or sourced from overlying soils; thus, no discussion of potential "upgradient" sources is relevant to the discussion for the UCRS. Nevertheless, a UTL for background also has been calculated for UCRS wells using concentrations from UCRS wells located in the same direction (relative to the landfill) as those RGA wells identified as upgradient. The results from these wells are considered to represent historical "background" for UCRS water quality. Similarly, other gradient references for UCRS wells are identified using the same gradient references (relative to the landfill) that are attributed to nearby RGA wells. Results from UCRS wells are compared to this UTL and exceedances of these values are reported in the quarterly report.

Groundwater sampling was conducted within the third quarter 2019 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor, procedure CP4-ES-2101, *Groundwater Sampling*. The analytical laboratory used U.S. Environmental Protection Agency-approved methods, as applicable. Appropriate sample containers and preservatives were used. The parameters specified in Permit Condition GSTR0001, Special Condition 1, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on July 29, 2019, in MWs of the C-746-U Landfill (see Table E.1), in MWs of the C-746-S&T Landfills, and in MWs of the surrounding region (shown on Figure E.4). Water level measurements in 39 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During July, RGA groundwater flow in the area of the landfill was oriented north-northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in July was 4.99×10^{-4} ft/ft. The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were 1.06×10^{-3} ft/ft and 1.10×10^{-3} ft/ft, respectively. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.80 to 3.08 ft/day for the URGA and 1.87 to 3.19 ft/day for the LRGA (see Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 *KAR* 48:090 § 5 and the approved Explosive Gas Monitoring Program (KEEC 2011), which is Technical Application Attachment 12, of the Solid Waste Permit. Landfill operations staff monitored for the occurrence of methane in four on-site building locations and four locations along the landfill boundary on September 3, 2019. See Appendix H for a map (Figure H.1) of the monitoring locations. Monitoring identified all locations to be compliant with the regulatory requirement of < 100% lower explosive limit (LEL) at boundary locations and < 25% LEL at all other locations. The results are documented on the C-746-U Landfill Methane Log provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water sampling was performed at three locations (see Figure 2) monitored for the C-746-U Landfill: (1) upstream location, L154; (2) downstream location, L351; and (3) location L150 capturing

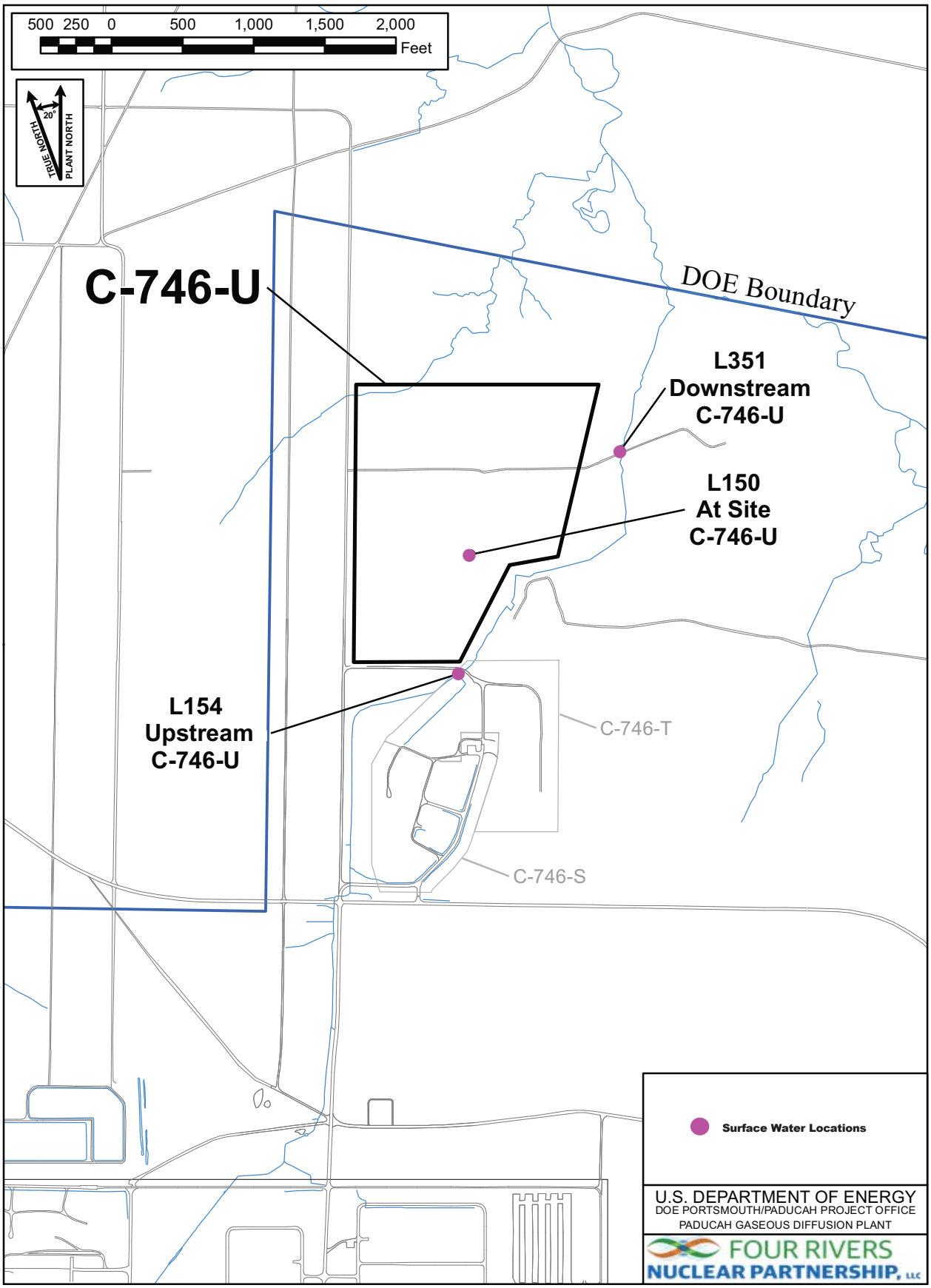

Figure 2. C-746-U Landfill Surface Water Monitoring Locations

runoff from the landfill surface. Surface water was monitored, as specified in 401 *KAR* 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24, of the Solid Waste Permit. Surface water results are provided in Appendix I.

1.3 KEY RESULTS

Groundwater data were evaluated in accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), which is Technical Application, Attachment 25, of the Solid Waste Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were evaluated further against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL[1] during the third quarter 2019, as well as parameters that exceeded their MCL and also exceeded their historical background UTL. Those constituents (present in downgradient wells) that exceed their historical background UTL were evaluated against their current UTL-derived background using the most recent eight quarters of data from wells considered to be upgradient (Table 3).

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW369: Beta activity	MW358: Trichloroethene
	MW372: Beta activity	MW361: Trichloroethene
		MW364: Trichloroethene
		MW370: Beta activity

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW359: Dissolved oxygen, oxidation-reduction potential, sulfate	MW357: Oxidation-reduction potential	MW361: Oxidation-reduction potential
MW362: Dissolved oxygen, oxidation-reduction potential, sulfate	MW360: Oxidation-reduction potential	MW364: Oxidation-reduction potential, technetium-99
MW365: Dissolved oxygen, oxidation-reduction potential, sulfate	MW363: Oxidation-reduction potential	MW367: Oxidation-reduction potential, pH**
MW368: Calcium, dissolved oxygen, magnesium, oxidation-reduction potential, sulfate	MW366: Oxidation-reduction potential	MW370: Beta activity, oxidation-reduction potential, technetium-99
MW371: Calcium, dissolved oxygen, oxidation-reduction potential, sulfate	MW369: Beta activity, oxidation-reduction potential	MW373: Chemical oxygen demand, oxidation-reduction potential
MW374: Oxidation-reduction potential	MW372: Beta activity, chemical oxygen demand, conductivity, dissolved solids oxidation-reduction potential, technetium-99	
MW375: Oxidation-reduction potential, sulfate		

[1] The UTL comparison for pH uses a two-sided test, for both UTLs and LTLs. For the purposes of this report, the reference to "UTL exceedances" also includes the LTL for pH.

Table 2. Exceedance of Statistically Derived historical Background Concentrations (Continued)

*Gradients in the UCRS are downward. UCRS gradient designations are identified using the same gradient reference (relative to the landfill) that is attributed to nearby RGA wells.
**pH concentration is less than the LTL.
Sidegradient wells: MW375, MW376, MW377
Downgradient wells: MW357, MW358, MW359, MW360, MW361, MW362, MW363, MW364, MW365, MW366, MW367, MW368
Upgradient wells: MW369, MW370, MW371, MW372, MW373, MW374

Table 3. Exceedances of Current Background UTL in Downgradient Wells

URGA	LRGA
None	MW367: pH*

*pH concentration is less than the LTL.

The notification of parameters that exceeded the MCL was submitted electronically to the KDWM, in accordance with 401 *KAR* 48:300 § 7, prior to the submittal of this report.

The constituents that exceeded their MCL in a downgradient well were subjected to a comparison against the UTL concentrations calculated using historical concentrations from wells identified as background. In accordance with the approved Groundwater Monitoring Plan, the MCL exceedances for trichloroethene in MW358, MW361, and MW364 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

This report serves as the notification of parameters that had statistically significant increased concentrations relative to historical background concentrations, as required by Permit Number SW07300014, SW07300015, SW07300045, Condition GSTR0001, Standard Requirement 5; and 401 *KAR* 48:300 § 7.

The constituents that had exceedances of the statistically derived historical background UTL underwent additional statistical evaluation. The current-quarter concentrations were compared to the current background UTLs that were developed using the most recent eight quarters of data from wells identified as upgradient in order to determine if the current downgradient concentrations are consistent with current background values. Table 3 summarizes the evaluation against current background UTL for those constituents present in downgradient RGA wells with historical UTL exceedances. In accordance with the approved Groundwater Monitoring Plan, constituents in downgradient wells that exceed the historical UTL, but do not exceed the current UTL, are considered not to have a C-746-U Landfill source; therefore, they are a Type 1 exceedance (not attributable to the C-746-U Landfill).

The constituent listed in Table 3 that exceeds both the historical UTL and the current UTL does not have an identified source and is considered preliminarily to be a Type 2 exceedance, per the approved Groundwater Monitoring Plan. To evaluate the preliminary Type 2 exceedance further, the parameter was subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results are summarized in Table 4. The preliminary Type 2 exceedance in a downgradient well did not have an increasing or decreasing trend and is considered to be a Type 1 exceedance (not attributable to the C-746-U Landfill).

Table 4. C-746-U Landfill Downgradient Wells Trend Summary Utilizing the Previous Eight Quarters

Location	Well ID	Parameter	Sample Size	Alpha[1]	p-Value[2]	S[3]	Decision[4]
C-746-U Landfill	MW367	pH[5]	8	0.05	0.106	-11	No Trend

Footnotes:
[1] An alpha of 0.05 represents a 95% confidence interval.
[2] The p-value represents the risk of acceptance the H_a hypothesis of a trend, in terms of a percentage.
[3] The initial value of the Mann-Kendall statistic, S, is assumed to be 0 (e.g., no trend). If a data value from a later time period is higher than a data value from an earlier time period, S is incremented by 1. On the other hand, if the data value from a later time period is lower than a data value sampled earlier, S is decremented by 1. The net result of all such increments and decrements yields the final value of S. A very high positive value of S is an indicator of an increasing trend, and a very low negative value indicates a decreasing trend.
[4] The Mann-Kendall decision operates on two hypotheses, the H_0 and H_a. H_0 assumes there is no trend in the data, whereas H_a assumes either a positive or negative trend.
[5] pH concentration is less than the LTL.
Note: Statistics generated using ProUCL.

The statistical evaluation of current UCRS concentrations against the current UCRS background UTL identified UCRS well, MW368 with calcium, magnesium, and sulfate values that exceed both the historical and current backgrounds (Table 5). Because UCRS wells are not hydrogeologically downgradient of the C-746-U Landfill, the exceedances are not attributable to C-746-U sources and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

Table 5. Exceedances of Current Background UTL in Downgradient UCRS Wells*

UCRS
MW368: Calcium, magnesium, sulfate

*In the same direction (relative to the landfill) as RGA wells.

All MCL and UTL exceedances reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

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2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2019 groundwater data collected from the C-746-U Landfill MWs were performed in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014). The statistical analyses for this report use data from the first eight quarters that were sampled for each parameter, beginning with the baseline sampling events in 2002, when available. The sampling dates associated with background data are listed next to the result in the statistical analysis sheets in Appendix D (Attachments D1 and D2).

For those parameters that exceed the MCL for Kentucky solid waste facilities found in 401 *KAR* 47:030 § 6, these exceedances were documented and evaluated further as follows. Exceedances were reviewed against historical background results (UTL). If the MCL exceedance was found not to exceed the historical UTL, the exceedance was noted as a Type 1 exceedance—an exceedance not attributable to the C-746-U Landfill. If there was an exceedance of the MCL in a downgradient well and this constituent also exceeded the historical background, the quarterly result was compared to the current background UTL (developed using the most recent eight quarters of data from wells identified as upgradient) to identify if this exceedance is attributable to upgradient/non-landfill sources. If the downgradient concentration was less than the current background, the exceedance was noted as a Type 1 exceedance. If a constituent exceeds its Kentucky solid waste facility MCL, historical background UTL, and current background UTL, it was reported as a Type 2 exceedance—source undetermined. Type 2 exceedances (undetermined source) were evaluated further using the Mann-Kendall test for trend. If there was no statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the C-746-U Landfill).

For those parameters that do not have a Kentucky solid waste facility MCL, the same process was used. If a constituent without an MCL exceeded its historical background UTL and its current background UTL, it was evaluated further to identify the source of the exceedance, if possible. If the source of the exceedance could not be identified, it was reported as a Type 2 exceedance—source undetermined. Type 2 exceedances (undetermined source) were evaluated further using the Mann-Kendall test for trend. If there was no statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the C-746-U Landfill).

To calculate the UTL, the data are divided into censored (nondetects) and uncensored (detected) observations. The one-sided tolerance interval statistical test is conducted only on parameters that have at least one uncensored observation. Results of the one-sided tolerance interval statistical test are used to determine whether the data show a statistical exceedance in concentrations with respect to historical background concentrations (UTL).

For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted. The test well results are compared to both a UTL and LTL to determine if statistically significant deviations in concentrations exist with respect to upgradient (background) well data.

A stepwise list of the one-sided tolerance interval statistical procedures applied to the data is provided in Appendix D under Statistical Analysis Process. The statistical analysis was conducted separately for each parameter in each well. The MWs included historically in the statistical analyses are listed in Table 6.

Table 6. Monitoring Wells Included in Statistical Analysis*

UCRS	URGA	LRGA
MW359	MW357	MW358
MW362	MW360	MW361
MW365	MW363	MW364
MW368	MW366	MW367
MW371**	MW369 (upgradient)	MW370 (upgradient)
MW374**	MW372 (upgradient)	MW373 (upgradient)
MW375		
MW376***		
MW377***		

*A map showing the monitoring well locations is shown on Figure 1.
**In the same direction (relative to the landfill) as RGA wells considered to be upgradient.
***Well had insufficient water to permit a water sample for laboratory analysis.

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Parameters requiring statistical analysis are summarized in Appendix D for each hydrogeological unit. A stepwise list for determining exceedances of statistically derived historical background concentrations is provided in Appendix D under Statistical Analysis Process. A comparison of the current quarter's results to the statistically derived historical background was conducted for parameters that do not have MCLs and also for those parameters whose concentrations exceed MCLs. Appendix G summarizes the occurrences (by well and by quarter) of exceedances of historical UTLs and MCL exceedances. The constituents that had exceedances of the statistically derived historical background UTL underwent additional statistical evaluation. The current-quarter concentrations were compared to the current background UTL developed using the most recent eight quarters of data from wells identified as upgradient in order to determine if the current downgradient concentrations are consistent with current background values.

2.1.1 Upper Continental Recharge System

In this quarter, 27 parameters, including those with MCLs, required statistical analysis in the UCRS. During the third quarter, calcium, dissolved oxygen, magnesium, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Calcium, magnesium, and sulfate exceeded the current background UTL and are included in Table 5.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 26 parameters, including those with MCLs, required statistical analysis in the URGA. During the third quarter, beta activity, chemical oxygen demand, conductivity, dissolved solids, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. There were no exceedences of the current background UTL for any downgradient wells.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 27 parameters, including those with MCLs, required statistical analysis in the LRGA. During the third quarter, beta activity, chemical oxygen demand, oxidation-reduction potential, pH, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. The pH exceeded the current background UTL and is included in Table 3.

2.2 DATA VERIFICATION AND VALIDATION

Data verification is the process of comparing a data set against a set standard or contractual requirements. In accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), data verification is performed for 100% of the data. Data are flagged as necessary.

Data validation was performed on 100% of the organic, inorganic, and radiochemical analytical data by a qualified individual independent from sampling, laboratory, project management, or other decision-making personnel. Data validation evaluates the laboratory adherence to analytical method requirements. Validation qualifiers are added by the independent validator and not the laboratory. Validation qualifiers are not requested on the groundwater reporting forms.

Field quality control samples are collected each sampling event. Field blanks, rinseate blanks, and trip blanks are obtained to ensure quality of field and laboratory practices and data are reported in the Groundwater Sample Analysis forms in Appendix C. Laboratory quality control samples, such as matrix spikes, matrix spike duplicates, and method blanks, are performed by the laboratory. Both field and laboratory quality control sample results are reviewed as part of the data verification/validation process.

Data verification and validation results for this data set indicated that all data were considered usable.

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3. PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: *C-746-U Contained Landfill*
Third Quarter Calendar Year 2019 (July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky (FRNP-RPT-0087/V3)

Stamped and signed pursuant to my authority as a duly registered geologist under the provisions of *KRS* Chapter 322A.

PG 113927
KDavis
11-18-19

Kenneth R. Davis
Kenneth R. Davis

PG113927

November 18, 2019
Date

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4. REFERENCES

KEEC (Kentucky Energy and Environment Cabinet) 2011. Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Division of Waste Management, Solid Waste Branch, Technical Application Attachment 12, "Explosive Gas Monitoring Program," January 21.

LATA Kentucky (LATA Environmental Services of Kentucky, LLC) 2014. *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, PAD-PROJ-0139, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 25, LATA Environmental Services of Kentucky, LLC, Kevil, KY, June.

PRS (Paducah Remediation Services, LLC) 2008. *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Paducah Remediation Services, LLC, Kevil, KY, June.

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APPENDIX A

GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM

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GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
SOLID WASTE BRANCH
14 REILLY ROAD
FRANKFORT, KY 40601

Facility Name: U.S. DOE–Paducah Gaseous Diffusion Plant (As officially shown on DWM Permit Face)

Activity: C-746-U Contained Landfill

Permit No: SW07300014, SW07300015, SW07300045

Finds/Unit No: _____

Quarter & Year: 3rd Qtr. CY 2019

Please check the following as applicable:

_____ Characterization __X__ Quarterly _____ Semiannual ____ Annual _____ Assessment

Please check applicable submittal(s): __X__ Groundwater __X__ Surface Water

_____ Leachate __X__ Methane Monitoring

This form is to be utilized by those sites required by regulation (Kentucky Waste Management Regulations-401 *KAR* 48:300 and 45:160) or by statute (Kentucky Revised Statues Chapter 224) to conduct groundwater and surface water monitoring under the jurisdiction of the Division of Waste Management. **You must report any indication of contamination within forty-eight (48) hours of making the determination using statistical analyses, direct comparison, or other similar techniques. Submitting the lab report is NOT considered notification.** Instructions for completing the form are attached. Do not submit the instruction pages.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or 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 such violations.

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

Date: 11/25/19

Jennifer Woodard, Paducah Site Lead
U.S. Department of Energy

Date: 11/25/19

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APPENDIX B

FACILITY INFORMATION SHEET

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FACILITY INFORMATION SHEET

Sampling Date: Groundwater: July 2019; Surface water: July 2019; Methane: September 2019 — County: McCracken — Permit Nos. SW07300014, SW07300015, SW07300045

Facility Name: U.S. DOE—Paducah Gaseous Diffusion Plant
(As officially shown on DWM Permit Face)

Site Address: 5600 Hobbs Road (Street) Kevil, Kentucky (City/State) 42053 (Zip)

Phone No: (270) 441-6800 Latitude: N 37° 07' 45" Longitude: W 88° 47' 55"

OWNER INFORMATION

Facility Owner: U.S. DOE, Robert E. Edwards III, Manager — Phone No: (859) 227-5020

Contact Person: David Hutchison — Phone No: (270) 441-5929

Contact Person Title: Director, Environmental Services, Four Rivers Nuclear Partnership, LLC

Mailing Address: 5511 Hobbs Road (Street) Kevil, Kentucky (City/State) 42053 (Zip)

SAMPLING PERSONNEL
(IF OTHER THAN LANDFILL OR LABORATORY)

Company: GEO Consultants, LLC

Contact Person: Jason Boulton — Phone No: (270) 816-3415

Mailing Address: 199 Kentucky Avenue (Street) Kevil, Kentucky (City/State) 42053 (Zip)

LABORATORY RECORD #1

Laboratory: GEL Laboratories, LLC — Lab ID No: KY90129

Contact Person: Valerie Davis — Phone No: (843) 769-7391

Mailing Address: 2040 Savage Road (Street) Charleston, South Carolina (City/State) 29407 (Zip)

LABORATORY RECORD #2

Laboratory: N/A — Lab ID No: N/A

Contact Person: N/A — Phone No: N/A

Mailing Address: N/A (Street) City/State Zip

LABORATORY RECORD #3

Laboratory: N/A — Lab ID No: N/A

Contact Person: N/A — Phone No: N/A

Mailing Address: N/A (Street) City/State Zip

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APPENDIX C

GROUNDWATER SAMPLE ANALYSES AND WRITTEN COMMENTS

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Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8004-4798	8004-4799	8004-0981	8004-4800
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	357	358	359	360
Sample Sequence #	1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA
Sample Date and Time (Month/Day/Year hour: minutes)	7/10/2019 09:11	7/10/2019 10:01	7/10/2019 10:48	7/10/2019 06:58
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	MW357UG4-19	MW358UG4-19	MW359UG4-19	MW360UG4-19
Laboratory Sample ID Number (if applicable)	484384002	484384004	484384005	484384006
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/12/2019	7/12/2019	7/12/2019	7/12/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056	0.388		0.452		<0.2		0.137	J
16887-00-6		Chloride(s)	T	mg/L	9056	32.4		34.9		0.893		8.64	
16984-48-8		Fluoride	T	mg/L	9056	0.181		0.173		0.241		0.244	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.3	*	1.14	*	0.714		0.498	
14808-79-8		Sulfate	T	mg/L	9056	44.7		65.3		47.1		9.94	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.01		30.01		30		29.98	
S0145- -		Specific Conductance	T	µMH0/cm	Field	427		505		224		402	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						357		358		359		360	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	330.7		330.7		340.61		330.74	
N238		Dissolved Oxygen	T	mg/L	Field	4.72		2.01		3.4		1.51	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	231		321		143		210	
S0296- -		pH	T	Units	Field	6.1		6.11		5.89		6.16	
NS215		Eh	T	mV	Field	413		101		217		423	
S0907 - -		Temperature	T	°C	Field	18.67		19.28		18.78		16.72	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0207	J	0.0271	J	0.126	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		0.00114	J
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00242	J	<0.005		0.00232	J
7440-39-3		Barium	T	mg/L	6020	0.0698		0.0514		0.0248		0.177	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.377		0.466		<0.015		0.0183	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	27		33.5		5.91		19	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.0019		<0.001		0.00286	
7440-50-8		Copper	T	mg/L	6020	0.00057	J	0.00045	J	0.00085	J	0.0008	J
7439-89-6		Iron	T	mg/L	6020	<0.1		0.845		0.0337	J	0.591	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	11.7	*	15.1	*	3.26	*	7.94	*
7439-96-5		Manganese	T	mg/L	6020	0.00263	J	0.173		<0.005		0.0395	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.00022	J	<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	<0.002		0.0041		0.00087	J	0.00118	J
7440-09-7		Potassium	T	mg/L	6020	1.57		2.23		<0.3		0.632	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	42.4		40.7		37.2		58.4	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		0.00007	J	0.00011	J
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		0.00536	J	0.00359	J
7440-66-6		Zinc	T	mg/L	6020	0.00642	BJ	0.00715	BJ	0.00628	BJ	0.0063	BJ
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6		Ethene, Trichloro-	T	mg/L	8260	0.00371		0.00512		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000197		<0.0000197		<0.0000198		<0.0000198	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB,Total	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0969		<0.101		<0.0977		<0.0969	
12587-46-1		Gross Alpha	T	pCi/L	9310	12.4	*	2.03	*	3.88	*	0.373	*
12587-47-2		Gross Beta	T	pCi/L	9310	45.5	*	32.7	*	-0.678	*	13.9	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.137	*	0.0593	*	0.318	*	0.413	*
10098-97-2		Strontium-90	T	pCi/L	905.0	0.98	*	0.251	*	1.36	*	0.318	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	30.5	*	36.6	*	-6.7	*	8.71	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.354	*	0.293	*	-0.377	*	0.0351	*
10028-17-8		Tritium	T	pCi/L	906.0	-102	*	-166	*	19.8	*	-126	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		10.8	J	<20		<20	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.902	J	1.09	J	0.899	J	1.29	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.00654	J	0.00684	J	<0.01		0.00654	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8004-4795	8004-0986	8004-4796	8004-4797
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	361	362	363	364
Sample Sequence #	1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA
Sample Date and Time (Month/Day/Year hour: minutes)	7/10/2019 07:44	7/10/2019 08:26	7/10/2019 11:32	7/10/2019 12:17
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	MW361UG4-19	MW362UG4-19	MW363UG4-19	MW364UG4-19
Laboratory Sample ID Number (if applicable)	484384007	484384001	484384008	484384009
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/12/2019	7/12/2019	7/12/2019	7/12/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056	0.446		0.117	J	<0.2		0.439	
16887-00-6		Chloride(s)	T	mg/L	9056	32.3		4.25		19.2		33	
16984-48-8		Fluoride	T	mg/L	9056	0.164		0.425		0.218		0.152	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1		0.416		5.08	*	1.01	
14808-79-8		Sulfate	T	mg/L	9056	73.8		32.1		36.7		70.2	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.99		30		30.01		30	
S0145- -		Specific Conductance	T	µMH0/cm	Field	492		733		412		485	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						361		362		363		364	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	330.75		341.57		330.67		329.17	
N238		Dissolved Oxygen	T	mg/L	Field	2.89		4.48		0.78		3.23	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	364		449		283		274	
S0296- -		pH	T	Units	Field	6.02		6.93		6.07		6.01	
NS215		Eh	T	mV	Field	412		381		365		356	
S0907 - -		Temperature	T	°C	Field	17		16.78		21.06		19.06	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.111		<0.05		<0.05	
7440-36-0		Antimony	T	mg/L	6020	0.00109	J	<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	0.00201	J	<0.005		<0.005		0.00215	J
7440-39-3		Barium	T	mg/L	6020	0.0562		0.104		0.128		0.0644	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.162		0.0189		0.0196		0.0168	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	32		22.8		26.5		32	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001		0.0011		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00052	J	0.00148	J	0.00033	J	0.00043	J
7439-89-6		Iron	T	mg/L	6020	<0.1		0.0953	J	0.0549	J	0.0411	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	13.8	*	10.1	*	10.5	*	13.7	*
7439-96-5		Manganese	T	mg/L	6020	0.00525		0.001	J	0.25		0.00521	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.00075	J	<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	<0.002		0.00093	J	0.0071		<0.002	
7440-09-7		Potassium	T	mg/L	6020	2.12		0.317		1.39		1.9	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	45.5		140		42.5		45	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		0.00437		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00617	BJ	0.00508	BJ	0.00535	BJ	0.0389	B
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6		Ethene, Trichloro-	T	mg/L	8260	0.00546		<0.001		<0.001		0.00669	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000194		<0.0000196		<0.0000193		<0.0000194	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB,Total	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0962		<0.1		<0.0984		<0.0999	
12587-46-1		Gross Alpha	T	pCi/L	9310	-0.58	*	3.36	*	-4.4	*	7.74	*
12587-47-2		Gross Beta	T	pCi/L	9310	44.1	*	4.39	*	-0.878	*	34.8	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.0668	*	0.368	*	0.825	*	0.23	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-2.09	*	-1.64	*	3.38	*	-0.835	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	43.3	*	9.4	*	5.08	*	52.5	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.466	*	0.0157	*	-0.793	*	-0.369	*
10028-17-8		Tritium	T	pCi/L	906.0	-96.6	*	-81.7	*	-86.9	*	-68.1	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	31.5		17.7	J	21.1		28	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.33	J	2.26		1.2	J	0.873	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.00726	BJ	0.019		0.00844	BJ	0.00666	BJ

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368		
Sample Sequence #						1		1		1		1		
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment						NA		NA		NA		NA		
Sample Date and Time (Month/Day/Year hour: minutes)						7/10/2019 13:00		7/11/2019 07:06		7/11/2019 07:59		7/11/2019 08:49		
Duplicate ("Y" or "N")[2]						N		N		N		N		
Split ("Y" or "N")[3]						N		N		N		N		
Facility Sample ID Number (if applicable)						MW365UG4-19		MW366UG4-19		MW367UG4-19		MW368UG4-19		
Laboratory Sample ID Number (if applicable)						484384010		484578001		484578003		484578005		
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						7/12/2019		7/17/2019		7/17/2019		7/17/2019		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						DOWN		DOWN		DOWN		DOWN		
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	
24959-67-9		Bromide	T	mg/L	9056	<0.2		0.477		0.445		<0.2		
16887-00-6		Chloride(s)	T	mg/L	9056	2.7		38.6	*	33.8	*	7.3	*	
16984-48-8		Fluoride	T	mg/L	9056	0.331		0.181		0.139		0.25		
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.975		0.91		0.0659	J	<0.1		
14808-79-8		Sulfate	T	mg/L	9056	58.4		53.1		48.3		164		
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.3		29.93		29.93		29.95		
S0145- -		Specific Conductance	T	µMH0/cm	Field	430		471		400		733		

