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August 26, 2020

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PPPO-02-10007684-20B

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 SECOND QUARTER CALENDAR YEAR 2020 (APRIL-JUNE) COMPLIANCE MONITORING REPORT, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0151/V2, PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID NO. 3059

Enclosed is the subject report for the second quarter calendar year (CY) 2020. 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 second quarter CY 2020 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 second quarter CY 2020, 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 Landfill 2nd Qtr. CY 2020 Compliance Monitoring Report, FRNP-RPT-0151/V2

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FRNP-RPT-0152/V2

C-746-S&T Landfills
Second Quarter Calendar Year 2020
(April–June)
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 — 8-19-2020

FRNP Classification Support — Date

FRNP-RPT-0152/V2

C-746-S&T Landfills
Second Quarter Calendar Year 2020
(April–June)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

Date Issued—August 2020

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

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

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ACRONYMS

CFR	*Code of Federal Regulations*
COD	chemical oxygen demand
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-S&T Landfills Second Quarter Calendar Year 2020 (April–June) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* is being submitted in accordance with Solid Waste Landfill 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 exceedances of the MCL and historical UTL that have occurred since the fourth quarter calendar year 2002. Methane monitoring results are documented on the approved C-746-S&T Landfills 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. Micropurging stability parameter results are provided in Appendix L.

1.1 BACKGROUND

The C-746-S&T Landfills are closed, solid waste landfills located north of the Paducah Site and south of the C-746-U Landfill. Construction and operation of the C-746-S Residential Landfill were permitted in April 1981 under Solid Waste Landfill Permit Number 073-00014. The permitted C-746-S Landfill area covers about 16 acres and contains a clay liner with a final cover of compacted soil. The C-746-S Landfill was a sanitary landfill for the Paducah Gaseous Diffusion Plant operations. The C-746-S Landfill is closed and has been inactive since July 1995.

Construction and operation of the C-746-T Inert Landfill were permitted in February 1985 under Solid Waste Landfill Permit Number 073-00015. The permitted C-746-T Landfill area covers about 20 acres and contains a clay liner with a final cover of compacted soil. The C-746-T Landfill was used to dispose of construction debris (e.g., concrete, wood, and rock) and steam plant fly ash from the Paducah Gaseous Diffusion Plant operations. The C-746-T Landfill is closed and has been inactive since June 1992.

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 23 monitoring wells (MWs) under permit for the C-746-S&T Landfills: 5 UCRS wells, 11 URGA wells, and 7 LRGA wells. A map of the MW locations is presented in Figure 1. All MWs listed on the permit were sampled this quarter,

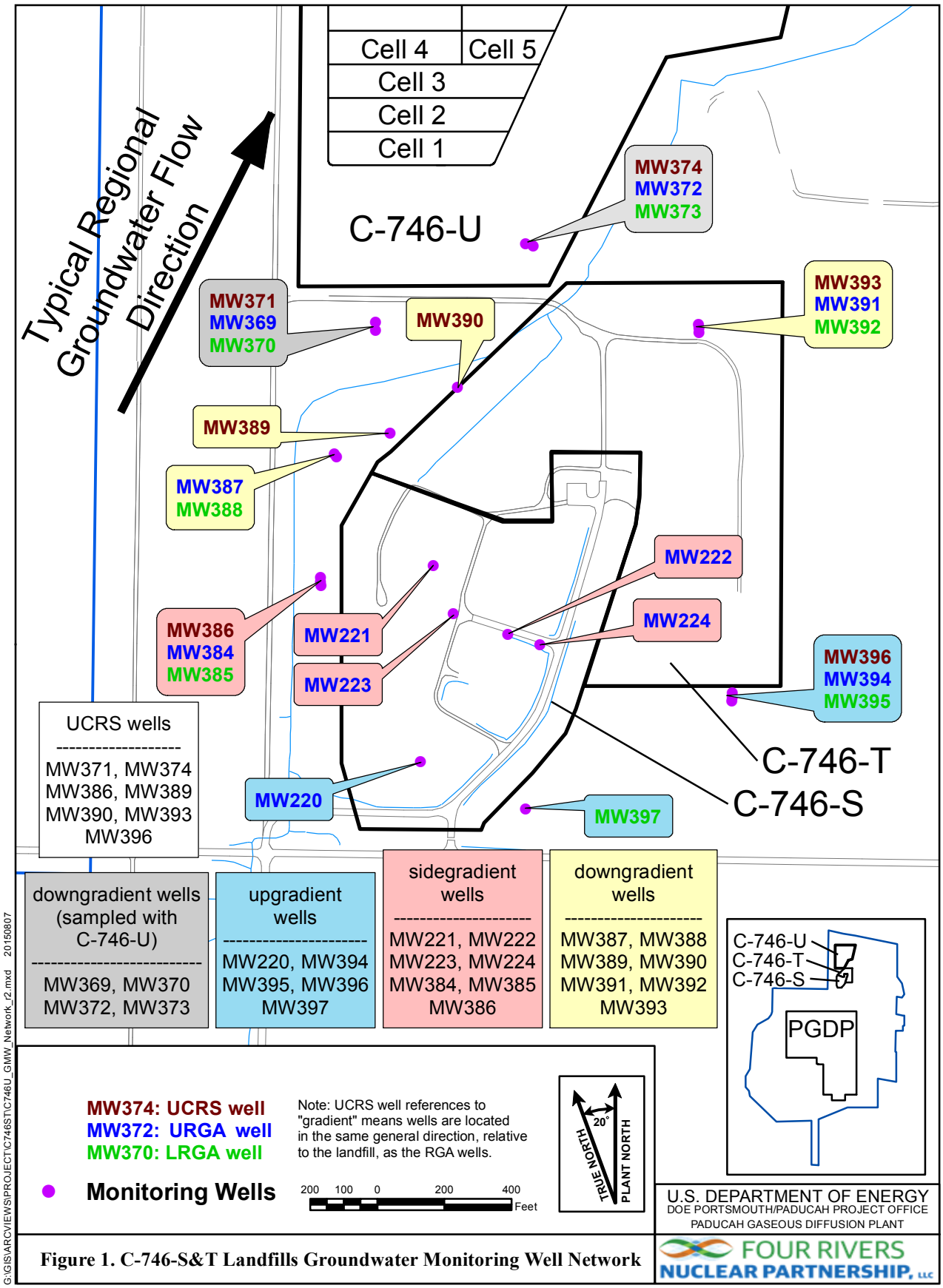

Figure 1. C-746-S&T Landfills Groundwater Monitoring Well Network

except MW389 (screened in the UCRS), which had an insufficient amount of water to obtain a water level measurement or sample; therefore, there are no analytical results for this location.

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,* PAD-PROJ-0139, (Groundwater Monitoring Plan) (LATA Kentucky 2014), UCRS wells are included in the monitoring program. Groundwater flow gradients are downward through the UCRS, but the underlying Regional Gravel Aquifer (RGA) flows laterally. Groundwater flow in the RGA is typically in a north-northeasterly direction in the vicinity of the C-746-S&T Landfills. 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 second quarter 2020 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor, procedure CP4-ES-2101, *Groundwater Sampling*. The laboratory also used U.S. Environmental Protection Agency-approved methods, as applicable. The parameters specified in Permit Condition GSTR0003, Special Condition 3, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on April 14 and 15, 2020, in MWs of the C-746-S&T Landfills (see Appendix E, Table E.1); in MWs of the C-746-U Landfill; and in MWs of the surrounding region (shown on Appendix E, Figure E.3). 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 April, RGA groundwater flow in the area of the landfill was oriented northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-S&T Landfills in April was 5.09×10^{-4} ft/ft, while the gradient beneath the C-746-S&T Landfills was approximately 3.32×10^{-4} ft/ft. Calculated groundwater flow rates (average linear velocities) for the RGA at the C-746-S&T Landfills range from 0.57 to 0.96 ft/day (see Appendix E, Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 *KAR* 48:090 § 5 and the Solid Waste Landfill Permit. Landfill operations staff monitored for the occurrence of methane in one on-site building location, four locations along the landfill boundary, and 27 passive gas vents located in Cells 1, 2, and 3 of the C-746-S Landfill on June 3, 2020. 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-S&T Landfills Methane Log provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water sampling was performed at the three locations (see Figure 2) monitored for the C-746-S&T Landfills: (1) upstream location, L135; (2) downstream location, L154; and (3) L136, a location capturing 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-S and C-746-T Landfills Permit Numbers*

KY-073-00014 and 073-00015, Paducah Gaseous Diffusion Plant, Paducah, Kentucky (PRS 2008), which is Technical Application, Attachment 24, of the Solid Waste Landfill 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 exceeded their MCL and also exceeded their historical background UTL, as well as other parameters that do not have MCLs but have concentrations that exceeded the statistically derived historical background UTL[1] during the second quarter 2020, 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 designated as background wells (Table 3).

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

The constituents that exceeded their MCL 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 (LATA Kentucky 2014), the MCL exceedances for TCE in MW391 and MW392 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

The MCL exceedances for beta activity in MW370, MW385, MW387, and MW388 (downgradient wells) were shown to exceed both the historical background UTL and the current background UTL; therefore, preliminarily they were considered to be Type 2 exceedances. To evaluate these preliminary Type 2 exceedances 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. None of the wells evaluated for beta activity showed an increasing Mann-Kendall trend and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

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 GSTR0003, Standard Requirement 5, and 401 *KAR* 48:300 § 7.

[1] The UTL comparison for pH uses a two-sided test, both UTL and LTL.

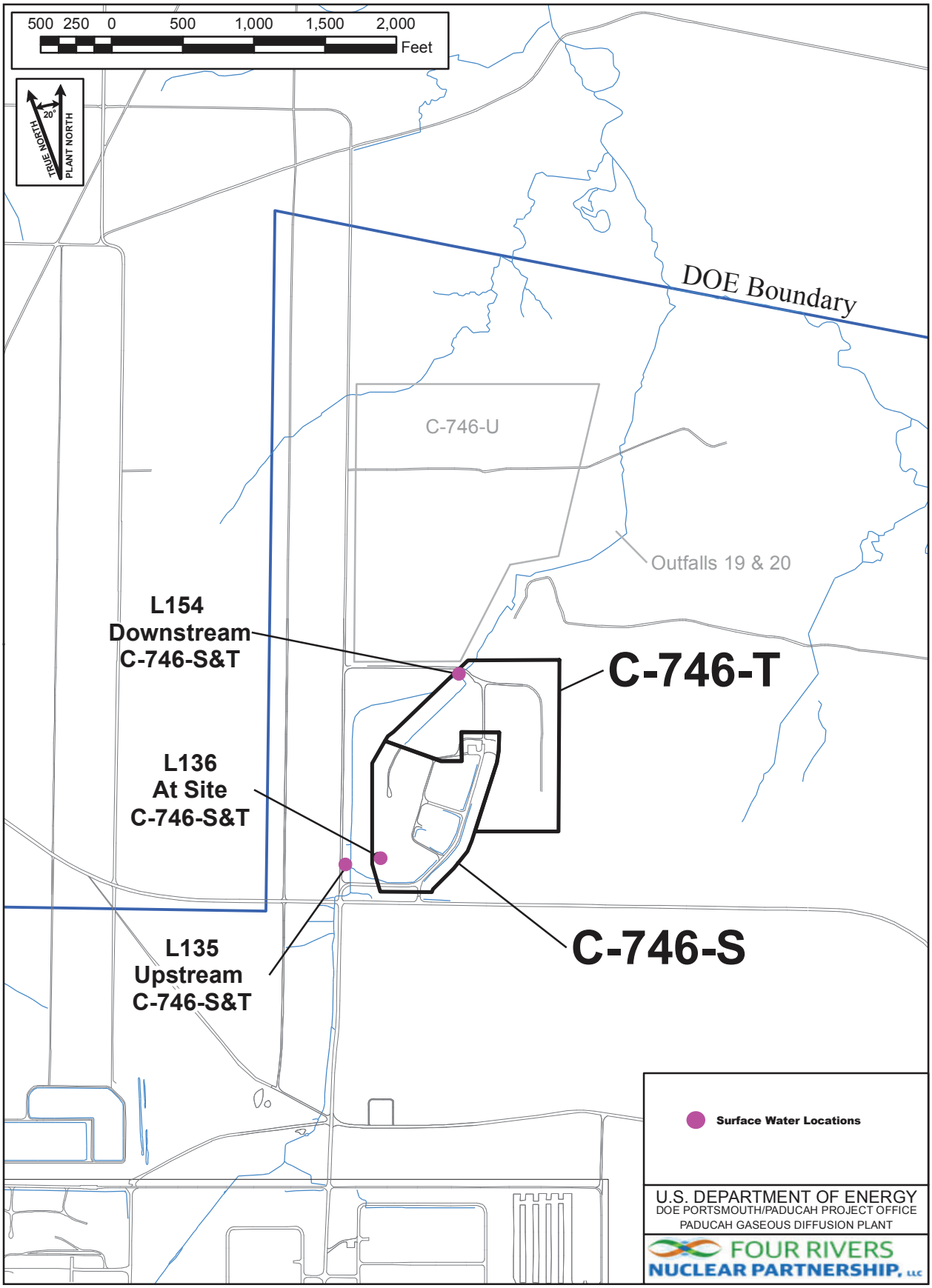

Figure 2. C-746-S&T Landfills Surface Water Monitoring Locations

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW387: Beta activity	MW370: Beta activity
	MW391: Trichloroethene	MW385: Beta activity
		MW388: Beta activity
		MW392: Trichloroethene

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW386: Oxidation-reduction potential	MW220: COD, oxidation-reduction potential, radium-226, sulfate	MW370: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW390: Oxidation-reduction potential, technetium-99	MW221: Oxidation-reduction potential	MW373: Calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate
MW393: Oxidation-reduction potential	MW222: Oxidation-reduction potential	MW385: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW396: Oxidation-reduction potential	MW223: Oxidation-reduction potential, sulfate	MW388: Beta activity, conductivity, oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	MW392: Oxidation-reduction potential, sulfate
	MW369: Sodium	MW395: Oxidation-reduction potential
	MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	MW397: Oxidation-reduction potential
	MW384: Oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity, dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate, technetium-99	
	MW391: Oxidation-reduction potential, sulfate	
	MW394: Oxidation-reduction potential	

*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.
Sidegradient wells: MW221, MW222, MW223, MW224, MW384, MW385, MW386
Downgradient wells: MW369, MW370, MW372, MW373, MW387, MW388, MW389, MW390, MW391, MW392, MW393
Background wells: MW220, MW394, MW395, MW396, MW397

Table 3. Exceedances of Current Background UTL in Downgradient Wells

URGA	LRGA
MW369: Sodium	MW370: Beta activity, sulfate, technetium-99
MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	MW373: Calcium, conductivity, dissolved solids, magnesium, sodium, sulfate
MW387: Beta activity, dissolved solids, magnesium, sodium, technetium-99	MW388: Beta activity, conductivity, sulfate, technetium-99
	MW392: Sulfate

Table 4. C-746-S&T Landfills 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-S&T Landfill	MW369	Sodium	8	0.05	0.016	19	Increasing
	MW370	Beta activity	8	0.05	0.054	-14	No Trend
		Sulfate	8	0.05	0.138	-10	No Trend
		Technetium-99	8	0.05	0.119	-8	No Trend
	MW372	Calcium	8	0.05	0.007	21	Increasing
		Conductivity	8	0.05	0.002	22	Increasing
		Dissolved Solids	8	0.05	0.138	10	No Trend
		Magnesium	8	0.05	0.007	20	Increasing
		Sulfate	8	0.05	0.089	12	No Trend
		Technetium-99	8	0.05	0.452	2	No Trend
	MW373	Calcium	8	0.05	0.000	26	Increasing
		Conductivity	8	0.05	0.000	26	Increasing
		Dissolved Solids	8	0.05	0.007	20	Increasing
		Magnesium	8	0.05	0.002	22	Increasing
		Sodium	8	0.05	0.001	24	Increasing
		Sulfate	8	0.05	0.138	10	No Trend
	MW387	Beta activity	8	0.05	0.119	8	No Trend
		Dissolved Solids	8	0.05	0.031	16	Increasing
		Magnesium	8	0.05	0.089	12	No Trend
		Sodium	8	0.05	0.119	8	No Trend
		Technetium-99	8	0.05	0.016	18	Increasing

Table 4. C-746-S&T Landfills Downgradient Wells Trend Summary Utilizing the Previous Eight Quarters (Continued)

Location	Well ID	Parameter	Sample Size	Alpha[1]	p-Value[2]	S[3]	Decision[4]
C-746-S&T Landfill	MW388	Beta activity	8	0.05	0.016	-18	Decreasing
		Conductivity	8	0.05	0.119	8	No Trend
		Sulfate	8	0.05	0.360	-4	No Trend
		Technetium-99	8	0.05	0.089	-12	No Trend
	MW392	Sulfate	8	0.05	0.007	20	Increasing

[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.

Note: Statistics generated using ProUCL.