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						365		366		367		368	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	335.75		330.84		330.63		339.89	
N238		Dissolved Oxygen	T	mg/L	Field	2.74		2.99		2.23		4.17	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	290		273		234		687	
S0296- -		pH	T	Units	Field	6.2		6.03		5.79		6.42	
NS215		Eh	T	mV	Field	388		390		312		338	
S0907 - -		Temperature	T	°C	Field	18.78		17.33		17.33		17.39	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05		0.139	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00238	J	0.00208	J	0.00467	J
7440-39-3		Barium	T	mg/L	6020	0.106		0.11		0.155		0.0506	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00728	J	0.191		0.0538		0.00821	J
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	23.2		33.4		25.9		73.1	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00173		<0.001		0.00726		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00488		0.00046	J	0.00059	J	0.00069	J
7439-89-6		Iron	T	mg/L	6020	<0.1		0.0508	J	0.593		0.0869	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	10.8	*	14.2	*	12.2	*	21.8	*
7439-96-5		Manganese	T	mg/L	6020	0.0113		0.00412	J	1		0.00473	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		0.00088	J
7440-02-0		Nickel	T	mg/L	6020	0.00491		<0.002		0.00387		0.00098	J
7440-09-7		Potassium	T	mg/L	6020	0.239	J	1.76		2.96		0.721	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	55.3		45.8		35.3		65.6	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	0.00019	J	<0.0002		<0.0002		0.0004	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00907	BJ	0.00477	BJ	0.0114	BJ	0.00634	BJ
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6		Ethene, Trichloro-	T	mg/L	8260	<0.001		0.00454		0.00495		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000195		<0.0000193		<0.0000194		<0.0000195	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB,Total	T	ug/L	8082	0.0954	J	<0.0985		<0.0986		<0.0992	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
53469-21-9		PCB-1242	T	ug/L	8082	0.0954	J	<0.0985		<0.0986		<0.0992	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0985		<0.0985		<0.0986		<0.0992	
12587-46-1		Gross Alpha	T	pCi/L	9310	4.31	*	-1.75	*	1.5	*	5.71	*
12587-47-2		Gross Beta	T	pCi/L	9310	7.98	*	42	*	9.55	*	4.53	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.706	*	0.823	*	0.838	*	0.322	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-0.704	*	0.882	*	-2.67	*	-0.0496	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-3.44	*	43.8	*	8.13	*	-0.571	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.139	*	-0.193	*	-0.392	*	-0.194	*
10028-17-8		Tritium	T	pCi/L	906.0	-32.9	*	-46.7	*	-202	*	-196	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	34.9		14.2	J	<20		149	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.65	J	0.849	J	0.929	J	1.73	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0201	B	0.0059	BJ	0.0064	BJ	0.00956	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8004-4820	8004-4818	8004-4819	8004-4808
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	369	370	371	372
Sample Sequence #	1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA
Sample Date and Time (Month/Day/Year hour: minutes)	7/15/2019 07:12	7/15/2019 07:58	7/15/2019 08:43	7/11/2019 09:36
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	MW369UG4-19	MW370UG4-19	MW371UG4-19	MW372UG4-19
Laboratory Sample ID Number (if applicable)	484743001	484743003	484743005	484578007
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/20/2019	7/20/2019	7/20/2019	7/19/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	UP	UP

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056	0.366		0.394		<0.2		0.576	
16887-00-6		Chloride(s)	T	mg/L	9056	31.6		34.2		1.87		44.8	*
16984-48-8		Fluoride	T	mg/L	9056	0.21		0.175		0.151		0.177	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.655		0.707		0.0621	J	1.53	*
14808-79-8		Sulfate	T	mg/L	9056	8.91		20.2		55.4		70.5	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.07		30.07		30.07		29.95	
S0145- -		Specific Conductance	T	µMH0/cm	Field	373		421		523		640	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						369		370		371		372	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	331.78		331.74		346.2		332.25	
N238		Dissolved Oxygen	T	mg/L	Field	3.09		4.09		4.6		3.63	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	194	B	241	B	341	B	616	
S0296- -		pH	T	Units	Field	6.25		6.15		6.56		6.08	
NS215		Eh	T	mV	Field	410		421		423		390	
S0907 - -		Temperature	T	°C	Field	17.06		17.22		17.06		18.44	
7429-90-5		Aluminum	T	mg/L	6020	0.0609		<0.05		0.249		<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00271	J	0.00337	J	0.0021	J
7440-39-3		Barium	T	mg/L	6020	0.381		0.23		0.0773		0.0582	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0168		0.0299		0.0102	J	0.889	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	17.7		27.7		70.4		49.7	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00539		<0.001		<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00121	J	0.0005	J	0.00215		0.00064	J
7439-89-6		Iron	T	mg/L	6020	0.136		<0.1		0.16		0.0634	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	7.51		12.1		12.6		19.2	*
7439-96-5		Manganese	T	mg/L	6020	0.00693		0.00111	J	0.0203		0.00159	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		0.00031	J	<0.001	
7440-02-0		Nickel	T	mg/L	6020	0.00474		<0.002		0.00169	J	0.00064	J
7440-09-7		Potassium	T	mg/L	6020	0.57		2.46		0.495		1.95	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	0.00207	J	<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	49.3		42.3		28.2		54.4	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		0.00088		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		0.00549	J	<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00487	BJ	0.00444	BJ	0.00632	BJ	0.00509	BJ
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	*
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-01-6		Ethene, Trichloro-	T	mg/L	8260	0.00099	J	0.00057	J	<0.001		0.00256	*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000196		<0.0000197		<0.0000198		<0.0000199	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
1336-36-3		PCB,Total	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
12674-11-2		PCB-1016	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
11104-28-2		PCB-1221	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
11141-16-5		PCB-1232	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
53469-21-9		PCB-1242	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
12672-29-6		PCB-1248	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
11096-82-5		PCB-1260	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
11100-14-4		PCB-1268	T	ug/L	8082	<0.1		<0.0986		<0.0981		<0.0998	
12587-46-1		Gross Alpha	T	pCi/L	9310	2.87	*	10.4	*	13.3	*	-1.85	*
12587-47-2		Gross Beta	T	pCi/L	9310	120	*	52.7	*	5.76	*	141	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.451	*	0.104	*	0.55	*	0.629	*
10098-97-2		Strontium-90	T	pCi/L	905.0	0.0294	*	-1.35	*	-0.437	*	-0.0276	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	55.8	*	107	*	-1.71	*	183	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.045	*	-0.233	*	0.739	*	0.0604	*
10028-17-8		Tritium	T	pCi/L	906.0	65.8	*	-40.2	*	-45.1	*	-112	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20	*	36.7	*	<20	*	69.4	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.11	J	0.988	J	1.75	J	1.27	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0092	J	0.007	J	0.00386	J	0.00828	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8004-4792	8004-0990	8004-0985	8004-0988
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	373	374	375	376
Sample Sequence #	1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA
Sample Date and Time (Month/Day/Year hour: minutes)	7/11/2019 10:21	7/11/2019 11:07	7/11/2019 11:52	NA
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	MW373UG4-19	MW374UG4-19	MW375UG4-19	NA
Laboratory Sample ID Number (if applicable)	484578009	484578011	484578013	NA
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/18/2019	7/18/2019	7/18/2019	NA
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	SIDE	SIDE

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056	0.532		0.705		<0.2			*
16887-00-6		Chloride(s)	T	mg/L	9056	40.5	*	60.5	*	3.89	*		*
16984-48-8		Fluoride	T	mg/L	9056	0.2		0.2		0.306			*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.06	*	<0.1		1.01			*
14808-79-8		Sulfate	T	mg/L	9056	148		8.06		24.2			*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.95		29.95		29.95			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	785		661		335			*

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						373		374		375		376	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.24		341.77		342.77			*
N238		Dissolved Oxygen	T	mg/L	Field	2.36		2.23		1.21			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	481		363		166			*
S0296- -		pH	T	Units	Field	6.03		6.54		6.27			*
NS215		Eh	T	mV	Field	417		354		363			*
S0907 - -		Temperature	T	°C	Field	19.11		18.5		17.72			*
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		0.0249	J		*
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		0.00115	J		*
7440-38-2		Arsenic	T	mg/L	6020	0.00262	J	<0.005		<0.005			*
7440-39-3		Barium	T	mg/L	6020	0.0393		0.129		0.163			*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020	1.52		0.00968	J	0.00903	J		*
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020	67.9		20.7		13.8			*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020	0.00097	J	0.00037	J	<0.001			*
7440-50-8		Copper	T	mg/L	6020	0.00065	J	0.00057	J	0.00057	J		*
7439-89-6		Iron	T	mg/L	6020	0.103		0.44		0.0715	J		*
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020	27.2	*	5.35	*	5.15	*		*
7439-96-5		Manganese	T	mg/L	6020	0.0499		0.309		0.00245	J		*
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002			*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.00021	J	<0.001			*
7440-02-0		Nickel	T	mg/L	6020	0.00217		0.00119	J	0.00074	J		*
7440-09-7		Potassium	T	mg/L	6020	2.6		0.317		0.252	J		*
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005			*
7782-49-2		Selenium	T	mg/L	6020	<0.005		0.00202	J	0.00234	J		*
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5		Sodium	T	mg/L	6020	58.6		119		52.9			*
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005			*
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002			*
7440-61-1		Uranium	T	mg/L	6020	0.000076	J	0.00036		<0.0002			*
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02			*
7440-66-6		Zinc	T	mg/L	6020	0.00565	BJ	0.00531	BJ	0.00527	BJ		*
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			*
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005			*
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			*
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			*
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			*
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-01-6		Ethene, Trichloro-	T	mg/L	8260	0.00069	J	0.00417		<0.001			*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005			*
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005			*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005			*
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			*
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000195		<0.0000195		<0.0000194			*
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
1336-36-3		PCB,Total	T	ug/L	8082	<0.101		<0.1		<0.0997			*
12674-11-2		PCB-1016	T	ug/L	8082	<0.101		<0.1		<0.0997			*
11104-28-2		PCB-1221	T	ug/L	8082	<0.101		<0.1		<0.0997			*
11141-16-5		PCB-1232	T	ug/L	8082	<0.101		<0.1		<0.0997			*
53469-21-9		PCB-1242	T	ug/L	8082	<0.101		<0.1		<0.0997			*
12672-29-6		PCB-1248	T	ug/L	8082	<0.101		<0.1		<0.0997			*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082	<0.101		<0.1		<0.0997			*
11096-82-5		PCB-1260	T	ug/L	8082	<0.101		<0.1		<0.0997			*
11100-14-4		PCB-1268	T	ug/L	8082	<0.101		<0.1		<0.0997			*
12587-46-1		Gross Alpha	T	pCi/L	9310	0.123	*	3.25	*	2.39	*		*
12587-47-2		Gross Beta	T	pCi/L	9310	21.9	*	2.84	*	1.28	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.26	*	0.281	*	0.474	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	-0.556	*	-3.68	*	-3.37	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	28.3	*	8.86	*	1.51	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.0756	*	0.564	*	0.0115	*		*
10028-17-8		Tritium	T	pCi/L	906.0	-146	*	-111	*	-55	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	107		17.7	J	<20			*
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2			*
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060	1.28	J	2.39		0.942	J		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.00652	J	0.0135		0.00828	J		*

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8004-0989	0000-0000	0000-0000	0000-0000
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	377	E. BLANK	F. BLANK	T. BLANK 1
Sample Sequence #	1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	E	F	T
Sample Date and Time (Month/Day/Year hour: minutes)	NA	7/10/2019 06:07	7/10/2019 10:08	7/10/2019 05:55
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	NA	RI1UG4-19	FB1UG4-19	TB1UG4-19
Laboratory Sample ID Number (if applicable)	NA	484384012	484384011	484384013
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	NA	7/12/2019	7/12/2019	7/12/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	SIDE	NA	NA	NA

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		*

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		*
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field		*		*		*		*
NS215		Eh	T	mV	Field		*		*		*		*
S0907 - -		Temperature	T	°C	Field		*		*		*		*
7429-90-5		Aluminum	T	mg/L	6020		*	<0.05		<0.05			*
7440-36-0		Antimony	T	mg/L	6020		*	0.00108	J	<0.003			*
7440-38-2		Arsenic	T	mg/L	6020		*	<0.005		0.00211	J		*
7440-39-3		Barium	T	mg/L	6020		*	<0.004		<0.004			*
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020		*	<0.015		<0.015			*
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020		*	<0.2		<0.2			*
7440-47-3		Chromium	T	mg/L	6020		*	<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020		*	<0.001		<0.001			*
7440-50-8		Copper	T	mg/L	6020		*	<0.002		<0.002			*
7439-89-6		Iron	T	mg/L	6020		*	<0.1		<0.1			*
7439-92-1		Lead	T	mg/L	6020		*	<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020		*	<0.03	*	<0.03	*		*
7439-96-5		Manganese	T	mg/L	6020		*	<0.005		<0.005			*
7439-97-6		Mercury	T	mg/L	7470		*	<0.0002		<0.0002			*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020		*	<0.001		<0.001			*
7440-02-0		Nickel	T	mg/L	6020		*	<0.002		<0.002			*
7440-09-7		Potassium	T	mg/L	6020		*	<0.3		<0.3			*
7440-16-6		Rhodium	T	mg/L	6020		*	<0.005		<0.005			*
7782-49-2		Selenium	T	mg/L	6020		*	<0.005		<0.005			*
7440-22-4		Silver	T	mg/L	6020		*	<0.001		<0.001			*
7440-23-5		Sodium	T	mg/L	6020		*	<0.25		<0.25			*
7440-25-7		Tantalum	T	mg/L	6020		*	<0.005		<0.005			*
7440-28-0		Thallium	T	mg/L	6020		*	<0.002		<0.002			*
7440-61-1		Uranium	T	mg/L	6020		*	<0.0002		<0.0002			*
7440-62-2		Vanadium	T	mg/L	6020		*	0.00491	J	0.00552	J		*
7440-66-6		Zinc	T	mg/L	6020		*	0.00512	BJ	0.00519	BJ		*
108-05-4		Vinyl acetate	T	mg/L	8260		*	<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260		*	0.00613		0.00511		0.00613	
107-02-8		Acrolein	T	mg/L	8260		*	<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260		*	<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260		*	0.00119		0.00086	J	0.00127	
1330-20-7		Xylenes	T	mg/L	8260		*	<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-25-2		Tribromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-83-9		Methyl bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	
78-93-3		Methyl ethyl ketone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-15-0		Carbon disulfide	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-00-3		Chloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
67-66-3		Chloroform	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-87-3		Methyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-95-3		Methylene bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-34-3		1,1-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
107-06-2		1,2-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-35-4		1,1-Dichloroethylene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-01-4		Vinyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-01-6		Ethene, Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260		*	<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260		*	<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011		*	<0.0000193		<0.0000194		<0.0000194	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1336-36-3		PCB,Total	T	ug/L	8082		*	<0.0998		<0.0942			*
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.0998		<0.0942			*
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.0998		<0.0942			*
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.0998		<0.0942			*
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.0998		<0.0942			*
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.0998		<0.0942			*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082		*	<0.0998		<0.0942			*
11096-82-5		PCB-1260	T	ug/L	8082		*	<0.0998		<0.0942			*
11100-14-4		PCB-1268	T	ug/L	8082		*	<0.0998		<0.0942			*
12587-46-1		Gross Alpha	T	pCi/L	9310		*	0.778	*	-2.42	*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*	3.61	*	6.27	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*	0.388	*	0.291	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*	-0.132	*	-0.777	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*	-1.45	*	-11	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*	0.332	*	0.572	*		*
10028-17-8		Tritium	T	pCi/L	906.0		*	-92.4	*	-142	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*		*		*
57-12-5		Cyanide	T	mg/L	9012		*		*		*		*
20461-54-5		Iodide	T	mg/L	300.0		*	<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020		*		*		*		*

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014,SW07300015,SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	0000-0000	0000-0000	8004-4799
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	T. BLANK 2	T. BLANK 3	358
Sample Sequence #	1	1	2
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	T	T	NA
Sample Date and Time (Month/Day/Year hour:minutes)	7/11/2019 06:00	7/15/2019 05:50	7/10/2019 10:01
Duplicate ("Y" or "N")[2]	N	N	Y
Split ("Y" or "N")[3]	N	N	N
Facility Sample ID Number (if applicable)	TB2UG4-19	TB3UG4-19	MW358DUG4-19
Laboratory Sample ID Number (if applicable)	484578015	484743007	484384003
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/18/2019	7/20/2019	7/12/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	NA	NA	DOWN

CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9		Bromide	T	mg/L	9056		*		*	0.473			
16887-00-6		Chloride(s)	T	mg/L	9056		*		*	36			
16984-48-8		Fluoride	T	mg/L	9056		*		*	0.18			
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*	1.31	*		
14808-79-8		Sulfate	T	mg/L	9056		*		*	66.6			
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[5]"T" = Total; "D" = Dissolved
[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						T. BLANK 2		T. BLANK 3		358			
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*	290			
S0296- -		pH	T	Units	Field		*		*		*		
NS215		Eh	T	mV	Field		*		*		*		
S0907 - -		Temperature	T	°C	Field		*		*		*		
7429-90-5		Aluminum	T	mg/L	6020		*		*	<0.05			
7440-36-0		Antimony	T	mg/L	6020		*		*	<0.003			
7440-38-2		Arsenic	T	mg/L	6020		*		*	0.00217	J		
7440-39-3		Barium	T	mg/L	6020		*		*	0.0494			
7440-41-7		Beryllium	T	mg/L	6020		*		*	<0.0005			
7440-42-8		Boron	T	mg/L	6020		*		*	0.474			
7440-43-9		Cadmium	T	mg/L	6020		*		*	<0.001			
7440-70-2		Calcium	T	mg/L	6020		*		*	33.5			
7440-47-3		Chromium	T	mg/L	6020		*		*	<0.01			
7440-48-4		Cobalt	T	mg/L	6020		*		*	0.00112			
7440-50-8		Copper	T	mg/L	6020		*		*	0.00043	J		
7439-89-6		Iron	T	mg/L	6020		*		*	0.267			
7439-92-1		Lead	T	mg/L	6020		*		*	<0.002			
7439-95-4		Magnesium	T	mg/L	6020		*		*	14.7	*		
7439-96-5		Manganese	T	mg/L	6020		*		*	0.07			
7439-97-6		Mercury	T	mg/L	7470		*		*	<0.0002			

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		358			
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
7439-98-7		Molybdenum	T	mg/L	6020		*		*	<0.001			
7440-02-0		Nickel	T	mg/L	6020		*		*	0.00246			
7440-09-7		Potassium	T	mg/L	6020		*		*	2.22			
7440-16-6		Rhodium	T	mg/L	6020		*		*	<0.005			
7782-49-2		Selenium	T	mg/L	6020		*		*	<0.005			
7440-22-4		Silver	T	mg/L	6020		*		*	<0.001			
7440-23-5		Sodium	T	mg/L	6020		*		*	42			
7440-25-7		Tantalum	T	mg/L	6020		*		*	<0.005			
7440-28-0		Thallium	T	mg/L	6020		*		*	<0.002			
7440-61-1		Uranium	T	mg/L	6020		*		*	<0.0002			
7440-62-2		Vanadium	T	mg/L	6020		*		*	<0.02			
7440-66-6		Zinc	T	mg/L	6020		*		*	0.00826	BJ		
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			
67-64-1		Acetone	T	mg/L	8260	<0.005		0.00864		<0.005			
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005			
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005			
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		0.0008	J	<0.001			
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		358			
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		0.00198	J	<0.005			
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001			
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001			
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001			
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-01-6		Ethene, Trichloro-	T	mg/L	8260	<0.001		<0.001		0.00505			

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		358			
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001			
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005			
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005			
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001			
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005			
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000195		<0.0000195		<0.0000195			
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
1336-36-3		PCB,Total	T	ug/L	8082		*		*	<0.0964			
12674-11-2		PCB-1016	T	ug/L	8082		*		*	<0.0964			
11104-28-2		PCB-1221	T	ug/L	8082		*		*	<0.0964			
11141-16-5		PCB-1232	T	ug/L	8082		*		*	<0.0964			
53469-21-9		PCB-1242	T	ug/L	8082		*		*	<0.0964			
12672-29-6		PCB-1248	T	ug/L	8082		*		*	<0.0964			

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		358			
CAS RN[4]		CONSTITUENT	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1		PCB-1254	T	ug/L	8082		*		*	<0.0964			
11096-82-5		PCB-1260	T	ug/L	8082		*		*	<0.0964			
11100-14-4		PCB-1268	T	ug/L	8082		*		*	<0.0964			
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*	2.12	*		
12587-47-2		Gross Beta	T	pCi/L	9310		*		*	37.6	*		
10043-66-0		Iodine-131	T	pCi/L			*		*		*		
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*	0.694	*		
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*	-0.259	*		
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*	43.7	*		
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*	-0.155	*		
10028-17-8		Tritium	T	pCi/L	906.0		*		*	-14.4	*		
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*	<20			
57-12-5		Cyanide	T	mg/L	9012		*		*	<0.2			
20461-54-5		Iodide	T	mg/L	300.0		*		*	<0.5			
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*	0.989	J		
S0586- -		Total Organic Halides	T	mg/L	9020		*		*	0.00694	J		

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG4-19	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha		TPU is 7.79. Rad error is 7.52.
		Gross beta		TPU is 12.4. Rad error is 10.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.434. Rad error is 0.434.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.68. Rad error is 2.68.
		Technetium-99		TPU is 13.6. Rad error is 13.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.526. Rad error is 0.526.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 151. Rad error is 151.
8004-4799 MW358	MW358UG4-19	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.16. Rad error is 6.14.
		Gross beta		TPU is 9.56. Rad error is 7.95.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.42. Rad error is 0.42.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.64. Rad error is 1.64.
		Technetium-99		TPU is 14. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.736. Rad error is 0.733.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 145. Rad error is 145.
8004-0981 MW359	MW359UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.93. Rad error is 4.89.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.21. Rad error is 4.21.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.587. Rad error is 0.586.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.66. Rad error is 2.65.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.7. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.589. Rad error is 0.588.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4800 MW360	MW360UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.32. Rad error is 4.31.
		Gross beta		TPU is 8.09. Rad error is 7.77.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.69. Rad error is 0.687.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.58. Rad error is 2.58.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.5. Rad error is 11.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.667. Rad error is 0.666.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.
8004-4795 MW361	MW361UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.94. Rad error is 3.94.
		Gross beta		TPU is 11.9. Rad error is 9.48.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.533. Rad error is 0.532.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.53. Rad error is 2.53.
		Technetium-99		TPU is 15.6. Rad error is 14.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.82. Rad error is 0.813.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.
8004-0986 MW362	MW362UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.62. Rad error is 6.6.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.66. Rad error is 5.61.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.641. Rad error is 0.641.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.31. Rad error is 2.31.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.3. Rad error is 12.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.66. Rad error is 0.658.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 137.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-19	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.54. Rad error is 4.53.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.55. Rad error is 4.55.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.85. Rad error is 0.836.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.96. Rad error is 3.92.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.8. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.788. Rad error is 0.787.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.
8004-4797 MW364	MW364UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.2. Rad error is 8.1.
		Gross beta		TPU is 10.5. Rad error is 8.81.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.567. Rad error is 0.565.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.18. Rad error is 2.18.
		Technetium-99		TPU is 14.7. Rad error is 13.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.398. Rad error is 0.397.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 155. Rad error is 155.
8004-0984 MW365	MW365UG4-19	Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.53. Rad error is 5.48.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.2. Rad error is 6.05.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.793. Rad error is 0.776.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.61. Rad error is 3.61.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.4. Rad error is 11.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.732. Rad error is 0.732.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 139. Rad error is 139.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0982 MW366	MW366UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.1. Rad error is 2.1.
		Gross beta		TPU is 11.6. Rad error is 9.21.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.796. Rad error is 0.796.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.69. Rad error is 2.69.
		Technetium-99		TPU is 13.4. Rad error is 12.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.501. Rad error is 0.5.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 145. Rad error is 145.
8004-4793 MW367	MW367UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.21. Rad error is 4.2.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.21. Rad error is 7.03.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.866. Rad error is 0.865.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.86. Rad error is 1.86.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.3. Rad error is 11.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.894. Rad error is 0.894.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 135.
8004-0983 MW368	MW368UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.14. Rad error is 8.08.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.84. Rad error is 6.8.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.656. Rad error is 0.655.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.08. Rad error is 2.08.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.518. Rad error is 0.517.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 137.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4820 MW369	MW369UG4-19	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.03. Rad error is 5.01.
		Gross beta		TPU is 24.3. Rad error is 14.7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.722. Rad error is 0.717.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.67. Rad error is 1.67.
		Technetium-99		TPU is 14.8. Rad error is 13.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.565. Rad error is 0.564.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 157. Rad error is 156.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4818 MW370	MW370UG4-19	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.31. Rad error is 9.15.
		Gross beta		TPU is 13.6. Rad error is 10.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.649. Rad error is 0.647.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.05. Rad error is 1.05.
		Technetium-99		TPU is 19.9. Rad error is 15.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.324. Rad error is 0.323.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 153. Rad error is 153.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4819 MW371	MW371UG4-19	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.36. Rad error is 9.09.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.67. Rad error is 5.58.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.849. Rad error is 0.838.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.24. Rad error is 1.24.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.6. Rad error is 12.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.08. Rad error is 1.07.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Magnesium	E	Result estimated due to matrix interferences.
		Vinyl acetate	H	Analysis performed outside holding time requirement
		Acetone	H	Analysis performed outside holding time requirement
		Acrolein	H	Analysis performed outside holding time requirement
		Acrylonitrile	H	Analysis performed outside holding time requirement
		Benzene	H	Analysis performed outside holding time requirement
		Chlorobenzene	H	Analysis performed outside holding time requirement
		Xylenes	H	Analysis performed outside holding time requirement
		Styrene	H	Analysis performed outside holding time requirement
		Toluene	H	Analysis performed outside holding time requirement
		Chlorobromomethane	H	Analysis performed outside holding time requirement
		Bromodichloromethane	H	Analysis performed outside holding time requirement
		Tribromomethane	H	Analysis performed outside holding time requirement
		Methyl bromide	H	Analysis performed outside holding time requirement
		Methyl Ethyl Ketone	H	Analysis performed outside holding time requirement
		trans-1,4-Dichloro-2-butene	H	Analysis performed outside holding time requirement
		Carbon disulfide	H	Analysis performed outside holding time requirement
		Chloroethane	H	Analysis performed outside holding time requirement
		Chloroform	H	Analysis performed outside holding time requirement
		Methyl chloride	H	Analysis performed outside holding time requirement
		cis-1,2-Dichloroethene	H	Analysis performed outside holding time requirement
		Methylene bromide	H	Analysis performed outside holding time requirement
		1,1-Dichloroethane	H	Analysis performed outside holding time requirement
		1,2-Dichloroethane	H	Analysis performed outside holding time requirement
		1,1-Dichloroethylene	H	Analysis performed outside holding time requirement
		1,2-Dibromoethane	H	Analysis performed outside holding time requirement
		1,1,2,2-Tetrachloroethane	H	Analysis performed outside holding time requirement
		1,1,1-Trichloroethane	H	Analysis performed outside holding time requirement
		1,1,2-Trichloroethane	H	Analysis performed outside holding time requirement
		1,1,1,2-Tetrachloroethane	H	Analysis performed outside holding time requirement
		Vinyl chloride	H	Analysis performed outside holding time requirement
		Tetrachloroethene	H	Analysis performed outside holding time requirement
		Trichloroethene	H	Analysis performed outside holding time requirement
		Ethylbenzene	H	Analysis performed outside holding time requirement
		2-Hexanone	H	Analysis performed outside holding time requirement
		Iodomethane	H	Analysis performed outside holding time requirement
		Dibromochloromethane	H	Analysis performed outside holding time requirement

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG4-19	Carbon tetrachloride	H	Analysis performed outside holding time requirement
		Dichloromethane	H	Analysis performed outside holding time requirement
		Methyl Isobutyl Ketone	H	Analysis performed outside holding time requirement
		1,2-Dichloropropane	H	Analysis performed outside holding time requirement
		trans-1,3-Dichloropropene	H	Analysis performed outside holding time requirement
		cis-1,3-Dichloropropene	H	Analysis performed outside holding time requirement
		trans-1,2-Dichloroethene	H	Analysis performed outside holding time requirement
		Trichlorofluoromethane	H	Analysis performed outside holding time requirement
		1,2,3-Trichloropropane	H	Analysis performed outside holding time requirement
		1,2-Dichlorobenzene	H	Analysis performed outside holding time requirement
		1,4-Dichlorobenzene	H	Analysis performed outside holding time requirement
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.72. Rad error is 3.72.
		Gross beta		TPU is 26.9. Rad error is 14.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.792. Rad error is 0.79.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.93. Rad error is 1.93.
		Technetium-99		TPU is 25.9. Rad error is 16.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.925. Rad error is 0.924.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 145. Rad error is 145.
8004-4792 MW373	MW373UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.27. Rad error is 6.26.
		Gross beta		TPU is 8.81. Rad error is 8.06.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.67. Rad error is 0.669.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.89. Rad error is 2.89.
		Technetium-99		TPU is 12.5. Rad error is 12.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.545. Rad error is 0.544.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 137.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0990 MW374	MW374UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.96. Rad error is 6.93.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6. Rad error is 5.98.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.372. Rad error is 0.37.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.89. Rad error is 2.89.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.863. Rad error is 0.853.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 142. Rad error is 142.
8004-0985 MW375	MW375UG4-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.75.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6. Rad error is 5.99.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.465. Rad error is 0.459.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.88. Rad error is 3.88.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.8. Rad error is 10.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.769. Rad error is 0.768.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 147. Rad error is 147.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988	MW376	Bromide		During sampling, the well went dry; therefore, no sample was collected.
		Chloride		During sampling, the well went dry; therefore, no sample was collected.
		Fluoride		During sampling, the well went dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well went dry; therefore, no sample was collected.
		Sulfate		During sampling, the well went dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well went dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well went dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well went dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well went dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well went dry; therefore, no sample was collected.
		pH		During sampling, the well went dry; therefore, no sample was collected.
		Eh		During sampling, the well went dry; therefore, no sample was collected.
		Temperature		During sampling, the well went dry; therefore, no sample was collected.
		Aluminum		During sampling, the well went dry; therefore, no sample was collected.
		Antimony		During sampling, the well went dry; therefore, no sample was collected.
		Arsenic		During sampling, the well went dry; therefore, no sample was collected.
		Barium		During sampling, the well went dry; therefore, no sample was collected.
		Beryllium		During sampling, the well went dry; therefore, no sample was collected.
		Boron		During sampling, the well went dry; therefore, no sample was collected.
		Cadmium		During sampling, the well went dry; therefore, no sample was collected.
		Calcium		During sampling, the well went dry; therefore, no sample was collected.
		Chromium		During sampling, the well went dry; therefore, no sample was collected.
		Cobalt		During sampling, the well went dry; therefore, no sample was collected.
		Copper		During sampling, the well went dry; therefore, no sample was collected.
		Iron		During sampling, the well went dry; therefore, no sample was collected.
		Lead		During sampling, the well went dry; therefore, no sample was collected.
		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988	MW376	Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988	MW376	Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989	MW377	Bromide		During sampling, the well went dry; therefore, no sample was collected.
		Chloride		During sampling, the well went dry; therefore, no sample was collected.
		Fluoride		During sampling, the well went dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well went dry; therefore, no sample was collected.
		Sulfate		During sampling, the well went dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well went dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well went dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well went dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well went dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well went dry; therefore, no sample was collected.
		pH		During sampling, the well went dry; therefore, no sample was collected.
		Eh		During sampling, the well went dry; therefore, no sample was collected.
		Temperature		During sampling, the well went dry; therefore, no sample was collected.
		Aluminum		During sampling, the well went dry; therefore, no sample was collected.
		Antimony		During sampling, the well went dry; therefore, no sample was collected.
		Arsenic		During sampling, the well went dry; therefore, no sample was collected.
		Barium		During sampling, the well went dry; therefore, no sample was collected.
		Beryllium		During sampling, the well went dry; therefore, no sample was collected.
		Boron		During sampling, the well went dry; therefore, no sample was collected.
		Cadmium		During sampling, the well went dry; therefore, no sample was collected.
		Calcium		During sampling, the well went dry; therefore, no sample was collected.
		Chromium		During sampling, the well went dry; therefore, no sample was collected.
		Cobalt		During sampling, the well went dry; therefore, no sample was collected.
		Copper		During sampling, the well went dry; therefore, no sample was collected.
		Iron		During sampling, the well went dry; therefore, no sample was collected.
		Lead		During sampling, the well went dry; therefore, no sample was collected.
		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989	MW377	Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY | Finds/Unit: KY8-890-008-982 / 1

Facility: US DOE - Paducah Gaseous Diffusion Plant | LAB ID:None

Permit Number: SW07300014, SW07300015, SW07300045 | For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG4-19	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.52. Rad error is 3.52.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.46. Rad error is 4.42.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.684. Rad error is 0.676.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.16. Rad error is 2.16.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.6. Rad error is 11.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.714. Rad error is 0.709.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 139. Rad error is 139.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY | Finds/Unit: KY8-890-008-982 / 1

Facility: US DOE - Paducah Gaseous Diffusion Plant | LAB ID:None

Permit Number: SW07300014, SW07300015, SW07300045 | For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG4-19	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.19. Rad error is 2.18.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.41. Rad error is 5.31.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.609. Rad error is 0.604.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.34. Rad error is 2.34.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.5. Rad error is 12.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.864. Rad error is 0.856.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 139. Rad error is 139.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG4-19	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
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Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG4-19	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
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LAB ID:None
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GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-19	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
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Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-19	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG4-19	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.

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LAB ID:None
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GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG4-19	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID:None
For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4799 MW358	MW358DUG4-19	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Magnesium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.32. Rad error is 6.31.
		Gross beta		TPU is 10.4. Rad error is 8.27.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.764. Rad error is 0.762.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.79. Rad error is 1.79.
		Technetium-99		TPU is 14.5. Rad error is 13.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.391. Rad error is 0.39.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 137.

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APPENDIX D

STATISTICAL ANALYSES AND QUALIFICATION STATEMENT

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GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the third quarter 2019 groundwater data collected from the C-746-U Landfill monitoring wells (MWs) were performed in accordance with Permit GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency (EPA) guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

The statistical evaluation was conducted separately for the three groundwater systems: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). For each groundwater system, data from wells considered to represent background conditions were compared with test wells (downgradient or sidegradient wells) (Exhibit D.1). The third quarter 2019 data used to conduct the statistical analyses were collected in July 2019. The statistical analyses for this report first used data from the first eight quarters that had been sampled for each parameter to develop the historical background value, beginning with the first two baseline sampling events in 2002, when available. Then a second set of statistical analyses, using the last eight quarters, was run on analytes that had at least one downgradient well that had exceeded the historical background. The sampling dates associated with both the historical and the current background data are listed next to the result in the statistical analysis sheets of this appendix.

Statistical Analysis Process

Constituents of concern that have Kentucky maximum contaminant levels (MCLs) and results that do not exceed their respective MCL are not included in the statistical evaluation. Parameters that have MCLs can be found in 401 *KAR* 47:030 § 6. For parameters with no established MCL and those parameters that exceed their MCLs, the most recent results are compared to historical background concentrations, as follows: the data are divided into censored and uncensored observations. The one-sided tolerance interval statistical test is conducted only on parameters that have at least one uncensored (detected) observation. The current result is compared to the results of the one-sided tolerance interval statistical test to determine if the current data exceed the historical background concentration calculated using the first eight quarters of data.

For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted. The test well results are compared to both an upper and lower tolerance limit (TL) to determine if statistically significant deviations in concentrations exist with respect to upgradient (background) well data from the first eight quarters. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

Statistical analyses are performed on the first eight quarters of historical background data, not on the data for the current quarter. Once a statistical result is obtained using the background data, the result for the current quarter is compared to that value. If the value is exceeded, the well is considered to have an exceedance of the statistically derived historical background concentration.

Exhibit D.1. Station Identification for Monitoring Wells Analyzed

Station	Type	Groundwater Unit
MW357	TW	URGA
MW358	TW	LRGA
MW359[a]	TW	UCRS
MW360	TW	URGA
MW361	TW	LRGA
MW362[a]	TW	UCRS
MW363	TW	URGA
MW364	TW	LRGA
MW365[a]	TW	UCRS
MW366	TW	URGA
MW367	TW	LRGA
MW368[a]	TW	UCRS
MW369	BG	URGA
MW370	BG	LRGA
MW371[a]	BG	UCRS
MW372	BG	URGA
MW373	BG	LRGA
MW374[a]	BG	UCRS
MW375[a]	SG	UCRS
MW376[a,b]	SG	UCRS
MW377[a,b]	SG	UCRS

[a] The gradients in UCRS wells are downward and, hydrogeologically, UCRS wells are not considered upgradient, downgradient, or sidegradient from the C-746-U Landfill. The UCRS wells identified as upgradient, sidegradient, or downgradient are those wells located in the same general direction as the RGA wells considered to be upgradient, sidegradient, or downgradient.
[b] Well was dry this quarter, and a groundwater sample could not be collected.
BG: upgradient or background wells
TW: downgradient or test wells
SG: sidegradient wells

For those parameters that are determined to exceed the historical background concentration, a second one-sided tolerance interval statistical test, or a two-sided tolerance interval statistical test in the case of pH, is conducted. The second one-sided tolerance interval statistical test is conducted to determine whether the current concentration in downgradient wells exceeds the current background, as determined by a comparison against the statistically derived upper TL using the most recent eight quarters of data for the relevant background wells. For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted, if required. The test well pH results are compared to both an upper and lower TL to determine if the current pH is different from the current background level to a statistically significant level. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

Statistical analyses are performed on the last eight quarters of current background data, not on the data for the current quarter. Once a statistical result is obtained using the background data, the result for the current quarter is compared to that value. If the value is exceeded, the well has an exceedance of the statistically derived current background concentration.

A stepwise list of the one-sided tolerance interval statistical procedure applied to the data is summarized below.[1]

1. The TL is calculated for the background data (first using the first eight quarters, then using the last eight quarters, if required).

    - For each parameter, the background data are used to establish a baseline. On this data set, the mean (X) and the standard deviation (S) are computed.

    - The data set is checked for normality using coefficient of variation (CV). If CV ≤ 1.0, then the data are assumed to be normally distributed. Data sets with CV > 1.0 are assumed to be log-normally distributed; for data sets with CV > 1.0, the data are log-transformed and analyzed.

    - The factor (K) for one-sided upper TL with 95% minimum coverage is determined (Table 5, Appendix B, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance*, 1989) based on the number of background data points.

    - The one-sided upper TL is calculated using the following equation:

      $TL = X + (K \times S)$

2. Each observation from downgradient wells is compared to the calculated one-sided upper TL in Step 1. If an observation value exceeds the TL, then there is statistically significant evidence that the well concentration exceeds the historical background.

Type of Data Used

Exhibit D.1 presents the upgradient or background wells (identified as "BG"), the downgradient or test wells (identified as "TW"), and the sidegradient wells (identified as "SG") for the C-746-U Contained Landfill. Exhibit D.2 presents the parameters from the available data set for which a statistical test was performed using the one-sided tolerance interval.

Exhibits D.3, D.4, and D.5 list the number of analyses (observations), nondetects (censored observations), and detects (uncensored observations), by parameter in the UCRS, the URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, third quarter 2019. The observations are representative of the current quarter data. Background data are presented in Attachments D1 and D2. The sampling dates associated with background data are listed next to the result in Attachments D1 and D2. When field duplicate data are available, the higher of the two readings is retained for further evaluation. When a data point has been rejected following data validation, this result is not used, and the next available data point is used for the background or current quarter data.

[1] For pH, two-sided TLs (upper and lower) were calculated with an adjusted K factor using the following equations:
upper TL = X + (K × S)
lower TL = X - (K × S)

Exhibit D.2. List of Parameters Tested Using the One-Sided Upper Tolerance Level Test with Historical Background

Parameters
Aluminum
Antimony
Beta Activity
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
PCB, Total
PCB-1242
pH*
Potassium
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
Vanadium
Zinc

*For pH, the test well results were compared to both an upper and lower TL to determine if the current result differs to a statistically significant degree from the historical background values.

Exhibit D.3. Summary of Censored, and Uncensored Data—UCRS

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	7	7	0	No
1,1,2,2-Tetrachloroethane	7	7	0	No
1,1,2-Trichloroethane	7	7	0	No
1,1-Dichloroethane	7	7	0	No
1,2,3-Trichloropropane	7	7	0	No
1,2-Dibromo-3-chloropropane	7	7	0	No
1,2-Dibromoethane	7	7	0	No
1,2-Dichlorobenzene	7	7	0	No
1,2-Dichloropropane	7	7	0	No
2-Butanone	7	7	0	No
2-Hexanone	7	7	0	No
4-Methyl-2-pentanone	7	7	0	No
Acetone	7	7	0	No
Acrolein	7	7	0	No
Acrylonitrile	7	7	0	No
Aluminum	**7**	**2**	**5**	**Yes**
Antimony	**7**	**6**	**1**	**Yes**
Beryllium	7	7	0	No
Boron	**7**	**1**	**6**	**Yes**
Bromide	**7**	**5**	**2**	**Yes**
Bromochloromethane	7	7	0	No
Bromodichloromethane	7	7	0	No
Bromoform	7	7	0	No
Bromomethane	7	7	0	No
Calcium	**7**	**0**	**7**	**Yes**
Carbon disulfide	7	7	0	No
Chemical Oxygen Demand (COD)	**7**	**3**	**4**	**Yes**
Chloride	**7**	**0**	**7**	**Yes**
Chlorobenzene	7	7	0	No
Chloroethane	7	7	0	No
Chloroform	7	7	0	No
Chloromethane	7	7	0	No
cis-1,2-Dichloroethene	7	7	0	No
cis-1,3-Dichloropropene	7	7	0	No
Cobalt	**7**	**5**	**2**	**Yes**
Conductivity	**7**	**0**	**7**	**Yes**
Copper	**7**	**0**	**7**	**Yes**
Cyanide	7	7	0	No
Dibromochloromethane	7	7	0	No
Dibromomethane	7	7	0	No
Dimethylbenzene, Total	7	7	0	No
Dissolved Oxygen	**7**	**0**	**7**	**Yes**
Dissolved Solids	**7**	**0**	**7**	**Yes**
Ethylbenzene	7	7	0	No
Iodide	7	7	0	No
Iodomethane	7	7	0	No
Iron	**7**	**1**	**6**	**Yes**
Magnesium	**7**	**0**	**7**	**Yes**
Manganese	**7**	**1**	**6**	**Yes**
Methylene chloride	7	7	0	No
Molybdenum	**7**	**4**	**3**	**Yes**

Exhibit D.3. Summary of Censored, and Uncensored Data—UCRS (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	**7**	**0**	**7**	**Yes**
Oxidation-Reduction Potential	**7**	**0**	**7**	**Yes**
PCB, Total	**7**	**6**	**1**	**Yes**
PCB-1016	7	7	0	No
PCB-1221	7	7	0	No
PCB-1232	7	7	0	No
PCB-1242	**7**	**6**	**1**	**Yes**
PCB-1248	7	7	0	No
PCB-1254	7	7	0	No
PCB-1260	7	7	0	No
PCB-1268	7	7	0	No
pH	**7**	**0**	**7**	**Yes**
Potassium	**7**	**1**	**6**	**Yes**
Radium-226	7	7	0	No
Rhodium	7	7	0	No
Sodium	**7**	**0**	**7**	**Yes**
Styrene	7	7	0	No
Sulfate	**7**	**0**	**7**	**Yes**
Tantalum	7	7	0	No
Technetium-99	7	7	0	No
Tetrachloroethene	7	7	0	No
Thallium	7	7	0	No
Thorium-230	7	7	0	No
Toluene	7	7	0	No
Total Organic Carbon (TOC)	**7**	**0**	**7**	**Yes**
Total Organic Halides (TOX)	**7**	**1**	**6**	**Yes**
trans-1,2-Dichloroethene	7	7	0	No
trans-1,3-Dichloropropene	7	7	0	No
trans-1,4-Dichloro-2-Butene	7	7	0	No
Trichlorofluoromethane	7	7	0	No
Vanadium	**7**	**5**	**2**	**Yes**
Vinyl Acetate	7	7	0	No
Zinc	7	7	0	No

Bold denotes parameters with at least one uncensored observation.

Exhibit D.4. Summary of Censored, and Uncensored Data—URGA

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	6	6	0	No
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	**6**	**4**	**2**	**Yes**
Antimony	**6**	**5**	**1**	**Yes**
Beryllium	6	6	0	No
Beta activity	**6**	**1**	**5**	**Yes**
Boron	**6**	**0**	**6**	**Yes**
Bromide	**6**	**1**	**5**	**Yes**
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	**6**	**0**	**6**	**Yes**
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	**6**	**3**	**3**	**Yes**
Chloride	**6**	**0**	**6**	**Yes**
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	**6**	**3**	**3**	**Yes**
Conductivity	**6**	**0**	**6**	**Yes**
Copper	**6**	**0**	**6**	**Yes**
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	**6**	**0**	**6**	**Yes**
Dissolved Solids	**6**	**0**	**6**	**Yes**
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
Iron	**6**	**1**	**5**	**Yes**
Magnesium	**6**	**0**	**6**	**Yes**
Manganese	**6**	**0**	**6**	**Yes**
Methylene chloride	6	6	0	No

Exhibit D.4. Summary of Censored, and Uncensored Data—URGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Molybdenum	6	6	0	No
Nickel	**6**	**2**	**4**	**Yes**
Oxidation-Reduction Potential	**6**	**0**	**6**	**Yes**
PCB, Total	6	6	0	No
PCB-1016	6	6	0	No
PCB-1221	6	6	0	No
PCB-1232	6	6	0	No
PCB-1242	6	6	0	No
PCB-1248	6	6	0	No
PCB-1254	6	6	0	No
PCB-1260	6	6	0	No
PCB-1268	6	6	0	No
pH	**6**	**0**	**6**	**Yes**
Potassium	**6**	**0**	**6**	**Yes**
Radium-226	6	6	0	No
Rhodium	6	6	0	No
Sodium	**6**	**0**	**6**	**Yes**
Styrene	6	6	0	No
Sulfate	**6**	**0**	**6**	**Yes**
Tantalum	6	6	0	No
Technetium-99	**6**	**2**	**4**	**Yes**
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
Total Organic Carbon (TOC)	**6**	**0**	**6**	**Yes**
Total Organic Halides (TOX)	**6**	**2**	**4**	**Yes**
trans-1,2-Dichloroethene	6	6	0	No
trans-1,3-Dichloropropene	6	6	0	No
trans-1,4-Dichloro-2-Butene	6	6	0	No
Trichlorofluoromethane	6	6	0	No
Vanadium	**6**	**5**	**1**	**Yes**
Vinyl Acetate	6	6	0	No
Zinc	6	6	0	No

Bold denotes parameters with at least one uncensored observation.

Exhibit D.5. Summary of Censored, and Uncensored Data—LRGA

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	6	6	0	No
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	**6**	**5**	**1**	**Yes**
Antimony	**6**	**5**	**1**	**Yes**
Beryllium	6	6	0	No
Beta activity	**6**	**1**	**5**	**Yes**
Boron	**6**	**0**	**6**	**Yes**
Bromide	**6**	**0**	**6**	**Yes**
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	**6**	**0**	**6**	**Yes**
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	**6**	**1**	**5**	**Yes**
Chloride	**6**	**0**	**6**	**Yes**
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	**6**	**3**	**3**	**Yes**
Conductivity	**6**	**0**	**6**	**Yes**
Copper	**6**	**0**	**6**	**Yes**
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	**6**	**0**	**6**	**Yes**
Dissolved Solids	**6**	**0**	**6**	**Yes**
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
Iron	**6**	**2**	**4**	**Yes**
Magnesium	**6**	**0**	**6**	**Yes**
Manganese	**6**	**0**	**6**	**Yes**
Methylene chloride	6	6	0	No

Exhibit D.5. Tests Summary for Qualified Parameters—LRGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Molybdenum	6	6	0	No
Nickel	**6**	**3**	**3**	**Yes**
Oxidation-Reduction Potential	**6**	**0**	**6**	**Yes**
PCB, Total	6	6	0	No
PCB-1016	6	6	0	No
PCB-1221	6	6	0	No
PCB-1232	6	6	0	No
PCB-1242	6	6	0	No
PCB-1248	6	6	0	No
PCB-1254	6	6	0	No
PCB-1260	6	6	0	No
PCB-1268	6	6	0	No
pH	**6**	**0**	**6**	**Yes**
Potassium	**6**	**0**	**6**	**Yes**
Radium-226	6	6	0	No
Rhodium	6	6	0	No
Sodium	**6**	**0**	**6**	**Yes**
Styrene	6	6	0	No
Sulfate	**6**	**0**	**6**	**Yes**
Tantalum	6	6	0	No
Technetium-99	**6**	**1**	**5**	**Yes**
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
Total Organic Carbon (TOC)	**6**	**0**	**6**	**Yes**
Total Organic Halides (TOX)	**6**	**3**	**3**	**Yes**
trans-1,2-Dichloroethene	6	6	0	No
trans-1,3-Dichloropropene	6	6	0	No
trans-1,4-Dichloro-2-Butene	6	6	0	No
Trichloroethene	**6**	**0**	**6**	**Yes**
Trichlorofluoromethane	6	6	0	No
Vanadium	6	6	0	No
Vinyl Acetate	6	6	0	No
Zinc	**6**	**5**	**1**	**Yes**

Bold denotes parameters with at least one uncensored observation.

Discussion of Results from Historical Background Comparison

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval test calculated using historical background and are presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 27, 26, and 27 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents (beta activity and trichloroethene) that exceeded their MCL. A summary of exceedances when compared to statistically derived historical upgradient background by well number is shown in Exhibit D.6.

UCRS

This quarter's results identified historical background exceedances for calcium, dissolved oxygen, magnesium, oxidation-reduction potential, and sulfate.

URGA

This quarter's results identified historical background exceedances for beta activity, chemical oxygen demand (COD), conductivity, dissolved solids, oxidation-reduction potential, and technetium-99.

LRGA

This quarter's results identified historical background exceedances for beta activity, chemical oxygen demand (COD), oxidation-reduction potential, pH, and technetium-99.

Statistical Summary

Summaries of the results of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and in the LRGA in comparison to historical data are presented in Exhibit D.7, Exhibit D.8, and Exhibit D.9, respectively.

Exhibit D.6. Summary of Exceedances of Statistically Derived Historical Background Concentrations

UCRS	URGA	LRGA
MW359: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	**MW357:** Oxidation-Reduction Potential	**MW361:** Oxidation-Reduction Potential
MW362: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	**MW360:** Oxidation-Reduction Potential	**MW364:** Oxidation-Reduction Potential, Technetium-99
MW365: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	**MW363:** Oxidation-Reduction Potential	**MW367:** Oxidation-Reduction Potential, pH*
MW368: Calcium, Dissolved Oxygen, Magnesium, Oxidation-Reduction Potential, Sulfate	**MW366:** Oxidation-Reduction Potential	**MW370:** Beta activity, Oxidation-Reduction Potential, Technetium-99
MW371: Calcium, Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	**MW369:** Beta Activity, Oxidation-Reduction Potential	**MW373:** Chemical Oxygen Demand (COD), Oxidation-Reduction Potential
MW374: Oxidation-Reduction Potential	**MW372:** Beta Activity, Chemical Oxygen Demand (COD), Conductivity, Dissolved Solids, Oxidation-Reduction Potential, Technetium-99	
MW375: Oxidation-Reduction Potential, Sulfate		

*pH concentration is less than the LTL.

Exhibit D.7. Test Summaries for Qualified Parameters for Historical Background—UCRS

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	1.89	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.40	Current results exceed statistically derived historical background concentration in MW368 and MW371.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.97	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.31	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.45	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	1.28	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, and MW371.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	Current results exceed statistically derived historical background concentration in MW368.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.

Exhibit D.7. Tests Summary for Qualified Parameters for Historical Background—UCRS (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, MW374, and MW375.
PCB, Total	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration.
PCB-1242	Tolerance Interval	1.41	No exceedance of statistically derived historical background concentration.
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.49	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, and MW375.
Total Organic Carbon (TOC)	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	1.32	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
*If CV > 1.0, used log-transformed data.

Exhibit D.8. Test Summaries for Qualified Parameters for Historical Background—URGA

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	1.25	No exceedance of statistically derived historical background concentration.
Beta activity[1]	Tolerance Interval	0.74	Current results exceed statistically derived historical background concentration in MW369 and MW372.
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.10	Current results exceed statistically derived historical background concentration in MW372.
Chloride	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	0.85	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.12	Current results exceed statistically derived historical background concentration in MW372.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW372.
Iron	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.

Exhibit D.8. Tests Summary for Qualified Parameters for Historical Background—URGA (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Oxidation-Reduction Potential	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW360, MW363, MW366, MW369, and MW372.
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.75	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	0.87	Current results exceed statistically derived historical background concentration in MW372.
Total Organic Carbon (TOC)	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
*If CV > 1.0, used log-transformed data.
[1] A tolerance interval was calculated based on an MCL exceedance.

Exhibit D.9. Test Summaries for Qualified Parameters for Historical Background—LRGA

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	2.78	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	1.25	No exceedance of statistically derived historical background concentration.
Beta activity[1]	Tolerance Interval	0.80	Current results exceed statistically derived historical background concentration in MW370.
Boron	Tolerance Interval	0.68	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.31	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.59	Current results exceed statistically derived historical background concentration in MW373.
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.17	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.83	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.

Exhibit D.9. Tests Summary for Qualified Parameters for Historical Background—LRGA (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW361, MW364, MW367, MW370, and MW373.
pH**	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW367.
Potassium	Tolerance Interval	0.19	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW364 and MW370.
Total Organic Carbon (TOC)	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Trichloroethene[1]	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.67	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
*If CV > 1.0, used log-transformed data.
**pH concentration is less than the LTL.
[1] A tolerance interval was calculated based on an MCL exceedance.

Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGA, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the results of the one-sided tolerance interval test compared to current background, and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 5, 6, and 5 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

For downgradient wells only, a summary of instances where concentrations exceeded the TL calculated using current background data is shown in Exhibit D.10.

Exhibit D.10. Summary of Exceedances (in Downgradient Wells) of the TL Calculated Using Current Background Concentrations

URGA	LRGA
None	**MW367:** pH*

*pH concentration is less than the LTL

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted, however, that calcium, magnesium, and sulfate in MW368 exceeded the current TL this quarter.

URGA

This quarter's results showed no exceedances in wells located downgradient of the landfill.

LRGA

This quarter's results showed an exceedance of pH in MW367; this well is located downgradient of the landfill.

Statistical Summary

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and the LRGA are presented in Exhibit D.11, Exhibit D.12, and Exhibit D.13, respectively.

Exhibit D.11. Test Summaries for Qualified Parameters for Current Background—UCRS

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Calcium	Tolerance Interval	0.42	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 and MW371 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Oxygen	Tolerance Interval	0.87	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Magnesium	Tolerance Interval	0.45	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.24	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	1.23	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

Exhibit D.12. Test Summaries for Qualified Parameters for Current Background—URGA

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Beta Activity	Tolerance Interval	0.83	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.55	MW372 exceeded the upper TL, which is evidence of a difference in concentration with respect to current background data
Conductivity	Tolerance Interval	0.24	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Dissolved Solids	Tolerance Interval	0.27	MW372 exceeded the upper TL, which is evidence of a difference in concentration with respect to current background data
Oxidation-Reduction Potential	Tolerance Interval	0.12	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	0.76	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation

Exhibit D.13. Test Summaries for Qualified Parameters for Current Background—LRGA

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Beta activity	Tolerance Interval	0.67	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.38	MW373 exceeded the upper TL, which is evidence of a difference in concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.11	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
pH	Tolerance Interval	0.01	MW367 exceeded the lower TL, which is evidence of a difference in concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.75	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation

ATTACHMENT D1

COMPARISON OF CURRENT DATA TO ONE-SIDED UPPER TOLERANCE INTERVAL TEST CALCULATED USING HISTORICAL BACKGROUND DATA

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C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 3.300	**S=** 6.859	**CV(1)=** 2.078	**K factor**=** 2.523	**TL(1)=** 20.604	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.371	**S=** 1.678	**CV(2)=** -4.521	**K factor**=** 2.523	**TL(2)=** 3.863	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.24	0.806
4/22/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	21.3	3.059
1/7/2003	20	2.996
4/2/2003	4.11	1.413
7/9/2003	1.41	0.344
10/7/2003	1.09	0.086
1/6/2004	0.854	-0.158
4/7/2004	0.2	-1.609
7/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.0271	N/A	-3.608	NO
MW362	Downgradient	Yes	0.111	N/A	-2.198	NO
MW365	Downgradient	No	0.05	N/A	-2.996	N/A
MW368	Downgradient	Yes	0.139	N/A	-1.973	NO
MW371	Upgradient	Yes	0.249	N/A	-1.390	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	Yes	0.0249	N/A	-3.693	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Antimony UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.042	**S=** 0.079	**CV(1)=** 1.891	**K factor**=** 2.523	**TL(1)=** 0.240	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.607	**S=** 1.487	**CV(2)=** -0.323	**K factor**=** 2.523	**TL(2)=** -0.855	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.2	-1.609
4/22/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/6/2003	0.005	-5.298

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/7/2003	0.005	-5.298
1/6/2004	0.005	-5.298
4/7/2004	0.005	-5.298
7/14/2004	0.005	-5.298

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.003	N/A	-5.809	N/A
MW362	Downgradient	No	0.003	N/A	-5.809	N/A
MW365	Downgradient	No	0.003	N/A	-5.809	N/A
MW368	Downgradient	No	0.003	N/A	-5.809	N/A
MW371	Upgradient	No	0.003	N/A	-5.809	N/A
MW374	Upgradient	No	0.003	N/A	-5.809	N/A
MW375	Sidegradient	Yes	0.00115	N/A	-6.768	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Boron UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.650	**S=** 0.805	**CV(1)=** 1.238	**K factor**=** 2.523	**TL(1)=** 2.681	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.034	**S=** 1.030	**CV(2)=** -0.996	**K factor**=** 2.523	**TL(2)=** 1.564	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2	0.693
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609
1/6/2004	0.2	-1.609
4/7/2004	0.2	-1.609
7/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.015	N/A	-4.200	N/A
MW362	Downgradient	Yes	0.0189	N/A	-3.969	NO
MW365	Downgradient	Yes	0.00728	N/A	-4.923	NO
MW368	Downgradient	Yes	0.00821	N/A	-4.802	NO
MW371	Upgradient	Yes	0.0102	N/A	-4.585	NO
MW374	Upgradient	Yes	0.00968	N/A	-4.638	NO
MW375	Sidegradient	Yes	0.00903	N/A	-4.707	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Bromide UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 1.394 **S=** 0.474 **CV(1)=** 0.340 **K factor**=** 2.523 **TL(1)=** 2.590 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 0.279 **S=** 0.332 **CV(2)=** 1.190 **K factor**=** 2.523 **TL(2)=** 1.118 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/9/2003	1	0.000
10/6/2003	1	0.000

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.1	0.742
1/7/2003	2.1	0.742
4/2/2003	1.9	0.642
7/9/2003	1	0.000
10/7/2003	1.9	0.642
1/6/2004	1.9	0.642
4/7/2004	1.8	0.588
7/14/2004	1.6	0.470

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.2	N/A	-1.609	N/A
MW362	Downgradient	Yes	0.117	NO	-2.146	N/A
MW365	Downgradient	No	0.2	N/A	-1.609	N/A
MW368	Downgradient	No	0.2	N/A	-1.609	N/A
MW371	Upgradient	No	0.2	N/A	-1.609	N/A
MW374	Upgradient	Yes	0.705	NO	-0.350	N/A
MW375	Sidegradient	No	0.2	N/A	-1.609	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 34.100 **S=** 13.637 **CV(1)=** 0.400 **K factor**=** 2.523 **TL(1)=** 68.505 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.466 **S=** 0.356 **CV(2)=** 0.103 **K factor**=** 2.523 **TL(2)=** 4.364 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	17.2	2.845
4/22/2002	22.4	3.109
7/15/2002	25.5	3.239
10/8/2002	26.4	3.273
1/8/2003	27.2	3.303
4/3/2003	30.3	3.411
7/9/2003	25.9	3.254
10/6/2003	27	3.296

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	67.3	4.209
1/7/2003	60.6	4.104
4/2/2003	47.2	3.854
7/9/2003	34.7	3.547
10/7/2003	37.1	3.614
1/6/2004	37.7	3.630
4/7/2004	32.2	3.472
7/14/2004	26.9	3.292

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	5.91	NO	1.777	N/A
MW362	Downgradient	Yes	22.8	NO	3.127	N/A
MW365	Downgradient	Yes	23.2	NO	3.144	N/A
MW368	Downgradient	Yes	73.1	YES	4.292	N/A
MW371	Upgradient	Yes	70.4	YES	4.254	N/A
MW374	Upgradient	Yes	20.7	NO	3.030	N/A
MW375	Sidegradient	Yes	13.8	NO	2.625	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW368
MW371

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chemical Oxygen Demand (COD) UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 72.938	**S=** 70.749	**CV(1)=** 0.970	**K factor**=** 2.523	**TL(1)=** 251.437	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 4.000	**S=** 0.702	**CV(2)=** 0.175	**K factor**=** 2.523	**TL(2)=** 5.770	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	260	5.561
1/7/2003	214	5.366
4/2/2003	147	4.990
7/9/2003	72	4.277
10/7/2003	56	4.025
1/6/2004	68	4.220
4/7/2004	35	3.555
7/14/2004	35	3.555

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	20	N/A	2.996	N/A
MW362	Downgradient	Yes	17.7	NO	2.874	N/A
MW365	Downgradient	Yes	34.9	NO	3.552	N/A
MW368	Downgradient	Yes	149	NO	5.004	N/A
MW371	Upgradient	No	20	N/A	2.996	N/A
MW374	Upgradient	Yes	17.7	NO	2.874	N/A
MW375	Sidegradient	No	20	N/A	2.996	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 91.300 **S=** 86.959 **CV(1)=** 0.952 **K factor**=** 2.523 **TL(1)=** 310.697 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.620 **S=** 1.590 **CV(2)=** 0.439 **K factor**=** 2.523 **TL(2)=** 7.631 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/15/2002	8.3	2.116
10/8/2002	7.6	2.028
1/8/2003	7.7	2.041
4/3/2003	8.8	2.175
7/9/2003	8.1	2.092
10/6/2003	8.6	2.152
1/7/2004	7.6	2.028
4/6/2004	7.6	2.028

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	199.2	5.294
1/7/2003	199.7	5.297
4/2/2003	171.8	5.146
7/9/2003	178.7	5.186
10/7/2003	175.6	5.168
1/6/2004	170.4	5.138
4/7/2004	156.4	5.052
7/14/2004	144.7	4.975

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.893	NO	-0.113	N/A
MW362	Downgradient	Yes	4.25	NO	1.447	N/A
MW365	Downgradient	Yes	2.7	NO	0.993	N/A
MW368	Downgradient	Yes	7.3	NO	1.988	N/A
MW371	Upgradient	Yes	1.87	NO	0.626	N/A
MW374	Upgradient	Yes	60.5	NO	4.103	N/A
MW375	Sidegradient	Yes	3.89	NO	1.358	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.007	**S=** 0.009	**CV(1)=** 1.314	**K factor**=** 2.523	**TL(1)=** 0.031	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.843	**S=** 1.392	**CV(2)=** -0.238	**K factor**=** 2.523	**TL(2)=** -2.331	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.001	-6.908
4/3/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/6/2003	0.001	-6.908

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.01	-4.605
1/7/2003	0.01	-4.605
4/2/2003	0.01	-4.605
7/9/2003	0.00161	-6.432
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	No	0.001	N/A	-6.908	N/A
MW365	Downgradient	Yes	0.00173	N/A	-6.360	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	No	0.001	N/A	-6.908	N/A
MW374	Upgradient	Yes	0.00037	N/A	-7.902	NO
MW375	Sidegradient	No	0.001	N/A	-6.908	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 918.744 **S=** 417.257 **CV(1)=** 0.454 **K factor**=** 2.523 **TL(1)=** 1971.483 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.705 **S=** 0.550 **CV(2)=** 0.082 **K factor**=** 2.523 **TL(2)=** 8.092 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	541	6.293
4/22/2002	643	6.466
7/15/2002	632	6.449
10/8/2002	631	6.447
1/8/2003	680	6.522
4/3/2003	749	6.619
7/9/2003	734	6.599
10/6/2003	753	6.624