The constituents listed in Table 2 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 background wells, to identify if the current downgradient well concentrations are consistent with current background values. Table 3 summarizes the evaluation against current background UTL for those constituents present in downgradient wells with historical UTL exceedances. In accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), constituents in downgradient wells that exceed the historical UTL, but do not exceed the current UTL, are considered not to have a C-746-S&T Landfills source; therefore, they are a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

The constituents listed in Table 3 that exceed both the historical UTL and the current UTL do not have an identified source and are considered preliminarily to be a Type 2 exceedance, per the approved Groundwater Monitoring Plan (LATA Kentucky 2014). To evaluate these preliminary Type 2 exceedances further, the parameters were subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results are summarized in Table 4. Fourteen of the 26 preliminary Type 2 exceedances in downgradient wells did not have an increasing trend and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

Twelve of the 26 preliminary Type 2 exceedances in downgradient wells have an increasing trend. Specifically, the Mann-Kendall statistical test indicates that there are increasing trends of groundwater constituents in MW369, MW372, MW373, MW387, and MW392 over the past eight quarters. MW369 showed an increasing trend for sodium. Constituents in MW372 that showed increasing trends were calcium, conductivity, and magnesium. Constituents that showed increasing trends in MW373 were calcium, conductivity, dissolved solids, magnesium, and sodium. Constituents in MW387 showed increasing trends for dissolved solids and technetium-99. Sulfate concentrations showed an increasing trend in MW392.

An increasing trend of sodium levels in MW369 was identified during the previous quarter, and the trend continues into the current quarter. These levels are within the range of previous analyses for groundwater from MW369 and reflect the normal range. This trend should be considered to be a Type 1 exceedance — not attributable to the C-746-S&T Landfills.

Levels of calcium, magnesium, and conductivity in both MW372 and MW373 and dissolved solids and sodium in MW373 all exceed the UTLs for historical and current background and exhibit similar increasing trends. These occurrences are indicators of high ionic strength of the area groundwater. Because levels of calcium, magnesium, and conductivity are lower in MW372 (URGA) than in MW373 (LRGA), these trends do not appear to be associated with the C-746-S&T Landfills. (Influence of the landfill should have a greater impact on the URGA well.) These trends should be considered to be Type 1 exceedances—not attributable to the C-746-S&T Landfills.

In MW387, levels of dissolved solids and magnesium (another analyte that exceeded both historical and current background UTL) have similar trends, indicating the dissolved solids are being determined by the ionic strength of the groundwater. The levels of both analytes are within the range of previous analyses. The April 2020 levels of dissolved solids and magnesium represent the normal range of the analytes in MW387. These trends should be considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

Activities of technetium-99 and beta activity (another analyte that exceeded both historical and current background UTL) have similar trends, corroborating the recent higher activities in MW387. These occurrences are attributed to a known upgradient regional source of dissolved technetium-99. In accordance with the Groundwater Monitoring Plan, the increasing trend of technetium-99 in MW387 is considered to be a Type 1 exceedance.

Sulfate levels in MW392 (LRGA) increased significantly in April 2019 and remained at higher levels subsequently. A decreasing trend for sulfate levels was observed in MW391 (URGA) over the past 8 quarters. Beginning in October 2019, the sulfate levels have remained at similar concentrations in MW391 and MW392. Sulfate levels in MW391 (URGA) and MW392 (LRGA) are near the median of sulfate levels observed in monitoring wells of the C-746-S&T Landfills in April 2020. Together, these trends indicate the increased sulfate concentrations in MW392 are reaching equilibrium with local sulfate concentrations in groundwater. These trends should be considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

In accordance with Permit Condition GSTR0003, Special Condition 2, of the Solid Waste Landfill Permit, the groundwater assessment and corrective action requirements of 401 *KAR* 48:300 § 8 shall not apply to the C-746-S Residential Landfill and the C-746-T Inert Landfill. This variance in the permit provides that groundwater assessment and corrective actions for these landfills will be conducted in accordance with the corrective action requirements of 401 *KAR* 34:060 § 12.

The statistical evaluation of current UCRS concentrations against the current UCRS background UTL identified UCRS well MW390 with technetium-99 values that exceed both the historical and current backgrounds (Table 5). Because UCRS wells are not hydrogeologically downgradient of the C-746-S&T Landfills, this exceedance is not attributable to C-746-S&T Landfills sources and is considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

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

UCRS
MW390: technetium-99

*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-S&T Landfills.

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2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the second quarter 2020 groundwater data collected from the C-746-S&T Landfill MWs were performed in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014). The statistical analyses for this report utilize data from the first eight quarters that were sampled for each parameter, beginning with the first two 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, 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 landfills. 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 downgradient wells) to identify if this exceedance is attributable to upgradient/non-landfill sources. If the downgradient well 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 further evaluated using the Mann-Kendall test for trend. If there was not a statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance—not attributable to the landfills.

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 further evaluated using the Mann-Kendall test for trend. If there was not a statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance—not attributable to the landfills.

To calculate the UTL, the data were divided into censored (non-detects) and uncensored (detected) observations. The one-sided tolerance interval statistical test was conducted only on parameters that had at least one uncensored observation. Results of the one-sided tolerance interval statistical test were 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 was conducted. The test well results were compared to both the UTL and LTL to determine if statistically significant deviations in concentrations exist with respect to 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 historically included in the statistical analyses are listed in Table 6.

Table 6. Monitoring Wells Included in Statistical Analysis[a]

UCRS	URGA	LRGA
MW386	MW220 (background)	MW370
MW389[b]	MW221	MW373
MW390	MW222	MW385
MW393	MW223	MW388
MW396[c]	MW224	MW392
	MW369	MW395 (background)
	MW372	MW397 (background)
	MW384	
	MW387	
	MW391	
	MW394 (background)	

[a]A map showing the MW locations is shown on Figure 1.
[b]Well had insufficient water to permit a water sample for laboratory analysis.
[c]In the same direction (relative to the landfill) as RGA wells considered to be background.

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Parameters requiring statistical analysis are summarized in Appendix D for each hydrological 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 background in order to determine if the current downgradient well concentrations are consistent with current background values. Table 3 summarizes the constituents present in downgradient wells with historical UTL exceedances that are above the current UTL. Those constituents that have exceeded both the historical and current background UTLs in downgradient wells were further evaluated for increasing trends and are listed in Table 4.

2.1.1 Upper Continental Recharge System

In this quarter, 25 parameters, including those with MCLs, required statistical analysis in the UCRS. During the second quarter, oxidation-reduction potential and technetium-99 displayed concentrations that exceeded their respective historical UTLs and are listed in Table 2. Technetium-99 exceeded the current background UTL in downgradient wells and is included in Table 5.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 28 parameters, including those with MCLs, required statistical analysis in the URGA. During the second quarter, beta activity, calcium, COD, conductivity, dissolved solids, magnesium, oxidation-reduction potential, radium-226, sodium, sulfate, and technetium-99 displayed concentrations that exceeded their respective historical UTLs and are listed in Table 2. Beta activity, calcium, conductivity, dissolved solids, magnesium, sodium, sulfate, and technetium-99 exceeded the current background UTL in downgradient wells and are included in Table 3.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 27 parameters, including those with MCLs, required statistical analysis in the LRGA. During the second quarter, beta activity, calcium, conductivity, dissolved solids, magnesium, oxidation reduction potential, sodium, sulfate, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Beta activity, calcium, conductivity, dissolved solids, magnesium, sodium, sulfate, and technetium-99 exceeded the current background UTL in downgradient wells and are included in Table 3.

2.2 DATA VERIFICATION AND VALIDATION

Data verification is the process of comparing a data set against 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 for 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-S&T Landfills*
Second Quarter Calendar Year 2020 (April–June)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky (FRNP-RPT-0152/V2)

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

PG 113927
R. Davis 8-19-2020

Kenneth R. Davis
Kenneth R. Davis

PG113927

8-19-2020
Date

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4. REFERENCES

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-S and C-746-T Landfills Permit Numbers KY-073-00014 and 073-00015, 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-S&T Landfills

Permit No: SW07300014, SW07300015, SW07300045

Finds/Unit No: _____

Quarter & Year: 2nd Qtr. CY 2020

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

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

Date

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APPENDIX B

FACILITY INFORMATION SHEET

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FACILITY INFORMATION SHEET

Sampling Date: Groundwater: April 2020; Surface water: April 2020; Methane: June 2020 | 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' 37.70" | Longitude: W 88° 47' 55.41"

OWNER INFORMATION

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

Contact Person: Bruce Ford | Phone No: (270) 441-5357

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 Corporation

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/INERT-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						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
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)						4/21/2020 07:15		4/16/2020 06:40		4/16/2020 08:27		4/16/2020 07:45	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW220SG3-20		MW221SG3-20		MW222SG3-20		MW223SG3-20	
Laboratory Sample ID Number (if applicable)						509875001		509596005		509596001		509596007	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/24/2020		4/22/2020		4/22/2020		4/22/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						UP		SIDE		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	0.242		0.471		0.432		0.394	
16887-00-6		Chloride(s)	T	mg/L	9056	18.2	*	34.8	*	31.4	*	28.2	*
16984-48-8		Fluoride	T	mg/L	9056	0.283		0.176		0.267		0.171	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.4		1.02		0.871		0.77	
14808-79-8		Sulfate	T	mg/L	9056	22.2		14.6		14.5		21.1	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.87		30.28		30.33		30.29	
S0145- -		Specific Conductance	T	µMH0/cm	Field	435		400		388		414	

[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						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						220		221		222		223	
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	332.37		331.95		332.11		332.19	
N238		Dissolved Oxygen	T	mg/L	Field	3.44		3.83		2.97		3.61	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	214	B	140	*	273	*	197	*
S0296- -		pH	T	Units	Field	6.16		5.82		6.15		6.14	
NS215		Eh	T	mV	Field	435		429		425		415	
S0907 - -		Temperature	T	°C	Field	15.5		14.11		15.56		14.89	
7429-90-5		Aluminum	T	mg/L	6020	0.0588		<0.05		<0.05		0.0473	J
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		<0.005		<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.228		0.221		0.294		0.229	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00649	J	0.0152		0.0114	J	0.00747	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	28.8		23		21.6		23.6	
7440-47-3		Chromium	T	mg/L	6020	0.00768	J	0.0111		0.00713	J	0.0173	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.00135		0.00157		0.0004	J
7440-50-8		Copper	T	mg/L	6020	0.000885	J	0.00218		0.00181	J	0.000767	J
7439-89-6		Iron	T	mg/L	6020	0.107		0.0406	J	0.067	J	0.124	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	11.9		10	B	9.5	B	9.91	B
7439-96-5		Manganese	T	mg/L	6020	0.00233	J	0.0115		0.0209		0.0215	
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						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
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	0.00121		0.00984		0.00446		0.00511	
7440-02-0		Nickel	T	mg/L	6020	0.0123		0.126		0.143		0.108	
7440-09-7		Potassium	T	mg/L	6020	2.76		2.5		0.661		2.39	
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	44		49.1		48.6		47.6	
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	<0.0002		<0.0002		<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	0.00352	J	0.00452	J	0.00371	J	0.00406	J
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						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
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		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
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	*	<0.0000192		<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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

RESIDENTIAL/INERT-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						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
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		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	1.67	*	2.21	*	2.08	*	-1.67	*
12587-47-2		Gross Beta	T	pCi/L	9310	16.5	*	1.66	*	10.2	*	-1.86	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	1.04	*	0.393	*	0.258	*	0.387	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.39	*	3.6	*	1.28	*	0.0932	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	18.7	*	12.8	*	0.923	*	5.66	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.357	*	0.136	*	0.0269	*	0.00181	*
10028-17-8		Tritium	T	pCi/L	906.0	-30.5	*	-3.57	*	-15.5	*	5.28	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	114		11.7	J	28.8		33.7	
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	1.35	BJ	1.02	BJ	0.993	BJ	1.07	BJ
S0586- -		Total Organic Halides	T	mg/L	9020	0.00804	J	<0.01	*	0.0105	*	0.00376	*J

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

RESIDENTIAL/INERT-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						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		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)						4/16/2020 09:23		4/6/2020 10:08		4/6/2020 11:56		4/6/2020 08:03	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW224SG3-20		MW369UG3-20		MW370UG3-20		MW372UG3-20	
Laboratory Sample ID Number (if applicable)						509596009		508913001		508913003		508913007	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/22/2020		4/9/2020		4/9/2020		4/9/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						SIDE		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	0.483		0.502	*	0.436	*	0.512	*
16887-00-6		Chloride(s)	T	mg/L	9056	35.8	*	31.2		36.7		39.5	
16984-48-8		Fluoride	T	mg/L	9056	0.218		0.154		0.144		0.17	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.98		0.604	J	1.02		0.77	J
14808-79-8		Sulfate	T	mg/L	9056	14.9		9.41		21		102	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.38		30.12		30.09		30.12	
S0145- -		Specific Conductance	T	µMH0/cm	Field	427		407		474		687	

[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						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						224		369		370		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	332.27		332.57		332.61		332.6	
N238		Dissolved Oxygen	T	mg/L	Field	3.19		0.65		2.72		0.83	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	169	*	214		246		399	
S0296- -		pH	T	Units	Field	6.21		6.23		6.08		6.17	
NS215		Eh	T	mV	Field	423		390		448		393	
S0907 - -		Temperature	T	°C	Field	15.89		17.72		18.33		15.78	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0243	J	<0.05		0.0233	J
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		<0.005		0.00229	J	0.00239	J
7440-39-3		Barium	T	mg/L	6020	0.216		0.465		0.239		0.0681	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0235		0.0202		0.302		1.15	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	24.5		20.4		33.5		62.7	
7440-47-3		Chromium	T	mg/L	6020	0.00648	J	<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00289		0.00564		0.000469	J	0.000789	J
7440-50-8		Copper	T	mg/L	6020	0.000503	J	0.00111	J	0.000905	J	0.00052	J
7439-89-6		Iron	T	mg/L	6020	0.0576	J	0.178		0.0608	J	0.179	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	10.3	B	8.43		14.1		22.4	
7439-96-5		Manganese	T	mg/L	6020	0.0239		0.503		0.0121		0.00952	
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						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		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	0.0011		0.000235	J	<0.001		0.000352	J
7440-02-0		Nickel	T	mg/L	6020	0.164		0.00798		0.000725	J	0.00126	J
7440-09-7		Potassium	T	mg/L	6020	0.894		0.625		2.77		2.45	
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	57.6		62		49.4		57.7	
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		<0.0002		<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	<0.02		0.00687	J	0.00339	J	0.00503	J
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						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		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	<0.001		0.00067	J	0.00066	J	0.00345	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		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	<0.0000195		<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		*	<0.1		<0.0991		<0.0972	
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		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		<0.0991		<0.0972	
11096-82-5		PCB-1260	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
11100-14-4		PCB-1268	T	ug/L	8082		*	<0.1		<0.0991		<0.0972	
12587-46-1		Gross Alpha	T	pCi/L	9310	0.0262	*	3.87	*	-0.343	*	3.91	*
12587-47-2		Gross Beta	T	pCi/L	9310	8.34	*	27.8	*	53	*	20.9	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	-0.0891	*	0.244	*	0.327	*	0.498	*
10098-97-2		Strontium-90	T	pCi/L	905.0	1.69	*	4.17	*	-1.21	*	-0.521	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	10.7	*	29.8	*	60.4	*	46.5	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.535	*	0.0905	*	0.1	*	0.707	*
10028-17-8		Tritium	T	pCi/L	906.0	40.7	*	-92.9	*	4.57	*	-137	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	14.2	J	33.9		<20		<20	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2	*	0.00209	*J	<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	1.05	BJ	1.83	BJ	1.09	BJ	1.2	BJ
S0586- -		Total Organic Halides	T	mg/L	9020	0.00814	*J	0.0369		0.0131		0.0125	

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

RESIDENTIAL/INERT-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		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		384		385		386	
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)						4/6/2020 08:46		4/20/2020 07:53		4/20/2020 08:32		4/20/2020 09:08	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW373UG3-20		MW384SG3-20		MW385SG3-20		MW386SG3-20	
Laboratory Sample ID Number (if applicable)						508913009		509752003		509752005		509752007	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/9/2020		4/22/2020		4/22/2020		4/22/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						DOWN		SIDE		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	0.515	*	0.347		0.33		<0.2	
16887-00-6		Chloride(s)	T	mg/L	9056	19		30.6		28.6		11.3	
16984-48-8		Fluoride	T	mg/L	9056	0.143		0.155		0.121		0.617	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.692	J	0.79		0.704		0.103	
14808-79-8		Sulfate	T	mg/L	9056	73.5		24.5		24.3		48.6	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.12		29.82		29.82		29.84	
S0145- -		Specific Conductance	T	µMH0/cm	Field	827		458		453		550	