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	1007	6.915
10/8/2002	1680	7.427
1/7/2003	1715.9	7.448
4/2/2003	172	5.147
7/9/2003	1231	7.116
10/7/2003	1214	7.102
1/6/2004	1172	7.066
4/7/2004	1145	7.043

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	224	NO	5.412	N/A
MW362	Downgradient	Yes	733	NO	6.597	N/A
MW365	Downgradient	Yes	430	NO	6.064	N/A
MW368	Downgradient	Yes	733	NO	6.597	N/A
MW371	Upgradient	Yes	523	NO	6.260	N/A
MW374	Upgradient	Yes	661	NO	6.494	N/A
MW375	Sidegradient	Yes	335	NO	5.814	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.056	**S=** 0.072	**CV(1)=** 1.275	**K factor**=** 2.523	**TL(1)=** 0.237	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.395	**S=** 0.915	**CV(2)=** -0.270	**K factor**=** 2.523	**TL(2)=** -1.086	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00085	N/A	-7.070	NO
MW362	Downgradient	Yes	0.00148	N/A	-6.516	NO
MW365	Downgradient	Yes	0.00488	N/A	-5.323	NO
MW368	Downgradient	Yes	0.00069	N/A	-7.279	NO
MW371	Upgradient	Yes	0.00215	N/A	-6.142	NO
MW374	Upgradient	Yes	0.00057	N/A	-7.470	NO
MW375	Sidegradient	Yes	0.00057	N/A	-7.470	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.138	**S=** 0.621	**CV(1)=** 0.546	**K factor**=** 2.523	**TL(1)=** 2.704	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.013	**S=** 0.577	**CV(2)=** -43.069	**K factor**=** 2.523	**TL(2)=** 1.441	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.26	0.815
4/22/2002	1.15	0.140
7/15/2002	0.94	-0.062
10/8/2002	0.74	-0.301
1/8/2003	2.62	0.963
4/3/2003	1.5	0.405
7/9/2003	1.66	0.507
10/6/2003	1.28	0.247

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	0.6	-0.511
10/8/2002	0.67	-0.400
1/7/2003	0.23	-1.470
4/2/2003	0.65	-0.431
7/9/2003	0.92	-0.083
10/7/2003	0.99	-0.010
1/6/2004	1.11	0.104
4/7/2004	0.88	-0.128

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.4	YES	1.224	N/A
MW362	Downgradient	Yes	4.48	YES	1.500	N/A
MW365	Downgradient	Yes	2.74	YES	1.008	N/A
MW368	Downgradient	Yes	4.17	YES	1.428	N/A
MW371	Upgradient	Yes	4.6	YES	1.526	N/A
MW374	Upgradient	Yes	2.23	NO	0.802	N/A
MW375	Sidegradient	Yes	1.21	NO	0.191	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW359
MW362
MW365
MW368
MW371

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 590.000 **S=** 248.068 **CV(1)=** 0.420 **K factor**=** 2.523 **TL(1)=** 1215.876 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.308 **S=** 0.383 **CV(2)=** 0.061 **K factor**=** 2.523 **TL(2)=** 7.274 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	274	5.613
4/22/2002	409	6.014
7/15/2002	418	6.035
10/8/2002	424	6.050
1/8/2003	431	6.066
4/3/2003	444	6.096
7/9/2003	445	6.098
10/6/2003	438	6.082

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1136	7.035
1/7/2003	1101	7.004
4/2/2003	863	6.760
7/9/2003	682	6.525
10/7/2003	589	6.378
1/6/2004	603	6.402
4/7/2004	601	6.399
7/14/2004	582	6.366

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	143	NO	4.963	N/A
MW362	Downgradient	Yes	449	NO	6.107	N/A
MW365	Downgradient	Yes	290	NO	5.670	N/A
MW368	Downgradient	Yes	687	NO	6.532	N/A
MW371	Upgradient	Yes	341	NO	5.832	N/A
MW374	Upgradient	Yes	363	NO	5.894	N/A
MW375	Sidegradient	Yes	166	NO	5.112	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.612	**S=** 6.487	**CV(1)=** 0.981	**K factor**=** 2.523	**TL(1)=** 22.979	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.363	**S=** 1.147	**CV(2)=** 0.841	**K factor**=** 2.523	**TL(2)=** 4.256	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	1.31	0.270
4/22/2002	0.913	-0.091
7/15/2002	0.881	-0.127
10/8/2002	3.86	1.351
1/8/2003	1.88	0.631
4/3/2003	3.18	1.157
7/9/2003	0.484	-0.726
10/6/2003	2.72	1.001

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	23	3.135
1/7/2003	13.9	2.632
4/2/2003	14	2.639
7/9/2003	14.2	2.653
10/7/2003	7.92	2.069
1/6/2004	7.86	2.062
4/7/2004	4.82	1.573
7/14/2004	4.87	1.583

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.0337	NO	-3.390	N/A
MW362	Downgradient	Yes	0.0953	NO	-2.351	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.0869	NO	-2.443	N/A
MW371	Upgradient	Yes	0.16	NO	-1.833	N/A
MW374	Upgradient	Yes	0.44	NO	-0.821	N/A
MW375	Sidegradient	Yes	0.0715	NO	-2.638	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 11.347	**S=** 3.019	**CV(1)=** 0.266	**K factor**=** 2.523	**TL(1)=** 18.963	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.401	**S=** 0.237	**CV(2)=** 0.099	**K factor**=** 2.523	**TL(2)=** 2.999	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	7.1	1.960
4/22/2002	9.77	2.279
7/15/2002	10.4	2.342
10/8/2002	10.2	2.322
1/8/2003	10.7	2.370
4/3/2003	11.9	2.477
7/9/2003	10.8	2.380
10/6/2003	10.9	2.389

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	20	2.996
1/7/2003	16.1	2.779
4/2/2003	13.1	2.573
7/9/2003	10.3	2.332
10/7/2003	11.1	2.407
1/6/2004	11	2.398
4/7/2004	9.69	2.271
7/14/2004	8.49	2.139

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.26	NO	1.182	N/A
MW362	Downgradient	Yes	10.1	NO	2.313	N/A
MW365	Downgradient	Yes	10.8	NO	2.380	N/A
MW368	Downgradient	Yes	21.8	YES	3.082	N/A
MW371	Upgradient	Yes	12.6	NO	2.534	N/A
MW374	Upgradient	Yes	5.35	NO	1.677	N/A
MW375	Sidegradient	Yes	5.15	NO	1.639	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW368

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.248	**S=** 0.222	**CV(1)=** 0.894	**K factor**=** 2.523	**TL(1)=** 0.809	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.873	**S=** 1.068	**CV(2)=** -0.570	**K factor**=** 2.523	**TL(2)=** 0.821	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.063	-2.765
4/22/2002	0.067	-2.703
7/15/2002	0.074	-2.604
10/8/2002	0.0521	-2.955
1/8/2003	0.0385	-3.257
4/3/2003	0.0551	-2.899
7/9/2003	0.0546	-2.908
10/6/2003	0.0543	-2.913

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.596	-0.518
1/7/2003	0.565	-0.571
4/2/2003	0.675	-0.393
7/9/2003	0.397	-0.924
10/7/2003	0.312	-1.165
1/6/2004	0.299	-1.207
4/7/2004	0.329	-1.112
7/14/2004	0.342	-1.073

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.005	N/A	-5.298	N/A
MW362	Downgradient	Yes	0.001	NO	-6.908	N/A
MW365	Downgradient	Yes	0.0113	NO	-4.483	N/A
MW368	Downgradient	Yes	0.00473	NO	-5.354	N/A
MW371	Upgradient	Yes	0.0203	NO	-3.897	N/A
MW374	Upgradient	Yes	0.309	NO	-1.174	N/A
MW375	Sidegradient	Yes	0.00245	NO	-6.012	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Molybdenum UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.006	**S=** 0.010	**CV(1)=** 1.650	**K factor**=** 2.523	**TL(1)=** 0.030	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -6.108	**S=** 1.239	**CV(2)=** -0.203	**K factor**=** 2.523	**TL(2)=** -2.983	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.00121	-6.717
4/3/2003	0.001	-6.908
7/9/2003	0.00111	-6.803
10/6/2003	0.001	-6.908

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.00222	-6.110
1/7/2003	0.00201	-6.210
4/2/2003	0.00159	-6.444
7/9/2003	0.00242	-6.024
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	No	0.00075	N/A	-7.195	N/A
MW365	Downgradient	No	0.001	N/A	-6.908	N/A
MW368	Downgradient	Yes	0.00088	N/A	-7.036	NO
MW371	Upgradient	Yes	0.00031	N/A	-8.079	NO
MW374	Upgradient	Yes	0.00021	N/A	-8.468	NO
MW375	Sidegradient	No	0.001	N/A	-6.908	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.023	**S=** 0.022	**CV(1)=** 0.980	**K factor**=** 2.523	**TL(1)=** 0.078	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.349	**S=** 1.109	**CV(2)=** -0.255	**K factor**=** 2.523	**TL(2)=** -1.552	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/22/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.0124	-4.390
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/6/2003	0.005	-5.298

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.05	-2.996
1/7/2003	0.05	-2.996
4/2/2003	0.05	-2.996
7/9/2003	0.00794	-4.836
10/7/2003	0.005	-5.298
1/6/2004	0.005	-5.298
4/7/2004	0.005	-5.298
7/14/2004	0.005	-5.298

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00087	NO	-7.047	N/A
MW362	Downgradient	Yes	0.00093	NO	-6.980	N/A
MW365	Downgradient	Yes	0.00491	NO	-5.316	N/A
MW368	Downgradient	Yes	0.00098	NO	-6.928	N/A
MW371	Upgradient	Yes	0.00169	NO	-6.383	N/A
MW374	Upgradient	Yes	0.00119	NO	-6.734	N/A
MW375	Sidegradient	Yes	0.00074	NO	-7.209	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 22.281	**S=** 78.889	**CV(1)=** 3.541	**K factor**=** 2.523	**TL(1)=** 221.319	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.642	**S=** 1.729	**CV(2)=** 0.475	**K factor**=** 2.523	**TL(2)=** 5.106	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	75	4.317
4/22/2002	165	5.106
7/15/2002	65	4.174
4/3/2003	-19	#Func!
7/9/2003	114	4.736
10/6/2003	-22	#Func!
1/7/2004	20.5	3.020
4/6/2004	113	4.727

Well Number: MW374

Date Collected	Result	LN(Result)
3/18/2002	135	4.905
4/2/2003	-56	#Func!
7/9/2003	-68	#Func!
10/7/2003	-50	#Func!
1/6/2004	-85	#Func!
4/7/2004	6	1.792
7/14/2004	-38	#Func!
10/7/2004	1	0.000

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	217	N/A	5.380	YES
MW362	Downgradient	Yes	381	N/A	5.943	YES
MW365	Downgradient	Yes	388	N/A	5.961	YES
MW368	Downgradient	Yes	338	N/A	5.823	YES
MW371	Upgradient	Yes	423	N/A	6.047	YES
MW374	Upgradient	Yes	354	N/A	5.869	YES
MW375	Sidegradient	Yes	363	N/A	5.894	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW359
MW362
MW365
MW368
MW371
MW374
MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

PCB, Total UNITS: UG/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.224	**S=** 0.207	**CV(1)=** 0.922	**K factor**=** 2.523	**TL(1)=** 0.746	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.647	**S=** 0.440	**CV(2)=** -0.267	**K factor**=** 2.523	**TL(2)=** -0.537	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	0.17	-1.772
7/15/2002	0.17	-1.772
7/9/2003	0.17	-1.772
10/6/2003	0.17	-1.772
7/13/2004	0.18	-1.715
7/25/2005	0.17	-1.772
4/5/2006	0.18	-1.715

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/9/2003	0.17	-1.772
10/7/2003	0.17	-1.772
7/14/2004	0.18	-1.715
7/26/2005	0.17	-1.772
4/6/2006	0.18	-1.715
7/10/2006	0.17	-1.772
10/12/2006	0.17	-1.772
1/8/2007	0.17	-1.772

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.0977	N/A	-2.326	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	Yes	0.0954	NO	-2.350	N/A
MW368	Downgradient	No	0.0992	N/A	-2.311	N/A
MW371	Upgradient	No	0.0981	N/A	-2.322	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0997	N/A	-2.306	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

PCB-1242 UNITS: UG/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.159	**S=** 0.224	**CV(1)=** 1.409	**K factor**=** 2.523	**TL(1)=** 0.726	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -2.134	**S=** 0.579	**CV(2)=** -0.272	**K factor**=** 2.523	**TL(2)=** -0.672	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	0.11	-2.207
7/15/2002	0.11	-2.207
7/9/2003	0.13	-2.040
10/6/2003	0.09	-2.408
7/13/2004	0.1	-2.303
7/25/2005	0.09	-2.408
4/5/2006	0.1	-2.303

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/9/2003	0.13	-2.040
10/7/2003	0.09	-2.408
7/14/2004	0.1	-2.303
7/26/2005	0.1	-2.303
4/6/2006	0.1	-2.303
7/10/2006	0.1	-2.303
10/12/2006	0.1	-2.303
1/8/2007	0.1	-2.303

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.0977	N/A	-2.326	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	Yes	0.0954	N/A	-2.350	NO
MW368	Downgradient	No	0.0992	N/A	-2.311	N/A
MW371	Upgradient	No	0.0981	N/A	-2.322	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0997	N/A	-2.306	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 6.619 **S=** 0.295 **CV(1)=** 0.045 **K factor**=** 2.904 **TL(1)=** 7.475 **LL(1)=**5.7635

Statistics-Transformed Background Data **X=** 1.889 **S=** 0.046 **CV(2)=** 0.024 **K factor**=** 2.904 **TL(2)=** 2.023 **LL(2)=**1.7548

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	6.3	1.841
4/22/2002	6.5	1.872
7/15/2002	6.5	1.872
10/8/2002	6.6	1.887
1/8/2003	6.6	1.887
4/3/2003	6.9	1.932
7/9/2003	6.7	1.902
10/6/2003	7	1.946

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	5.75	1.749
10/8/2002	6.6	1.887
1/7/2003	6.82	1.920
4/2/2003	6.86	1.926
7/9/2003	6.7	1.902
10/7/2003	6.6	1.887
1/6/2004	6.9	1.932
4/7/2004	6.58	1.884

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW359	Downgradient	Yes	5.89	NO	1.773	N/A
MW362	Downgradient	Yes	6.93	NO	1.936	N/A
MW365	Downgradient	Yes	6.2	NO	1.825	N/A
MW368	Downgradient	Yes	6.42	NO	1.859	N/A
MW371	Upgradient	Yes	6.56	NO	1.881	N/A
MW374	Upgradient	Yes	6.54	NO	1.878	N/A
MW375	Sidegradient	Yes	6.27	NO	1.836	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 1.262 **S=** 0.907 **CV(1)=** 0.718 **K factor**=** 2.523 **TL(1)=** 3.549 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -0.023 **S=** 0.752 **CV(2)=** -32.218 **K factor**=** 2.523 **TL(2)=** 1.874 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.408	-0.896
1/8/2003	0.384	-0.957
4/3/2003	0.368	-1.000
7/9/2003	0.587	-0.533
10/6/2003	0.382	-0.962

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	3.04	1.112
1/7/2003	2.83	1.040
4/2/2003	2	0.693
7/9/2003	1.09	0.086
10/7/2003	0.802	-0.221
1/6/2004	0.897	-0.109
4/7/2004	0.689	-0.373
7/14/2004	0.716	-0.334

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.3	N/A	-1.204	N/A
MW362	Downgradient	Yes	0.317	NO	-1.149	N/A
MW365	Downgradient	Yes	0.239	NO	-1.431	N/A
MW368	Downgradient	Yes	0.721	NO	-0.327	N/A
MW371	Upgradient	Yes	0.495	NO	-0.703	N/A
MW374	Upgradient	Yes	0.317	NO	-1.149	N/A
MW375	Sidegradient	Yes	0.252	NO	-1.378	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 183.063 **S=** 73.222 **CV(1)=** 0.400 **K factor**=** 2.523 **TL(1)=** 367.800 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.146 **S=** 0.356 **CV(2)=** 0.069 **K factor**=** 2.523 **TL(2)=** 6.044 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	129	4.860
4/22/2002	131	4.875
7/15/2002	127	4.844
10/8/2002	123	4.812
1/8/2003	128	4.852
4/3/2003	144	4.970
7/9/2003	126	4.836
10/6/2003	120	4.787

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	336	5.817
1/7/2003	329	5.796
4/2/2003	287	5.659
7/9/2003	181	5.198
10/7/2003	182	5.204
1/6/2004	206	5.328
4/7/2004	182	5.204
7/14/2004	198	5.288

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	37.2	NO	3.616	N/A
MW362	Downgradient	Yes	140	NO	4.942	N/A
MW365	Downgradient	Yes	55.3	NO	4.013	N/A
MW368	Downgradient	Yes	65.6	NO	4.184	N/A
MW371	Upgradient	Yes	28.2	NO	3.339	N/A
MW374	Upgradient	Yes	119	NO	4.779	N/A
MW375	Sidegradient	Yes	52.9	NO	3.968	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.469	**S=** 3.153	**CV(1)=** 0.487	**K factor**=** 2.523	**TL(1)=** 14.423	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.794	**S=** 0.357	**CV(2)=** 0.199	**K factor**=** 2.523	**TL(2)=** 2.694	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	16.3	2.791
4/22/2002	8.6	2.152
7/15/2002	6.7	1.902
10/8/2002	5	1.609
1/8/2003	5	1.609
4/3/2003	5	1.609
7/9/2003	5	1.609
10/6/2003	5	1.609

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5.6	1.723
10/7/2003	5	1.609
1/6/2004	5	1.609
4/7/2004	11.3	2.425
7/14/2004	5	1.609

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	47.1	YES	3.852	N/A
MW362	Downgradient	Yes	32.1	YES	3.469	N/A
MW365	Downgradient	Yes	58.4	YES	4.067	N/A
MW368	Downgradient	Yes	164	YES	5.100	N/A
MW371	Upgradient	Yes	55.4	YES	4.015	N/A
MW374	Upgradient	Yes	8.06	NO	2.087	N/A
MW375	Sidegradient	Yes	24.2	YES	3.186	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW359
MW362
MW365
MW368
MW371
MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 17.631 **S=** 24.314 **CV(1)=** 1.379 **K factor**=** 2.523 **TL(1)=** 78.977 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.318 **S=** 0.979 **CV(2)=** 0.422 **K factor**=** 2.523 **TL(2)=** 4.788 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	11.1	2.407
4/22/2002	7	1.946
7/15/2002	4.1	1.411
10/8/2002	6	1.792
1/8/2003	5.3	1.668
4/3/2003	5.3	1.668
7/9/2003	2.9	1.065
10/6/2003	3.2	1.163

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	90	4.500
1/7/2003	64	4.159
4/2/2003	25	3.219
7/9/2003	16	2.773
10/7/2003	13	2.565
1/6/2004	10	2.303
4/7/2004	7.2	1.974
7/14/2004	12	2.485

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.899	N/A	-0.106	NO
MW362	Downgradient	Yes	2.26	N/A	0.815	NO
MW365	Downgradient	Yes	1.65	N/A	0.501	NO
MW368	Downgradient	Yes	1.73	N/A	0.548	NO
MW371	Upgradient	Yes	1.75	N/A	0.560	NO
MW374	Upgradient	Yes	2.39	N/A	0.871	NO
MW375	Sidegradient	Yes	0.942	N/A	-0.060	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 214.094 **S=** 231.089 **CV(1)=** 1.079 **K factor**=** 2.523 **TL(1)=** 797.131 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 4.867 **S=** 1.065 **CV(2)=** 0.219 **K factor**=** 2.523 **TL(2)=** 7.554 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/22/2002	105	4.654
7/15/2002	70	4.248
10/8/2002	52	3.951
1/8/2003	20.2	3.006
4/3/2003	104	4.644
7/9/2003	34.2	3.532
10/6/2003	46.1	3.831

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	903	6.806
1/7/2003	539	6.290
4/2/2003	295	5.687
7/9/2003	272	5.606
10/7/2003	197	5.283
1/6/2004	330	5.799
4/7/2004	183	5.209
7/14/2004	225	5.416

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	10	N/A	2.303	N/A
MW362	Downgradient	Yes	19	N/A	2.944	NO
MW365	Downgradient	Yes	20.1	N/A	3.001	NO
MW368	Downgradient	Yes	9.56	N/A	2.258	NO
MW371	Upgradient	Yes	3.86	N/A	1.351	NO
MW374	Upgradient	Yes	13.5	N/A	2.603	NO
MW375	Sidegradient	Yes	8.28	N/A	2.114	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Vanadium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.055	**S=** 0.072	**CV(1)=** 1.319	**K factor**=** 2.523	**TL(1)=** 0.237	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.438	**S=** 0.912	**CV(2)=** -0.265	**K factor**=** 2.523	**TL(2)=** -1.138	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00536	N/A	-5.229	NO
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	No	0.02	N/A	-3.912	N/A
MW368	Downgradient	No	0.02	N/A	-3.912	N/A
MW371	Upgradient	Yes	0.00549	N/A	-5.205	NO
MW374	Upgradient	No	0.02	N/A	-3.912	N/A
MW375	Sidegradient	No	0.02	N/A	-3.912	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.625	**S=** 0.774	**CV(1)=** 1.239	**K factor**=** 2.523	**TL(1)=** 2.578	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.973	**S=** 0.935	**CV(2)=** -0.961	**K factor**=** 2.523	**TL(2)=** 1.386	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.255	-1.366
4/22/2002	0.2	-1.609
7/15/2002	0.322	-1.133
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/8/2003	0.2	-1.609
10/6/2003	0.689	-0.373

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.61	0.959
4/23/2002	0.2	-1.609
7/16/2002	1.14	0.131
10/8/2002	0.862	-0.149
1/7/2003	2.32	0.842
4/2/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.05	N/A	-2.996	N/A
MW360	Downgradient	Yes	0.126	N/A	-2.071	NO
MW363	Downgradient	No	0.05	N/A	-2.996	N/A
MW366	Downgradient	No	0.05	N/A	-2.996	N/A
MW369	Upgradient	Yes	0.0609	N/A	-2.799	NO
MW372	Upgradient	No	0.05	N/A	-2.996	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Antimony UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.078	**S=** 0.098	**CV(1)=** 1.248	**K factor**=** 2.523	**TL(1)=** 0.324	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.915	**S=** 1.844	**CV(2)=** -0.471	**K factor**=** 2.523	**TL(2)=** 0.739	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.2	-1.609
4/22/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/8/2003	0.005	-5.298
10/6/2003	0.005	-5.298

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.2	-1.609
4/23/2002	0.2	-1.609
7/16/2002	0.2	-1.609
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/7/2003	0.005	-5.298

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.003	N/A	-5.809	N/A
MW360	Downgradient	Yes	0.00114	N/A	-6.777	NO
MW363	Downgradient	No	0.003	N/A	-5.809	N/A
MW366	Downgradient	No	0.003	N/A	-5.809	N/A
MW369	Upgradient	No	0.003	N/A	-5.809	N/A
MW372	Upgradient	No	0.003	N/A	-5.809	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Beta activity UNITS: pCi/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 15.996	**S=** 11.899	**CV(1)=** 0.744	**K factor**=** 2.523	**TL(1)=** 46.017	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.497	**S=** 0.783	**CV(2)=** 0.314	**K factor**=** 2.523	**TL(2)=** 4.473	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	32.5	3.481
4/22/2002	35.4	3.567
7/15/2002	12.9	2.557
10/8/2002	7.59	2.027
1/8/2003	9.58	2.260
4/3/2003	6.69	1.901
7/8/2003	9.1	2.208
10/6/2003	7.31	1.989

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	28.5	3.350
4/23/2002	5.37	1.681
7/16/2002	19.9	2.991
10/8/2002	38.7	3.656
1/7/2003	13	2.565
4/2/2003	3.94	1.371
7/9/2003	3.56	1.270
10/7/2003	21.9	3.086

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	45.5	N/A	3.818	N/A
MW360	Downgradient	Yes	13.9	N/A	2.632	N/A
MW363	Downgradient	No	-0.878	N/A	#Error	N/A
MW366	Downgradient	Yes	42	N/A	3.738	N/A
MW369	Upgradient	Yes	120	YES	4.787	N/A
MW372	Upgradient	Yes	141	YES	4.949	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW369
MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Boron **UNITS: mg/L** **URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.985	**S=** 0.825	**CV(1)=** 0.838	**K factor**=** 2.523	**TL(1)=** 3.067	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.430	**S=** 0.990	**CV(2)=** -2.302	**K factor**=** 2.523	**TL(2)=** 2.068	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/8/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.492	-0.709
1/7/2003	0.492	-0.709
4/2/2003	0.6	-0.511
7/9/2003	0.57	-0.562
10/7/2003	0.604	-0.504

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.377	NO	-0.976	N/A
MW360	Downgradient	Yes	0.0183	NO	-4.001	N/A
MW363	Downgradient	Yes	0.0196	NO	-3.932	N/A
MW366	Downgradient	Yes	0.191	NO	-1.655	N/A
MW369	Upgradient	Yes	0.0168	NO	-4.086	N/A
MW372	Upgradient	Yes	0.889	NO	-0.118	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Bromide UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 1.000	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.000	**S=** 0.000	**CV(2)=** #Num!	**K factor**=** 2.523	**TL(2)=** 0.000	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/8/2003	1	0.000
10/6/2003	1	0.000

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.388	NO	-0.947	N/A
MW360	Downgradient	Yes	0.137	NO	-1.988	N/A
MW363	Downgradient	No	0.2	N/A	-1.609	N/A
MW366	Downgradient	Yes	0.477	NO	-0.740	N/A
MW369	Upgradient	Yes	0.366	NO	-1.005	N/A
MW372	Upgradient	Yes	0.576	NO	-0.552	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 32.763	**S=** 9.391	**CV(1)=** 0.287	**K factor**=** 2.523	**TL(1)=** 56.456	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.449	**S=** 0.299	**CV(2)=** 0.087	**K factor**=** 2.523	**TL(2)=** 4.202	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	29.5	3.384
4/22/2002	29.8	3.395
7/15/2002	25.3	3.231
10/8/2002	21.9	3.086
1/8/2003	20.9	3.040
4/3/2003	22.2	3.100
7/8/2003	22.9	3.131
10/6/2003	21.7	3.077

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	41.5	3.726
4/23/2002	43.6	3.775
7/16/2002	40.4	3.699
10/8/2002	38.8	3.658
1/7/2003	41.1	3.716
4/2/2003	42.9	3.759
7/9/2003	35.1	3.558
10/7/2003	46.6	3.842

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	27	NO	3.296	N/A
MW360	Downgradient	Yes	19	NO	2.944	N/A
MW363	Downgradient	Yes	26.5	NO	3.277	N/A
MW366	Downgradient	Yes	33.4	NO	3.509	N/A
MW369	Upgradient	Yes	17.7	NO	2.874	N/A
MW372	Upgradient	Yes	49.7	NO	3.906	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chemical Oxygen Demand (COD) UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 35.938	**S=** 3.750	**CV(1)=** 0.104	**K factor**=** 2.523	**TL(1)=** 45.399	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.578	**S=** 0.089	**CV(2)=** 0.025	**K factor**=** 2.523	**TL(2)=** 3.803	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	50	3.912
1/8/2003	35	3.555
4/3/2003	35	3.555
7/8/2003	35	3.555
10/6/2003	35	3.555

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	35	3.555
4/23/2002	35	3.555
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	20	N/A	2.996	N/A
MW360	Downgradient	No	20	N/A	2.996	N/A
MW363	Downgradient	Yes	21.1	NO	3.049	N/A
MW366	Downgradient	Yes	14.2	NO	2.653	N/A
MW369	Upgradient	No	20	N/A	2.996	N/A
MW372	Upgradient	Yes	69.4	YES	4.240	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 44.119	**S=** 4.554	**CV(1)=** 0.103	**K factor**=** 2.523	**TL(1)=** 55.607	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.782	**S=** 0.099	**CV(2)=** 0.026	**K factor**=** 2.523	**TL(2)=** 4.033	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/15/2002	48.3	3.877
10/8/2002	47.7	3.865
1/8/2003	45.7	3.822
4/3/2003	47.4	3.859
7/8/2003	55.9	4.024
10/6/2003	47.4	3.859
1/7/2004	45.5	3.818
4/7/2004	43.4	3.770

Well Number: MW372

Date Collected	Result	LN(Result)
7/16/2002	39.8	3.684
10/8/2002	41	3.714
1/7/2003	39.4	3.674
4/2/2003	39.2	3.669
7/9/2003	39.8	3.684
10/7/2003	40	3.689
1/5/2004	43.4	3.770
4/5/2004	42	3.738

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	32.4	NO	3.478	N/A
MW360	Downgradient	Yes	8.64	NO	2.156	N/A
MW363	Downgradient	Yes	19.2	NO	2.955	N/A
MW366	Downgradient	Yes	38.6	NO	3.653	N/A
MW369	Upgradient	Yes	31.6	NO	3.453	N/A
MW372	Upgradient	Yes	44.8	NO	3.802	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.021	**CV(1)=** 0.845	**K factor**=** 2.523	**TL(1)=** 0.077	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.090	**S=** 1.006	**CV(2)=** -0.246	**K factor**=** 2.523	**TL(2)=** -1.553	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.00938	-4.669
1/8/2003	0.00548	-5.207
4/3/2003	0.00587	-5.138
7/8/2003	0.0541	-2.917
10/6/2003	0.0689	-2.675

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.00158	-6.450
1/7/2003	0.0147	-4.220
4/2/2003	0.0116	-4.457
7/9/2003	0.0653	-2.729
10/7/2003	0.00788	-4.843

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.001	N/A	-6.908	N/A
MW360	Downgradient	Yes	0.00286	NO	-5.857	N/A
MW363	Downgradient	Yes	0.0011	NO	-6.812	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00539	NO	-5.223	N/A
MW372	Upgradient	No	0.001	N/A	-6.908	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 482.856	**S=** 57.603	**CV(1)=** 0.119	**K factor**=** 2.523	**TL(1)=** 628.189	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 6.173	**S=** 0.123	**CV(2)=** 0.020	**K factor**=** 2.523	**TL(2)=** 6.484	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	388	5.961
4/22/2002	404	6.001
7/15/2002	394	5.976
10/8/2002	403	5.999
1/8/2003	520	6.254
4/3/2003	487	6.188
7/8/2003	478	6.170
10/6/2003	476	6.165

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	508	6.230
4/23/2002	501	6.217
7/16/2002	507	6.229
10/8/2002	495	6.205
1/7/2003	508.7	6.232
4/2/2003	515	6.244
7/9/2003	576	6.356
10/7/2003	565	6.337