[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		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						373		384		385		386	
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	332.57		332.37		332.38		345.93	
N238		Dissolved Oxygen	T	mg/L	Field	1.18		3.8		2.95		5.55	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	471		233	*	247	*	300	*
S0296- -		pH	T	Units	Field	6.15		6.09		6.07		6.93	
NS215		Eh	T	mV	Field	409		402		414		409	
S0907 - -		Temperature	T	°C	Field	16.33		15.94		15.39		15.33	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		0.0341	J	<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	0.00211	J	0.00246	J	0.00224	J	0.00258	J
7440-39-3		Barium	T	mg/L	6020	0.0385		0.234		0.273		0.132	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	1.83		0.06		0.0794		0.00663	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	74.6		26.9		29.6		19.6	
7440-47-3		Chromium	T	mg/L	6020	<0.01		0.00337	J	<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.000573	J	<0.001		<0.001		0.00043	J
7440-50-8		Copper	T	mg/L	6020	0.000882	J	0.00086	J	0.000665	J	0.00131	J
7439-89-6		Iron	T	mg/L	6020	0.192		0.471		0.0495	J	0.12	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	27.8		11.2		12.2		7.27	
7439-96-5		Manganese	T	mg/L	6020	0.0235		0.0114		0.00149	J	0.0458	
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						8004-4792		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		384		385		386	
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		0.000421	J
7440-02-0		Nickel	T	mg/L	6020	0.00111	J	<0.002		0.000721	J	<0.002	
7440-09-7		Potassium	T	mg/L	6020	2.92		1.67		1.97		0.306	
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	64.8		53		51.8		99	
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		<0.0002		0.000084	J
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00349	J	0.00549	J	0.00469	J	0.00488	J
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						8004-4792		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		384		385		386	
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	0.00381		0.00056	J	0.00058	J	<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4792		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		384		385		386	
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	*	<0.0000193		<0.0000194		<0.0000193	
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	<0.097			*		*		*
12674-11-2		PCB-1016	T	ug/L	8082	<0.097			*		*		*
11104-28-2		PCB-1221	T	ug/L	8082	<0.097			*		*		*
11141-16-5		PCB-1232	T	ug/L	8082	<0.097			*		*		*
53469-21-9		PCB-1242	T	ug/L	8082	<0.097			*		*		*
12672-29-6		PCB-1248	T	ug/L	8082	<0.097			*		*		*

RESIDENTIAL/INERT-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		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		384		385		386	
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	<0.097			*		*		*
11096-82-5		PCB-1260	T	ug/L	8082	<0.097			*		*		*
11100-14-4		PCB-1268	T	ug/L	8082	<0.097			*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	4.34	*	2.54	*	5.79	*	-1.03	*
12587-47-2		Gross Beta	T	pCi/L	9310	4.74	*	43.6	*	59.8	*	4.79	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.57	*	0.336	*	-0.0875	*	0.243	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-2.21	*	-2.57	*	0.923	*	2.28	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	13.8	*	83.9	*	80.8	*	0.45	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.42	*	-0.273	*	-0.0791	*	0.0272	*
10028-17-8		Tritium	T	pCi/L	906.0	-36.2	*	90	*	71.4	*	-7.22	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	27.2		14.2	J	14.2	J	19	J
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	1.23	BJ	1.38	BJ	1.35	BJ	3.51	B
S0586- -		Total Organic Halides	T	mg/L	9020	0.00892	J	0.00762	J	0.00766	J	0.0786	

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

RESIDENTIAL/INERT-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						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						387		388		389		390	
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)						4/20/2020 06:34		4/20/2020 07:24		NA		4/21/2020 06:32	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW387SG3-20		MW388SG3-20		NA		MW390SG3-20	
Laboratory Sample ID Number (if applicable)						509752001		509752009		NA		509875003	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/22/2020		4/22/2020		NA		4/24/2020	
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	0.628		0.439			*	0.221	
16887-00-6		Chloride(s)	T	mg/L	9056	45.4		34.4			*	30.7	*
16984-48-8		Fluoride	T	mg/L	9056	0.442		0.244			*	0.336	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	2.09		0.936			*	0.439	
14808-79-8		Sulfate	T	mg/L	9056	23.4		29.2			*	46.7	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.78		29.8			*	29.84	
S0145- -		Specific Conductance	T	µMH0/cm	Field	566		513			*	667	

[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						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						387		388		389		390	
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	332.45		332.34			*	332.53	
N238		Dissolved Oxygen	T	mg/L	Field	1.8		3.03			*	3.52	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	304	*	206	*		*	396	B
S0296- -		pH	T	Units	Field	6.03		6.14			*	6.21	
NS215		Eh	T	mV	Field	402		392			*	424	
S0907 - -		Temperature	T	°C	Field	15.28		16.5			*	14.78	
7429-90-5		Aluminum	T	mg/L	6020	0.0831		<0.05			*	0.0425	J
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003			*	<0.003	
7440-38-2		Arsenic	T	mg/L	6020	0.00417	J	0.00239	J		*	<0.005	
7440-39-3		Barium	T	mg/L	6020	0.213		0.191			*	0.242	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005			*	<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0217		0.0298			*	0.0235	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-70-2		Calcium	T	mg/L	6020	38.7		31.8			*	31.1	
7440-47-3		Chromium	T	mg/L	6020	0.00724	J	<0.01			*	<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-50-8		Copper	T	mg/L	6020	0.000993	J	0.000487	J		*	0.000811	J
7439-89-6		Iron	T	mg/L	6020	0.839		0.107			*	0.0474	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002			*	<0.002	
7439-95-4		Magnesium	T	mg/L	6020	15.4		14.2			*	13.2	
7439-96-5		Manganese	T	mg/L	6020	0.0821		0.003	J		*	0.00247	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002			*	<0.0002	

RESIDENTIAL/INERT-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						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						387		388		389		390	
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			*	0.000363	J
7440-02-0		Nickel	T	mg/L	6020	0.000619	J	0.000641	J		*	0.00117	J
7440-09-7		Potassium	T	mg/L	6020	1.45		2.12			*	0.388	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005			*	<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005			*	<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-23-5		Sodium	T	mg/L	6020	58.3		48.9			*	93.2	
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	<0.0002		<0.0002			*	0.000201	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02			*	<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.0037	J	0.0038	J		*	0.0254	
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						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						387		388		389		390	
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	0.00077	J	0.00048	J		*	<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						387		388		389		390	
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		<0.0000193			*	<0.0000192	*
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						387		388		389		390	
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		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	3.27	*	-3.48	*		*	-0.488	*
12587-47-2		Gross Beta	T	pCi/L	9310	240	*	77.4	*		*	32.4	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.392	*	0.58	*		*	0.0371	*
10098-97-2		Strontium-90	T	pCi/L	905.0	3.1	*	-1.57	*		*	-0.0487	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	335	*	106	*		*	58.1	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.458	*	-0.585	*		*	-0.428	*
10028-17-8		Tritium	T	pCi/L	906.0	29	*	71.3	*		*	28.8	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	23.9		11.7	J		*	27.7	
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	1.45	BJ	1.29	BJ		*	2.76	B
S0586- -		Total Organic Halides	T	mg/L	9020	0.00866	J	0.00548	J		*	0.0174	

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

RESIDENTIAL/INERT-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						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						391		392		393		394	
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)						4/21/2020 08:08		4/21/2020 08:47		4/21/2020 09:23		4/22/2020 06:40	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW391SG3-20		MW392SG3-20		MW393SG3-20		MW394SG3-20	
Laboratory Sample ID Number (if applicable)						509875005		509875007		509875009		509948003	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/24/2020		4/24/2020		4/25/2020		4/27/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						DOWN		DOWN		DOWN		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	0.596		0.628		0.188	J	0.512	
16887-00-6		Chloride(s)	T	mg/L	9056	46.3	*	48.5	*	12.3	*	42	*
16984-48-8		Fluoride	T	mg/L	9056	0.176		0.237		0.203		0.189	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.09		0.727		0.651	J	1.45	
14808-79-8		Sulfate	T	mg/L	9056	21		22.6		20.8		12.7	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.91		29.91		29.94		30.06	
S0145- -		Specific Conductance	T	µMH0/cm	Field	412		433		441		367	

[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.
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[6]"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.
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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						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						391		392		393		394	
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	332.34		332.28		341.76		332.3	
N238		Dissolved Oxygen	T	mg/L	Field	3.45		1.53		1.75		4.53	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	216	B	219	B	266	B	200	
S0296- -		pH	T	Units	Field	6.1		6.15		6.3		5.82	
NS215		Eh	T	mV	Field	457		450		443		432	
S0907 - -		Temperature	T	°C	Field	15.11		15.56		15.83		14.56	
7429-90-5		Aluminum	T	mg/L	6020	0.0369	J	<0.05		0.0325	J	0.0399	J
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		<0.005		0.0045	J	<0.005	
7440-39-3		Barium	T	mg/L	6020	0.166		0.221		0.125		0.233	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0812		0.0287		0.021		0.022	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	29.1		31.4		15		24.9	
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		<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.001	J	0.00203		0.00064	J	0.000601	J
7439-89-6		Iron	T	mg/L	6020	0.212		0.269		1.01		0.187	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	12.6		12.2		4.45		10.7	
7439-96-5		Manganese	T	mg/L	6020	0.00597		0.0231		0.015		0.00434	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						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						391		392		393		394	
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		0.000238	J	<0.001	
7440-02-0		Nickel	T	mg/L	6020	<0.002		<0.002		<0.002		0.00462	
7440-09-7		Potassium	T	mg/L	6020	1.69		1.97		0.488		1.44	
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	34.6		37.6		82.7		33.4	
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		<0.0002		<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	0.00336	J	0.00592	J	0.00435	J	0.00487	J
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						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						391		392		393		394	
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	0.00046	J	0.00123		<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	0.0115		0.0158		<0.001		0.00191	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						391		392		393		394	
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	<0.0000192	*	<0.0000191	*	<0.0000192	*	<0.0000191	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						391		392		393		394	
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		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	1.86	*	4.31	*	-1.24	*	-0.863	*
12587-47-2		Gross Beta	T	pCi/L	9310	10.4	*	3.13	*	2	*	5.27	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.487	*	0.552	*	0.524	*	0.298	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-0.98	*	0.716	*	3.67	*	-1.16	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-1.36	*	-2.16	*	-2.35	*	6.29	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.0657	*	-0.595	*	0.194	*	0.81	*
10028-17-8		Tritium	T	pCi/L	906.0	31.5	*	111	*	72.1	*	136	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	27.7		34.6		20.8		31.1	
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	0.999	BJ	1.18	BJ	2.6	B	0.957	BJ
S0586- -		Total Organic Halides	T	mg/L	9020	0.0125		0.0203		0.0123		0.0114	

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						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
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		E	
Sample Date and Time (Month/Day/Year hour: minutes)						4/22/2020 07:21		4/22/2020 07:57		4/22/2020 08:40		4/16/2020 05:50	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						MW395SG3-20		MW396SG3-20		MW397SG3-20		RI1SG3-20	
Laboratory Sample ID Number (if applicable)						509948005		509948007		509948001		509596012	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/27/2020		4/27/2020		4/27/2020		4/22/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						UP		UP		UP		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	0.478		0.831		0.403			*
16887-00-6		Chloride(s)	T	mg/L	9056	39.4	*	56.6	*	35.4	*		*
16984-48-8		Fluoride	T	mg/L	9056	0.184		0.787		0.193			*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.48		0.268		1.15			*
14808-79-8		Sulfate	T	mg/L	9056	12.4		29.8		11			*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.06		30.07		30.07			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	350		708		319			*

[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/INERT-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						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						395		396		397		E. BLANK	
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	332.7		374.01		332.35			*
N238		Dissolved Oxygen	T	mg/L	Field	4.48		2.6		5.2			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	199		364		160			*
S0296- -		pH	T	Units	Field	6		6.67		6.05			*
NS215		Eh	T	mV	Field	419		401		420			*
S0907 - -		Temperature	T	°C	Field	15.22		15.39		15.59			*
7429-90-5		Aluminum	T	mg/L	6020	0.0249	J	<0.05		0.231		<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		<0.005		<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.232		0.352		0.137		<0.004	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0223		0.00872	J	0.0112	J	<0.015	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	24		31.7		18.1		<0.2	
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		<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00052	J	0.000964	J	0.000614	J	<0.002	
7439-89-6		Iron	T	mg/L	6020	0.0693	J	0.189		0.4		<0.1	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	10.2		13.9		7.81		<0.03	
7439-96-5		Manganese	T	mg/L	6020	0.00143	J	0.029		0.00807		<0.005	
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						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
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		0.000362	J	<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	0.0068		<0.002		0.000827	J	<0.002	
7440-09-7		Potassium	T	mg/L	6020	1.55		0.921		1.82		<0.3	
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	29.4		101		34.2		<0.25	
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		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		0.00337	J
7440-66-6		Zinc	T	mg/L	6020	0.00332	J	0.0037	J	0.00433	J	<0.02	
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		0.00256	J
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						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
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	0.00186		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
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	<0.0000191		<0.0000193		<0.0000191		<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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
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		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	4.84	*	-0.713	*	-2.38	*	4.1	*
12587-47-2		Gross Beta	T	pCi/L	9310	7.55	*	4.38	*	8.69	*	-3.41	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.231	*	0.305	*	0.465	*	0.502	*
10098-97-2		Strontium-90	T	pCi/L	905.0	3.07	*	3.59	*	2.58	*	1.45	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	8.44	*	5.69	*	15	*	1.91	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.106	*	-0.308	*	1.33	*	0.504	*
10028-17-8		Tritium	T	pCi/L	906.0	70.5	*	55.2	*	111	*	-61.8	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	24.2		31.1		38			*
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		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.992	BJ	4.35	B	0.972	BJ		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.00352	J	0.0389		0.00582	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						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
Sample Sequence #						1		1		1		1	
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment						F		T		T		T	
Sample Date and Time (Month/Day/Year hour: minutes)						4/16/2020 06:42		4/16/2020 05:45		4/20/2020 05:45		4/21/2020 05:45	
Duplicate ("Y" or "N")[2]						N		N		N		N	
Split ("Y" or "N")[3]						N		N		N		N	
Facility Sample ID Number (if applicable)						FB1SG3-20		TB1SG3-20		TB2SG3-20		TB3SG3-20	
Laboratory Sample ID Number (if applicable)						509596011		509596013		509752011		509875011	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/22/2020		4/22/2020		4/22/2020		4/25/2020	
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						NA		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

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
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			*		*		*
7440-36-0		Antimony	T	mg/L	6020	<0.003			*		*		*
7440-38-2		Arsenic	T	mg/L	6020	<0.005			*		*		*
7440-39-3		Barium	T	mg/L	6020	<0.004			*		*		*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005			*		*		*
7440-42-8		Boron	T	mg/L	6020	<0.015			*		*		*
7440-43-9		Cadmium	T	mg/L	6020	<0.001			*		*		*
7440-70-2		Calcium	T	mg/L	6020	<0.2			*		*		*
7440-47-3		Chromium	T	mg/L	6020	<0.01			*		*		*
7440-48-4		Cobalt	T	mg/L	6020	<0.001			*		*		*
7440-50-8		Copper	T	mg/L	6020	<0.002			*		*		*
7439-89-6		Iron	T	mg/L	6020	<0.1			*		*		*
7439-92-1		Lead	T	mg/L	6020	<0.002			*		*		*
7439-95-4		Magnesium	T	mg/L	6020	<0.03			*		*		*
7439-96-5		Manganese	T	mg/L	6020	<0.005			*		*		*
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		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
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	<0.002			*		*		*
7440-09-7		Potassium	T	mg/L	6020	<0.3			*		*		*
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	<0.25			*		*		*
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	0.00352	J		*		*		*
7440-66-6		Zinc	T	mg/L	6020	<0.02			*		*		*
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	0.00883		0.00215	J	0.00805		0.0071	
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						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
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		<0.001		<0.001		<0.001	

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
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	<0.0000199		<0.0000194		<0.0000195		<0.0000193	*
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
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		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310	-1	*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310	3.25	*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.19	*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	1.66	*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-8.59	*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.534	*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0	105	*		*		*		*
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			*		*		*
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/INERT-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		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
Sample Sequence #						1		2					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment						T		NA					
Sample Date and Time (Month/Day/Year hour: minutes)						4/22/2020 05:40		4/16/2020 06:40					
Duplicate ("Y" or "N")[2]						N		Y					
Split ("Y" or "N")[3]						N		N					
Facility Sample ID Number (if applicable)						TB4SG3-20		MW221DSG3-20					
Laboratory Sample ID Number (if applicable)						509948009		509596003					
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis						4/27/2020		4/22/2020					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)						NA		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		*	0.456					
16887-00-6		Chloride(s)	T	mg/L	9056		*	34.8	*				
16984-48-8		Fluoride	T	mg/L	9056		*	0.163					
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*	1.02					
14808-79-8		Sulfate	T	mg/L	9056		*	14.6					
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/INERT-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		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						T. BLANK 4		221					
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		*	196	*				
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		*	<0.005					
7440-39-3		Barium	T	mg/L	6020		*	0.211					
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005					
7440-42-8		Boron	T	mg/L	6020		*	0.0147	J				
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001					
7440-70-2		Calcium	T	mg/L	6020		*	21.8					
7440-47-3		Chromium	T	mg/L	6020		*	0.00982	J				
7440-48-4		Cobalt	T	mg/L	6020		*	0.00121					
7440-50-8		Copper	T	mg/L	6020		*	0.00103	J				
7439-89-6		Iron	T	mg/L	6020		*	<0.1					
7439-92-1		Lead	T	mg/L	6020		*	<0.002					
7439-95-4		Magnesium	T	mg/L	6020		*	9.46	B				
7439-96-5		Manganese	T	mg/L	6020		*	0.0103					
7439-97-6		Mercury	T	mg/L	7470		*	<0.0002					