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	427	NO	6.057	N/A
MW360	Downgradient	Yes	402	NO	5.996	N/A
MW363	Downgradient	Yes	412	NO	6.021	N/A
MW366	Downgradient	Yes	471	NO	6.155	N/A
MW369	Upgradient	Yes	373	NO	5.922	N/A
MW372	Upgradient	Yes	640	YES	6.461	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.010	**CV(1)=** 0.400	**K factor**=** 2.523	**TL(1)=** 0.050	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.742	**S=** 0.307	**CV(2)=** -0.082	**K factor**=** 2.523	**TL(2)=** -2.967	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00057	NO	-7.470	N/A
MW360	Downgradient	Yes	0.0008	NO	-7.131	N/A
MW363	Downgradient	Yes	0.00033	NO	-8.016	N/A
MW366	Downgradient	Yes	0.00046	NO	-7.684	N/A
MW369	Upgradient	Yes	0.00121	NO	-6.717	N/A
MW372	Upgradient	Yes	0.00064	NO	-7.354	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.781	**S=** 1.351	**CV(1)=** 0.759	**K factor**=** 2.523	**TL(1)=** 5.190	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.228	**S=** 1.065	**CV(2)=** 4.665	**K factor**=** 2.523	**TL(2)=** 2.915	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5.41	1.688
4/22/2002	1.57	0.451
7/15/2002	0.8	-0.223
10/8/2002	1.09	0.086
1/8/2003	2.69	0.990
4/3/2003	2.04	0.713
7/8/2003	1.19	0.174
10/6/2003	1.78	0.577

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.89	1.358
4/23/2002	0.05	-2.996
7/16/2002	1.33	0.285
10/8/2002	2.66	0.978
1/7/2003	0.4	-0.916
4/2/2003	0.91	-0.094
7/9/2003	1.42	0.351
10/7/2003	1.26	0.231

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.72	NO	1.552	N/A
MW360	Downgradient	Yes	1.51	NO	0.412	N/A
MW363	Downgradient	Yes	0.78	NO	-0.248	N/A
MW366	Downgradient	Yes	2.99	NO	1.095	N/A
MW369	Upgradient	Yes	3.09	NO	1.128	N/A
MW372	Upgradient	Yes	3.63	NO	1.289	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 285.188	**S=** 44.908	**CV(1)=** 0.157	**K factor**=** 2.523	**TL(1)=** 398.489	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 5.640	**S=** 0.175	**CV(2)=** 0.031	**K factor**=** 2.523	**TL(2)=** 6.080	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	173	5.153
4/22/2002	246	5.505
7/15/2002	232	5.447
10/8/2002	275	5.617
1/8/2003	269	5.595
4/3/2003	250	5.521
7/8/2003	295	5.687
10/6/2003	276	5.620

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	295	5.687
4/23/2002	322	5.775
7/16/2002	329	5.796
10/8/2002	290	5.670
1/7/2003	316	5.756
4/2/2003	311	5.740
7/9/2003	347	5.849
10/7/2003	337	5.820

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	231	NO	5.442	N/A
MW360	Downgradient	Yes	210	NO	5.347	N/A
MW363	Downgradient	Yes	283	NO	5.645	N/A
MW366	Downgradient	Yes	273	NO	5.609	N/A
MW369	Upgradient	Yes	194	NO	5.268	N/A
MW372	Upgradient	Yes	616	YES	6.423	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 7.385	**S=** 6.991	**CV(1)=** 0.947	**K factor**=** 2.523	**TL(1)=** 25.024	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.358	**S=** 1.323	**CV(2)=** 0.974	**K factor**=** 2.523	**TL(2)=** 4.697	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	0.656	-0.422
4/22/2002	0.695	-0.364
7/15/2002	7.1	1.960
10/8/2002	21.5	3.068
1/8/2003	18.5	2.918
4/3/2003	14.9	2.701
7/8/2003	11.3	2.425
10/6/2003	14.9	2.701

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	5.95	1.783
4/23/2002	0.792	-0.233
7/16/2002	1.78	0.577
10/8/2002	0.776	-0.254
1/7/2003	3.55	1.267
4/2/2003	5.02	1.613
7/9/2003	10	2.303
10/7/2003	0.733	-0.311

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.1	N/A	-2.303	N/A
MW360	Downgradient	Yes	0.591	NO	-0.526	N/A
MW363	Downgradient	Yes	0.0549	NO	-2.902	N/A
MW366	Downgradient	Yes	0.0508	NO	-2.980	N/A
MW369	Upgradient	Yes	0.136	NO	-1.995	N/A
MW372	Upgradient	Yes	0.0634	NO	-2.758	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 12.864	**S=** 3.505	**CV(1)=** 0.272	**K factor**=** 2.523	**TL(1)=** 21.707	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.517	**S=** 0.290	**CV(2)=** 0.115	**K factor**=** 2.523	**TL(2)=** 3.248	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	11.4	2.434
4/22/2002	12	2.485
7/15/2002	10	2.303
10/8/2002	8.62	2.154
1/8/2003	7.89	2.066
4/3/2003	7.97	2.076
7/8/2003	10.3	2.332
10/6/2003	9.14	2.213

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	15.7	2.754
4/23/2002	16.6	2.809
7/16/2002	15.4	2.734
10/8/2002	15.8	2.760
1/7/2003	15.8	2.760
4/2/2003	16.4	2.797
7/9/2003	15.2	2.721
10/7/2003	17.6	2.868

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	11.7	NO	2.460	N/A
MW360	Downgradient	Yes	7.94	NO	2.072	N/A
MW363	Downgradient	Yes	10.5	NO	2.351	N/A
MW366	Downgradient	Yes	14.2	NO	2.653	N/A
MW369	Upgradient	Yes	7.51	NO	2.016	N/A
MW372	Upgradient	Yes	19.2	NO	2.955	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.413	**S=** 0.274	**CV(1)=** 0.664	**K factor**=** 2.523	**TL(1)=** 1.105	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.226	**S=** 1.008	**CV(2)=** -0.822	**K factor**=** 2.523	**TL(2)=** 1.317	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.034	-3.381
4/22/2002	0.062	-2.781
7/15/2002	0.436	-0.830
10/8/2002	0.867	-0.143
1/8/2003	0.828	-0.189
4/3/2003	0.672	-0.397
7/8/2003	0.321	-1.136
10/6/2003	0.714	-0.337

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.205	-1.585
4/23/2002	0.345	-1.064
7/16/2002	0.21	-1.561
10/8/2002	0.0539	-2.921
1/7/2003	0.537	-0.622
4/2/2003	0.415	-0.879
7/9/2003	0.654	-0.425
10/7/2003	0.254	-1.370

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00263	NO	-5.941	N/A
MW360	Downgradient	Yes	0.0395	NO	-3.231	N/A
MW363	Downgradient	Yes	0.25	NO	-1.386	N/A
MW366	Downgradient	Yes	0.00412	NO	-5.492	N/A
MW369	Upgradient	Yes	0.00693	NO	-4.972	N/A
MW372	Upgradient	Yes	0.00159	NO	-6.444	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.024	**S=** 0.021	**CV(1)=** 0.910	**K factor**=** 2.523	**TL(1)=** 0.078	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.246	**S=** 1.075	**CV(2)=** -0.253	**K factor**=** 2.523	**TL(2)=** -1.535	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/22/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/8/2003	0.013	-4.343
10/6/2003	0.0104	-4.566

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.019	-3.963
10/7/2003	0.005	-5.298

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.002	N/A	-6.215	N/A
MW360	Downgradient	Yes	0.00118	NO	-6.742	N/A
MW363	Downgradient	Yes	0.0071	NO	-4.948	N/A
MW366	Downgradient	No	0.002	N/A	-6.215	N/A
MW369	Upgradient	Yes	0.00474	NO	-5.352	N/A
MW372	Upgradient	Yes	0.00064	NO	-7.354	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 74.563	**S=** 94.243	**CV(1)=** 1.264	**K factor**=** 2.523	**TL(1)=** 312.337	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 4.554	**S=** 0.784	**CV(2)=** 0.172	**K factor**=** 2.523	**TL(2)=** 5.371	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	215	5.371
4/22/2002	110	4.700
7/15/2002	20	2.996
1/8/2003	-5	#Func!
4/3/2003	-18	#Func!
7/8/2003	-67	#Func!
10/6/2003	-1	#Func!
1/7/2004	55	4.007

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	210	5.347
4/23/2002	65	4.174
7/16/2002	215	5.371
10/8/2002	185	5.220
1/7/2003	45	3.807
4/2/2003	65	4.174
7/9/2003	-39	#Func!
10/7/2003	138	4.927

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	413	N/A	6.023	YES
MW360	Downgradient	Yes	423	N/A	6.047	YES
MW363	Downgradient	Yes	365	N/A	5.900	YES
MW366	Downgradient	Yes	390	N/A	5.966	YES
MW369	Upgradient	Yes	410	N/A	6.016	YES
MW372	Upgradient	Yes	390	N/A	5.966	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW357
MW360
MW363
MW366
MW369
MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 6.274 **S=** 0.194 **CV(1)=** 0.031 **K factor**=** 2.904 **TL(1)=** 6.837 **LL(1)=**5.7114

Statistics-Transformed Background Data **X=** 1.836 **S=** 0.031 **CV(2)=** 0.017 **K factor**=** 2.904 **TL(2)=** 1.925 **LL(2)=**1.7467

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	6.1	1.808
4/22/2002	6.1	1.808
7/15/2002	6.1	1.808
10/8/2002	6.5	1.872
1/8/2003	6.5	1.872
4/3/2003	6.6	1.887
7/8/2003	6.5	1.872
10/6/2003	6.5	1.872

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	6.1	1.808
4/23/2002	6.12	1.812
7/16/2002	6.1	1.808
10/8/2002	6.06	1.802
1/7/2003	6.26	1.834
4/2/2003	6.15	1.816
7/9/2003	6.3	1.841
10/7/2003	6.4	1.856

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW357	Downgradient	Yes	6.1	NO	1.808	N/A
MW360	Downgradient	Yes	6.16	NO	1.818	N/A
MW363	Downgradient	Yes	6.07	NO	1.803	N/A
MW366	Downgradient	Yes	6.03	NO	1.797	N/A
MW369	Upgradient	Yes	6.25	NO	1.833	N/A
MW372	Upgradient	Yes	6.08	NO	1.805	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.663	**S=** 0.488	**CV(1)=** 0.293	**K factor**=** 2.523	**TL(1)=** 2.895	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.456	**S=** 0.362	**CV(2)=** 0.794	**K factor**=** 2.523	**TL(2)=** 1.368	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2.21	0.793
7/15/2002	2	0.693
10/8/2002	0.966	-0.035
1/8/2003	0.727	-0.319
4/3/2003	0.8	-0.223
7/8/2003	1.62	0.482
10/6/2003	1.14	0.131

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.04	0.713
4/23/2002	2.03	0.708
7/16/2002	2	0.693
10/8/2002	1.54	0.432
1/7/2003	1.88	0.631
4/2/2003	2.09	0.737
7/9/2003	1.78	0.577
10/7/2003	1.79	0.582

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.57	NO	0.451	N/A
MW360	Downgradient	Yes	0.632	NO	-0.459	N/A
MW363	Downgradient	Yes	1.39	NO	0.329	N/A
MW366	Downgradient	Yes	1.76	NO	0.565	N/A
MW369	Upgradient	Yes	0.57	NO	-0.562	N/A
MW372	Upgradient	Yes	1.95	NO	0.668	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.100	**S=** 11.875	**CV(1)=** 0.263	**K factor**=** 2.523	**TL(1)=** 75.061	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.780	**S=** 0.242	**CV(2)=** 0.064	**K factor**=** 2.523	**TL(2)=** 4.390	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	35.7	3.575
4/22/2002	37.6	3.627
7/15/2002	42.4	3.747
10/8/2002	66.9	4.203
1/8/2003	67.9	4.218
4/3/2003	61.8	4.124
7/8/2003	45.6	3.820
10/6/2003	59.1	4.079

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	37.2	3.616
4/23/2002	38.6	3.653
7/16/2002	35.6	3.572
10/8/2002	37.5	3.624
1/7/2003	34.1	3.529
4/2/2003	34.4	3.538
7/9/2003	44.1	3.786
10/7/2003	43.1	3.764

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	42.4	NO	3.747	N/A
MW360	Downgradient	Yes	58.4	NO	4.067	N/A
MW363	Downgradient	Yes	42.5	NO	3.750	N/A
MW366	Downgradient	Yes	45.8	NO	3.824	N/A
MW369	Upgradient	Yes	49.3	NO	3.898	N/A
MW372	Upgradient	Yes	54.4	NO	3.996	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.031	**S=** 33.919	**CV(1)=** 0.753	**K factor**=** 2.523	**TL(1)=** 130.609	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.420	**S=** 0.981	**CV(2)=** 0.287	**K factor**=** 2.523	**TL(2)=** 5.894	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	15.5	2.741
4/22/2002	15.8	2.760
7/15/2002	13.8	2.625
10/8/2002	6.9	1.932
1/8/2003	10.5	2.351
4/3/2003	10.5	2.351
7/8/2003	10.9	2.389
10/6/2003	16.3	2.791

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	71.7	4.272
4/23/2002	74.7	4.313
7/16/2002	74.1	4.305
10/8/2002	70.5	4.256
1/7/2003	75.8	4.328
4/2/2003	81.8	4.404
7/9/2003	83.6	4.426
10/7/2003	88.1	4.478

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	44.7	NO	3.800	N/A
MW360	Downgradient	Yes	9.94	NO	2.297	N/A
MW363	Downgradient	Yes	36.7	NO	3.603	N/A
MW366	Downgradient	Yes	53.1	NO	3.972	N/A
MW369	Upgradient	Yes	8.91	NO	2.187	N/A
MW372	Upgradient	Yes	70.5	NO	4.256	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Technetium-99 UNITS: pCi/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 20.821	**S=** 18.044	**CV(1)=** 0.867	**K factor**=** 2.523	**TL(1)=** 66.344	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.770	**S=** 1.150	**CV(2)=** 0.415	**K factor**=** 2.523	**TL(2)=** 3.972	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	41.7	3.731
4/22/2002	53.1	3.972
7/15/2002	18.1	2.896
10/8/2002	16.4	2.797
1/8/2003	3.49	1.250
4/3/2003	9.34	2.234
7/8/2003	17.5	2.862
10/6/2003	17	2.833

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	44.8	3.802
4/23/2002	0.802	-0.221
7/16/2002	19.8	2.986
10/8/2002	46.1	3.831
1/7/2003	-0.973	#Func!
4/2/2003	9.07	2.205
7/9/2003	0	#Func!
10/7/2003	36.9	3.608

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	30.5	NO	3.418	N/A
MW360	Downgradient	No	8.71	N/A	2.164	N/A
MW363	Downgradient	No	5.08	N/A	1.625	N/A
MW366	Downgradient	Yes	43.8	NO	3.780	N/A
MW369	Upgradient	Yes	55.8	NO	4.022	N/A
MW372	Upgradient	Yes	183	YES	5.209	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 3.513	**S=** 4.307	**CV(1)=** 1.226	**K factor**=** 2.523	**TL(1)=** 14.378	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.851	**S=** 0.828	**CV(2)=** 0.973	**K factor**=** 2.523	**TL(2)=** 2.940	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.7	0.531
4/22/2002	1.6	0.470
7/15/2002	3.1	1.131
10/8/2002	17.7	2.874
1/8/2003	9	2.197
4/3/2003	4	1.386
7/8/2003	4.9	1.589
10/6/2003	2.4	0.875

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1.2	0.182
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1.6	0.470
4/2/2003	1.5	0.405
7/9/2003	3	1.099
10/7/2003	1.5	0.405

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.902	N/A	-0.103	NO
MW360	Downgradient	Yes	1.29	N/A	0.255	NO
MW363	Downgradient	Yes	1.2	N/A	0.182	NO
MW366	Downgradient	Yes	0.849	N/A	-0.164	NO
MW369	Upgradient	Yes	1.11	N/A	0.104	NO
MW372	Upgradient	Yes	1.27	N/A	0.239	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 67.963	**S=** 64.316	**CV(1)=** 0.946	**K factor**=** 2.523	**TL(1)=** 230.231	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.772	**S=** 1.023	**CV(2)=** 0.271	**K factor**=** 2.523	**TL(2)=** 6.353	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/22/2002	50	3.912
7/15/2002	81	4.394
10/8/2002	202	5.308
1/8/2003	177	5.176
4/3/2003	93.1	4.534
7/8/2003	17.5	2.862
10/6/2003	37.5	3.624

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	184	5.215
4/23/2002	50	3.912
7/16/2002	50	3.912
10/8/2002	50	3.912
1/7/2003	10	2.303
4/2/2003	12.7	2.542
7/9/2003	10	2.303
10/7/2003	12.6	2.534

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	6.54	NO	1.878	N/A
MW360	Downgradient	Yes	6.54	NO	1.878	N/A
MW363	Downgradient	No	8.44	N/A	2.133	N/A
MW366	Downgradient	No	5.9	N/A	1.775	N/A
MW369	Upgradient	Yes	9.2	NO	2.219	N/A
MW372	Upgradient	Yes	8.28	NO	2.114	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Vanadium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.024	**S=** 0.006	**CV(1)=** 0.259	**K factor**=** 2.523	**TL(1)=** 0.039	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.771	**S=** 0.223	**CV(2)=** -0.059	**K factor**=** 2.523	**TL(2)=** -3.208	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.027	-3.612
7/15/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.039	-3.244
4/23/2002	0.037	-3.297
7/16/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.02	N/A	-3.912	N/A
MW360	Downgradient	Yes	0.00359	NO	-5.630	N/A
MW363	Downgradient	No	0.02	N/A	-3.912	N/A
MW366	Downgradient	No	0.02	N/A	-3.912	N/A
MW369	Upgradient	No	0.02	N/A	-3.912	N/A
MW372	Upgradient	No	0.02	N/A	-3.912	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 2.026	**S=** 5.626	**CV(1)=** 2.777	**K factor**=** 2.523	**TL(1)=** 16.219	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.803	**S=** 1.380	**CV(2)=** -1.718	**K factor**=** 2.523	**TL(2)=** 2.678	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	4.66	1.539
4/23/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	22.7	3.122
4/23/2002	1.46	0.378
7/16/2002	0.253	-1.374
10/8/2002	0.482	-0.730
1/7/2003	0.608	-0.498
4/2/2003	0.446	-0.807
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0207	N/A	-3.878	NO
MW361	Downgradient	No	0.05	N/A	-2.996	N/A
MW364	Downgradient	No	0.05	N/A	-2.996	N/A
MW367	Downgradient	No	0.05	N/A	-2.996	N/A
MW370	Upgradient	No	0.05	N/A	-2.996	N/A
MW373	Upgradient	No	0.05	N/A	-2.996	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Antimony UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.078	**S=** 0.098	**CV(1)=** 1.248	**K factor**=** 2.523	**TL(1)=** 0.324	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.915	**S=** 1.844	**CV(2)=** -0.471	**K factor**=** 2.523	**TL(2)=** 0.739	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.2	-1.609
4/23/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/6/2003	0.005	-5.298

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.2	-1.609
4/23/2002	0.2	-1.609
7/16/2002	0.2	-1.609
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/7/2003	0.005	-5.298

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	0.003	N/A	-5.809	N/A
MW361	Downgradient	Yes	0.00109	N/A	-6.822	NO
MW364	Downgradient	No	0.003	N/A	-5.809	N/A
MW367	Downgradient	No	0.003	N/A	-5.809	N/A
MW370	Upgradient	No	0.003	N/A	-5.809	N/A
MW373	Upgradient	No	0.003	N/A	-5.809	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Beta activity UNITS: pCi/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 9.815	**S=** 7.838	**CV(1)=** 0.799	**K factor**=** 2.523	**TL(1)=** 29.591	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.072	**S=** 0.630	**CV(2)=** 0.304	**K factor**=** 2.523	**TL(2)=** 3.662	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.1	2.313
4/23/2002	4.46	1.495
7/15/2002	6.58	1.884
10/8/2002	4.9	1.589
1/8/2003	4.47	1.497
4/3/2003	8.65	2.158
7/9/2003	3.66	1.297
10/6/2003	5.38	1.683

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	15.1	2.715
4/23/2002	6.26	1.834
7/16/2002	6.22	1.828
10/8/2002	4.06	1.401
1/7/2003	11.2	2.416
4/2/2003	18.5	2.918
7/9/2003	13.3	2.588
10/7/2003	34.2	3.532

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	37.6	N/A	3.627	N/A
MW361	Downgradient	Yes	44.1	N/A	3.786	N/A
MW364	Downgradient	Yes	34.8	N/A	3.550	N/A
MW367	Downgradient	No	9.55	N/A	2.257	N/A
MW370	Upgradient	Yes	52.7	YES	3.965	N/A
MW373	Upgradient	Yes	21.9	N/A	3.086	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW370

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Boron UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.140	**S=** 0.780	**CV(1)=** 0.684	**K factor**=** 2.523	**TL(1)=** 3.108	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.235	**S=** 1.006	**CV(2)=** -4.287	**K factor**=** 2.523	**TL(2)=** 2.303	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2	0.693
4/23/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.79	-0.236
1/7/2003	0.807	-0.214
4/2/2003	1.13	0.122
7/9/2003	1.28	0.247
10/7/2003	1.24	0.215

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.474	NO	-0.747	N/A
MW361	Downgradient	Yes	0.162	NO	-1.820	N/A
MW364	Downgradient	Yes	0.0168	NO	-4.086	N/A
MW367	Downgradient	Yes	0.0538	NO	-2.922	N/A
MW370	Upgradient	Yes	0.0299	NO	-3.510	N/A
MW373	Upgradient	Yes	1.52	NO	0.419	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Bromide UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 1.000	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.000	**S=** 0.000	**CV(2)=** #Num!	**K factor**=** 2.523	**TL(2)=** 0.000	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1	0.000
4/23/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/9/2003	1	0.000
10/6/2003	1	0.000

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.473	NO	-0.749	N/A
MW361	Downgradient	Yes	0.446	NO	-0.807	N/A
MW364	Downgradient	Yes	0.439	NO	-0.823	N/A
MW367	Downgradient	Yes	0.445	NO	-0.810	N/A
MW370	Upgradient	Yes	0.394	NO	-0.931	N/A
MW373	Upgradient	Yes	0.532	NO	-0.631	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 43.413	**S=** 13.444	**CV(1)=** 0.310	**K factor**=** 2.523	**TL(1)=** 77.331	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.723	**S=** 0.323	**CV(2)=** 0.087	**K factor**=** 2.523	**TL(2)=** 4.539	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	34.8	3.550
4/23/2002	43.4	3.770
7/15/2002	33.2	3.503
10/8/2002	29.2	3.374
1/8/2003	31.3	3.444
4/3/2003	32.4	3.478
7/9/2003	22.9	3.131
10/6/2003	28	3.332

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	61.9	4.126
4/23/2002	59.2	4.081
7/16/2002	47.6	3.863
10/8/2002	46.1	3.831
1/7/2003	49.2	3.896
4/2/2003	57.8	4.057
7/9/2003	52.7	3.965
10/7/2003	64.9	4.173

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	33.5	NO	3.512	N/A
MW361	Downgradient	Yes	32	NO	3.466	N/A
MW364	Downgradient	Yes	32	NO	3.466	N/A
MW367	Downgradient	Yes	25.9	NO	3.254	N/A
MW370	Upgradient	Yes	27.7	NO	3.321	N/A
MW373	Upgradient	Yes	67.9	NO	4.218	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chemical Oxygen Demand (COD) UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 41.938	**S=** 24.732	**CV(1)=** 0.590	**K factor**=** 2.523	**TL(1)=** 104.336	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.658	**S=** 0.339	**CV(2)=** 0.093	**K factor**=** 2.523	**TL(2)=** 4.512	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	35	3.555
4/23/2002	134	4.898
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/23/2002	47	3.850
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	10.8	NO	2.380	N/A
MW361	Downgradient	Yes	31.5	NO	3.450	N/A
MW364	Downgradient	Yes	28	NO	3.332	N/A
MW367	Downgradient	No	20	N/A	2.996	N/A
MW370	Upgradient	Yes	36.7	NO	3.603	N/A
MW373	Upgradient	Yes	107	YES	4.673	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.919	**S=** 7.524	**CV(1)=** 0.164	**K factor**=** 2.523	**TL(1)=** 64.901	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.814	**S=** 0.165	**CV(2)=** 0.043	**K factor**=** 2.523	**TL(2)=** 4.231	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/15/2002	55.5	4.016
10/8/2002	53.6	3.982
1/8/2003	52.9	3.968
4/3/2003	53.6	3.982
7/9/2003	51.9	3.949
10/6/2003	53	3.970
1/7/2004	53	3.970
4/7/2004	51.6	3.944

Well Number: MW373

Date Collected	Result	LN(Result)
7/16/2002	40.6	3.704
10/8/2002	38.8	3.658
1/7/2003	39	3.664
4/2/2003	38.4	3.648
7/9/2003	38.1	3.640
10/7/2003	38	3.638
1/6/2004	37.9	3.635
4/7/2004	38.8	3.658

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	36	NO	3.584	N/A
MW361	Downgradient	Yes	32.3	NO	3.475	N/A
MW364	Downgradient	Yes	33	NO	3.497	N/A
MW367	Downgradient	Yes	33.8	NO	3.520	N/A
MW370	Upgradient	Yes	34.2	NO	3.532	N/A
MW373	Upgradient	Yes	40.5	NO	3.701	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.027	**S=** 0.032	**CV(1)=** 1.165	**K factor**=** 2.523	**TL(1)=** 0.108	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.058	**S=** 1.011	**CV(2)=** -0.249	**K factor**=** 2.523	**TL(2)=** -1.507	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.0174	-4.051
1/8/2003	0.0105	-4.556
4/3/2003	0.00931	-4.677
7/9/2003	0.137	-1.988
10/6/2003	0.0463	-3.073

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.034	-3.381
7/16/2002	0.025	-3.689
10/8/2002	0.00411	-5.494
1/7/2003	0.00344	-5.672
4/2/2003	0.00368	-5.605
7/9/2003	0.0405	-3.206
10/7/2003	0.00843	-4.776

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0019	N/A	-6.266	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	No	0.001	N/A	-6.908	N/A
MW367	Downgradient	Yes	0.00726	N/A	-4.925	NO
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	Yes	0.00097	N/A	-6.938	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 608.719 **S=** 156.157 **CV(1)=** 0.257 **K factor**=** 2.523 **TL(1)=** 1002.702 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.380 **S=** 0.260 **CV(2)=** 0.041 **K factor**=** 2.523 **TL(2)=** 7.036 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	406	6.006
4/23/2002	543	6.297
7/15/2002	476	6.165
10/8/2002	441	6.089
1/8/2003	486	6.186
4/3/2003	466	6.144
7/9/2003	479	6.172
10/6/2003	435	6.075

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	661	6.494
4/23/2002	801	6.686
7/16/2002	774	6.652
10/8/2002	680	6.522
1/7/2003	686.5	6.532
4/2/2003	763	6.637
7/9/2003	828	6.719
10/7/2003	814	6.702

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	505	NO	6.225	N/A
MW361	Downgradient	Yes	492	NO	6.198	N/A
MW364	Downgradient	Yes	485	NO	6.184	N/A
MW367	Downgradient	Yes	400	NO	5.991	N/A
MW370	Upgradient	Yes	421	NO	6.043	N/A
MW373	Upgradient	Yes	785	NO	6.666	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.010	**CV(1)=** 0.399	**K factor**=** 2.523	**TL(1)=** 0.050	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.739	**S=** 0.308	**CV(2)=** -0.082	**K factor**=** 2.523	**TL(2)=** -2.963	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.026	-3.650
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00045	NO	-7.706	N/A
MW361	Downgradient	Yes	0.00052	NO	-7.562	N/A
MW364	Downgradient	Yes	0.00043	NO	-7.752	N/A
MW367	Downgradient	Yes	0.00059	NO	-7.435	N/A
MW370	Upgradient	Yes	0.0005	NO	-7.601	N/A
MW373	Upgradient	Yes	0.00065	NO	-7.339	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.387	**S=** 1.153	**CV(1)=** 0.831	**K factor**=** 2.523	**TL(1)=** 4.295	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.115	**S=** 1.207	**CV(2)=** -10.514	**K factor**=** 2.523	**TL(2)=** 2.930	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	4.32	1.463
4/23/2002	1.24	0.215
7/15/2002	0.75	-0.288
10/8/2002	0.94	-0.062
1/8/2003	3.08	1.125
4/3/2003	1.45	0.372
7/9/2003	1.22	0.199
10/6/2003	1.07	0.068

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.04	1.112
4/23/2002	0.03	-3.507
7/16/2002	0.23	-1.470
10/8/2002	0.86	-0.151
1/7/2003	0.21	-1.561
4/2/2003	1.19	0.174
7/9/2003	1.1	0.095
10/7/2003	1.46	0.378

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.01	NO	0.698	N/A
MW361	Downgradient	Yes	2.89	NO	1.061	N/A
MW364	Downgradient	Yes	3.23	NO	1.172	N/A
MW367	Downgradient	Yes	2.23	NO	0.802	N/A
MW370	Upgradient	Yes	4.09	NO	1.409	N/A
MW373	Upgradient	Yes	2.36	NO	0.859	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 356.188 **S=** 106.752 **CV(1)=** 0.300 **K factor**=** 2.523 **TL(1)=** 625.523 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.831 **S=** 0.311 **CV(2)=** 0.053 **K factor**=** 2.523 **TL(2)=** 6.616 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	236	5.464
4/23/2002	337	5.820
7/15/2002	266	5.583
10/8/2002	240	5.481
1/8/2003	282	5.642
4/3/2003	238	5.472
7/9/2003	248	5.513
10/6/2003	224	5.412

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	427	6.057
4/23/2002	507	6.229
7/16/2002	464	6.140
10/8/2002	408	6.011
1/7/2003	404	6.001
4/2/2003	450	6.109
7/9/2003	487	6.188
10/7/2003	481	6.176

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	321	NO	5.771	N/A
MW361	Downgradient	Yes	364	NO	5.897	N/A
MW364	Downgradient	Yes	274	NO	5.613	N/A
MW367	Downgradient	Yes	234	NO	5.455	N/A
MW370	Upgradient	Yes	241	NO	5.485	N/A
MW373	Upgradient	Yes	481	NO	6.176	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 9.230	**S=** 8.841	**CV(1)=** 0.958	**K factor**=** 2.523	**TL(1)=** 31.535	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.942	**S=** 0.713	**CV(2)=** 0.367	**K factor**=** 2.523	**TL(2)=** 3.740	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	9.34	2.234
4/23/2002	4.33	1.466
7/15/2002	3.52	1.258
10/8/2002	7.45	2.008
1/8/2003	7.04	1.952
4/3/2003	4.64	1.535
7/9/2003	15.8	2.760
10/6/2003	6.49	1.870

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	37.6	3.627
4/23/2002	19	2.944
7/16/2002	10.7	2.370
10/8/2002	3.75	1.322
1/7/2003	3.87	1.353
4/2/2003	3.5	1.253
7/9/2003	7.72	2.044
10/7/2003	2.93	1.075

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.845	NO	-0.168	N/A
MW361	Downgradient	No	0.1	N/A	-2.303	N/A
MW364	Downgradient	Yes	0.0411	NO	-3.192	N/A
MW367	Downgradient	Yes	0.593	NO	-0.523	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	Yes	0.103	NO	-2.273	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 17.544	**S=** 5.911	**CV(1)=** 0.337	**K factor**=** 2.523	**TL(1)=** 32.458	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.810	**S=** 0.343	**CV(2)=** 0.122	**K factor**=** 2.523	**TL(2)=** 3.676	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	12.1	2.493
4/23/2002	15.1	2.715
7/15/2002	12.4	2.518
10/8/2002	12.2	2.501
1/8/2003	11.5	2.442
4/3/2003	12.3	2.510
7/9/2003	10	2.303
10/6/2003	12.1	2.493

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	24.8	3.211
4/23/2002	22.7	3.122
7/16/2002	18.8	2.934
10/8/2002	21.1	3.049
1/7/2003	19.9	2.991
4/2/2003	25.5	3.239
7/9/2003	23.3	3.148
10/7/2003	26.9	3.292