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
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		*	0.00915					
7440-02-0		Nickel	T	mg/L	6020		*	0.117					
7440-09-7		Potassium	T	mg/L	6020		*	2.35					
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		*	45.7					
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		*	0.00376	J				
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005					
67-64-1		Acetone	T	mg/L	8260	0.00626		<0.005					
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005					
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005					
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001					
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001					
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003					
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001					
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001					
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001					

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
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					
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001					
74-83-9		Methyl bromide	T	mg/L	8260	<0.001	*	<0.001					
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005					
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005					
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005					
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001					
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001					
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001					
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001					
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001					
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001					
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001					
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001					
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001					
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001					
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001					
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001					
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001					
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001					
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001					
79-01-6		Ethene, Trichloro-	T	mg/L	8260	<0.001		<0.001					

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number						0000-0000		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
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					
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005					
74-88-4		Iodomethane	T	mg/L	8260	<0.005	*	<0.005					
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001					
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001					
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005					
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005					
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000191		<0.0000196					
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001					
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001					
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001					
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001					
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001					
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001					
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001					
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001					
1336-36-3		PCB,Total	T	ug/L	8082		*		*				
12674-11-2		PCB-1016	T	ug/L	8082		*		*				
11104-28-2		PCB-1221	T	ug/L	8082		*		*				
11141-16-5		PCB-1232	T	ug/L	8082		*		*				
53469-21-9		PCB-1242	T	ug/L	8082		*		*				
12672-29-6		PCB-1248	T	ug/L	8082		*		*				

RESIDENTIAL/INERT-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		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
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		*		*				
11096-82-5		PCB-1260	T	ug/L	8082		*		*				
11100-14-4		PCB-1268	T	ug/L	8082		*		*				
12587-46-1		Gross Alpha	T	pCi/L	9310		*	1.52	*				
12587-47-2		Gross Beta	T	pCi/L	9310		*	5.08	*				
10043-66-0		Iodine-131	T	pCi/L			*		*				
13982-63-3		Radium-226	T	pCi/L	AN-1418		*	0.628	*				
10098-97-2		Strontium-90	T	pCi/L	905.0		*	-0.121	*				
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*	0.663	*				
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*	0.202	*				
10028-17-8		Tritium	T	pCi/L	906.0		*	39.6	*				
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*	28.8					
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		*	1.01	BJ				
S0586- -		Total Organic Halides	T	mg/L	9020		*	0.00578	*J				

RESIDENTIAL/INERT – 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
8000-5201 MW220	MW220SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.03. Rad error is 5.02.
		Gross beta		TPU is 8.87. Rad error is 8.43.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.8. Rad error is 0.797.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.57. Rad error is 2.54.
		Technetium-99		TPU is 11.3. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.363. Rad error is 0.362.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. Rad error is 117.

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

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GROUNDWATER
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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5202 MW221	MW221SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.83. Rad error is 5.82.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.28. Rad error is 9.27.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.511. Rad error is 0.511.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.74. Rad error is 2.68.
		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 0.879. Rad error is 0.877.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 126.
		Total Organic Halides	N	Sample spike (MS/MSD) recovery not within control limits

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5242 MW222	MW222SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.02. Rad error is 4.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.36. Rad error is 8.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.476. Rad error is 0.476.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.91. Rad error is 2.9.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.7. Rad error is 12.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.674. Rad error is 0.672.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 123.
		Total Organic Halides	N	Sample spike (MS/MSD) recovery not within control limits

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5243 MW223	MW223SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.52. Rad error is 3.51.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.13. Rad error is 8.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.437. Rad error is 0.436.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.51. Rad error is 2.51.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.762. Rad error is 0.761.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 123.
		Total Organic Halides	N	Sample spike (MS/MSD) recovery not within control limits

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5244 MW224	MW224SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.72. Rad error is 3.72.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.85. Rad error is 6.7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.463. Rad error is 0.462.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.95. Rad error is 2.94.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.918. Rad error is 0.912.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.
		Total Organic Halides	N	Sample spike (MS/MSD) recovery not within control limits
8004-4820 MW369	MW369UG3-20	Bromide	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.44. Rad error is 4.39.
		Gross beta		TPU is 10.5. Rad error is 9.52.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.367. Rad error is 0.367.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.12. Rad error is 3.05.
		Technetium-99		TPU is 13.3. Rad error is 12.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.724. Rad error is 0.722.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
		Cyanide	N	Sample spike (MS/MSD) recovery not within control limits

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4818 MW370	MW370UG3-20	Bromide	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.07. Rad error is 3.06.
		Gross beta		TPU is 13.7. Rad error is 10.7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.405. Rad error is 0.405.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.37. Rad error is 2.37.
		Technetium-99		TPU is 15.6. Rad error is 14.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.894. Rad error is 0.892.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.
		Cyanide	N	Sample spike (MS/MSD) recovery not within control limits
8004-4808 MW372	MW372UG3-20	Bromide	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.99. Rad error is 5.96.
		Gross beta		TPU is 9.05. Rad error is 8.35.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.464. Rad error is 0.464.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.95. Rad error is 2.95.
		Technetium-99		TPU is 14.2. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.945. Rad error is 0.936.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 131.
		Cyanide	N	Sample spike (MS/MSD) recovery not within control limits
8004-4792 MW373	MW373UG3-20	Bromide	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.81. Rad error is 7.78.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.22. Rad error is 6.17.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.519. Rad error is 0.519.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.29. Rad error is 2.29.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.6. Rad error is 12.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.723. Rad error is 0.718.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.
		Cyanide	N	Sample spike (MS/MSD) recovery not within control limits

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4809 MW384	MW384SG3-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.08. Rad error is 5.06.
		Gross beta		TPU is 12.4. Rad error is 10.1.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.321. Rad error is 0.32.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.02. Rad error is 2.02.
		Technetium-99		TPU is 16.9. Rad error is 14.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.831. Rad error is 0.83.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 133.
		Cyanide	NN1	Sample spike (MS/MSD) recovery not within control limits and MS/MSD RPD outside acceptance criteria

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4810 MW385	MW385SG3-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.91. Rad error is 5.82.
		Gross beta		TPU is 15. Rad error is 11.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.299. Rad error is 0.299.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.66. Rad error is 2.66.
		Technetium-99		TPU is 17. Rad error is 14.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.06. Rad error is 1.06.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 134.
		Cyanide	NN1	Sample spike (MS/MSD) recovery not within control limits and MS/MSD RPD outside acceptance criteria

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4804 MW386	MW386SG3-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.89. Rad error is 3.89.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.43. Rad error is 6.38.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.308. Rad error is 0.307.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.32. Rad error is 4.31.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.04. Rad error is 1.04.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Cyanide	NN1	Sample spike (MS/MSD) recovery not within control limits and MS/MSD RPD outside acceptance criteria

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4815 MW387	MW387SG3-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.44. Rad error is 5.41.
		Gross beta		TPU is 44.6. Rad error is 20.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.374. Rad error is 0.373.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.04. Rad error is 3.
		Technetium-99		TPU is 41.5. Rad error is 18.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.899. Rad error is 0.893.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.
		Cyanide	NN1	Sample spike (MS/MSD) recovery not within control limits and MS/MSD RPD outside acceptance criteria

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4816 MW388	MW388SG3-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.04. Rad error is 4.03.
		Gross beta		TPU is 17.7. Rad error is 12.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.569. Rad error is 0.568.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.44. Rad error is 3.44.
		Technetium-99		TPU is 18.3. Rad error is 14.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.647. Rad error is 0.645.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 135.
		Cyanide	NN1	Sample spike (MS/MSD) recovery not within control limits and MS/MSD RPD outside acceptance criteria

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Bromide		During sampling, the well was dry; therefore, no sample was collected.
		Chloride		During sampling, the well was dry; therefore, no sample was collected.
		Fluoride		During sampling, the well was dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well was dry; therefore, no sample was collected.
		Sulfate		During sampling, the well was dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well was dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well was dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well was dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well was dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well was dry; therefore, no sample was collected.
		pH		During sampling, the well was dry; therefore, no sample was collected.
		Eh		During sampling, the well was dry; therefore, no sample was collected.
		Temperature		During sampling, the well was dry; therefore, no sample was collected.
		Aluminum		During sampling, the well was dry; therefore, no sample was collected.
		Antimony		During sampling, the well was dry; therefore, no sample was collected.
		Arsenic		During sampling, the well was dry; therefore, no sample was collected.
		Barium		During sampling, the well was dry; therefore, no sample was collected.
		Beryllium		During sampling, the well was dry; therefore, no sample was collected.
		Boron		During sampling, the well was dry; therefore, no sample was collected.
		Cadmium		During sampling, the well was dry; therefore, no sample was collected.
		Calcium		During sampling, the well was dry; therefore, no sample was collected.
		Chromium		During sampling, the well was dry; therefore, no sample was collected.
		Cobalt		During sampling, the well was dry; therefore, no sample was collected.
		Copper		During sampling, the well was dry; therefore, no sample was collected.
		Iron		During sampling, the well was dry; therefore, no sample was collected.
		Lead		During sampling, the well was dry; therefore, no sample was collected.
		Magnesium		During sampling, the well was dry; therefore, no sample was collected.
		Manganese		During sampling, the well was dry; therefore, no sample was collected.
		Mercury		During sampling, the well was dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Molybdenum		During sampling, the well was dry; therefore, no sample was collected.
		Nickel		During sampling, the well was dry; therefore, no sample was collected.
		Potassium		During sampling, the well was dry; therefore, no sample was collected.
		Rhodium		During sampling, the well was dry; therefore, no sample was collected.
		Selenium		During sampling, the well was dry; therefore, no sample was collected.
		Silver		During sampling, the well was dry; therefore, no sample was collected.
		Sodium		During sampling, the well was dry; therefore, no sample was collected.
		Tantalum		During sampling, the well was dry; therefore, no sample was collected.
		Thallium		During sampling, the well was dry; therefore, no sample was collected.
		Uranium		During sampling, the well was dry; therefore, no sample was collected.
		Vanadium		During sampling, the well was dry; therefore, no sample was collected.
		Zinc		During sampling, the well was dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well was dry; therefore, no sample was collected.
		Acetone		During sampling, the well was dry; therefore, no sample was collected.
		Acrolein		During sampling, the well was dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well was dry; therefore, no sample was collected.
		Benzene		During sampling, the well was dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		Xylenes		During sampling, the well was dry; therefore, no sample was collected.
		Styrene		During sampling, the well was dry; therefore, no sample was collected.
		Toluene		During sampling, the well was dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well was dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well was dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well was dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well was dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well was dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well was dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Chloroform		During sampling, the well was dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well was dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well was dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well was dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well was dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well was dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well was dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well was dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well was dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well was dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well was dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well was dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		1,2-Dichlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well was dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well was dry; therefore, no sample was collected.
		Gross beta		During sampling, the well was dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well was dry; therefore, no sample was collected.
		Radium-226		During sampling, the well was dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well was dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well was dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well was dry; therefore, no sample was collected.
		Tritium		During sampling, the well was dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well was dry; therefore, no sample was collected.
		Cyanide		During sampling, the well was dry; therefore, no sample was collected.
		Iodide		During sampling, the well was dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well was dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well was dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4811 MW390	MW390SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.4. Rad error is 4.39.
		Gross beta		TPU is 11.8. Rad error is 10.6.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.377. Rad error is 0.377.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.98. Rad error is 2.98.
		Technetium-99		TPU is 14.2. Rad error is 12.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.511. Rad error is 0.511.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4805 MW391	MW391SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.26. Rad error is 4.25.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.3. Rad error is 7.1.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.491. Rad error is 0.49.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.71. Rad error is 2.71.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.741. Rad error is 0.74.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4806 MW392	MW392SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.78. Rad error is 5.74.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.81. Rad error is 6.79.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.479. Rad error is 0.478.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.27. Rad error is 2.26.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.7. Rad error is 10.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.484. Rad error is 0.483.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 135.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4807 MW393	MW393SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.32. Rad error is 3.32.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.44. Rad error is 6.43.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.615. Rad error is 0.614.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.52. Rad error is 3.48.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.767. Rad error is 0.764.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 132.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4802 MW394	MW394SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.89. Rad error is 2.89.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.52. Rad error is 7.47.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.52. Rad error is 0.52.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.7. Rad error is 3.7.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13.8. Rad error is 13.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.931. Rad error is 0.92.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 120. Rad error is 117.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4801 MW395	MW395SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.29. Rad error is 6.24.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.44. Rad error is 6.31.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.293. Rad error is 0.293.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.39. Rad error is 3.36.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13.5. Rad error is 13.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.769. Rad error is 0.769.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 111. Rad error is 110.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4803 MW396	MW396SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.26. Rad error is 3.26.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.71. Rad error is 7.68.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.291. Rad error is 0.29.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.29. Rad error is 4.25.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 14.1. Rad error is 14.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.499. Rad error is 0.499.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 113. Rad error is 112.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4817 MW397	MW397SG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.24. Rad error is 2.23.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.27. Rad error is 7.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.629. Rad error is 0.628.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.93. Rad error is 2.9.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 14.3. Rad error is 14.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.18. Rad error is 1.16.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 114. Rad error is 112.

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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	RI1SG3-20	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.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.39. Rad error is 5.35.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.98. Rad error is 6.98.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.461. Rad error is 0.46.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.91. Rad error is 2.9.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.5. Rad error is 12.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.03. Rad error is 1.03.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 125.
		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.

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

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1SG3-20	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.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.77.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.34. Rad error is 6.31.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.419. Rad error is 0.419.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.62. Rad error is 2.61.
		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 1.06. Rad error is 1.05.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 128.
		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.

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG3-20	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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Facility: US DOE - Paducah Gaseous Diffusion Plant LAB ID:None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG3-20	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.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG3-20	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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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG3-20	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.

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG3-20	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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Facility: US DOE - Paducah Gaseous Diffusion Plant LAB ID:None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG3-20	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		1,2-Dibromo-3-chloropropane	Y2	MS/MSD RPD outside acceptance criteria
		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.

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

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4SG3-20	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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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4SG3-20	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		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.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5202 MW221	MW221DSG3-20	Chloride	W	Post-digestion spike recovery out of control limits.
		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	*	Duplicate analysis not within control limits.
		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.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.18. Rad error is 6.18.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.15. Rad error is 8.11.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.622. Rad error is 0.621.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.63. Rad error is 1.63.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.4. Rad error is 12.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.779. Rad error is 0.776.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.
		Total Organic Halides	N	Sample spike (MS/MSD) recovery not within control limits

APPENDIX D

STATISTICAL ANALYSES AND QUALIFICATION STATEMENT

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GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the second quarter 2020 groundwater data collected from the C-746-S&T Landfills monitoring wells (MWs) were performed in accordance with Permit GSTR0003, 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 second quarter 2020 data used to conduct the statistical analyses were collected in April 2020. The statistical analyses for this report first used data from the initial 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 compliance well that 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 for 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 for pH. 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
MW220	BG	URGA
MW221	SG	URGA
MW222	SG	URGA
MW223	SG	URGA
MW224	SG	URGA
MW369	TW	URGA
MW370	TW	LRGA
MW372	TW	URGA
MW373	TW	LRGA
MW384	SG	URGA
MW385	SG	LRGA
MW386[1]	SG	UCRS
MW387	TW	URGA
MW388	TW	LRGA
MW389[1]*	TW	UCRS
MW390[1]	TW	UCRS
MW391	TW	URGA
MW392	TW	LRGA
MW393[1]	TW	UCRS
MW394	BG	URGA
MW395	BG	LRGA
MW396[1]	BG	UCRS
MW397	BG	LRGA

[1]**NOTE:** The gradients in UCRS wells are downward. The UCRS wells identified as up-, side- or downgradient are those wells located in the same general direction as the RGA wells considered to be up-, side-, or downgradient.
BG: upgradient or background wells
TW: compliance or test wells
SG: sidegradient wells
***** Well was dry this quarter and a groundwater sample could not be collected.

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. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

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. Statistical analyses are performed on the last eight quarters of 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 a statistically significant difference in concentration compared to the 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).

    - 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 background wells (identified as "BG"), the compliance or test wells (identified as "TW"), and the sidegradient wells (identified as "SG") for the C-746-S&T Residential and Inert Landfills. 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, second quarter 2020. The observations are representative of the current quarter data. Historical background data are presented in Attachment D1. The sampling dates associated with background data are listed next to the result in Attachment D1. 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 or data assessment, this result is not used, and the next available data point is used for the background or current quarter data. A result has been considered a nondetect if it has a "U" validation code.

[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
Beta Activity
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
cis-1,2-Dichloroethene
Cobalt
Conductivity
Copper
Cyanide
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
pH*
Potassium
Radium-226
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
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	4	4	0	No
1,1,2,2-Tetrachloroethane	4	4	0	No
1,1,2-Trichloroethane	4	4	0	No
1,1-Dichloroethane	4	4	0	No
1,2,3-Trichloropropane	4	4	0	No
1,2-Dibromo-3-chloropropane	4	4	0	No
1,2-Dibromoethane	4	4	0	No
1,2-Dichlorobenzene	4	4	0	No
1,2-Dichloropropane	4	4	0	No
2-Butanone	4	4	0	No
2-Hexanone	4	4	0	No
4-Methyl-2-pentanone	4	4	0	No
Acetone	4	4	0	No
Acrolein	4	4	0	No
Acrylonitrile	4	4	0	No
Aluminum	**4**	**2**	**2**	**Yes**
Antimony	4	4	0	No
Beryllium	4	4	0	No
Boron	**4**	**0**	**4**	**Yes**
Bromide	**4**	**1**	**3**	**Yes**
Bromochloromethane	4	4	0	No
Bromodichloromethane	4	4	0	No
Bromoform	4	4	0	No
Bromomethane	4	4	0	No
Calcium	**4**	**0**	**4**	**Yes**
Carbon disulfide	4	4	0	No
Chemical Oxygen Demand (COD)	**4**	**0**	**4**	**Yes**
Chloride	**4**	**0**	**4**	**Yes**
Chlorobenzene	4	4	0	No
Chloroethane	4	4	0	No
Chloroform	4	4	0	No
Chloromethane	4	4	0	No
cis-1,2-Dichloroethene	4	4	0	No
cis-1,3-Dichloropropene	4	4	0	No
Cobalt	**4**	**3**	**1**	**Yes**
Conductivity	**4**	**0**	**4**	**Yes**
Copper	**4**	**0**	**4**	**Yes**
Cyanide	4	4	0	No
Dibromochloromethane	4	4	0	No
Dibromomethane	4	4	0	No
Dimethylbenzene, Total	4	4	0	No
Dissolved Oxygen	**4**	**0**	**4**	**Yes**
Dissolved Solids	**4**	**0**	**4**	**Yes**
Ethylbenzene	4	4	0	No
Iodide	4	4	0	No

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Iodomethane	4	4	0	No
Iron	**4**	**0**	**4**	**Yes**
Magnesium	**4**	**0**	**4**	**Yes**
Manganese	**4**	**0**	**4**	**Yes**
Methylene chloride	4	4	0	No
Molybdenum	**4**	**0**	**4**	**Yes**
Nickel	**4**	**3**	**1**	**Yes**
Oxidation-Reduction Potential	**4**	**0**	**4**	**Yes**
pH	**4**	**0**	**4**	**Yes**
Potassium	**4**	**0**	**4**	**Yes**
Radium-226	4	4	0	No
Rhodium	4	4	0	No
Sodium	**4**	**0**	**4**	**Yes**
Styrene	4	4	0	No
Sulfate	**4**	**0**	**4**	**Yes**
Tantalum	4	4	0	No
Technetium-99	**4**	**3**	**1**	**Yes**
Tetrachloroethene	4	4	0	No
Thallium	4	4	0	No
Thorium-230	4	4	0	No
Toluene	4	4	0	No
Total Organic Carbon (TOC)	**4**	**0**	**4**	**Yes**
Total Organic Halides (TOX)	**4**	**0**	**4**	**Yes**
trans-1,2-Dichloroethene	4	4	0	No
trans-1,3-Dichloropropene	4	4	0	No
trans-1,4-Dichloro-2-Butene	4	4	0	No
Trichlorofluoromethane	4	4	0	No
Vanadium	4	4	0	No
Vinyl Acetate	4	4	0	No
Zinc	**4**	**0**	**4**	**Yes**

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	11	11	0	No
1,1,2,2-Tetrachloroethane	11	11	0	No
1,1,2-Trichloroethane	11	11	0	No
1,1-Dichloroethane	11	11	0	No
1,2,3-Trichloropropane	11	11	0	No
1,2-Dibromo-3-chloropropane	11	11	0	No
1,2-Dibromoethane	11	11	0	No
1,2-Dichlorobenzene	11	11	0	No
1,2-Dichloropropane	11	11	0	No
2-Butanone	11	11	0	No
2-Hexanone	11	11	0	No
4-Methyl-2-pentanone	11	11	0	No
Acetone	11	11	0	No
Acrolein	11	11	0	No
Acrylonitrile	11	11	0	No
Aluminum	**11**	**4**	**7**	**Yes**
Antimony	11	11	0	No
Beryllium	11	11	0	No
Beta activity	**11**	**6**	**5**	**Yes**
Boron	**11**	**0**	**11**	**Yes**
Bromide	**11**	**0**	**11**	**Yes**
Bromochloromethane	11	11	0	No
Bromodichloromethane	11	11	0	No
Bromoform	11	11	0	No
Bromomethane	11	11	0	No
Calcium	**11**	**0**	**11**	**Yes**
Carbon disulfide	11	11	0	No
Chemical Oxygen Demand (COD)	**11**	**1**	**10**	**Yes**
Chloride	**11**	**0**	**11**	**Yes**
Chlorobenzene	11	11	0	No
Chloroethane	11	11	0	No
Chloroform	11	11	0	No
Chloromethane	11	11	0	No
***cis*-1,2-Dichloroethene**	**11**	**10**	**1**	**Yes**
cis-1,3-Dichloropropene	11	11	0	No
Cobalt	**11**	**5**	**6**	**Yes**
Conductivity	**11**	**0**	**11**	**Yes**
Copper	**11**	**0**	**11**	**Yes**
Cyanide	11	11	0	No
Dibromochloromethane	11	11	0	No
Dibromomethane	11	11	0	No
Dimethylbenzene, Total	11	11	0	No
Dissolved Oxygen	**11**	**0**	**11**	**Yes**
Dissolved Solids	**11**	**0**	**11**	**Yes**
Ethylbenzene	11	11	0	No

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Iodide	11	11	0	No
Iodomethane	11	11	0	No
Iron	**11**	**0**	**11**	**Yes**
Magnesium	**11**	**0**	**11**	**Yes**
Manganese	**11**	**0**	**11**	**Yes**
Methylene chloride	11	11	0	No
Molybdenum	**11**	**4**	**7**	**Yes**
Nickel	**11**	**2**	**9**	**Yes**
Oxidation-Reduction Potential	**11**	**0**	**11**	**Yes**
pH	**11**	**0**	**11**	**Yes**
Potassium	**11**	**0**	**11**	**Yes**
Radium-226	**11**	**10**	**1**	**Yes**
Rhodium	11	11	0	No
Sodium	**11**	**0**	**11**	**Yes**
Styrene	11	11	0	No
Sulfate	**11**	**0**	**11**	**Yes**
Tantalum	11	11	0	No
Technetium-99	**11**	**6**	**5**	**Yes**
Tetrachloroethene	11	11	0	No
Thallium	11	11	0	No
Thorium-230	11	11	0	No
Toluene	11	11	0	No
Total Organic Carbon (TOC)	11	11	0	No
Total Organic Halides (TOX)	**11**	**0**	**11**	**Yes**
trans-1,2-Dichloroethene	11	11	0	No
trans-1,3-Dichloropropene	11	11	0	No
trans-1,4-Dichloro-2-Butene	11	11	0	No
Trichloroethene	**11**	**5**	**6**	**Yes**
Trichlorofluoromethane	11	11	0	No
Vanadium	11	11	0	No
Vinyl Acetate	11	11	0	No
Zinc	**11**	**1**	**10**	**Yes**

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	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**	**4**	**3**	**Yes**
Antimony	7	7	0	No
Beryllium	7	7	0	No
Beta activity	**7**	**4**	**3**	**Yes**
Boron	**7**	**0**	**7**	**Yes**
Bromide	**7**	**0**	**7**	**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**	**1**	**6**	**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**	**6**	**1**	**Yes**
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**	**6**	**1**	**Yes**
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**	**0**	**7**	**Yes**

Exhibit D.5. Summary of Censored and Uncensored Data—LRGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Magnesium	**7**	**0**	**7**	**Yes**
Manganese	**7**	**0**	**7**	**Yes**
Methylene chloride	7	7	0	No
Molybdenum	7	7	0	No
Nickel	**7**	**1**	**6**	**Yes**
Oxidation-Reduction Potential	**7**	**0**	**7**	**Yes**
pH	**7**	**0**	**7**	**Yes**
Potassium	**7**	**0**	**7**	**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**	**4**	**3**	**Yes**
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	7	0	No
Total Organic Halides (TOX)	**7**	**0**	**7**	**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
Trichloroethene	**7**	**1**	**6**	**Yes**
Trichlorofluoromethane	7	7	0	No
Vanadium	7	7	0	No
Vinyl Acetate	7	7	0	No
Zinc	**7**	**0**	**7**	**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 tests that were calculated using historical background and presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 25, 28, and 27 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which include those constituents (beta activity and trichloroethene) that exceeded their MCL. A summary of exceedances when compared to statistically derived historical background by well number is shown in Exhibit D.6.

UCRS

This quarter's results identified exceedances of historical background upper tolerance limit (UTL) for oxidation-reduction potential and technetium-99.

URGA

This quarter's results identified exceedances of historical background UTL for beta activity, calcium, COD, conductivity, dissolved solids, magnesium, oxidation-reduction potential, radium-226, sodium, sulfate, and technetium-99.

LRGA

This quarter's results identified exceedances of historical background UTL for beta activity, calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate, 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 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
MW386: Oxidation-reduction potential	**MW220:** COD, oxidation-reduction potential, radium-226, sulfate	**MW370:** Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW390: Oxidation-reduction potential, technetium-99	**MW221:** Oxidation-reduction potential	**MW373:** Calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate
MW393: Oxidation-reduction potential	**MW222:** Oxidation-reduction potential	**MW385:** Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW396: Oxidation-reduction potential	**MW223:** Oxidation-reduction potential, sulfate	**MW388:** Beta activity, conductivity, oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	**MW392:** Oxidation-reduction potential, sulfate
	MW369: Sodium	**MW395:** Oxidation-reduction potential
	MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	**MW397:** Oxidation-reduction potential
	MW384: Oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity, dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate, technetium-99	
	MW391: Oxidation-reduction potential, sulfate	
	MW394: Oxidation-reduction potential	

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	0.57	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	1.28	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.24	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.20	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.02	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.34	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.12	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.48	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.19	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.48	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.20	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Manganese	Tolerance Interval	0.46	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.51	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.27	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	4.77	Current results exceed statistically derived historical background concentration in MW386, MW390, MW393, and MW396.
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.28	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	0.86	Current results exceed statistically derived historical background concentration in MW390.
Total Organic Carbon (TOC)	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.38	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.79	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	0.28	No exceedance of statistically derived historical background concentration.
Beta Activity[1]	Tolerance Interval	0.97	Current results exceed statistically derived historical background concentrations in MW387.
Boron	Tolerance Interval	1.45	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.17	Current results exceed statistically derived historical background concentrations in MW372.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.00	Current results exceed statistically derived historical background concentrations in MW220.
Chloride	Tolerance Interval	0.23	No exceedance of statistically derived historical background concentration.
cis-1,2-Dichloroethene	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	2.44	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.28	Current results exceed statistically derived historical background concentrations in MW372.
Copper	Tolerance Interval	0.43	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.50	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.12	Current results exceed statistically derived historical background concentration in MW372 and MW387.
Iron	Tolerance Interval	1.17	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW372 and MW387.
Manganese	Tolerance Interval	2.15	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Molybdenum	Tolerance Interval	1.26	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.79	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	0.48	Current results exceed statistically derived historical background concentration in MW220, MW221, MW222, MW223, MW224, MW384, MW387, MW391, and MW394.
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	1.40	No exceedance of statistically derived historical background concentration.
Radium-226	Tolerance Interval	10.6	Current results exceed statistically derived historical background concentration in MW220.
Sodium	Tolerance Interval	0.24	Current results exceed statistically derived historical background concentration in MW369 and MW387.
Sulfate	Tolerance Interval	0.25	Current results exceed statistically derived historical background concentration in MW220, MW223, MW372, MW384, MW387, and MW391.
Technetium-99	Tolerance Interval	0.99	Current results exceed statistically derived historical background concentration in MW372, MW384, and MW387.
Total Organic Halides (TOX)	Tolerance Interval	2.57	No exceedance of statistically derived historical background concentration.
Trichloroethene[1]	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
*If CV > 1.0, used log-transformed data.
[1] 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	0.86	No exceedance of statistically derived historical background concentration.
Beta Activity[1]	Tolerance Interval	0.36	Current results exceed statistically derived historical background concentration in MW370, MW385, and MW388.
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.50	Current results exceed statistically derived historical background concentration in MW373.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.04	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.22	No exceedance of statistically derived historical background concentration.
cis-1,2-Dichloroethene	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.51	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.14	Current results exceed statistically derived historical background concentration in MW373 and MW388.
Copper	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Cyanide	Tolerance Interval	0.00	No exceedance of historically derived background concentration.
Dissolved Oxygen	Tolerance Interval	0.52	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW373.
Iron	Tolerance Interval	1.29	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.51	Current results exceed statistically derived historical background concentration in MW373.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Manganese	Tolerance Interval	1.49	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.09	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	0.33	Current results exceed statistically derived historical background concentration in MW370, MW373, MW385, MW388, MW392, MW395, and MW397.
pH	Tolerance Interval	0.04	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.47	Current results exceed statistically derived historical background concentration in MW373.
Sulfate	Tolerance Interval	0.20	Current results exceed statistically derived historical background concentration in MW370, MW373, MW385, MW388, and MW392.
Technetium-99	Tolerance Interval	0.80	Current results exceed statistically derived historical background concentration in MW370, MW385, and MW388.
Total Organic Halides (TOX)	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration.
Trichloroethene[1]	Tolerance Interval	0.78	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
*If CV > 1.0, used log-transformed data.
[1] 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 one-sided TL calculated using the most recent eight quarters of data 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 2, 11, and 9 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 (Downgradient Wells) of the TL Calculated Using Current Background Concentrations

URGA	LRGA
MW369: Sodium	**MW370:** Beta activity, sulfate, technetium-99
MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	**MW373:** Calcium, conductivity, dissolved solids, magnesium, sodium, sulfate
MW387: Beta activity, dissolved solids, magnesium, sodium, technetium-99	**MW388:** Beta activity, conductivity, sulfate, technetium-99
	MW392: Sulfate

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted; however, that the technetium-99 concentration in one UCRS well (i.e., MW390) exceeded the current TL this quarter.

URGA

This quarter's results identified current background exceedances in downgradient wells for beta activity, calcium, conductivity, dissolved solids, magnesium, sodium, sulfate, and technetium-99.

LRGA

This quarter's results identified current background exceedances in downgradient wells for beta activity, calcium, conductivity, dissolved solids, magnesium, sodium, sulfate, and technetium-99.