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	15.1	NO	2.715	N/A
MW361	Downgradient	Yes	13.8	NO	2.625	N/A
MW364	Downgradient	Yes	13.7	NO	2.617	N/A
MW367	Downgradient	Yes	12.2	NO	2.501	N/A
MW370	Upgradient	Yes	12.1	NO	2.493	N/A
MW373	Upgradient	Yes	27.2	NO	3.303	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.080	**S=** 0.674	**CV(1)=** 0.624	**K factor**=** 2.523	**TL(1)=** 2.780	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.114	**S=** 0.658	**CV(2)=** -5.762	**K factor**=** 2.523	**TL(2)=** 1.547	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.244	-1.411
4/23/2002	1.82	0.599
7/15/2002	1.22	0.199
10/8/2002	0.988	-0.012
1/8/2003	0.729	-0.316
4/3/2003	0.637	-0.451
7/9/2003	2.51	0.920
10/6/2003	1.05	0.049

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.355	-1.036
4/23/2002	2.16	0.770
7/16/2002	1.39	0.329
10/8/2002	0.717	-0.333
1/7/2003	0.587	-0.533
4/2/2003	0.545	-0.607
7/9/2003	1.76	0.565
10/7/2003	0.57	-0.562

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.173	NO	-1.754	N/A
MW361	Downgradient	Yes	0.00525	NO	-5.250	N/A
MW364	Downgradient	Yes	0.00521	NO	-5.257	N/A
MW367	Downgradient	Yes	1	NO	0.000	N/A
MW370	Upgradient	Yes	0.00111	NO	-6.803	N/A
MW373	Upgradient	Yes	0.0499	NO	-2.998	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.024	**S=** 0.022	**CV(1)=** 0.901	**K factor**=** 2.523	**TL(1)=** 0.078	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.239	**S=** 1.087	**CV(2)=** -0.256	**K factor**=** 2.523	**TL(2)=** -1.497	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.0264	-3.634
10/6/2003	0.00971	-4.635

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.0112	-4.492
10/7/2003	0.005	-5.298

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0041	NO	-5.497	N/A
MW361	Downgradient	No	0.002	N/A	-6.215	N/A
MW364	Downgradient	No	0.002	N/A	-6.215	N/A
MW367	Downgradient	Yes	0.00387	NO	-5.555	N/A
MW370	Upgradient	No	0.002	N/A	-6.215	N/A
MW373	Upgradient	Yes	0.00217	NO	-6.133	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 46.688	**S=** 60.986	**CV(1)=** 1.306	**K factor**=** 2.523	**TL(1)=** 200.555	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.829	**S=** 1.151	**CV(2)=** 0.301	**K factor**=** 2.523	**TL(2)=** 4.942	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	140	4.942
4/23/2002	-15	#Func!
7/15/2002	5	1.609
4/3/2003	49	3.892
7/9/2003	-35	#Func!
10/6/2003	40	3.689
1/7/2004	101	4.615
4/7/2004	105	4.654

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	140	4.942
4/23/2002	-20	#Func!
10/8/2002	10	2.303
1/7/2003	10	2.303
4/2/2003	67	4.205
7/9/2003	-29	#Func!
10/7/2003	127	4.844
1/6/2004	52	3.951

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	101	N/A	4.615	NO
MW361	Downgradient	Yes	412	N/A	6.021	YES
MW364	Downgradient	Yes	356	N/A	5.875	YES
MW367	Downgradient	Yes	312	N/A	5.743	YES
MW370	Upgradient	Yes	421	N/A	6.043	YES
MW373	Upgradient	Yes	417	N/A	6.033	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW361
MW364
MW367
MW370
MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 6.283 **S=** 0.159 **CV(1)=** 0.025 **K factor**=** 2.904 **TL(1)=** 6.745 **LL(1)=**5.8202

Statistics-Transformed Background Data **X=** 1.837 **S=** 0.025 **CV(2)=** 0.014 **K factor**=** 2.904 **TL(2)=** 1.911 **LL(2)=**1.7634

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	6.3	1.841
4/23/2002	6.4	1.856
7/15/2002	6.3	1.841
10/8/2002	6.3	1.841
1/8/2003	6.4	1.856
4/3/2003	6.5	1.872
7/9/2003	6.3	1.841
10/6/2003	6.5	1.872

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	6	1.792
4/23/2002	6.3	1.841
7/16/2002	6.45	1.864
10/8/2002	6.18	1.821
1/7/2003	6.35	1.848
4/2/2003	6.14	1.815
7/9/2003	6.1	1.808
10/7/2003	6	1.792

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	6.11	NO	1.810	N/A
MW361	Downgradient	Yes	6.02	NO	1.795	N/A
MW364	Downgradient	Yes	6.01	NO	1.793	N/A
MW367	Downgradient	Yes	5.79	YES	1.756	N/A
MW370	Upgradient	Yes	6.15	NO	1.816	N/A
MW373	Upgradient	Yes	6.03	NO	1.797	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW367

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 2.823	**S=** 0.522	**CV(1)=** 0.185	**K factor**=** 2.523	**TL(1)=** 4.139	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.024	**S=** 0.167	**CV(2)=** 0.163	**K factor**=** 2.523	**TL(2)=** 1.445	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.22	1.169
4/23/2002	3.43	1.233
7/15/2002	2.98	1.092
10/8/2002	2.46	0.900
1/8/2003	2.41	0.880
4/3/2003	2.43	0.888
7/9/2003	2.44	0.892
10/6/2003	2.48	0.908

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34	1.468
4/23/2002	3.04	1.112
7/16/2002	2.93	1.075
10/8/2002	2.3	0.833
1/7/2003	2.45	0.896
4/2/2003	2.7	0.993
7/9/2003	2.68	0.986
10/7/2003	2.88	1.058

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.23	NO	0.802	N/A
MW361	Downgradient	Yes	2.12	NO	0.751	N/A
MW364	Downgradient	Yes	1.9	NO	0.642	N/A
MW367	Downgradient	Yes	2.96	NO	1.085	N/A
MW370	Upgradient	Yes	2.46	NO	0.900	N/A
MW373	Upgradient	Yes	2.6	NO	0.956	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 51.544	**S=** 15.227	**CV(1)=** 0.295	**K factor**=** 2.523	**TL(1)=** 89.962	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.906	**S=** 0.272	**CV(2)=** 0.070	**K factor**=** 2.523	**TL(2)=** 4.592	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	31.8	3.459
4/23/2002	50	3.912
7/15/2002	44.7	3.800
10/8/2002	40	3.689
1/8/2003	44.6	3.798
4/3/2003	41.9	3.735
7/9/2003	40	3.689
10/6/2003	38.1	3.640

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	43.4	3.770
4/23/2002	79.8	4.380
7/16/2002	87.7	4.474
10/8/2002	61.6	4.121
1/7/2003	59.3	4.083
4/2/2003	62.1	4.129
7/9/2003	50.1	3.914
10/7/2003	49.6	3.904

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	42	NO	3.738	N/A
MW361	Downgradient	Yes	45.5	NO	3.818	N/A
MW364	Downgradient	Yes	45	NO	3.807	N/A
MW367	Downgradient	Yes	35.3	NO	3.564	N/A
MW370	Upgradient	Yes	42.3	NO	3.745	N/A
MW373	Upgradient	Yes	58.6	NO	4.071	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 122.381	**S=** 195.095	**CV(1)=** 1.594	**K factor**=** 2.523	**TL(1)=** 614.606	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.985	**S=** 1.323	**CV(2)=** 0.332	**K factor**=** 2.523	**TL(2)=** 7.322	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	17.4	2.856
4/23/2002	37.9	3.635
7/15/2002	15.7	2.754
10/8/2002	13.4	2.595
1/8/2003	14.4	2.667
4/3/2003	18.1	2.896
7/9/2003	9.6	2.262
10/6/2003	16.5	2.803

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	163.3	5.096
4/23/2002	809.6	6.697
7/16/2002	109.4	4.695
10/8/2002	110.6	4.706
1/7/2003	113.7	4.734
4/2/2003	133	4.890
7/9/2003	182.1	5.205
10/7/2003	193.4	5.265

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	66.6	N/A	4.199	NO
MW361	Downgradient	Yes	73.8	N/A	4.301	NO
MW364	Downgradient	Yes	70.2	N/A	4.251	NO
MW367	Downgradient	Yes	48.3	N/A	3.877	NO
MW370	Upgradient	Yes	20.2	N/A	3.006	NO
MW373	Upgradient	Yes	148	N/A	4.997	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Technetium-99 UNITS: pCi/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 7.655	**S=** 13.274	**CV(1)=** 1.734	**K factor**=** 2.523	**TL(1)=** 41.146	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.946	**S=** 0.939	**CV(2)=** 0.483	**K factor**=** 2.523	**TL(2)=** 3.833	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.8	2.380
4/23/2002	8.53	2.144
7/15/2002	5.09	1.627
10/8/2002	4.78	1.564
1/8/2003	-5.12	#Func!
4/3/2003	5.11	1.631
7/9/2003	4.25	1.447
10/6/2003	6.54	1.878

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	16.5	2.803
4/23/2002	3.49	1.250
7/16/2002	1.42	0.351
10/8/2002	-6.06	#Func!
1/7/2003	-8.41	#Func!
4/2/2003	26.3	3.270
7/9/2003	3.06	1.118
10/7/2003	46.2	3.833

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	43.7	N/A	3.777	NO
MW361	Downgradient	Yes	43.3	N/A	3.768	NO
MW364	Downgradient	Yes	52.5	N/A	3.961	YES
MW367	Downgradient	No	8.13	N/A	2.096	N/A
MW370	Upgradient	Yes	107	N/A	4.673	YES
MW373	Upgradient	Yes	28.3	N/A	3.343	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW364
MW370

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.169	**S=** 12.072	**CV(1)=** 1.957	**K factor**=** 2.523	**TL(1)=** 36.626	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.069	**S=** 1.014	**CV(2)=** 0.948	**K factor**=** 2.523	**TL(2)=** 3.626	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.2	0.182
4/23/2002	4.3	1.459
7/15/2002	2.6	0.956
10/8/2002	2.3	0.833
1/8/2003	3	1.099
4/3/2003	1.2	0.182
7/9/2003	2.6	0.956
10/6/2003	1.7	0.531

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.1	0.095
4/23/2002	17.5	2.862
7/16/2002	49	3.892
10/8/2002	2.9	1.065
1/7/2003	3.9	1.361
4/2/2003	2.5	0.916
7/9/2003	1.7	0.531
10/7/2003	1.2	0.182

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.09	N/A	0.086	NO
MW361	Downgradient	Yes	1.33	N/A	0.285	NO
MW364	Downgradient	Yes	0.873	N/A	-0.136	NO
MW367	Downgradient	Yes	0.929	N/A	-0.074	NO
MW370	Upgradient	Yes	0.988	N/A	-0.012	NO
MW373	Upgradient	Yes	1.28	N/A	0.247	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 79.819	**S=** 78.470	**CV(1)=** 0.983	**K factor**=** 2.523	**TL(1)=** 277.798	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.971	**S=** 0.950	**CV(2)=** 0.239	**K factor**=** 2.523	**TL(2)=** 6.368	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	50	3.912
4/23/2002	228	5.429
7/15/2002	88	4.477
10/8/2002	58	4.060
1/8/2003	72.4	4.282
4/3/2003	26.6	3.281
7/9/2003	16.4	2.797
10/6/2003	31.1	3.437

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/23/2002	276	5.620
7/16/2002	177	5.176
10/8/2002	76	4.331
1/7/2003	45.9	3.826
4/2/2003	57.8	4.057
7/9/2003	10	2.303
10/7/2003	13.9	2.632

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	6.94	NO	1.937	N/A
MW361	Downgradient	No	7.26	N/A	1.982	N/A
MW364	Downgradient	No	6.66	N/A	1.896	N/A
MW367	Downgradient	No	6.4	N/A	1.856	N/A
MW370	Upgradient	Yes	7	NO	1.946	N/A
MW373	Upgradient	Yes	6.52	NO	1.875	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Trichloroethene UNITS: ug/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 12.188	**S=** 6.950	**CV(1)=** 0.570	**K factor**=** 2.523	**TL(1)=** 29.721	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.305	**S=** 0.687	**CV(2)=** 0.298	**K factor**=** 2.523	**TL(2)=** 4.039	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	19	2.944
4/23/2002	17	2.833
7/15/2002	15	2.708
10/8/2002	18	2.890
1/8/2003	17	2.833
4/3/2003	18	2.890
7/9/2003	15	2.708
10/6/2003	16	2.773

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/23/2002	25	3.219
7/16/2002	3	1.099
10/8/2002	4	1.386
1/7/2003	6	1.792
4/2/2003	5	1.609
7/9/2003	6	1.792
10/7/2003	6	1.792

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.12	NO	1.633	N/A
MW361	Downgradient	Yes	5.46	NO	1.697	N/A
MW364	Downgradient	Yes	6.69	NO	1.901	N/A
MW367	Downgradient	Yes	4.95	N/A	1.599	N/A
MW370	Upgradient	Yes	0.57	N/A	-0.562	N/A
MW373	Upgradient	Yes	0.69	N/A	-0.371	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Historical Background Comparison

Zinc UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.055	**S=** 0.037	**CV(1)=** 0.673	**K factor**=** 2.523	**TL(1)=** 0.147	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.131	**S=** 0.691	**CV(2)=** -0.221	**K factor**=** 2.523	**TL(2)=** -1.388	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.1	-2.303
4/23/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/23/2002	0.1	-2.303
7/16/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/7/2003	0.035	-3.352
4/2/2003	0.035	-3.352
7/9/2003	0.0234	-3.755
10/7/2003	0.02	-3.912

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	0.00826	N/A	-4.796	N/A
MW361	Downgradient	No	0.00617	N/A	-5.088	N/A
MW364	Downgradient	Yes	0.0389	NO	-3.247	N/A
MW367	Downgradient	No	0.0114	N/A	-4.474	N/A
MW370	Upgradient	No	0.00444	N/A	-5.417	N/A
MW373	Upgradient	No	0.00565	N/A	-5.176	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

ATTACHMENT D2

COMPARISON OF CURRENT DATA TO ONE-SIDED UPPER TOLERANCE INTERVAL TEST CALCULATED USING CURRENT BACKGROUND DATA

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C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Calcium — UNITS: mg/L — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 34.088 **S=** 14.357 **CV(1)=** 0.421 **K factor**=** 2.523 **TL(1)=** 70.311 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.448 **S=** 0.412 **CV(2)=** 0.119 **K factor**=** 2.523 **TL(2)=** 4.487 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/20/2017	40.3	3.696
10/3/2017	42.1	3.740
1/22/2018	38.1	3.640
4/12/2018	62.5	4.135
7/18/2018	58.4	4.067
10/10/2018	48	3.871
1/16/2019	40	3.689
4/15/2019	43.3	3.768

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/20/2017	21.5	3.068
10/3/2017	22	3.091
1/22/2018	24.2	3.186
4/12/2018	21.4	3.063
7/18/2018	19.9	2.991
10/10/2018	20.4	3.016
1/17/2019	21.8	3.082
4/11/2019	21.5	3.068

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW368	Downgradient	Yes	73.1	YES	4.292	N/A
MW371	Upgradient	Yes	70.4	YES	4.254	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW368
MW371

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Dissolved Oxygen — UNITS: mg/L — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 2.798	**S=** 2.444	**CV(1)=** 0.873	**K factor**=** 2.523	**TL(1)=** 8.964	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.693	**S=** 0.847	**CV(2)=** 1.222	**K factor**=** 2.523	**TL(2)=** 2.828	**LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/20/2017	3.51	1.256
10/3/2017	1.82	0.599
1/22/2018	2.8	1.030
4/12/2018	7.85	2.061
7/18/2018	4.89	1.587
10/10/2018	0.96	-0.041
1/16/2019	8.02	2.082
5/28/2019	5.2	1.649

Well Number: MW374

Date Collected	Result	LN(Result)
7/20/2017	1.95	0.668
10/3/2017	1.12	0.113
1/22/2018	1.39	0.329
4/12/2018	1.67	0.513
7/18/2018	0.52	-0.654
10/10/2018	0.88	-0.128
1/17/2019	0.67	-0.400
4/11/2019	1.52	0.419

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.4	NO	1.224	N/A
MW362	Downgradient	Yes	4.48	NO	1.500	N/A
MW365	Downgradient	Yes	2.74	NO	1.008	N/A
MW368	Downgradient	Yes	4.17	NO	1.428	N/A
MW371	Upgradient	Yes	4.6	NO	1.526	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Magnesium — UNITS: mg/L — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 8.874	**S=** 4.028	**CV(1)=** 0.454	**K factor**=** 2.523	**TL(1)=** 19.036	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.091	**S=** 0.439	**CV(2)=** 0.210	**K factor**=** 2.523	**TL(2)=** 3.198	**LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/20/2017	13.8	2.625
10/3/2017	14.8	2.695
1/22/2018	14.4	2.667
4/12/2018	10.3	2.332
7/18/2018	11.3	2.425
10/10/2018	16.1	2.779
1/16/2019	9.38	2.239
4/15/2019	7.86	2.062

Well Number: MW374

Date Collected	Result	LN(Result)
7/20/2017	5.32	1.671
10/3/2017	6.22	1.828
1/22/2018	5.91	1.777
4/12/2018	5.03	1.615
7/18/2018	5.09	1.627
10/10/2018	5.62	1.726
1/17/2019	5.63	1.728
4/11/2019	5.22	1.652

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW368	Downgradient	Yes	21.8	YES	3.082	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW368

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 307.000 **S=** 73.300 **CV(1)=** 0.239 **K factor**=** 2.523 **TL(1)=** 491.937 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.696 **S=** 0.263 **CV(2)=** 0.046 **K factor**=** 2.523 **TL(2)=** 6.360 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/20/2017	364	5.897
10/3/2017	375	5.927
1/22/2018	339	5.826
4/12/2018	365	5.900
7/18/2018	342	5.835
10/10/2018	328	5.793
1/16/2019	396	5.981
4/15/2019	388	5.961

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/20/2017	188	5.236
10/3/2017	194	5.268
1/22/2018	206	5.328
4/12/2018	331	5.802
7/18/2018	269	5.595
10/10/2018	218	5.384
1/17/2019	254	5.537
5/28/2019	355	5.872

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	217	NO	5.380	N/A
MW362	Downgradient	Yes	381	NO	5.943	N/A
MW365	Downgradient	Yes	388	NO	5.961	N/A
MW368	Downgradient	Yes	338	NO	5.823	N/A
MW371	Upgradient	Yes	423	NO	6.047	N/A
MW374	Upgradient	Yes	354	NO	5.869	N/A
MW375	Sidegradient	Yes	363	NO	5.894	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Sulfate — **UNITS: mg/L** — **UCRS**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 20.090	**S=** 24.624	**CV(1)=** 1.226	**K factor**=** 2.523	**TL(1)=** 82.217	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.546	**S=** 0.871	**CV(2)=** 0.342	**K factor**=** 2.523	**TL(2)=** 4.745	**LL(2)=**N/A

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/20/2017	14	2.639
10/3/2017	10	2.303
1/22/2018	11	2.398
4/12/2018	91.6	4.517
7/18/2018	47.7	3.865
10/10/2018	21.9	3.086
1/16/2019	10.1	2.313
4/15/2019	59.1	4.079

Well Number: MW374

Date Collected	Result	LN(Result)
7/20/2017	6.31	1.842
10/3/2017	6.78	1.914
1/22/2018	6.34	1.847
4/12/2018	7.24	1.980
7/18/2018	7.69	2.040
10/10/2018	6.6	1.887
1/17/2019	6.8	1.917
4/11/2019	8.28	2.114

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	47.1	N/A	3.852	NO
MW362	Downgradient	Yes	32.1	N/A	3.469	NO
MW365	Downgradient	Yes	58.4	N/A	4.067	NO
MW368	Downgradient	Yes	164	N/A	5.100	YES
MW371	Upgradient	Yes	55.4	N/A	4.015	NO
MW375	Sidegradient	Yes	24.2	N/A	3.186	NO

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW368

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Beta activity — UNITS: pCi/L — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 47.381 **S=** 39.265 **CV(1)=** 0.829 **K factor**=** 2.523 **TL(1)=** 146.447 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.599 **S=** 0.700 **CV(2)=** 0.194 **K factor**=** 2.523 **TL(2)=** 5.365 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/20/2017	26.1	3.262
10/3/2017	40.7	3.706
1/22/2018	32	3.466
4/11/2018	102	4.625
7/18/2018	14.9	2.701
10/9/2018	23.2	3.144
1/16/2019	22.5	3.114
4/15/2019	83.7	4.427

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/20/2017	21.3	3.059
10/3/2017	132	4.883
1/22/2018	21.7	3.077
4/12/2018	20.9	3.040
7/18/2018	27.7	3.321
10/10/2018	123	4.812
1/17/2019	25.4	3.235
4/11/2019	41	3.714

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW369	Upgradient	Yes	120	NO	4.787	N/A
MW372	Upgradient	Yes	141	NO	4.949	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Chemical Oxygen Demand (COD) — UNITS: mg/L — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 20.857	**S=** 11.357	**CV(1)=** 0.545	**K factor**=** 2.523	**TL(1)=** 49.512	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.928	**S=** 0.463	**CV(2)=** 0.158	**K factor**=** 2.523	**TL(2)=** 4.096	**LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/20/2017	12.7	2.542
10/3/2017	9.71	2.273
1/22/2018	12.6	2.534
4/11/2018	24.7	3.207
7/18/2018	14.5	2.674
10/9/2018	21.4	3.063
1/16/2019	18.4	2.912
4/15/2019	17.4	2.856

Well Number: MW372

Date Collected	Result	LN(Result)
7/20/2017	12.7	2.542
10/3/2017	21.5	3.068
1/22/2018	29.3	3.378
4/12/2018	10.7	2.370
7/18/2018	39.1	3.666
10/10/2018	16.4	2.797
1/17/2019	20	2.996
4/11/2019	52.6	3.963

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	69.4	YES	4.240	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Current Background Comparison

Conductivity UNITS: umho/cm URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 499.063 **S=** 119.557 **CV(1)=** 0.240 **K factor**=** 2.523 **TL(1)=** 800.705 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.185 **S=** 0.247 **CV(2)=** 0.040 **K factor**=** 2.523 **TL(2)=** 6.807 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/20/2017	367	5.905
10/3/2017	370	5.914
1/22/2018	351	5.861
4/11/2018	425	6.052
7/18/2018	372	5.919
10/9/2018	374	5.924
1/16/2019	386	5.956
4/15/2019	439	6.084

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/20/2017	585	6.372
10/3/2017	622	6.433
1/22/2018	620	6.430
4/12/2018	614	6.420
7/18/2018	597	6.392
10/10/2018	618	6.426
1/17/2019	613	6.418
4/11/2019	632	6.449

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	640	NO	6.461	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Dissolved Solids — UNITS: mg/L — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 274.500 **S=** 71.734 **CV(1)=** 0.261 **K factor**=** 2.523 **TL(1)=** 455.484 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.580 **S=** 0.278 **CV(2)=** 0.050 **K factor**=** 2.523 **TL(2)=** 6.281 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/20/2017	206	5.328
10/3/2017	180	5.193
1/22/2018	161	5.081
4/11/2018	281	5.638
7/18/2018	197	5.283
10/9/2018	196	5.278
1/16/2019	224	5.412
4/15/2019	261	5.565

Well Number: MW372

Date Collected	Result	LN(Result)
7/20/2017	334	5.811
10/3/2017	304	5.717
1/22/2018	330	5.799
4/12/2018	356	5.875
7/18/2018	323	5.778
10/10/2018	336	5.817
1/17/2019	394	5.976
4/11/2019	309	5.733

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	616	YES	6.423	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 358.813 **S=** 42.818 **CV(1)=** 0.119 **K factor**=** 2.523 **TL(1)=** 466.842 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.876 **S=** 0.124 **CV(2)=** 0.021 **K factor**=** 2.523 **TL(2)=** 6.188 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/20/2017	376	5.930
10/3/2017	399	5.989
1/22/2018	346	5.846
4/11/2018	397	5.984
7/18/2018	338	5.823
10/9/2018	341	5.832
1/16/2019	432	6.068
4/15/2019	372	5.919

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/20/2017	300	5.704
10/3/2017	358	5.881
1/22/2018	275	5.617
4/12/2018	348	5.852
7/18/2018	371	5.916
10/10/2018	295	5.687
1/17/2019	393	5.974
5/28/2019	400	5.991

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	413	NO	6.023	N/A
MW360	Downgradient	Yes	423	NO	6.047	N/A
MW363	Downgradient	Yes	365	NO	5.900	N/A
MW366	Downgradient	Yes	390	NO	5.966	N/A
MW369	Upgradient	Yes	410	NO	6.016	N/A
MW372	Upgradient	Yes	390	NO	5.966	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis Current Background Comparison

Technetium-99 UNITS: pCi/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 67.781 **S=** 51.779 **CV(1)=** 0.764 **K factor**=** 2.523 **TL(1)=** 198.419 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.993 **S=** 0.666 **CV(2)=** 0.167 **K factor**=** 2.523 **TL(2)=** 5.673 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/20/2017	34.2	3.532
10/3/2017	70.8	4.260
1/22/2018	38.8	3.658
4/11/2018	142	4.956
7/18/2018	31.4	3.447
10/9/2018	55	4.007
1/16/2019	39.1	3.666
4/15/2019	70.8	4.260

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/20/2017	30.2	3.408
10/3/2017	195	5.273
1/22/2018	17.3	2.851
4/12/2018	36.6	3.600
7/18/2018	70.9	4.261
10/10/2018	158	5.063
1/17/2019	35	3.555
4/11/2019	59.4	4.084

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	183	NO	5.209	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Beta activity — UNITS: pCi/L — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 46.643 **S=** 31.146 **CV(1)=** 0.668 **K factor**=** 2.523 **TL(1)=** 125.224 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.560 **S=** 0.857 **CV(2)=** 0.241 **K factor**=** 2.523 **TL(2)=** 5.721 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/20/2017	84.6	4.438
10/3/2017	69	4.234
1/22/2018	71.9	4.275
4/11/2018	50	3.912
7/18/2018	102	4.625
10/9/2018	81.7	4.403
1/16/2019	75.8	4.328
4/15/2019	61	4.111

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/20/2017	16.7	2.815
10/3/2017	20.6	3.025
1/22/2018	23.5	3.157
4/12/2018	4.99	1.607
7/18/2018	30.6	3.421
10/10/2018	22.8	3.127
1/17/2019	17.4	2.856
4/11/2019	13.7	2.617

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	52.7	NO	3.965	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Chemical Oxygen Demand (COD) — UNITS: mg/L — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 22.506	**S=** 8.653	**CV(1)=** 0.384	**K factor**=** 2.523	**TL(1)=** 44.338	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.049	**S=** 0.370	**CV(2)=** 0.122	**K factor**=** 2.523	**TL(2)=** 3.983	**LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/20/2017	10.4	2.342
10/3/2017	17.5	2.862
1/22/2018	16.8	2.821
4/11/2018	20	2.996
7/18/2018	19.4	2.965
10/9/2018	31.4	3.447
1/16/2019	28.6	3.353
4/15/2019	20	2.996

Well Number: MW373

Date Collected	Result	LN(Result)
7/20/2017	14.9	2.701
10/3/2017	15.6	2.747
1/22/2018	31.4	3.447
4/12/2018	24.7	3.207
7/18/2018	30.9	3.431
10/10/2018	14.7	2.688
1/17/2019	20	2.996
4/11/2019	43.8	3.780

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Upgradient	Yes	107	YES	4.673	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 366.875 **S=** 38.889 **CV(1)=** 0.106 **K factor**=** 2.523 **TL(1)=** 464.993 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.900 **S=** 0.104 **CV(2)=** 0.018 **K factor**=** 2.523 **TL(2)=** 6.163 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/20/2017	343	5.838
10/3/2017	392	5.971
1/22/2018	334	5.811
4/11/2018	368	5.908
7/18/2018	369	5.911
10/9/2018	346	5.846
1/16/2019	440	6.087
5/28/2019	400	5.991

Well Number: MW373

Date Collected	Result	LN(Result)
7/20/2017	309	5.733
10/3/2017	347	5.849
1/22/2018	393	5.974
4/12/2018	350	5.858
7/18/2018	318	5.762
10/10/2018	438	6.082
1/17/2019	336	5.817
4/11/2019	387	5.958

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	412	NO	6.021	N/A
MW364	Downgradient	Yes	356	NO	5.875	N/A
MW367	Downgradient	Yes	312	NO	5.743	N/A
MW370	Upgradient	Yes	421	NO	6.043	N/A
MW373	Upgradient	Yes	417	NO	6.033	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

pH — UNITS: Std Unit — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.159	**S=** 0.059	**CV(1)=** 0.010	**K factor**=** 2.904	**TL(1)=** 6.331	**LL(1)=**5.9864
Statistics-Transformed Background Data	**X=** 1.818	**S=** 0.010	**CV(2)=** 0.005	**K factor**=** 2.904	**TL(2)=** 1.846	**LL(2)=**1.7897

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/20/2017	6.19	1.823
10/3/2017	6.13	1.813
1/22/2018	6.12	1.812
4/11/2018	6.1	1.808
7/18/2018	6.09	1.807
10/9/2018	6.01	1.793
1/16/2019	6.17	1.820
4/15/2019	6.18	1.821

Well Number: MW373

Date Collected	Result	LN(Result)
7/20/2017	6.24	1.831
10/3/2017	6.24	1.831
1/22/2018	6.19	1.823
4/12/2018	6.18	1.821
7/18/2018	6.14	1.815
10/10/2018	6.19	1.823
1/17/2019	6.16	1.818
4/11/2019	6.21	1.826

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW367	Downgradient	Yes	5.79	YES	1.756	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW367

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2019 Statistical Analysis — Current Background Comparison

Technetium-99 — UNITS: pCi/L — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 60.539 **S=** 45.620 **CV(1)=** 0.754 **K factor**=** 2.523 **TL(1)=** 175.637 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.910 **S=** 0.838 **CV(2)=** 0.214 **K factor**=** 2.523 **TL(2)=** 4.787 **LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/20/2017	120	4.787
10/3/2017	103	4.635
1/22/2018	73.9	4.303
4/11/2018	107	4.673
7/18/2018	96.2	4.566
10/9/2018	114	4.736
1/16/2019	94.3	4.546
4/15/2019	111	4.710

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/20/2017	9.12	2.210
10/3/2017	29.6	3.388
1/22/2018	24.8	3.211
4/12/2018	30.2	3.408
7/18/2018	-15.9	#Func!
10/10/2018	20.3	3.011
1/17/2019	28.4	3.346
4/11/2019	22.7	3.122

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW364	Downgradient	Yes	52.5	NO	3.961	N/A
MW370	Upgradient	Yes	107	NO	4.673	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

ATTACHMENT D3

STATISTICIAN QUALIFICATION STATEMENT

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FOUR RIVERS
NUCLEAR PARTNERSHIP, LLC

Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053
www.fourriversnuclearpartnership.com

October 17, 2019

Ms. Kelly Layne
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

Dear Ms. Layne:

This statement is submitted in response to your request that it be included with the completed statistical analysis that I have performed on the groundwater data for the C-746-S&T and C-746-U Landfills at the Paducah Site.