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
Oxidation-Reduction Potential	Tolerance Interval	0.38	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	-7.26	Because gradients in UCRS wells are downward, there are no UCRS wells that are hydrogeologically downgradient of the landfill; however, MW390 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

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

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	0.56	MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Calcium	Tolerance Interval	0.13	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.32	MW220 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Conductivity	Tolerance Interval	0.07	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.16	MW372 and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Magnesium	Tolerance Interval	0.09	MW372 and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.15	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.
Radium-226	Tolerance Interval	0.96	None of the test wells exceed the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sodium	Tolerance Interval	0.19	MW369 and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.34	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.68	MW372, MW384, and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

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

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	0.39	MW370, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Calcium	Tolerance Interval	0.17	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Conductivity	Tolerance Interval	0.08	MW373 and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.23	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Magnesium	Tolerance Interval	0.18	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.19	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.
Sodium	Tolerance Interval	0.08	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.07	MW370, MW373, MW385, MW388, and MW392 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.65	MW370, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

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

ATTACHMENT D1

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

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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=** 0.320	**S=** 0.182	**CV(1)=** 0.567	**K factor**=** 3.188	**TL(1)=** 0.900	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.259	**S=** 0.503	**CV(2)=** -0.400	**K factor**=** 3.188	**TL(2)=** 0.345	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.393	-0.934
9/16/2002	0.2	-1.609
10/16/2002	0.2	-1.609
1/13/2003	0.501	-0.691
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/14/2004	0.668	-0.403

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.05	N/A	-2.996	N/A
MW390	Downgradient	Yes	0.0425	NO	-3.158	N/A
MW393	Downgradient	Yes	0.0325	NO	-3.427	N/A
MW396	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.*

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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=** 0.833	**CV(1)=** 1.282	**K factor**=** 3.188	**TL(1)=** 3.306	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.034	**S=** 1.066	**CV(2)=** -1.031	**K factor**=** 3.188	**TL(2)=** 2.364	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.00663	N/A	-5.016	NO
MW390	Downgradient	Yes	0.0235	N/A	-3.751	NO
MW393	Downgradient	Yes	0.021	N/A	-3.863	NO
MW396	Upgradient	Yes	0.00872	N/A	-4.742	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.*

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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=** 1.388	**S=** 0.327	**CV(1)=** 0.236	**K factor**=** 3.188	**TL(1)=** 2.430	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 0.301	**S=** 0.252	**CV(2)=** 0.838	**K factor**=** 3.188	**TL(2)=** 1.105	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	1.5	0.405
9/16/2002	1.6	0.470
10/16/2002	1.6	0.470
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1.7	0.531
1/14/2004	1.7	0.531

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.2	N/A	-1.609	N/A
MW390	Downgradient	Yes	0.221	NO	-1.510	N/A
MW393	Downgradient	Yes	0.188	NO	-1.671	N/A
MW396	Upgradient	Yes	0.831	NO	-0.185	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.*

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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=** 41.825	**S=** 8.445	**CV(1)=** 0.202	**K factor**=** 3.188	**TL(1)=** 68.748	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.711	**S=** 0.241	**CV(2)=** 0.065	**K factor**=** 3.188	**TL(2)=** 4.479	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	38.4	3.648
9/16/2002	42.9	3.759
10/16/2002	40.2	3.694
1/13/2003	46.7	3.844
4/8/2003	49.8	3.908
7/16/2003	43.3	3.768
10/14/2003	49.7	3.906
1/14/2004	23.6	3.161

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	19.6	NO	2.976	N/A
MW390	Downgradient	Yes	31.1	NO	3.437	N/A
MW393	Downgradient	Yes	15	NO	2.708	N/A
MW396	Upgradient	Yes	31.7	NO	3.456	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.*

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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=** 35.375	**S=** 0.744	**CV(1)=** 0.021	**K factor**=** 3.188	**TL(1)=** 37.747	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.566	**S=** 0.021	**CV(2)=** 0.006	**K factor**=** 3.188	**TL(2)=** 3.632	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	36	3.584
9/16/2002	35	3.555
10/16/2002	37	3.611
1/13/2003	35	3.555
4/8/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/14/2004	35	3.555

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	19	NO	2.944	N/A
MW390	Downgradient	Yes	27.7	NO	3.321	N/A
MW393	Downgradient	Yes	20.8	NO	3.035	N/A
MW396	Upgradient	Yes	31.1	NO	3.437	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-S/T Second Quarter 2020 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=** 101.725	**S=** 5.245	**CV(1)=** 0.052	**K factor**=** 3.188	**TL(1)=** 118.447	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 4.621	**S=** 0.053	**CV(2)=** 0.011	**K factor**=** 3.188	**TL(2)=** 4.789	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	91.6	4.517
9/16/2002	98.3	4.588
10/16/2002	101.4	4.619
1/13/2003	108.3	4.685
4/8/2003	100.5	4.610
7/16/2003	102.5	4.630
10/14/2003	106.8	4.671
1/14/2004	104.4	4.648

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	11.3	NO	2.425	N/A
MW390	Downgradient	Yes	30.7	NO	3.424	N/A
MW393	Downgradient	Yes	12.3	NO	2.510	N/A
MW396	Upgradient	Yes	56.6	NO	4.036	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-S/T Second Quarter 2020 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=** 0.008	**S=** 0.011	**CV(1)=** 1.340	**K factor**=** 3.188	**TL(1)=** 0.042	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.645	**S=** 1.339	**CV(2)=** -0.237	**K factor**=** 3.188	**TL(2)=** -1.377	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00324	-5.732
4/8/2003	0.00436	-5.435
7/16/2003	0.00276	-5.893
10/14/2003	0.001	-6.908
1/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.00043	N/A	-7.752	NO
MW390	Downgradient	No	0.001	N/A	-6.908	N/A
MW393	Downgradient	No	0.001	N/A	-6.908	N/A
MW396	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-S/T Second Quarter 2020 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=** 922.500 **S=** 107.616 **CV(1)=** 0.117 **K factor**=** 3.188 **TL(1)=** 1265.579 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 6.822 **S=** 0.111 **CV(2)=** 0.016 **K factor**=** 3.188 **TL(2)=** 7.175 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	784	6.664
9/30/2002	871	6.770
10/16/2002	868	6.766
1/13/2003	912	6.816
4/8/2003	942	6.848
7/16/2003	910	6.813
10/14/2003	935	6.841
1/14/2004	1158	7.054

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	550	NO	6.310	N/A
MW390	Downgradient	Yes	667	NO	6.503	N/A
MW393	Downgradient	Yes	441	NO	6.089	N/A
MW396	Upgradient	Yes	708	NO	6.562	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-S/T Second Quarter 2020 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=** 0.028	**S=** 0.014	**CV(1)=** 0.481	**K factor**=** 3.188	**TL(1)=** 0.072	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.650	**S=** 0.414	**CV(2)=** -0.113	**K factor**=** 3.188	**TL(2)=** -2.331	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.026	-3.650
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.00131	NO	-6.638	N/A
MW390	Downgradient	Yes	0.000811	NO	-7.117	N/A
MW393	Downgradient	Yes	0.00064	NO	-7.354	N/A
MW396	Upgradient	Yes	0.000964	NO	-6.944	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-S/T Second Quarter 2020 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=** 1.395	**S=** 1.677	**CV(1)=** 1.202	**K factor**=** 3.188	**TL(1)=** 6.743	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.043	**S=** 0.814	**CV(2)=** -18.867	**K factor**=** 3.188	**TL(2)=** 2.553	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	5.45	1.696
9/16/2002	0.4	-0.916
10/16/2002	0.54	-0.616
1/13/2003	0.72	-0.329
4/8/2003	0.69	-0.371
7/16/2003	1.1	0.095
10/14/2003	0.71	-0.342
1/14/2004	1.55	0.438

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	5.55	N/A	1.714	NO
MW390	Downgradient	Yes	3.52	N/A	1.258	NO
MW393	Downgradient	Yes	1.75	N/A	0.560	NO
MW396	Upgradient	Yes	2.6	N/A	0.956	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.*

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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=** 550.375 **S=** 104.330 **CV(1)=** 0.190 **K factor**=** 3.188 **TL(1)=** 882.980 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.298 **S=** 0.162 **CV(2)=** 0.026 **K factor**=** 3.188 **TL(2)=** 6.815 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	502	6.219
9/16/2002	506	6.227
10/16/2002	543	6.297
1/13/2003	521	6.256
4/8/2003	504	6.223
7/16/2003	532	6.277
10/14/2003	490	6.194
1/14/2004	805	6.691

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	300	NO	5.704	N/A
MW390	Downgradient	Yes	396	NO	5.981	N/A
MW393	Downgradient	Yes	266	NO	5.583	N/A
MW396	Upgradient	Yes	364	NO	5.897	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-S/T Second Quarter 2020 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=** 7.796	**S=** 3.723	**CV(1)=** 0.478	**K factor**=** 3.188	**TL(1)=** 19.666	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.880	**S=** 0.723	**CV(2)=** 0.384	**K factor**=** 3.188	**TL(2)=** 4.184	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	1.8	0.588
9/16/2002	9.53	2.254
10/16/2002	7.43	2.006
1/13/2003	9.93	2.296
4/8/2003	10.2	2.322
7/16/2003	9.16	2.215
10/14/2003	11.9	2.477
1/14/2004	2.42	0.884

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.12	NO	-2.120	N/A
MW390	Downgradient	Yes	0.0474	NO	-3.049	N/A
MW393	Downgradient	Yes	1.01	NO	0.010	N/A
MW396	Upgradient	Yes	0.189	NO	-1.666	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.*

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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=** 16.876	**S=** 3.313	**CV(1)=** 0.196	**K factor**=** 3.188	**TL(1)=** 27.438	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.804	**S=** 0.240	**CV(2)=** 0.086	**K factor**=** 3.188	**TL(2)=** 3.569	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	15.5	2.741
9/16/2002	17.3	2.851
10/16/2002	17.8	2.879
1/13/2003	19.2	2.955
4/8/2003	17.8	2.879
7/16/2003	17.8	2.879
10/14/2003	20.2	3.006
1/14/2004	9.41	2.242

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	7.27	NO	1.984	N/A
MW390	Downgradient	Yes	13.2	NO	2.580	N/A
MW393	Downgradient	Yes	4.45	NO	1.493	N/A
MW396	Upgradient	Yes	13.9	NO	2.632	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.*

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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=** 0.774	**S=** 0.353	**CV(1)=** 0.456	**K factor**=** 3.188	**TL(1)=** 1.900	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.566	**S=** 1.192	**CV(2)=** -2.105	**K factor**=** 3.188	**TL(2)=** 3.235	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.57	-0.562
9/16/2002	0.647	-0.435
10/16/2002	0.88	-0.128
1/13/2003	1.132	0.124
4/8/2003	0.965	-0.036
7/16/2003	0.983	-0.017
10/14/2003	0.984	-0.016
1/14/2004	0.0314	-3.461

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.0458	NO	-3.083	N/A
MW390	Downgradient	Yes	0.00247	NO	-6.004	N/A
MW393	Downgradient	Yes	0.015	NO	-4.200	N/A
MW396	Upgradient	Yes	0.029	NO	-3.540	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.*

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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=** 0.007	**S=** 0.011	**CV(1)=** 1.507	**K factor**=** 3.188	**TL(1)=** 0.042	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.928	**S=** 1.420	**CV(2)=** -0.240	**K factor**=** 3.188	**TL(2)=** -1.400	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00128	-6.661
4/8/2003	0.00271	-5.911
7/16/2003	0.00117	-6.751
10/14/2003	0.001	-6.908
1/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.000421	N/A	-7.773	NO
MW390	Downgradient	Yes	0.000363	N/A	-7.921	NO
MW393	Downgradient	Yes	0.000238	N/A	-8.343	NO
MW396	Upgradient	Yes	0.000362	N/A	-7.924	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.*

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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=** 0.016	**S=** 0.021	**CV(1)=** 1.272	**K factor**=** 3.188	**TL(1)=** 0.083	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.706	**S=** 1.057	**CV(2)=** -0.225	**K factor**=** 3.188	**TL(2)=** -1.338	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/8/2003	0.00571	-5.166
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/14/2004	0.005	-5.298

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.002	N/A	-6.215	N/A
MW390	Downgradient	Yes	0.00117	N/A	-6.751	NO
MW393	Downgradient	No	0.002	N/A	-6.215	N/A
MW396	Upgradient	No	0.002	N/A	-6.215	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.*

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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=** 13.000 **S=** 61.952 **CV(1)=** 4.766 **K factor**=** 3.188 **TL(1)=** 210.502 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 4.364 **S=** 0.333 **CV(2)=** 0.076 **K factor**=** 3.188 **TL(2)=** 4.736 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	60	4.094
4/8/2003	71	4.263
7/16/2003	-56	#Func!
10/14/2003	-54	#Func!
1/14/2004	-22	#Func!
4/12/2004	-6	#Func!
7/20/2004	-3	#Func!
10/12/2004	114	4.736

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	409	N/A	6.014	YES
MW390	Downgradient	Yes	424	N/A	6.050	YES
MW393	Downgradient	Yes	443	N/A	6.094	YES
MW396	Upgradient	Yes	401	N/A	5.994	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

MW386
MW390
MW393
MW396

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.*

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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=** 6.460	**S=** 0.350	**CV(1)=** 0.054	**K factor**=** 3.736	**TL(1)=** 7.766	**LL(1)=**5.1541
Statistics-Transformed Background Data	**X=** 1.864	**S=** 0.054	**CV(2)=** 0.029	**K factor**=** 3.736	**TL(2)=** 2.067	**LL(2)=**1.6621

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	6.17	1.820
9/16/2002	6.4	1.856
10/16/2002	5.9	1.775
1/13/2003	6.4	1.856
4/8/2003	6.65	1.895
7/16/2003	6.4	1.856
10/14/2003	6.71	1.904
1/14/2004	7.05	1.953

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)?
MW386	Sidegradient	Yes	6.93	NO	1.936	N/A
MW390	Downgradient	Yes	6.21	NO	1.826	N/A
MW393	Downgradient	Yes	6.3	NO	1.841	N/A
MW396	Upgradient	Yes	6.67	NO	1.898	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.*

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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=** 1.411	**S=** 0.399	**CV(1)=** 0.282	**K factor**=** 3.188	**TL(1)=** 2.682	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 0.311	**S=** 0.271	**CV(2)=** 0.870	**K factor**=** 3.188	**TL(2)=** 1.175	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.978	-0.022
1/13/2003	1.08	0.077
4/8/2003	1.12	0.113
7/16/2003	1.38	0.322
10/14/2003	1.24	0.215
1/14/2004	1.49	0.399

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.306	NO	-1.184	N/A
MW390	Downgradient	Yes	0.388	NO	-0.947	N/A
MW393	Downgradient	Yes	0.488	NO	-0.717	N/A
MW396	Upgradient	Yes	0.921	NO	-0.082	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.*

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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=** 106.825 **S=** 32.041 **CV(1)=** 0.300 **K factor**=** 3.188 **TL(1)=** 208.973 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 4.595 **S=** 0.492 **CV(2)=** 0.107 **K factor**=** 3.188 **TL(2)=** 6.163 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	115	4.745
9/16/2002	116	4.754
10/16/2002	117	4.762
1/13/2003	122	4.804
4/8/2003	106	4.663
7/16/2003	117	4.762
10/14/2003	132	4.883
1/14/2004	29.6	3.388

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	99	NO	4.595	N/A
MW390	Downgradient	Yes	93.2	NO	4.535	N/A
MW393	Downgradient	Yes	82.7	NO	4.415	N/A
MW396	Upgradient	Yes	101	NO	4.615	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.*

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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=** 22.463	**S=** 8.876	**CV(1)=** 0.395	**K factor**=** 3.188	**TL(1)=** 50.759	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.054	**S=** 0.351	**CV(2)=** 0.115	**K factor**=** 3.188	**TL(2)=** 4.173	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	41.9	3.735
9/16/2002	26.3	3.270
10/16/2002	20.6	3.025
1/13/2003	16.6	2.809
4/8/2003	23.9	3.174
7/16/2003	18.8	2.934
10/14/2003	12.9	2.557
1/14/2004	18.7	2.929

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	48.6	NO	3.884	N/A
MW390	Downgradient	Yes	46.7	NO	3.844	N/A
MW393	Downgradient	Yes	20.8	NO	3.035	N/A
MW396	Upgradient	Yes	29.8	NO	3.395	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.*

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Technetium-99 UNITS: pCi/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=** 7.624	**S=** 6.558	**CV(1)=** 0.860	**K factor**=** 3.188	**TL(1)=** 28.531	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.498	**S=** 1.321	**CV(2)=** 0.882	**K factor**=** 3.188	**TL(2)=** 5.710	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	16.7	2.815
9/16/2002	6.39	1.855
10/16/2002	4.55	1.515
1/13/2003	16.5	2.803
4/8/2003	3.04	1.112
7/16/2003	0.354	-1.038
10/14/2003	11.9	2.477
1/14/2004	1.56	0.445

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.45	N/A	-0.799	N/A
MW390	Downgradient	Yes	58.1	YES	4.062	N/A
MW393	Downgradient	No	-2.35	N/A	#Error	N/A
MW396	Upgradient	No	5.69	N/A	1.739	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

MW390

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.*

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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=** 9.988	**S=** 4.696	**CV(1)=** 0.470	**K factor**=** 3.188	**TL(1)=** 24.959	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.210	**S=** 0.454	**CV(2)=** 0.205	**K factor**=** 3.188	**TL(2)=** 3.657	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	19	2.944
9/16/2002	14.6	2.681
10/16/2002	10.4	2.342
1/13/2003	4.4	1.482
4/8/2003	7	1.946
7/16/2003	7.3	1.988
10/14/2003	9.1	2.208
1/14/2004	8.1	2.092

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	3.51	NO	1.256	N/A
MW390	Downgradient	Yes	2.76	NO	1.015	N/A
MW393	Downgradient	Yes	2.6	NO	0.956	N/A
MW396	Upgradient	Yes	4.35	NO	1.470	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.*

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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=** 142.650 **S=** 53.533 **CV(1)=** 0.375 **K factor**=** 3.188 **TL(1)=** 313.314 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 4.896 **S=** 0.390 **CV(2)=** 0.080 **K factor**=** 3.188 **TL(2)=** 6.138 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	193	5.263
9/16/2002	190	5.247
10/16/2002	221	5.398
1/13/2003	106	4.663
4/8/2003	77.8	4.354
7/16/2003	122	4.804
10/14/2003	86.4	4.459
1/14/2004	145	4.977

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	78.6	NO	4.364	N/A
MW390	Downgradient	Yes	17.4	NO	2.856	N/A
MW393	Downgradient	Yes	12.3	NO	2.510	N/A
MW396	Upgradient	Yes	38.9	NO	3.661	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.*

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Zinc **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=** 0.044	**S=** 0.035	**CV(1)=** 0.786	**K factor**=** 3.188	**TL(1)=** 0.156	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -3.342	**S=** 0.682	**CV(2)=** -0.204	**K factor**=** 3.188	**TL(2)=** -1.168	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/8/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.00488	NO	-5.323	N/A
MW390	Downgradient	Yes	0.0254	NO	-3.673	N/A
MW393	Downgradient	Yes	0.00435	NO	-5.438	N/A
MW396	Upgradient	Yes	0.0037	NO	-5.599	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.*

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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=** 0.221	**S=** 0.061	**CV(1)=** 0.277	**K factor**=** 2.523	**TL(1)=** 0.376	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.534	**S=** 0.212	**CV(2)=** -0.138	**K factor**=** 2.523	**TL(2)=** -0.999	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/14/2003	0.2	-1.609
10/13/2003	0.427	-0.851
1/13/2004	0.309	-1.174
4/13/2004	0.2	-1.609
7/21/2004	0.202	-1.599

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

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)
MW220	Upgradient	Yes	0.0588	NO	-2.834	N/A
MW221	Sidegradient	No	0.05	N/A	-2.996	N/A
MW222	Sidegradient	No	0.05	N/A	-2.996	N/A
MW223	Sidegradient	Yes	0.0473	NO	-3.051	N/A
MW224	Sidegradient	No	0.05	N/A	-2.996	N/A
MW369	Downgradient	Yes	0.0243	NO	-3.717	N/A
MW372	Downgradient	Yes	0.0233	NO	-3.759	N/A
MW384	Sidegradient	No	0.05	N/A	-2.996	N/A
MW387	Downgradient	Yes	0.0831	NO	-2.488	N/A
MW391	Downgradient	Yes	0.0369	NO	-3.300	N/A
MW394	Upgradient	Yes	0.0399	NO	-3.221	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.*

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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=** 14.273	**S=** 13.883	**CV(1)=** 0.973	**K factor**=** 2.523	**TL(1)=** 49.300	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.213	**S=** 1.033	**CV(2)=** 0.467	**K factor**=** 2.523	**TL(2)=** 4.819	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	15.2	2.721
1/15/2003	42.5	3.750
4/10/2003	45.4	3.816
7/14/2003	8.53	2.144
10/13/2003	11.7	2.460
1/13/2004	13.5	2.603
4/13/2004	33.5	3.512
7/21/2004	13.7	2.617

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	5.03	1.615
9/16/2002	5.57	1.717
10/16/2002	12.8	2.549
1/13/2003	4.3	1.459
4/10/2003	9.52	2.253
7/16/2003	3.92	1.366
10/14/2003	1.06	0.058
1/13/2004	2.14	0.761

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)
MW220	Upgradient	Yes	16.5	N/A	2.803	N/A
MW221	Sidegradient	No	5.08	N/A	1.625	N/A
MW222	Sidegradient	No	10.2	N/A	2.322	N/A
MW223	Sidegradient	No	-1.86	N/A	#Error	N/A
MW224	Sidegradient	No	8.34	N/A	2.121	N/A
MW369	Downgradient	Yes	27.8	N/A	3.325	N/A
MW372	Downgradient	Yes	20.9	N/A	3.040	N/A
MW384	Sidegradient	Yes	43.6	N/A	3.775	N/A
MW387	Downgradient	Yes	240	YES	5.481	N/A
MW391	Downgradient	No	10.4	N/A	2.342	N/A
MW394	Upgradient	No	5.27	N/A	1.662	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

MW387

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.*

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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=** 0.425	**S=** 0.615	**CV(1)=** 1.447	**K factor**=** 2.523	**TL(1)=** 1.976	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.322	**S=** 0.786	**CV(2)=** -0.595	**K factor**=** 2.523	**TL(2)=** 0.663	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/14/2003	0.2	-1.609
10/13/2003	0.2	-1.609
1/13/2004	0.2	-1.609
4/13/2004	0.2	-1.609
7/21/2004	0.2	-1.609

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	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)
MW220	Upgradient	Yes	0.00649	N/A	-5.037	NO
MW221	Sidegradient	Yes	0.0152	N/A	-4.186	NO
MW222	Sidegradient	Yes	0.0114	N/A	-4.474	NO
MW223	Sidegradient	Yes	0.00747	N/A	-4.897	NO
MW224	Sidegradient	Yes	0.0235	N/A	-3.751	NO
MW369	Downgradient	Yes	0.0202	N/A	-3.902	NO
MW372	Downgradient	Yes	1.15	N/A	0.140	NO
MW384	Sidegradient	Yes	0.06	N/A	-2.813	NO
MW387	Downgradient	Yes	0.0217	N/A	-3.830	NO
MW391	Downgradient	Yes	0.0812	N/A	-2.511	NO
MW394	Upgradient	Yes	0.022	N/A	-3.817	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-S/T Second Quarter 2020 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:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	1	0.000
1/15/2003	1	0.000
4/10/2003	1	0.000
7/14/2003	1	0.000
10/13/2003	1	0.000
1/13/2004	1	0.000
4/13/2004	1	0.000
7/21/2004	1	0.000

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/16/2002	1	0.000
1/13/2003	1	0.000
4/10/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	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)
MW220	Upgradient	Yes	0.242	NO	-1.419	N/A
MW221	Sidegradient	Yes	0.471	NO	-0.753	N/A
MW222	Sidegradient	Yes	0.432	NO	-0.839	N/A
MW223	Sidegradient	Yes	0.394	NO	-0.931	N/A
MW224	Sidegradient	Yes	0.483	NO	-0.728	N/A
MW369	Downgradient	Yes	0.502	NO	-0.689	N/A
MW372	Downgradient	Yes	0.512	NO	-0.669	N/A
MW384	Sidegradient	Yes	0.347	NO	-1.058	N/A
MW387	Downgradient	Yes	0.628	NO	-0.465	N/A
MW391	Downgradient	Yes	0.596	NO	-0.518	N/A
MW394	Upgradient	Yes	0.512	NO	-0.669	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-S/T Second Quarter 2020 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=** 27.638	**S=** 4.743	**CV(1)=** 0.172	**K factor**=** 2.523	**TL(1)=** 39.604	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.304	**S=** 0.183	**CV(2)=** 0.055	**K factor**=** 2.523	**TL(2)=** 3.765	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	23.6	3.161
1/15/2003	25.9	3.254
4/10/2003	30.4	3.414
7/14/2003	33.9	3.523
10/13/2003	21.3	3.059
1/13/2004	20.3	3.011
4/13/2004	23.8	3.170
7/21/2004	19	2.944

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	29.5	3.384
9/16/2002	29.9	3.398
10/16/2002	31.2	3.440
1/13/2003	30.7	3.424
4/10/2003	34.4	3.538
7/16/2003	29.6	3.388
10/14/2003	30.3	3.411
1/13/2004	28.4	3.346

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)
MW220	Upgradient	Yes	28.8	NO	3.360	N/A
MW221	Sidegradient	Yes	21.8	NO	3.082	N/A
MW222	Sidegradient	Yes	21.6	NO	3.073	N/A
MW223	Sidegradient	Yes	23.6	NO	3.161	N/A
MW224	Sidegradient	Yes	24.5	NO	3.199	N/A
MW369	Downgradient	Yes	20.4	NO	3.016	N/A
MW372	Downgradient	Yes	62.7	YES	4.138	N/A
MW384	Sidegradient	Yes	26.9	NO	3.292	N/A
MW387	Downgradient	Yes	38.7	NO	3.656	N/A
MW391	Downgradient	Yes	29.1	NO	3.371	N/A
MW394	Upgradient	Yes	24.9	NO	3.215	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-S/T Second Quarter 2020 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=** 35.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 35.000	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.555	**S=** 0.000	**CV(2)=** 0.000	**K factor**=** 2.523	**TL(2)=** 3.555	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	35	3.555
1/15/2003	35	3.555
4/10/2003	35	3.555
7/14/2003	35	3.555
10/13/2003	35	3.555
1/13/2004	35	3.555
4/13/2004	35	3.555
7/21/2004	35	3.555

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	35	3.555
9/16/2002	35	3.555
10/16/2002	35	3.555
1/13/2003	35	3.555
4/10/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	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)
MW220	Upgradient	Yes	114	YES	4.736	N/A
MW221	Sidegradient	Yes	28.8	NO	3.360	N/A
MW222	Sidegradient	Yes	28.8	NO	3.360	N/A
MW223	Sidegradient	Yes	33.7	NO	3.517	N/A
MW224	Sidegradient	Yes	14.2	NO	2.653	N/A
MW369	Downgradient	Yes	33.9	NO	3.523	N/A
MW372	Downgradient	No	20	N/A	2.996	N/A
MW384	Sidegradient	Yes	14.2	NO	2.653	N/A
MW387	Downgradient	Yes	23.9	NO	3.174	N/A
MW391	Downgradient	Yes	27.7	NO	3.321	N/A
MW394	Upgradient	Yes	31.1	NO	3.437	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

MW220

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-S/T Second Quarter 2020 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=** 49.044	**S=** 11.278	**CV(1)=** 0.230	**K factor**=** 2.523	**TL(1)=** 77.499	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.866	**S=** 0.244	**CV(2)=** 0.063	**K factor**=** 2.523	**TL(2)=** 4.482	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	44.6	3.798
1/15/2003	43.2	3.766
4/10/2003	31.5	3.450
7/14/2003	30.8	3.428
10/13/2003	40.9	3.711
1/13/2004	40.8	3.709
4/13/2004	37.5	3.624
7/21/2004	40.8	3.709

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	60.4	4.101
9/16/2002	60.3	4.099
10/16/2002	58	4.060
1/13/2003	60.7	4.106
4/10/2003	62.9	4.142
7/16/2003	58.1	4.062
10/14/2003	58.2	4.064
1/13/2004	56	4.025

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)
MW220	Upgradient	Yes	18.2	NO	2.901	N/A
MW221	Sidegradient	Yes	34.8	NO	3.550	N/A
MW222	Sidegradient	Yes	31.4	NO	3.447	N/A
MW223	Sidegradient	Yes	28.2	NO	3.339	N/A
MW224	Sidegradient	Yes	35.8	NO	3.578	N/A
MW369	Downgradient	Yes	31.2	NO	3.440	N/A
MW372	Downgradient	Yes	39.5	NO	3.676	N/A
MW384	Sidegradient	Yes	30.6	NO	3.421	N/A
MW387	Downgradient	Yes	45.4	NO	3.816	N/A
MW391	Downgradient	Yes	46.3	NO	3.835	N/A
MW394	Upgradient	Yes	42	NO	3.738	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

cis-1,2-Dichloroethene 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=** 5.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 5.000	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.609	**S=** 0.000	**CV(2)=** 0.000	**K factor**=** 2.523	**TL(2)=** 1.609	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	5	1.609
1/15/2003	5	1.609
4/10/2003	5	1.609
7/14/2003	5	1.609
10/13/2003	5	1.609
1/13/2004	5	1.609
4/13/2004	5	1.609
7/21/2004	5	1.609

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

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)
MW220	Upgradient	No	1	N/A	0.000	N/A
MW221	Sidegradient	No	1	N/A	0.000	N/A
MW222	Sidegradient	No	1	N/A	0.000	N/A
MW223	Sidegradient	No	1	N/A	0.000	N/A
MW224	Sidegradient	No	1	N/A	0.000	N/A
MW369	Downgradient	No	1	N/A	0.000	N/A
MW372	Downgradient	No	1	N/A	0.000	N/A
MW384	Sidegradient	No	1	N/A	0.000	N/A
MW387	Downgradient	No	1	N/A	0.000	N/A
MW391	Downgradient	Yes	0.46	NO	-0.777	N/A
MW394	Upgradient	No	1	N/A	0.000	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-S/T Second Quarter 2020 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=** 0.016	**S=** 0.040	**CV(1)=** 2.440	**K factor**=** 2.523	**TL(1)=** 0.116	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -5.582	**S=** 1.573	**CV(2)=** -0.282	**K factor**=** 2.523	**TL(2)=** -1.613	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.0041	-5.497
1/15/2003	0.00496	-5.306
4/10/2003	0.00289	-5.846
7/14/2003	0.161	-1.826
10/13/2003	0.0226	-3.790
1/13/2004	0.00464	-5.373
4/13/2004	0.001	-6.908
7/21/2004	0.00264	-5.937

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/10/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

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)
MW220	Upgradient	No	0.001	N/A	-6.908	N/A
MW221	Sidegradient	Yes	0.00135	N/A	-6.608	NO
MW222	Sidegradient	Yes	0.00157	N/A	-6.457	NO
MW223	Sidegradient	Yes	0.0004	N/A	-7.824	NO
MW224	Sidegradient	Yes	0.00289	N/A	-5.846	NO
MW369	Downgradient	Yes	0.00564	N/A	-5.178	NO
MW372	Downgradient	Yes	0.000789	N/A	-7.145	NO
MW384	Sidegradient	No	0.001	N/A	-6.908	N/A
MW387	Downgradient	No	0.001	N/A	-6.908	N/A
MW391	Downgradient	No	0.001	N/A	-6.908	N/A
MW394	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-S/T Second Quarter 2020 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=** 382.132 **S=** 107.134 **CV(1)=** 0.280 **K factor**=** 2.523 **TL(1)=** 652.432 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.716 **S=** 1.164 **CV(2)=** 0.204 **K factor**=** 2.523 **TL(2)=** 8.652 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	368	5.908
1/15/2003	433.2	6.071
4/10/2003	489	6.192
7/14/2003	430	6.064
10/13/2003	346	5.846
1/13/2004	365	5.900
4/13/2004	416	6.031
7/21/2004	353	5.866

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	406	6.006
9/16/2002	418	6.035
10/16/2002	411	6.019
1/13/2003	422	6.045
4/10/2003	420	6.040
7/16/2003	438	6.082
10/14/2003	3.91	1.364
1/13/2004	395	5.979

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)
MW220	Upgradient	Yes	435	NO	6.075	N/A
MW221	Sidegradient	Yes	400	NO	5.991	N/A
MW222	Sidegradient	Yes	388	NO	5.961	N/A
MW223	Sidegradient	Yes	414	NO	6.026	N/A
MW224	Sidegradient	Yes	427	NO	6.057	N/A
MW369	Downgradient	Yes	407	NO	6.009	N/A
MW372	Downgradient	Yes	687	YES	6.532	N/A
MW384	Sidegradient	Yes	458	NO	6.127	N/A
MW387	Downgradient	Yes	566	NO	6.339	N/A
MW391	Downgradient	Yes	412	NO	6.021	N/A
MW394	Upgradient	Yes	367	NO	5.905	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-S/T Second Quarter 2020 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=** 0.024	**S=** 0.010	**CV(1)=** 0.429	**K factor**=** 2.523	**TL(1)=** 0.050	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.794	**S=** 0.312	**CV(2)=** -0.082	**K factor**=** 2.523	**TL(2)=** -3.007	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.0211	-3.858
1/15/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/14/2003	0.02	-3.912
10/13/2003	0.02	-3.912
1/13/2004	0.02	-3.912
4/13/2004	0.02	-3.912
7/21/2004	0.02	-3.912

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	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)
MW220	Upgradient	Yes	0.000885	NO	-7.030	N/A
MW221	Sidegradient	Yes	0.00218	NO	-6.128	N/A
MW222	Sidegradient	Yes	0.00181	NO	-6.314	N/A
MW223	Sidegradient	Yes	0.000767	NO	-7.173	N/A
MW224	Sidegradient	Yes	0.000503	NO	-7.595	N/A
MW369	Downgradient	Yes	0.00111	NO	-6.803	N/A
MW372	Downgradient	Yes	0.00052	NO	-7.562	N/A
MW384	Sidegradient	Yes	0.00086	NO	-7.059	N/A
MW387	Downgradient	Yes	0.000993	NO	-6.915	N/A
MW391	Downgradient	Yes	0.001	NO	-6.908	N/A
MW394	Upgradient	Yes	0.000601	NO	-7.417	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-S/T Second Quarter 2020 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=** 3.784	**S=** 1.887	**CV(1)=** 0.499	**K factor**=** 2.523	**TL(1)=** 8.545	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.182	**S=** 0.612	**CV(2)=** 0.518	**K factor**=** 2.523	**TL(2)=** 2.727	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	6.79	1.915
1/15/2003	7.25	1.981
4/10/2003	3.6	1.281
7/14/2003	0.94	-0.062
10/13/2003	1.65	0.501
1/13/2004	3.48	1.247
4/13/2004	1.05	0.049
7/21/2004	4.46	1.495