As an Environmental Scientist, with a bachelor's degree in science, I have over 20 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was observed and reviewed by a senior chemist with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the third quarter 2019 monitoring well data collected from the C-746-S&T and C-746-U Landfills were performed in accordance with guidance provided in the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Sincerely,

Jennifer R. Watson

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APPENDIX E

GROUNDWATER FLOW RATE AND DIRECTION

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GROUNDWATER FLOW RATE AND DIRECTION

Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 *KAR* 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently are recorded in several wells at the landfill on a quarterly basis. These measurements were used to plot the potentiometric surface of the RGA for the third quarter 2019 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on July 29, 2019. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling for laboratory analysis.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradients for the URGA and LRGA at the C-746-U Landfill, as measured along the defined groundwater flow directions, were 1.06×10^{-3} ft/ft and 1.10×10^{-3} ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was 4.99×10^{-4} ft/ft. The hydraulic gradients are shown in Table E.2.

The average linear groundwater flow velocity (v) is determined by multiplying the hydraulic gradient (i) by the hydraulic conductivity (K) [resulting in the specific discharge (q)] and dividing by the effective porosity (n_e). The RGA hydraulic conductivity values used are reported in the Administrative Application for the New Solid Waste Landfill Permit No. SW07300045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA (both URGA and LRGA) effective porosity is assumed to be 25%. Flow velocities were calculated for the URGA and LRGA using the low and high values for hydraulic conductivity, as shown in the Table E.3.

Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for July 2019, the groundwater flow direction in the immediate area of the landfill was to the north/northeast.

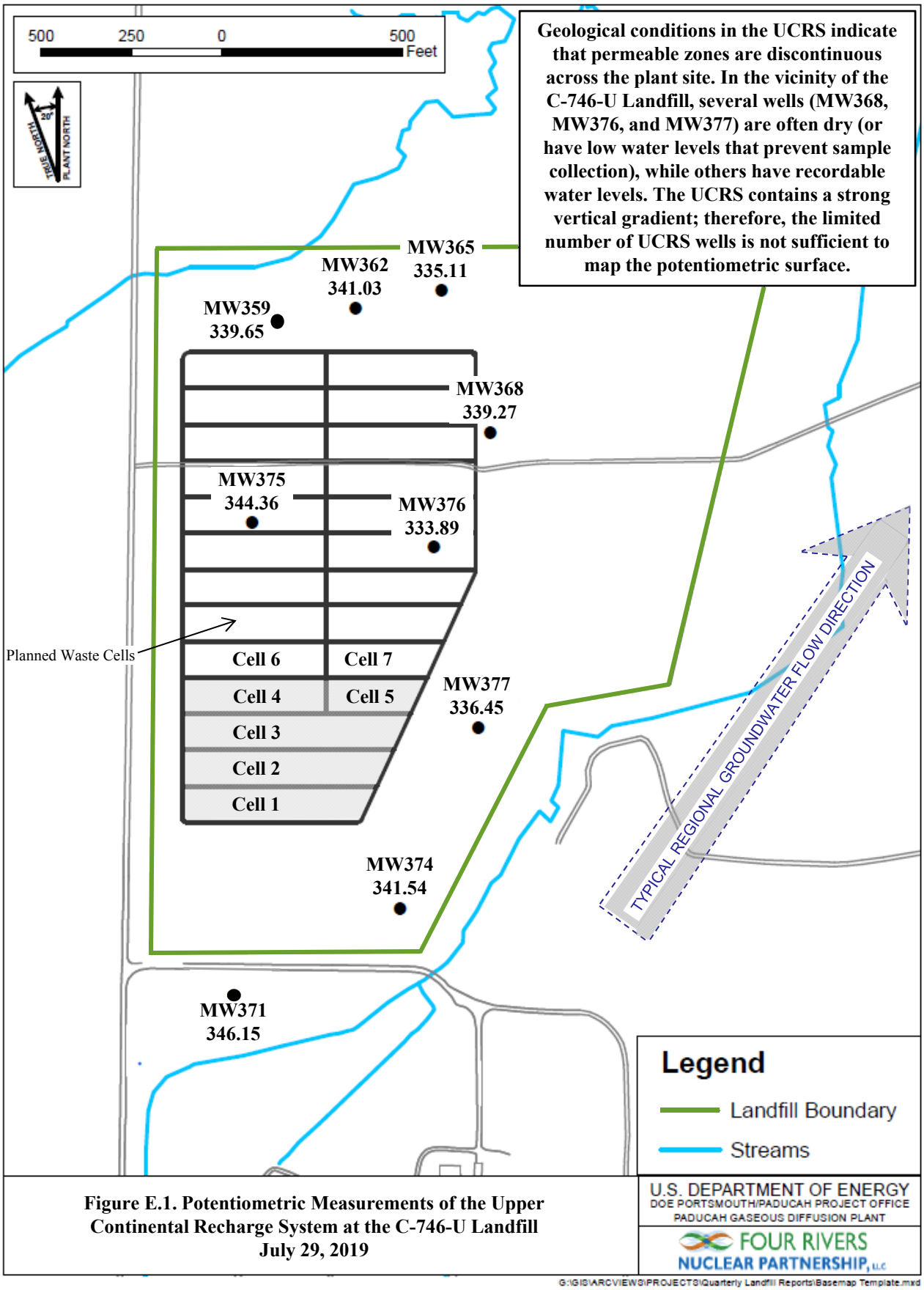

Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-U Landfill July 29, 2019

Table E.1. C-746-U Landfill Third Quarter 2019 (July) Water Levels

C-746-U Landfill (July 2019) Water Levels										
							Raw Data		*Corrected Data	
Date	Time	Well	Aquifer	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H20)	DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
7/29/2019	15:16	MW357	URGA	368.99	29.98	0.02	39.37	329.62	39.39	329.60
7/29/2019	15:14	MW358	LRGA	369.13	29.98	0.02	39.52	329.61	39.54	329.59
7/29/2019	15:15	MW359	UCRS	369.11	29.98	0.02	29.44	339.67	29.46	339.65
7/29/2019	15:10	MW360	URGA	362.30	29.98	0.02	32.65	329.65	32.67	329.63
7/29/2019	15:12	MW361	LRGA	361.54	29.98	0.02	31.94	329.60	31.96	329.58
7/29/2019	15:11	MW362	UCRS	362.04	29.98	0.02	20.99	341.05	21.01	341.03
7/29/2019	15:24	MW363	URGA	368.84	29.98	0.02	39.20	329.64	39.22	329.62
7/29/2019	15:26	MW364	LRGA	368.45	29.98	0.02	38.88	329.57	38.90	329.55
7/29/2019	15:25	MW365	UCRS	368.37	29.98	0.02	33.24	335.13	33.26	335.11
7/29/2019	15:27	MW366	URGA	369.27	29.98	0.02	39.35	329.92	39.37	329.90
7/29/2019	15:29	MW367	LRGA	369.66	29.98	0.02	39.79	329.87	39.81	329.85
7/29/2019	15:28	MW368	UCRS	369.27	29.98	0.02	29.98	339.29	30.00	339.27
7/29/2019	15:46	MW369	URGA	364.48	29.98	0.02	33.08	331.40	33.10	331.38
7/29/2019	15:48	MW370	LRGA	365.35	29.98	0.02	33.95	331.40	33.97	331.38
7/29/2019	15:47	MW371	UCRS	364.88	29.98	0.02	18.71	346.17	18.73	346.15
7/29/2019	15:44	MW372	URGA	359.66	29.98	0.02	28.19	331.47	28.21	331.45
7/29/2019	15:42	MW373	LRGA	359.95	29.98	0.02	28.50	331.45	28.52	331.43
7/29/2019	15:43	MW374	UCRS	359.71	29.98	0.02	18.15	341.56	18.17	341.54
7/29/2019	15:36	MW375	UCRS	370.53	29.98	0.02	26.15	344.38	26.17	344.36
7/29/2019	15:38	MW376	UCRS	370.61	29.98	0.02	36.70	333.91	36.72	333.89
7/29/2019	15:40	MW377	UCRS	365.92	29.98	0.02	29.45	336.47	29.47	336.45

Reference Barometric Pressure **30.00**

Elev = elevation

amsl = above mean sea level

BP = barometric pressure

DTW = depth to water in feet below datum

URGA = Upper Regional Gravel Aquifer

LRGA = Lower Regional Gravel Aquifer

UCRS = Upper Continental Recharge System

ND = No Data acquired

*Assumes a barometric efficiency of 1.0

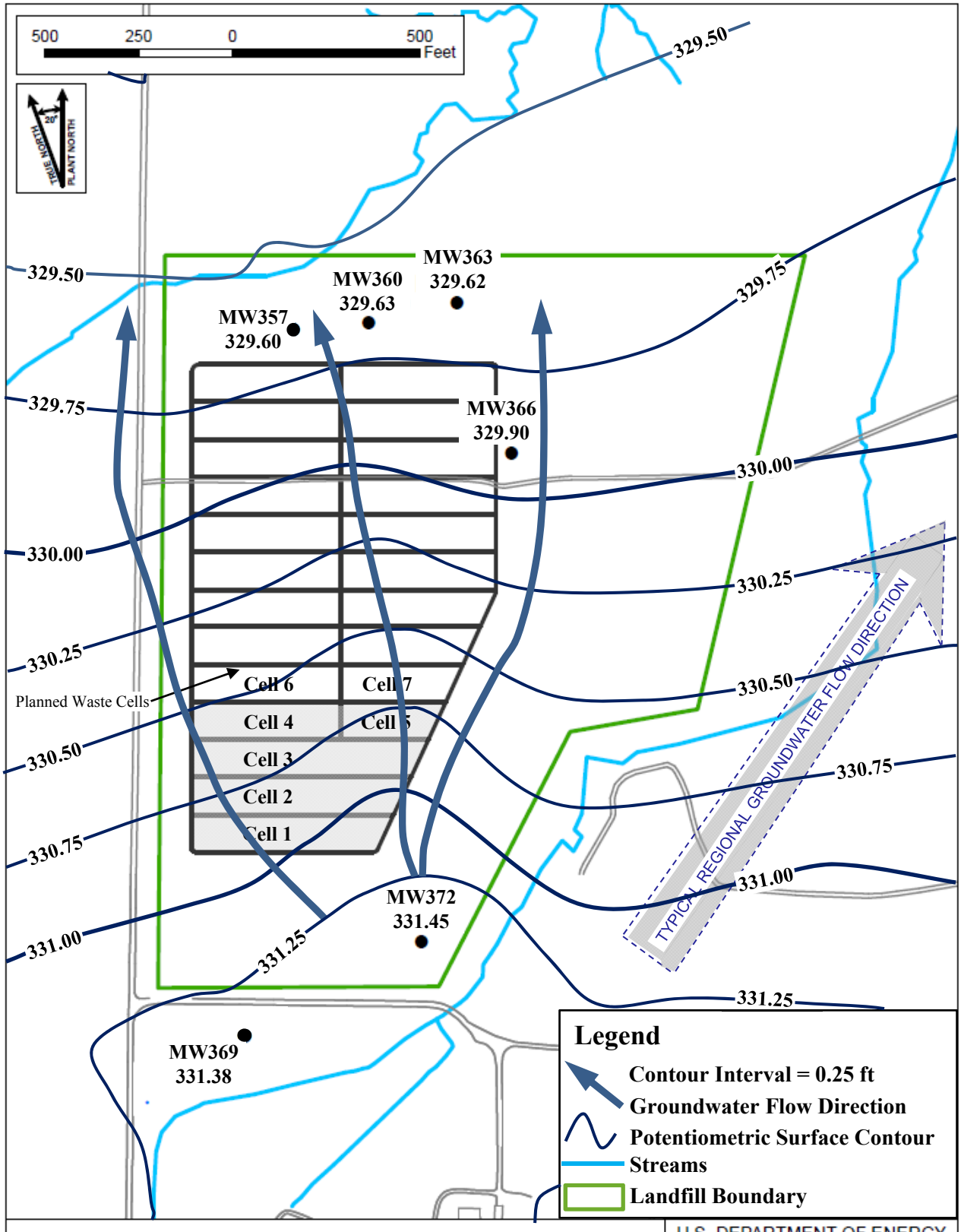

Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer at the C-746-U Landfill, July 29, 2019

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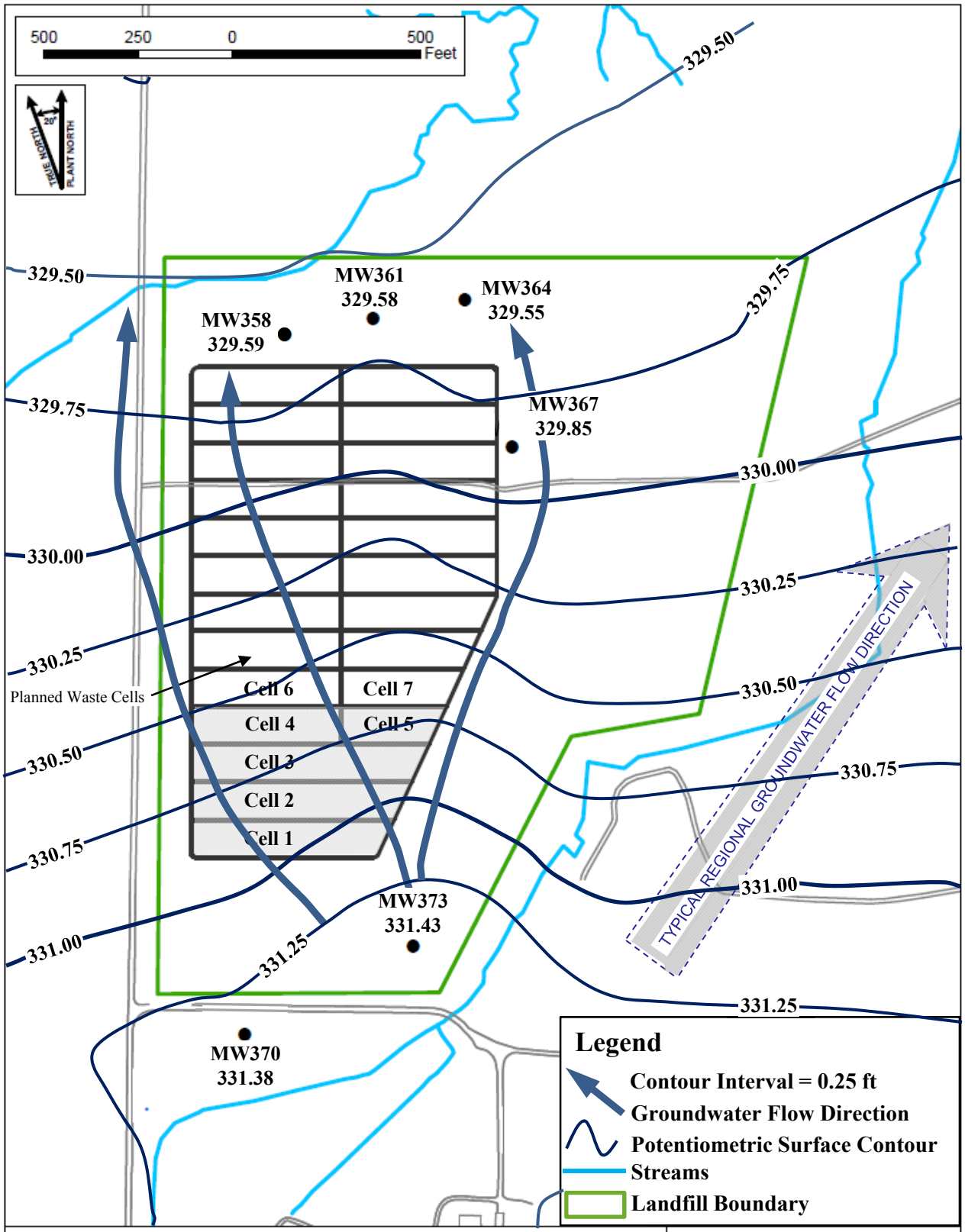

Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer at the C-746-U Landfill, July 29, 2019

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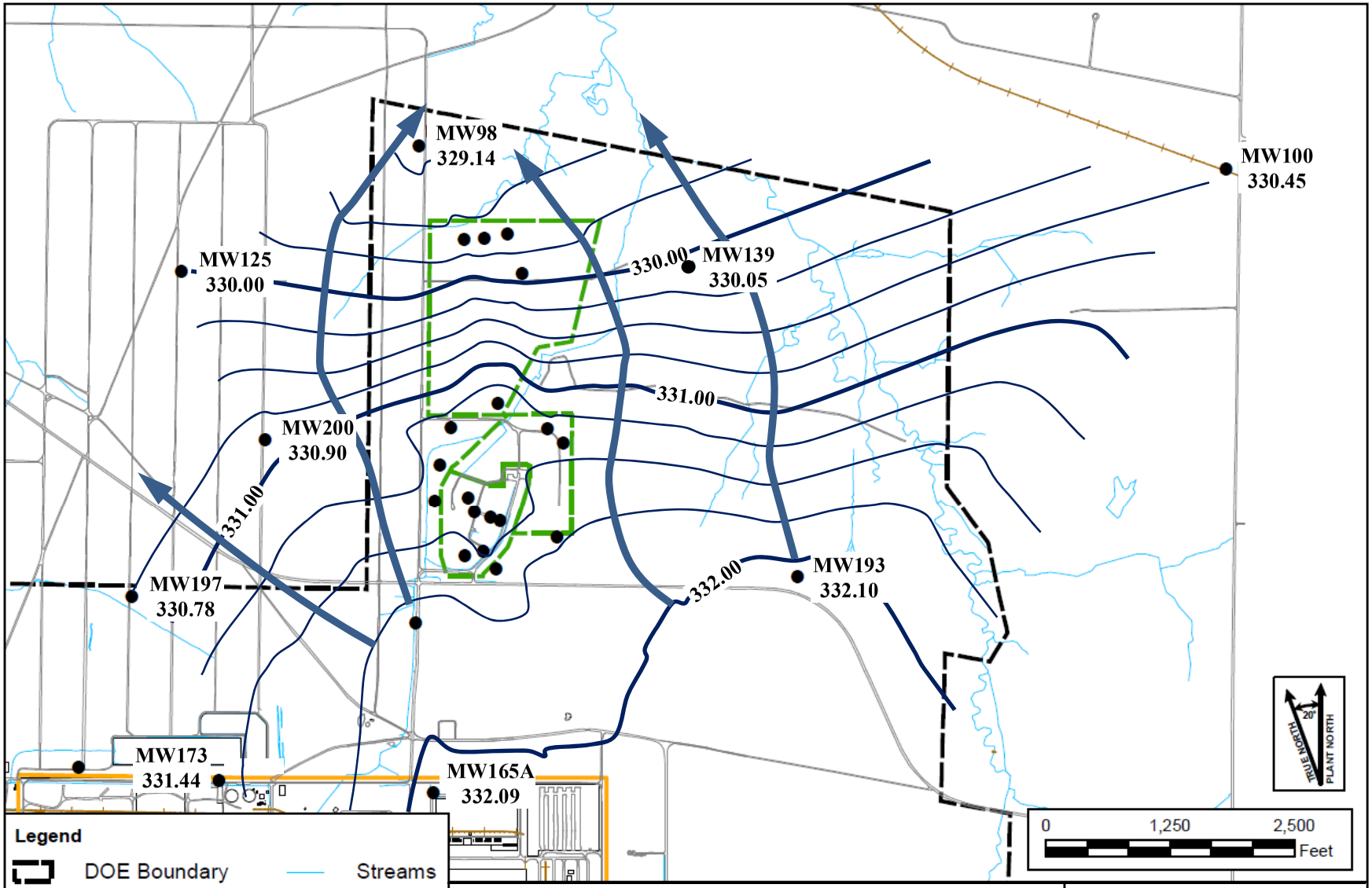

Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, July 29, 2019

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PADUCAH GASEOUS DIFFUSION PLANT

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

G:\GIS\ARCVIEWS\PROJECTS\Quarterly Landfill Reports\Basemap Template_Regional.mxd
12/3/2018

Table E.2. C-746-U Landfill Hydraulic Gradients

	ft/ft
Beneath Landfill—Upper RGA	1.06×10^{-3}
Beneath Landfill—Lower RGA	1.10×10^{-3}
Vicinity	4.99×10^{-4}

Table E.3. C-746-U Landfill Groundwater Flow Rate

Hydraulic Conductivity (K)		Specific Discharge (q)		Average Linear Velocity (v)	
ft/day	cm/s	ft/day	cm/s	ft/day	cm/s
Upper RGA					
725	0.256	0.769	2.72×10^{-4}	3.08	1.09×10^{-3}
425	0.150	0.451	1.59×10^{-4}	1.80	6.37×10^{-4}
Lower RGA					
725	0.256	0.798	2.82×10^{-4}	3.19	1.13×10^{-3}
425	0.150	0.468	1.65×10^{-4}	1.87	6.61×10^{-4}

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APPENDIX F

NOTIFICATIONS

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NOTIFICATIONS

In accordance with 401 *KAR* 48:300 § 7, the notification for parameters that exceed the maximum contaminant level (MCL) has been submitted to the Kentucky Division of Waste Management. The parameters submitted are listed on page F-4. The notification for parameters that do not have MCLs, but had statistically significant increased concentrations relative to historical background concentrations, is provided below.

Statistical Analysis of Parameters Notification

The statistical analyses conducted on the third quarter 2019 groundwater data collected from the C-746-U Landfill monitoring wells were performed in accordance with *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (LATA Kentucky 2014).

The following are the permit required parameters in 40 *CFR* § 302.4, Appendix A, which had statistically significant increased concentrations relative to historical background concentrations.

	Parameter	**Monitoring Well**
Upper Continental Recharge System	None	
Upper Regional Gravel Aquifer	Technetium-99	MW372
Lower Regional Gravel Aquifer	Technetium-99	MW364, MW370

NOTE: Although technetium-99 is not cited in 40 *CFR* § 302.4, Appendix A, this radionuclide is being reported along with the parameters of this regulation.

8/19/2019

Four Rivers Nuclear Partnership, LLC
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM
C-746-U LANDFILL
SOLID WASTE PERMIT NUMBER SW07300014, SW07300015, SW07300045
MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE REPORT
Quarterly Groundwater Sampling

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4799	MW358	Trichloroethene	8260B	5.12	ug/L	5
		Trichloroethene	8260B	5.05	ug/L	5
8004-4795	MW361	Trichloroethene	8260B	5.46	ug/L	5
8004-4797	MW364	Trichloroethene	8260B	6.69	ug/L	5
8004-4820	MW369	Beta activity	9310	120	pCi/L	50
8004-4818	MW370	Beta activity	9310	52.7	pCi/L	50
8004-4808	MW372	Beta activity	9310	141	pCi/L	50

NOTE 1: MCLs are defined in 401 KAR 47:030.

NOTE 2: MW369, MW370, MW372, and MW373 are down-gradient wells for the C-746-S and C-746-T Landfills and upgradient for the C-746-U Landfill. These wells are sampled with the C-746-U Landfill monitoring well network. These wells are reported on the exceedance reports for C-746-S, C-746-T, and C-746-U.

APPENDIX G

CHART OF MCL AND UTL EXCEEDANCES

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Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
ACETONE																					
Quarter 3, 2002										✱	✱	✱									
Quarter 4, 2002										✱	✱	✱									
Quarter 1, 2003											✱	✱									
Quarter 2, 2003											✱	✱									
Quarter 3, 2003	✱						✱			✱	✱	✱			✱			✱			
Quarter 4, 2003						✱	✱				✱			✱							
Quarter 3, 2004						✱										✱					
Quarter 3, 2005						✱															
Quarter 4, 2005						✱															
ALPHA ACTIVITY																					
Quarter 1, 2004																					■
Quarter 2, 2004						■															
Quarter 3, 2009						■															
ALUMINUM																					
Quarter 3, 2003											✱										
BETA ACTIVITY																					
Quarter 1, 2004															■						
Quarter 2, 2004															■						■
Quarter 3, 2004															■						
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Quarter 4, 2005															■						
Quarter 1, 2006															■						■
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Quarter 1, 2007										■					■						■
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Quarter 4, 2007										■					■						■
Quarter 1, 2008										■					■						
Quarter 2, 2008														■		■					
Quarter 3, 2008										■					■				■		
Quarter 4, 2008										■					■				■		
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Quarter 2, 2009															■	■	■				
Quarter 3, 2009										■					■						
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Quarter 4, 2015															■				■		
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Quarter 2, 2017																				■	
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Quarter 4, 2017															■					■	
Quarter 1, 2018																			■	■	
Quarter 2, 2018														■							
Quarter 3, 2018																				■	
Quarter 4, 2018															■					■	
Quarter 1, 2019																				■	
Quarter 2, 2019														■						■	
Quarter 3, 2019														■	■					■	
BROMIDE																					
Quarter 2, 2004													✱								

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CALCIUM																					
Quarter 3, 2003										*											
Quarter 2, 2005																					*
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Quarter 1, 2012															*						*
Quarter 2, 2012															*						*
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Quarter 1, 2016															*						
Quarter 2, 2016															*						
Quarter 2, 2017	*																				
Quarter 1, 2018	*																				
Quarter 3, 2018	*																				
Quarter 3, 2019	*							*													
CARBON DISULFIDE																					
Quarter 3, 2003										*											
Quarter 2, 2005							*														
Quarter 3, 2005						*															
Quarter 4, 2005						*															
Quarter 1, 2006						*															
Quarter 2, 2006						*															
Quarter 3, 2010		*									*										
Quarter 4, 2010														*							
Quarter 1, 2011															*						
CHEMICAL OXYGEN DEMAND																					
Quarter 3, 2002										*	*	*	*	*	*						
Quarter 4, 2002										*	*										
Quarter 1, 2003										*	*										
Quarter 2, 2003										*	*	*									
Quarter 3, 2003	*									*	*					*					
Quarter 4, 2003						*				*	*										
Quarter 3, 2004										*											
Quarter 3, 2005						*				*					*	*			*		
Quarter 4, 2005						*												*	*		
Quarter 1, 2006																			*		
Quarter 4, 2016																		*			
Quarter 1, 2017											*										
Quarter 2, 2019												*			*						
Quarter 3, 2019															*						*
CHLORIDE																					
Quarter 1, 2006																				*	
Quarter 2, 2014															*						
COBALT																					
Quarter 3, 2003	*						*			*	*		*	*	*	*	*	*		*	
Quarter 1, 2004														*							
Quarter 2, 2016														*							
CONDUCTIVITY																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*	*										
Quarter 4, 2003										*											
Quarter 1, 2004										*											
Quarter 2, 2004										*											

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CONDUCTIVITY																					
Quarter 3, 2004										*											
Quarter 1, 2005															*						
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Quarter 4, 2005															*			*			
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Quarter 1, 2016															*						
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Quarter 3, 2016															*						
Quarter 2, 2019															*						
Quarter 3, 2019															*						
DISSOLVED OXYGEN																					
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Quarter 3, 2003					*					*											
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Quarter 2, 2010					*	*		*	*											*	*
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Quarter 4, 2010							*					*								*	
Quarter 1, 2011						*															
Quarter 2, 2011					*	*	*	*	*					*							

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
DISSOLVED OXYGEN																					
Quarter 3, 2011						*			*												
Quarter 1, 2012							*		*												
Quarter 2, 2012	*			*	*	*		*	*												
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Quarter 1, 2013						*			*												
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Quarter 2, 2014	*				*	*	*	*	*									*			
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Quarter 4, 2015	*					*	*														
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Quarter 4, 2016						*			*												
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Quarter 2, 2017	*				*	*	*	*													
Quarter 3, 2017	*	*			*	*	*	*										*			
Quarter 4, 2017						*	*											*			
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Quarter 3, 2018	*				*	*	*	*													
Quarter 4, 2018						*															
Quarter 1, 2019					*	*	*	*													
Quarter 2, 2019					*	*		*													
Quarter 3, 2019	*				*	*	*	*													
DISSOLVED SOLIDS																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
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IODIDE																					
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Quarter 3, 2003	*									*											
Quarter 4, 2003							*														
Quarter 3, 2010						*		*					*				*				

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
IODINE-131																					
Quarter 3, 2010																		■			
IODOMETHANE																					
Quarter 4, 2003						✱															
IRON																					
Quarter 4, 2002						✱															
Quarter 3, 2003																✱					
Quarter 4, 2003										✱						✱					
Quarter 1, 2004										✱						✱					
Quarter 2, 2004										✱											
Quarter 3, 2004										✱											
Quarter 3, 2005																✱					
MAGNESIUM																					
Quarter 2, 2005															✱						✱
Quarter 3, 2005						✱															✱
Quarter 2, 2006															✱						✱
Quarter 3, 2006															✱						
Quarter 1, 2007															✱						
Quarter 2, 2008															✱						
Quarter 2, 2009															✱						
Quarter 3, 2009															✱						
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Quarter 4, 2015															✱						
Quarter 1, 2016															✱						
Quarter 2, 2016															✱						
Quarter 3, 2016	✱																				
Quarter 4, 2016	✱																				
Quarter 2, 2017	✱																				
Quarter 3, 2017	✱																				
Quarter 1, 2018	✱																				
Quarter 3, 2018	✱																				
Quarter 3, 2019	✱																				
MANGANESE																					
Quarter 3, 2002										✱		✱									
Quarter 4, 2002		✱				✱	✱			✱		✱		✱							
Quarter 2, 2003										✱		✱									
Quarter 3, 2003										✱		✱	✱			✱	✱	✱	✱		
Quarter 4, 2003										✱	✱	✱	✱				✱	✱			
Quarter 1, 2004										✱	✱	✱				✱	✱	✱			
Quarter 2, 2004							✱			✱	✱	✱						✱			
Quarter 3, 2004							✱			✱	✱	✱				✱					
Quarter 4, 2004										✱		✱				✱					
Quarter 1, 2005										✱		✱									
Quarter 2, 2005										✱		✱									
Quarter 3, 2005										✱		✱				✱					
Quarter 4, 2005										✱						✱					
Quarter 1, 2006										✱											
Quarter 2, 2006							✱			✱		✱									
Quarter 3, 2006										✱						✱					
Quarter 4, 2006										✱											
Quarter 1, 2007										✱											
Quarter 2, 2007							✱			✱											
Quarter 3, 2007							✱														
Quarter 3, 2008							✱														
Quarter 4, 2008							✱														

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
MANGANESE																					
Quarter 3, 2009							✱														
Quarter 3, 2011							✱														
Quarter 2, 2016														✱							
Quarter 3, 2016									✱												
NICKEL																					
Quarter 3, 2003										✱											
OXIDATION-REDUCTION POTENTIAL																					
Quarter 4, 2002																	✱		✱		
Quarter 1, 2003																	✱		✱		
Quarter 2, 2003																			✱		
Quarter 3, 2003	✱																				
Quarter 4, 2003					✱																
Quarter 2, 2004													✱				✱				✱
Quarter 3, 2004					✱			✱					✱	✱	✱		✱			✱	✱
Quarter 4, 2004												✱									✱
Quarter 1, 2005																	✱			✱	✱
Quarter 2, 2005								✱					✱				✱			✱	
Quarter 3, 2005					✱	✱		✱			✱	✱	✱				✱		✱	✱	✱
Quarter 4, 2005		✱						✱					✱				✱			✱	
Quarter 1, 2006					✱			✱	✱								✱				✱
Quarter 2, 2006					✱		✱	✱					✱				✱			✱	
Quarter 3, 2006					✱			✱					✱				✱			✱	
Quarter 4, 2006					✱		✱			✱		✱	✱				✱			✱	✱
Quarter 1, 2007		✱			✱			✱					✱				✱			✱	✱
Quarter 2, 2007					✱								✱				✱			✱	✱
Quarter 3, 2007					✱			✱									✱			✱	
Quarter 4, 2007																	✱			✱	✱
Quarter 1, 2008					✱			✱				✱	✱						✱	✱	
Quarter 2, 2008					✱			✱		✱			✱	✱				✱		✱	✱
Quarter 3, 2008					✱		✱	✱	✱	✱		✱	✱	✱			✱	✱	✱	✱	✱
Quarter 4, 2008								✱		✱		✱	✱				✱	✱		✱	✱
Quarter 1, 2009							✱	✱		✱		✱	✱					✱		✱	
Quarter 2, 2009					✱		✱	✱		✱		✱	✱				✱	✱		✱	✱
Quarter 3, 2009		✱			✱	✱	✱	✱	✱	✱		✱	✱	✱			✱	✱	✱	✱	✱
Quarter 4, 2009		✱				✱	✱	✱	✱	✱		✱	✱				✱	✱	✱	✱	✱
Quarter 1, 2010		✱			✱		✱	✱		✱			✱			✱	✱	✱		✱	
Quarter 2, 2010					✱	✱		✱		✱	✱	✱	✱			✱	✱	✱	✱	✱	✱
Quarter 3, 2010		✱			✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱
Quarter 4, 2010		✱				✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2011						✱		✱		✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	
Quarter 2, 2011		✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 3, 2011		✱				✱		✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2011		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱
Quarter 1, 2012		✱				✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 2, 2012	✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 3, 2012		✱				✱		✱		✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2012		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2013		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	
Quarter 2, 2013		✱						✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2013	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2013		✱				✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 1, 2014		✱						✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2014	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2014	✱	✱			✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2014		✱				✱		✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2015		✱				✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2015	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2015		✱			✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2015	✱	✱				✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 1, 2016	✱	✱			✱		✱	✱		✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2016	✱	✱			✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2016	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2016	✱	✱				✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 1, 2017	✱	✱				✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2017	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2017	✱	✱			✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2017		✱				✱	✱	✱	✱	✱		✱	✱	✱	✱		✱	✱		✱	✱
Quarter 1, 2018	✱	✱			✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱	✱		✱	✱
Quarter 2, 2018	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2018	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2018		✱				✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 1, 2019	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2019	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2019	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
PCB, TOTAL																					
Quarter 4, 2003																	✱				
Quarter 3, 2004												✱									
Quarter 3, 2005							✱														
Quarter 2, 2006							✱														
Quarter 3, 2006							✱														
Quarter 1, 2007							✱														
Quarter 2, 2007							✱														
Quarter 3, 2007							✱														
Quarter 1, 2008							✱														
Quarter 2, 2008							✱														
Quarter 4, 2008							✱														
Quarter 3, 2009							✱														
Quarter 1, 2010							✱														
Quarter 2, 2010							✱														
Quarter 4, 2010							✱														
PCB-1016																					
Quarter 3, 2004												✱									
Quarter 2, 2006							✱					✱									
Quarter 1, 2007							✱														
Quarter 2, 2007							✱														
Quarter 3, 2007							✱														
Quarter 2, 2008							✱														
Quarter 4, 2008							✱														
Quarter 3, 2009							✱														
Quarter 1, 2010							✱														
Quarter 2, 2010							✱														
Quarter 4, 2010							✱														
PCB-1242																					
Quarter 3, 2006							✱					✱									
Quarter 4, 2006										✱											
Quarter 1, 2008							✱														
Quarter 2, 2012							✱														
PCB-1248																					
Quarter 2, 2008							✱														
PCB-1260																					
Quarter 2, 2006							✱														
pH																					
Quarter 3, 2002										✱											
Quarter 4, 2002										✱											
Quarter 1, 2003										✱											
Quarter 2, 2003										✱											
Quarter 3, 2003	✱						✱			✱											
Quarter 4, 2003							✱									✱					
Quarter 1, 2004							✱									✱					
Quarter 3, 2005						✱												✱	✱		
Quarter 4, 2005						✱													✱		
Quarter 3, 2006																✱					
Quarter 2, 2011														✱							
Quarter 3, 2011														✱							
Quarter 4, 2011														✱							
Quarter 1, 2012																✱	✱				
Quarter 2, 2012												✱									
Quarter 1, 2013										✱		✱				✱					
Quarter 3, 2015																	✱				
Quarter 2, 2016																				✱	✱
Quarter 3, 2016																				✱	
Quarter 2, 2017																	✱				
Quarter 3, 2018					✱					✱		✱					✱	✱	✱		
Quarter 4, 2018																✱		✱			
Quarter 3, 2019																✱					
POTASSIUM																					
Quarter 1, 2014																✱					
RADIUM-228																					
Quarter 2, 2005														■							
Quarter 4, 2005						■						■						■			
SELENIUM																					
Quarter 4, 2003									■												

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
SODIUM																					
Quarter 3, 2002										✱	✱		✱								
Quarter 4, 2002										✱	✱			✱							
Quarter 1, 2003										✱											
Quarter 2, 2003										✱	✱										
Quarter 3, 2003											✱										
Quarter 1, 2007											✱										
Quarter 1, 2012														✱							
Quarter 1, 2014															✱						
Quarter 3, 2014											✱										
Quarter 4, 2014											✱										
Quarter 4, 2015											✱										
Quarter 1, 2016											✱										
Quarter 2, 2016											✱										
Quarter 3, 2016											✱										
Quarter 4, 2016											✱										
Quarter 1, 2017											✱										
Quarter 2, 2017											✱										
Quarter 3, 2017											✱										
Quarter 4, 2017											✱										
Quarter 1, 2018											✱										
Quarter 3, 2018											✱										
STRONTIUM-90																					
Quarter 4, 2008							■														
SULFATE																					
Quarter 1, 2003							✱														
Quarter 2, 2003						✱	✱														
Quarter 3, 2003	✱					✱															
Quarter 4, 2003					✱		✱														
Quarter 1, 2004					✱	✱	✱														
Quarter 2, 2004					✱	✱	✱														
Quarter 3, 2004					✱	✱	✱														
Quarter 1, 2005					✱	✱			✱												
Quarter 2, 2005					✱		✱		✱						✱						
Quarter 3, 2005					✱	✱	✱														
Quarter 4, 2005															✱						
Quarter 1, 2006					✱				✱												
Quarter 2, 2006						✱	✱		✱						✱						
Quarter 3, 2006							✱														
Quarter 1, 2007							✱														
Quarter 2, 2007							✱														
Quarter 3, 2007							✱														
Quarter 4, 2007		✱																			
Quarter 1, 2008		✱			✱		✱		✱												
Quarter 2, 2008		✱			✱	✱	✱														
Quarter 3, 2008		✱			✱	✱	✱														
Quarter 4, 2008		✱				✱	✱														
Quarter 1, 2009		✱					✱														
Quarter 2, 2009		✱			✱	✱	✱														
Quarter 3, 2009		✱			✱	✱	✱								✱						
Quarter 4, 2009		✱			✱	✱									✱						
Quarter 1, 2010		✱			✱	✱	✱								✱						
Quarter 2, 2010		✱			✱	✱	✱								✱						
Quarter 3, 2010		✱			✱	✱	✱								✱						
Quarter 4, 2010		✱				✱	✱								✱						
Quarter 1, 2011		✱																			
Quarter 2, 2011		✱			✱	✱	✱								✱						
Quarter 3, 2011		✱				✱	✱	✱							✱						
Quarter 4, 2011		✱				✱									✱						
Quarter 1, 2012		✱					✱	✱							✱						
Quarter 2, 2012	✱	✱		✱	✱	✱	✱	✱	✱						✱						
Quarter 3, 2012		✱				✱									✱						
Quarter 4, 2012		✱													✱						
Quarter 1, 2013		✱				✱									✱						
Quarter 2, 2013		✱													✱						
Quarter 3, 2013	✱	✱		✱	✱	✱	✱								✱						
Quarter 4, 2013		✱													✱						
Quarter 1, 2014		✱													✱						
Quarter 2, 2014	✱	✱			✱		✱	✱							✱						
Quarter 3, 2014	✱	✱			✱	✱	✱	✱							✱						
Quarter 4, 2014		✱				✱															
Quarter 1, 2015		✱																			

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
SULFATE																					
Quarter 2, 2015	*	*			*		*								*						
Quarter 3, 2015		*			*	*		*							*						
Quarter 4, 2015	*	*				*	*	*													
Quarter 1, 2016	*	*			*	*	*														
Quarter 2, 2016	*	*			*	*	*														
Quarter 3, 2016	*	*			*	*	*	*													
Quarter 4, 2016	*	*				*	*	*													
Quarter 1, 2017	*	*				*	*														
Quarter 2, 2017	*	*			*	*	*														
Quarter 3, 2017	*	*			*	*	*														
Quarter 4, 2017		*				*	*														
Quarter 1, 2018	*	*			*	*	*														
Quarter 2, 2018	*	*			*	*	*	*													
Quarter 3, 2018	*	*			*	*	*	*													
Quarter 4, 2018		*				*	*	*													
Quarter 1, 2019	*	*			*	*	*														
Quarter 2, 2019	*	*			*	*	*	*													
Quarter 3, 2019	*	*			*	*	*	*													
TECHNETIUM-99																					
Quarter 4, 2002																	*	*	*		
Quarter 2, 2003							*						*			*	*	*	*		*
Quarter 3, 2003																	*				
Quarter 4, 2003																	*				*
Quarter 1, 2004															*		*				*
Quarter 2, 2004															*						*
Quarter 3, 2004															*						*
Quarter 4, 2004															*		*				*
Quarter 3, 2005																	*				
Quarter 1, 2006															*						*
Quarter 2, 2006		*							*												*
Quarter 3, 2006																					*
Quarter 4, 2006															*						*
Quarter 1, 2007																					*
Quarter 2, 2007													*		*					*	
Quarter 3, 2007															*		*	*			
Quarter 4, 2007										*					*				*		*
Quarter 1, 2008															*					*	*
Quarter 2, 2008							*	*						*		*			*		
Quarter 3, 2008															*						
Quarter 4, 2008										*							*		*		
Quarter 1, 2009										*											
Quarter 2, 2009																		*			
Quarter 3, 2009								*		*					*						
Quarter 4, 2009										*					*			*	*		
Quarter 2, 2010										*						*	*	*	*		
Quarter 3, 2010										*					*						
Quarter 4, 2010																		*			
Quarter 1, 2011		*								*							*				
Quarter 2, 2011																*	*	*	*		
Quarter 1, 2012																	*	*			
Quarter 2, 2012								*										*			
Quarter 3, 2012																	*	*			
Quarter 4, 2012															*			*			*
Quarter 1, 2013																		*			*
Quarter 2, 2013																					*
Quarter 3, 2013										*											*
Quarter 4, 2013															*		*	*			*
Quarter 1, 2014															*		*	*			
Quarter 2, 2014																		*			
Quarter 3, 2014																	*	*	*		
Quarter 4, 2014															*						
Quarter 1, 2015															*			*			
Quarter 2, 2015																*					
Quarter 3, 2015																		*	*	*	
Quarter 4, 2015															*		*			*	
Quarter 1, 2016																*	*	*	*		*
Quarter 2, 2016																*	*	*	*	*	
Quarter 3, 2016																	*		*	*	
Quarter 4, 2016										*				*			*	*			
Quarter 1, 2017																	*		*	*	
Quarter 2, 2017																				*	
Quarter 3, 2017																		*		*	
Quarter 4, 2017														*	*		*	*		*	
Quarter 1, 2018																				*	
Quarter 2, 2018														*		*				*	
Quarter 3, 2018															*					*	
Quarter 4, 2018															*		*	*	*	*	
Quarter 1, 2019																*				*	

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
TECHNETIUM-99																					
Quarter 2, 2019														✱						✱	
Quarter 3, 2019															✱			✱		✱	
THORIUM-230																					
Quarter 4, 2015																✱					
Quarter 2, 2016										✱											
Quarter 4, 2016	✱											✱				✱			✱		
Quarter 4, 2017													✱								
Quarter 2, 2018										✱			✱								
TOLUENE																					
Quarter 2, 2014										✱				✱							
TOTAL ORGANIC CARBON																					
Quarter 3, 2002										✱	✱	✱		✱							✱
Quarter 4, 2002										✱	✱			✱							
Quarter 1, 2003											✱										
Quarter 3, 2003	✱									✱	✱					✱					
Quarter 4, 2003										✱	✱										
Quarter 1, 2004											✱										
Quarter 3, 2005						✱				✱					✱	✱			✱		
Quarter 4, 2005						✱												✱	✱		
Quarter 1, 2006																			✱		
TOTAL ORGANIC HALIDES																					
Quarter 4, 2002										✱											
Quarter 1, 2003										✱											
Quarter 2, 2003										✱											
Quarter 1, 2004																✱					
TRICHLOROETHENE																					
Quarter 3, 2002														■						■	
Quarter 4, 2002															■					■	
Quarter 1, 2003																				■	■
Quarter 2, 2003															■					■	
Quarter 3, 2003							■													■	■
Quarter 4, 2003															■					■	■
Quarter 1, 2004															■					■	■
Quarter 2, 2004															■					■	■
Quarter 3, 2004															■					■	■
Quarter 4, 2004															■					■	■
Quarter 1, 2005															■					■	■
Quarter 2, 2005															■					■	■
Quarter 3, 2005															■					■	■
Quarter 4, 2005															■					■	■
Quarter 1, 2006															■					■	■
Quarter 2, 2006															■					■	■
Quarter 3, 2006															■					■	■
Quarter 4, 2006															■						■
Quarter 1, 2007															■					■	■
Quarter 2, 2007															■						■
Quarter 3, 2007															■						■
Quarter 4, 2007															■						■
Quarter 1, 2008															■						■
Quarter 2, 2008															■				■		■
Quarter 3, 2008															■						■
Quarter 4, 2008															■						■
Quarter 1, 2009															■						■
Quarter 2, 2009															■						■
Quarter 3, 2009															■						■
Quarter 4, 2009						■	■				■		■	■	■		■				■
Quarter 1, 2010													■		■						■
Quarter 2, 2010													■		■						■
Quarter 3, 2010													■		■						■
Quarter 4, 2010													■		■						■
Quarter 2, 2011															■				■		■
Quarter 3, 2011													■		■				■		■
Quarter 4, 2011													■		■						■
Quarter 1, 2012													■		■		■		▨		■
Quarter 2, 2012															■						■
Quarter 3, 2012															■						■
Quarter 4, 2012														■	■						■
Quarter 1, 2013													■		■						■
Quarter 2, 2013													■		■		■		■		■
Quarter 3, 2013													■		■						■
Quarter 4, 2013													■		■				■		■
Quarter 1, 2014													■		■				■		■
Quarter 2, 2014															■		■		■		

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
TRICHLOROETHENE																					
Quarter 3, 2014													■		■				■		■
Quarter 4, 2014													■		■				■		■
Quarter 1, 2015													■		■						■
Quarter 2, 2015					■										■				■		■
Quarter 3, 2015													■		■		■				■
Quarter 4, 2015													■		■						■
Quarter 1, 2016													■		■		■	■			■
Quarter 2, 2016												■	■		■		■		■		■
Quarter 3, 2016													■		■		■	■			■
Quarter 4, 2016													■		■		■	■	■		■
Quarter 1, 2017													■		■			■			■
Quarter 2, 2017															■		■	■			■
Quarter 3, 2017															■		■	■			■
Quarter 4, 2017										■			■	■			■	■			■
Quarter 1, 2018															■		■	■			■
Quarter 2, 2018													■		■	■	■	■	■		■
Quarter 3, 2018										■					■		■	■			■
Quarter 4, 2018										■			■		■		■	■	■		■
Quarter 1, 2019										■					■	■	■	■			
Quarter 2, 2019										■						■	■	■			■
Quarter 3, 2019																	■	■	■		
TURBIDITY																					
Quarter 1, 2003										✱											
URANIUM																					
Quarter 4, 2002		✱			✱	✱	✱			✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱
Quarter 4, 2006																					✱
ZINC																					
Quarter 3, 2005																			✱		

✱ Statistical test results indicate an elevated concentration (i.e., a statistical exceedance).

■ MCL Exceedance

■ Previously reported as an MCL exceedance; however, result was equal to MCL

UCRS Upper Continental Recharge System

URGA Upper Regional Gravel Aquifer

LRGA Lower Regional Gravel Aquifer

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APPENDIX H

METHANE MONITORING DATA

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CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

PADUCAH GASEOUS DIFFUSION PLANT
Permit #: 073-00045
McCracken County, Kentucky

Date:	09/03/19	Time:	0915	Monitor:	Robert Kirby

Weather Conditions: Sunny, Warm, Slight Wind, and 80 Degrees

Monitoring Equipment:: RAE Systems, Multi-RAE Serial #7970

Monitoring Location		Reading (% LEL)
C-746-U1	Checked at floor level	0
C-746-U2	Checked at floor level	0
C-746-U-T-14	Checked at floor level	0
C-746-U15	Checked at floor level	0
MG1	Dry casing	0
MG2	Dry casing	0
MG3	Dry casing	0
MG4	Dry casing	0
Suspect or Problem Areas	No problems noted	0

Remarks: NA

Performed by: Robert Kirby 09/03/19

Signature Date

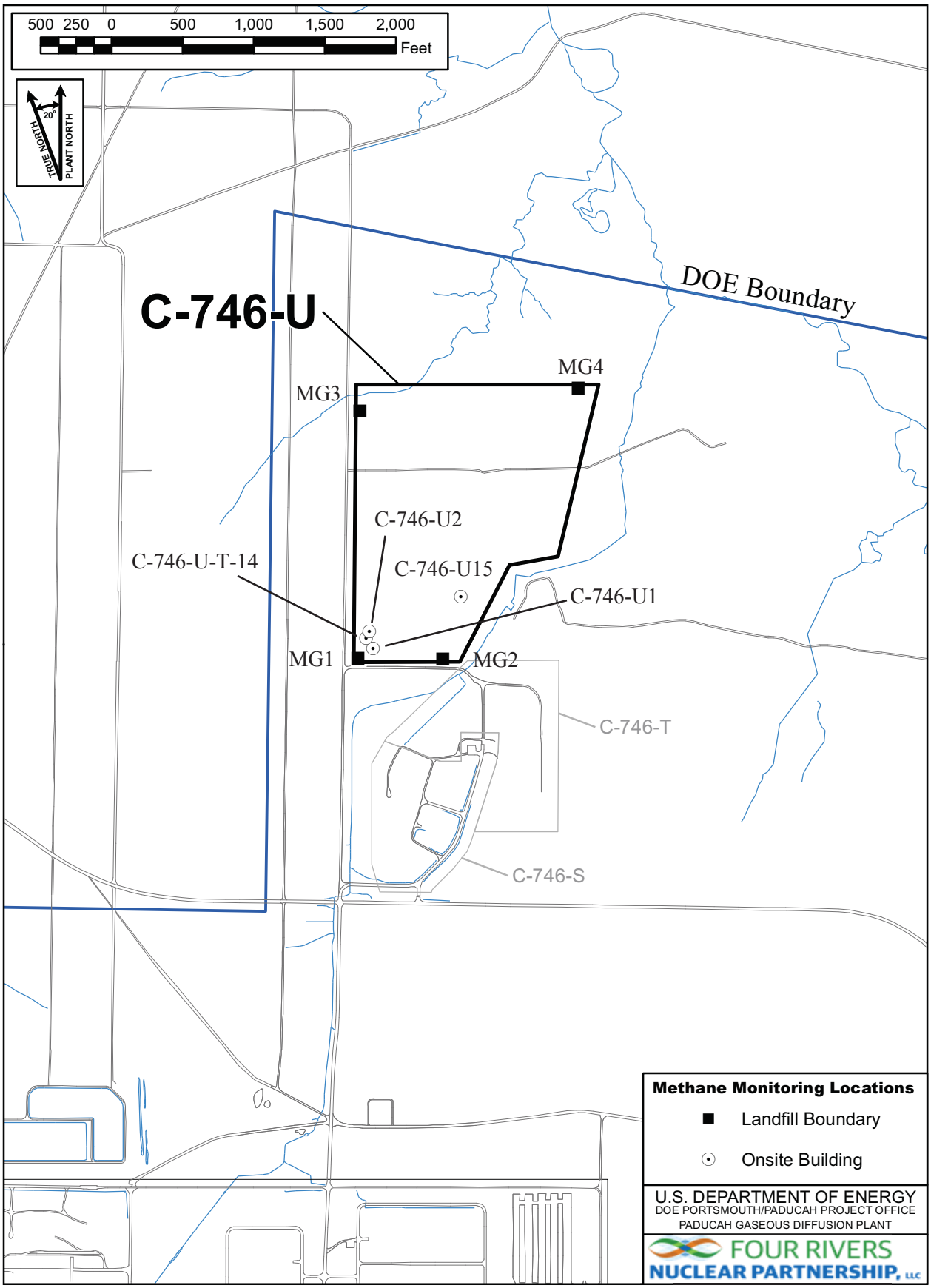

Figure H.1. C-746-U Methane Monitoring Locations

APPENDIX I

SURFACE WATER ANALYSES AND WRITTEN COMMENTS

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Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")	L150 AT SITE	L154 UPSTREAM	L351 DOWNSTREAM
Sample Sequence #	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA
Sample Date and Time (Month/Day/Year hour:minutes)	7/22/2019 14:34	7/22/2019 14:53	7/22/2019 14:17
Duplicate ("Y" or "N")[1]	N	N	N
Split ('Y' or "N")[2]	N	N	N
Facility Sample ID Number (if applicable)	L150US4-19	L154US4-19	L351US4-19
Laboratory Sample ID Number (if applicable)	485497001	485497002	485497003
Date of Analysis (Month/Day/Year)	8/19/2019	8/16/2019	8/16/2019

CAS RN[3]		CONSTITUENT	TD[4]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]
A200-00-0	0	Flow	T	MGD	Field		*		*		*		
16887-00-6	2	Chloride(s)	T	mg/L	300.0	3.12	*	6.91	*	2.73	*		
14808-79-8	0	Sulfate	T	mg/L	300.0	22.9		2.87		5.32			
7439-89-6	0	Iron	T	mg/L	200.8	61.4		1.5		1.28			
7440-23-5	0	Sodium	T	mg/L	200.8	10.5		1.75		2.81			
S0268- -	0	Organic Carbon[6]	T	mg/L	9060	8.3		20.9		12.1			
S0097- -	0	BOD[6]	T	mg/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	41.9		114		34.4			

[1]Respond "Y" if the sample was a duplicate of another sample in this report
[2]Respond "Y" if the sample was split and analyzed by separate laboratories.
[3]Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.
[4]"T" = Total; "D" = Dissolved
[5]"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit
[6]Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments" page.

STANDARD FLAGS:
* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution factor

SURFACE WATER - QUARTERLY

Facility: **US DOE - Paducah Gaseous Diffusion Plant**

Permit Number: **SW07300015, SW07300015, SW07300045**

FINDS/UNIT: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

SURFACE WATER SAMPLE ANALYSIS - (Cont.)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM" or "DOWNSTREAM")						L150 AT SITE		L154 UPSTREAM		L351 DOWNSTREAM			
CAS RN[3]		CONSTITUENT	TD[4]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]
S0145- -	1	Specific Conductance	T	µmho/cm	Field	175		88		147			
S0270- -	0	Total Suspended Solids	T	mg/L	160.2	13700		28.8		29			
S0266- -	0	Total Dissolved Solids	T	mg/L	160.1	870	B	173	B	137	B		
S0269- -	0	Total Solids	T	mg/L	SM-2540 B 17	13800	*	121	*	140	*		
S0296- -	0	pH	T	Units	Field	7.47		7.24		6.45			
7440-61-1		Uranium	T	mg/L	200.8	0.00844		0.00124		0.00479			
12587-46-1		Gross Alpha (α)	T	pCi/L	9310	453	*	2.99	*	7.84	*		
12587-47-2		Gross Beta (β)	T	pCi/L	9310	336	*	13.9	*	19	*		

RESIDENTIAL/CONTAINED – QUARTERLY **Finds/Unit: KY8-890-008-982 / 1**

Facility: US DOE - Paducah Gaseous Diffusion Plant **LAB ID: None**

Permit Number: SW07300014, SW07300015, SW07300045 **For Official Use Only**

SURFACE WATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US4-19	Flow Rate		Analysis of constituent not required and not performed.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity		TPU is 99.4. Rad error is 64.1.
		Beta activity		TPU is 65.7. Rad error is 31.6.
L154	L154US4-19	Flow Rate		Analysis of constituent not required and not performed.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.19. Rad error is 5.17.
		Beta activity		TPU is 7.73. Rad error is 7.4.
L351	L351US4-19	Flow Rate		Analysis of constituent not required and not performed.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity		TPU is 4.54. Rad error is 4.33.
		Beta activity		TPU is 7.17. Rad error is 6.45.

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APPENDIX J

ANALYTICAL LABORATORY CERTIFICATION

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From: Valerie Davis
To: Crabtree, Lisa
Subject: Fwd: Fwd: Extension of A2LA Certificate 2567.01
Date: Tuesday, November 19, 2019 2:16:52 PM

Hi Lisa,

I am forwarding the email notification we received regarding our A2LA extension.

Thanks,

Valerie

-------- Forwarded Message --------
Subject: Extension of A2LA Certificate 2567.01
Date: Thu, 27 Jun 2019 15:43:33 -0400 (EDT)
From:srippeon@A2LA.org
To:rlp@gel.com, srippeon@A2LA.org

The certificate listed below has been extended. An extended certificate has been placed on our website. Please feel free to print a copy of the certificate and scope directly from the website. Please contact your assigned Accreditation Officer (AcO) if you need further clarification.

Name: Pullano, Robert
Company: GEL Laboratories, LLC
Email: rlp@gel.com
Certificate Number: 2567.01
Expires: 06/30/2019
Field: Environmental
Extended Until: 07/31/2019
Ac0: Rippeon, Stephanie
AcO Email: srippeon@A2LA.org

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http://www.gellaboratories.com

Accredited Laboratory

A2LA has accredited

GEL LABORATORIES, LLC

Charleston, SC

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 TNI Environmental Testing Laboratory Standard, the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP), and the requirements of the Department of Energy Consolidated Audit Program (DOECAP) as detailed in Version 5.3 of the DoD/DOE Quality System Manual for Environmental Laboratories (QSM), accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 15th day of July 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2567.01
Valid to June 30, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

APPENDIX K

LABORATORY ANALYTICAL METHODS

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Analytical Method	Preparation Method	Product
SW846 8260B		Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer
SW846 8011	SW846 8011 PREP	Analysis of 1,2-Dibromoethane (EDB), 1,2-Dibromo-3-Chloropropane (DBCP) and 1,2,3-Trichloropropane in Water by GC/ECD Using Methods 504.1 or 8011
SW846 3535A/8082	SW846 3535A	Analysis of The Analysis of Polychlorinated Biphenyls by GC/ECD by ECD
SW846 6020	SW846 3005A	Determination of Metals by ICP-MS
SW846 7470A	SW846 7470A Prep	Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer
SW846 9060A		Carbon, Total Organic
SW846 9012B	SW846 9010C Distillation	Cyanide, Total
EPA 300.0		Ion Chromatography Iodide
SW846 9056		Ion Chromatography
EPA 160.1		Solids, Total Dissolved
EPA 410.4		COD
Eichrom Industries, AN-1418		AlphaSpec Ra226, Liquid
DOE EML HASL-300, Th-01-RC Modified		Th-01-RC M, Th Isotopes, Liquid
EPA 904.0/SW846 9320 Modified		904.0Mod, Ra228, Liquid
EPA 900.0/SW846 9310		9310, Alpha/Beta Activity, liquid
EPA 905.0 Modified/DOE RP501 Rev. 1 Modified		905.0Mod, Sr90, liquid
DOE EML HASL-300, Tc-02-RC Modified		Tc-02-RC-MOD, Tc99, Liquid
EPA 906.0 Modified		906.0M, Tritium Dist, Liquid

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APPENDIX L

MICRO-PURGING STABILITY PARAMETERS

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Micro-Purge Stability Parameters
for the C-746-U Contained Landfill

	Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW357					
Date Collected: 7/10/2019					
0904	64.8	426	6.18	4.96	4.70
0907	65.1	428	6.13	4.87	4.10
0910	65.6	427	6.10	4.72	4.50
MW359					
Date Collected: 7/10/2019					
1041	63.3	224	6.00	3.71	4.7
1044	64.7	225	5.93	3.36	3.9
1047	65.8	224	5.89	3.40	5.1
MW361					
Date Collected: 7/10/2019					
0737	61.6	493	6.02	2.95	2.1
0740	62.2	493	6.05	2.90	3.3
0743	62.6	492	6.02	2.89	3.0
MW363					
Date Collected: 7/10/2019					
1125	68.2	414	6.09	1.07	3.2
1128	69.4	412	6.07	0.86	2.0
1131	69.9	412	6.07	0.78	2.4
MW365					
Date Collected: 7/10/2019					
1253	64.4	431	6.28	3.25	1.6
1256	65.1	431	6.24	2.83	2.5
1259	65.8	430	6.20	2.74	3.1
MW367					
Date Collected: 7/11/2019					
0752	62.4	403	5.85	2.61	2.5
0755	62.9	401	5.80	2.35	2.3
0758	63.2	400	5.79	2.23	2.1
MW369					
Date Collected: 7/15/2019					
0705	62.6	374	6.26	3.20	4.0
0708	62.7	373	6.26	3.11	2.8
0711	62.7	373	6.25	3.09	2.6
MW371					
Date Collected: 7/15/2019					
0836	61.8	524	6.55	4.75	84.5
0839	62.2	525	6.56	4.69	66.3
0842	62.7	523	6.56	4.60	61.4
MW373					
Date Collected: 7/11/2019					
1014	65.6	780	6.06	2.75	1.4
1017	65.9	782	6.04	2.54	1.3
1020	66.4	785	6.03	2.36	0.8
MW375					
Date Collected: 7/11/2019					
1144	62.8	335	6.33	1.30	3.6
1147	63.3	335	6.28	1.28	2.4
1150	63.9	335	6.27	1.21	3.1

	Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW358					
Date Collected: 7/10/2019					
0954	65.5	503	6.11	3.12	8.00
0957	66.2	506	6.12	2.11	8.50
1000	66.7	505	6.11	2.01	9.30
MW360					
Date Collected: 7/10/2019					
0651	61.5	403	6.18	1.93	17.0
0654	62.0	403	6.16	1.62	14.5
0657	62.1	402	6.16	1.51	12.4
MW362					
Date Collected: 7/10/2019					
0819	61.7	730	7.01	4.54	4.5
0822	61.9	732	6.95	4.47	4.8
0825	62.2	733	6.93	4.48	4.5
MW364					
Date Collected: 7/10/2019					
1210	64.1	484	6.10	3.26	3.7
1213	65.5	484	6.04	3.19	5.2
1216	66.3	485	6.01	3.23	6.6
MW366					
Date Collected: 7/11/2019					
0659	62.5	472	6.06	2.97	2.0
0702	63.0	472	6.04	2.95	1.5
0705	63.2	471	6.03	2.99	1.6
MW368					
Date Collected: 7/11/2019					
0842	61.8	726	6.54	3.98	14.1
0845	62.7	731	6.46	4.06	7.7
0848	63.3	733	6.42	4.17	6.4
MW370					
Date Collected: 7/15/2019					
0752	62.5	420	6.16	4.50	0.1
0755	62.8	419	6.15	4.21	0.7
0758	63.0	421	6.15	4.09	0.8
MW372					
Date Collected: 7/11/2019					
0929	64.2	641	6.13	3.97	0.8
0932	64.9	641	6.09	3.76	2.1
0935	65.2	640	6.08	3.63	1.6
MW374					
Date Collected: 7/11/2019					
1100	64.3	665	6.55	2.87	1.9
1103	64.9	662	6.58	2.46	2.4
1106	65.3	661	6.54	2.23	3.1

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