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	6.09	1.807
9/16/2002	3.85	1.348
10/16/2002	5.11	1.631
1/13/2003	3.83	1.343
4/10/2003	4.15	1.423
7/16/2003	1.83	0.604
10/14/2003	3.33	1.203
1/13/2004	3.14	1.144

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)
MW220	Upgradient	Yes	3.44	NO	1.235	N/A
MW221	Sidegradient	Yes	3.83	NO	1.343	N/A
MW222	Sidegradient	Yes	2.97	NO	1.089	N/A
MW223	Sidegradient	Yes	3.61	NO	1.284	N/A
MW224	Sidegradient	Yes	3.19	NO	1.160	N/A
MW369	Downgradient	Yes	0.65	NO	-0.431	N/A
MW372	Downgradient	Yes	0.83	NO	-0.186	N/A
MW384	Sidegradient	Yes	3.8	NO	1.335	N/A
MW387	Downgradient	Yes	1.8	NO	0.588	N/A
MW391	Downgradient	Yes	3.45	NO	1.238	N/A
MW394	Upgradient	Yes	4.53	NO	1.511	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-S/T Second Quarter 2020 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=** 232.688	**S=** 27.490	**CV(1)=** 0.118	**K factor**=** 2.523	**TL(1)=** 302.045	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 5.443	**S=** 0.118	**CV(2)=** 0.022	**K factor**=** 2.523	**TL(2)=** 5.740	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	208	5.338
1/15/2003	257	5.549
4/10/2003	288	5.663
7/14/2003	262	5.568
10/13/2003	197	5.283
1/13/2004	198	5.288
4/13/2004	245	5.501
7/21/2004	204	5.318

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	247	5.509
9/16/2002	259	5.557
10/16/2002	201	5.303
1/13/2003	228	5.429
4/10/2003	249	5.517
7/16/2003	240	5.481
10/14/2003	230	5.438
1/13/2004	210	5.347

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)
MW220	Upgradient	Yes	214	NO	5.366	N/A
MW221	Sidegradient	Yes	196	NO	5.278	N/A
MW222	Sidegradient	Yes	273	NO	5.609	N/A
MW223	Sidegradient	Yes	197	NO	5.283	N/A
MW224	Sidegradient	Yes	169	NO	5.130	N/A
MW369	Downgradient	Yes	214	NO	5.366	N/A
MW372	Downgradient	Yes	399	YES	5.989	N/A
MW384	Sidegradient	Yes	233	NO	5.451	N/A
MW387	Downgradient	Yes	304	YES	5.717	N/A
MW391	Downgradient	Yes	216	NO	5.375	N/A
MW394	Upgradient	Yes	200	NO	5.298	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
MW387

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-S/T Second Quarter 2020 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=** 0.897	**S=** 1.050	**CV(1)=** 1.170	**K factor**=** 2.523	**TL(1)=** 3.545	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.565	**S=** 0.951	**CV(2)=** -1.683	**K factor**=** 2.523	**TL(2)=** 1.834	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.429	-0.846
7/14/2003	4.33	1.466
10/13/2003	1.81	0.593
1/13/2004	0.793	-0.232
4/13/2004	0.13	-2.040
7/21/2004	0.382	-0.962

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	1.34	0.293
9/16/2002	0.328	-1.115
10/16/2002	1.38	0.322
1/13/2003	1.3	0.262
4/10/2003	0.494	-0.705
7/16/2003	0.62	-0.478
10/14/2003	0.37	-0.994
1/13/2004	0.251	-1.382

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)
MW220	Upgradient	Yes	0.107	N/A	-2.235	NO
MW221	Sidegradient	Yes	0.0406	N/A	-3.204	NO
MW222	Sidegradient	Yes	0.067	N/A	-2.703	NO
MW223	Sidegradient	Yes	0.124	N/A	-2.087	NO
MW224	Sidegradient	Yes	0.0576	N/A	-2.854	NO
MW369	Downgradient	Yes	0.178	N/A	-1.726	NO
MW372	Downgradient	Yes	0.179	N/A	-1.720	NO
MW384	Sidegradient	Yes	0.471	N/A	-0.753	NO
MW387	Downgradient	Yes	0.839	N/A	-0.176	NO
MW391	Downgradient	Yes	0.212	N/A	-1.551	NO
MW394	Upgradient	Yes	0.187	N/A	-1.677	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-S/T Second Quarter 2020 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=** 10.796	**S=** 1.703	**CV(1)=** 0.158	**K factor**=** 2.523	**TL(1)=** 15.092	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.368	**S=** 0.158	**CV(2)=** 0.067	**K factor**=** 2.523	**TL(2)=** 2.766	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	9.16	2.215
1/15/2003	10	2.303
4/10/2003	10.8	2.380
7/14/2003	14.7	2.688
10/13/2003	9.03	2.201
1/13/2004	8.49	2.139
4/13/2004	9.7	2.272
7/21/2004	8.06	2.087

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	11.8	2.468
9/16/2002	12.1	2.493
10/16/2002	11.3	2.425
1/13/2003	10.3	2.332
4/10/2003	11.7	2.460
7/16/2003	12	2.485
10/14/2003	12.2	2.501
1/13/2004	11.4	2.434

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)
MW220	Upgradient	Yes	11.9	NO	2.477	N/A
MW221	Sidegradient	Yes	10	NO	2.303	N/A
MW222	Sidegradient	Yes	9.5	NO	2.251	N/A
MW223	Sidegradient	Yes	9.91	NO	2.294	N/A
MW224	Sidegradient	Yes	10.3	NO	2.332	N/A
MW369	Downgradient	Yes	8.43	NO	2.132	N/A
MW372	Downgradient	Yes	22.4	YES	3.109	N/A
MW384	Sidegradient	Yes	11.2	NO	2.416	N/A
MW387	Downgradient	Yes	15.4	YES	2.734	N/A
MW391	Downgradient	Yes	12.6	NO	2.534	N/A
MW394	Upgradient	Yes	10.7	NO	2.370	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
MW387

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-S/T Second Quarter 2020 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=** 0.287	**S=** 0.619	**CV(1)=** 2.156	**K factor**=** 2.523	**TL(1)=** 1.848	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -2.455	**S=** 1.619	**CV(2)=** -0.659	**K factor**=** 2.523	**TL(2)=** 1.630	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.0306	-3.487
1/15/2003	0.0291	-3.537
4/10/2003	0.0137	-4.290
7/14/2003	2.54	0.932
10/13/2003	0.378	-0.973
1/13/2004	0.159	-1.839
4/13/2004	0.00707	-4.952
7/21/2004	0.0841	-2.476

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.542	-0.612
9/16/2002	0.155	-1.864
10/16/2002	0.103	-2.273
1/13/2003	0.128	-2.056
4/10/2003	0.005	-5.298
7/16/2003	0.272	-1.302
10/14/2003	0.0795	-2.532
1/13/2004	0.0658	-2.721

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)
MW220	Upgradient	Yes	0.00233	N/A	-6.062	NO
MW221	Sidegradient	Yes	0.0115	N/A	-4.465	NO
MW222	Sidegradient	Yes	0.0209	N/A	-3.868	NO
MW223	Sidegradient	Yes	0.0215	N/A	-3.840	NO
MW224	Sidegradient	Yes	0.0239	N/A	-3.734	NO
MW369	Downgradient	Yes	0.503	N/A	-0.687	NO
MW372	Downgradient	Yes	0.00952	N/A	-4.654	NO
MW384	Sidegradient	Yes	0.0114	N/A	-4.474	NO
MW387	Downgradient	Yes	0.0821	N/A	-2.500	NO
MW391	Downgradient	Yes	0.00597	N/A	-5.121	NO
MW394	Upgradient	Yes	0.00434	N/A	-5.440	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

Molybdenum 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=** 0.006	**S=** 0.008	**CV(1)=** 1.261	**K factor**=** 2.523	**TL(1)=** 0.026	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.747	**S=** 1.205	**CV(2)=** -0.210	**K factor**=** 2.523	**TL(2)=** -2.708	**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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.00558	-5.189
1/15/2003	0.00983	-4.622
4/10/2003	0.0109	-4.519
7/14/2003	0.00245	-6.012
10/13/2003	0.00566	-5.174
1/13/2004	0.00572	-5.164
4/13/2004	0.001	-6.908
7/21/2004	0.00392	-5.542

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/10/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.00121	N/A	-6.717	NO
MW221	Sidegradient	Yes	0.00984	N/A	-4.621	NO
MW222	Sidegradient	Yes	0.00446	N/A	-5.413	NO
MW223	Sidegradient	Yes	0.00511	N/A	-5.277	NO
MW224	Sidegradient	Yes	0.0011	N/A	-6.812	NO
MW369	Downgradient	Yes	0.000235	N/A	-8.356	NO
MW372	Downgradient	Yes	0.000352	N/A	-7.952	NO
MW384	Sidegradient	No	0.001	N/A	-6.908	N/A
MW387	Downgradient	No	0.001	N/A	-6.908	N/A
MW391	Downgradient	No	0.001	N/A	-6.908	N/A
MW394	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-S/T Second Quarter 2020 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=** 0.127	**S=** 0.228	**CV(1)=** 1.790	**K factor**=** 2.523	**TL(1)=** 0.701	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.617	**S=** 1.837	**CV(2)=** -0.508	**K factor**=** 2.523	**TL(2)=** 1.019	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.418	-0.872
1/15/2003	0.738	-0.304
4/10/2003	0.544	-0.609
7/14/2003	0.106	-2.244
10/13/2003	0.0529	-2.939
1/13/2004	0.0209	-3.868
4/13/2004	0.005	-5.298
7/21/2004	0.0192	-3.953

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/10/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	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)
MW220	Upgradient	Yes	0.0123	N/A	-4.398	NO
MW221	Sidegradient	Yes	0.126	N/A	-2.071	NO
MW222	Sidegradient	Yes	0.143	N/A	-1.945	NO
MW223	Sidegradient	Yes	0.108	N/A	-2.226	NO
MW224	Sidegradient	Yes	0.164	N/A	-1.808	NO
MW369	Downgradient	Yes	0.00798	N/A	-4.831	NO
MW372	Downgradient	Yes	0.00126	N/A	-6.677	NO
MW384	Sidegradient	No	0.002	N/A	-6.215	N/A
MW387	Downgradient	Yes	0.000619	N/A	-7.387	NO
MW391	Downgradient	No	0.002	N/A	-6.215	N/A
MW394	Upgradient	Yes	0.00462	N/A	-5.377	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-S/T Second Quarter 2020 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=** 179.872	**S=** 86.318	**CV(1)=** 0.480	**K factor**=** 2.523	**TL(1)=** 397.652	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 4.861	**S=** 1.252	**CV(2)=** 0.258	**K factor**=** 2.523	**TL(2)=** 8.021	**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).

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	205	5.323
1/15/2003	1.95	0.668
4/10/2003	203	5.313
7/14/2003	30	3.401
10/13/2003	107	4.673
1/13/2004	295	5.687
4/13/2004	190	5.247
7/21/2004	319	5.765

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	90	4.500
9/16/2002	240	5.481
10/16/2002	185	5.220
1/13/2003	220	5.394
4/10/2003	196	5.278
7/16/2003	172	5.147
10/14/2003	175	5.165
1/13/2004	249	5.517

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	435	YES	6.075	N/A
MW221	Sidegradient	Yes	429	YES	6.061	N/A
MW222	Sidegradient	Yes	425	YES	6.052	N/A
MW223	Sidegradient	Yes	415	YES	6.028	N/A
MW224	Sidegradient	Yes	423	YES	6.047	N/A
MW369	Downgradient	Yes	390	NO	5.966	N/A
MW372	Downgradient	Yes	393	NO	5.974	N/A
MW384	Sidegradient	Yes	402	YES	5.996	N/A
MW387	Downgradient	Yes	402	YES	5.996	N/A
MW391	Downgradient	Yes	457	YES	6.125	N/A
MW394	Upgradient	Yes	432	YES	6.068	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.

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.*

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
MW220
MW221
MW222
MW223
MW224
MW384
MW387
MW391
MW394

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-S/T Second Quarter 2020 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=** 6.138	**S=** 0.282	**CV(1)=** 0.046	**K factor**=** 2.904	**TL(1)=** 6.957	**LL(1)=**5.3179
Statistics-Transformed Background Data	**X=** 1.813	**S=** 0.047	**CV(2)=** 0.026	**K factor**=** 2.904	**TL(2)=** 1.950	**LL(2)=**1.6765

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: MW220

Date Collected	Result	LN(Result)
10/14/2002	6.04	1.798
1/15/2003	6.31	1.842
4/10/2003	6.5	1.872
7/14/2003	6.3	1.841
10/13/2003	6.34	1.847
1/13/2004	6.33	1.845
4/13/2004	6.3	1.841
7/21/2004	5.9	1.775

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5.8	1.758
9/30/2002	5.93	1.780
10/16/2002	5.42	1.690
1/13/2003	6	1.792
4/10/2003	6.04	1.798
7/16/2003	6.2	1.825
10/14/2003	6.4	1.856
1/13/2004	6.39	1.855

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW220	Upgradient	Yes	6.16	NO	1.818	N/A
MW221	Sidegradient	Yes	5.82	NO	1.761	N/A
MW222	Sidegradient	Yes	6.15	NO	1.816	N/A
MW223	Sidegradient	Yes	6.14	NO	1.815	N/A
MW224	Sidegradient	Yes	6.21	NO	1.826	N/A
MW369	Downgradient	Yes	6.23	NO	1.829	N/A
MW372	Downgradient	Yes	6.17	NO	1.820	N/A
MW384	Sidegradient	Yes	6.09	NO	1.807	N/A
MW387	Downgradient	Yes	6.03	NO	1.797	N/A
MW391	Downgradient	Yes	6.1	NO	1.808	N/A
MW394	Upgradient	Yes	5.82	NO	1.761	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-S/T Second Quarter 2020 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=** 6.654	**S=** 9.310	**CV(1)=** 1.399	**K factor**=** 2.523	**TL(1)=** 30.144	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.130	**S=** 1.208	**CV(2)=** 1.069	**K factor**=** 2.523	**TL(2)=** 4.178	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	6.7	1.902
1/15/2003	29.7	3.391
4/10/2003	24.9	3.215
7/14/2003	1.13	0.122
10/13/2003	3.43	1.233
1/13/2004	6.71	1.904
4/13/2004	19.3	2.960
7/21/2004	3.97	1.379

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	1.03	0.030
1/13/2003	1.1	0.095
4/10/2003	1.24	0.215
7/16/2003	1.14	0.131
10/14/2003	1.05	0.049
1/13/2004	1.07	0.068

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)
MW220	Upgradient	Yes	2.76	N/A	1.015	NO
MW221	Sidegradient	Yes	2.5	N/A	0.916	NO
MW222	Sidegradient	Yes	0.661	N/A	-0.414	NO
MW223	Sidegradient	Yes	2.39	N/A	0.871	NO
MW224	Sidegradient	Yes	0.894	N/A	-0.112	NO
MW369	Downgradient	Yes	0.625	N/A	-0.470	NO
MW372	Downgradient	Yes	2.45	N/A	0.896	NO
MW384	Sidegradient	Yes	1.67	N/A	0.513	NO
MW387	Downgradient	Yes	1.45	N/A	0.372	NO
MW391	Downgradient	Yes	1.69	N/A	0.525	NO
MW394	Upgradient	Yes	1.44	N/A	0.365	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

Radium-226 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=** 0.036	**S=** 0.382	**CV(1)=** 10.588	**K factor**=** 2.523	**TL(1)=** 1.001	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.873	**S=** 1.110	**CV(2)=** -0.592	**K factor**=** 2.523	**TL(2)=** -0.538	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	-0.804	#Func!
1/15/2003	0	#Func!
10/13/2003	0.389	-0.944
1/13/2004	-0.12	#Func!
4/13/2004	0.159	-1.839
7/21/2004	0.382	-0.962
10/11/2004	0.211	-1.556
1/20/2005	0.229	-1.474

Well Number:	MW394	
Date Collected	Result	LN(Result)
10/16/2002	0.584	-0.538
1/13/2003	-0.839	#Func!
10/14/2003	0.0325	-3.427
1/13/2004	-0.00402	#Func!
4/12/2004	-0.000337	#Func!
7/20/2004	0.29	-1.238
10/12/2004	0.0366	-3.308
1/18/2005	0.0319	-3.445

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)
MW220	Upgradient	Yes	1.04	N/A	0.039	YES
MW221	Sidegradient	No	0.628	N/A	-0.465	N/A
MW222	Sidegradient	No	0.258	N/A	-1.355	N/A
MW223	Sidegradient	No	0.387	N/A	-0.949	N/A
MW224	Sidegradient	No	-0.0891	N/A	#Error	N/A
MW369	Downgradient	No	0.244	N/A	-1.411	N/A
MW372	Downgradient	No	0.498	N/A	-0.697	N/A
MW384	Sidegradient	No	0.336	N/A	-1.091	N/A
MW387	Downgradient	No	0.392	N/A	-0.936	N/A
MW391	Downgradient	No	0.487	N/A	-0.719	N/A
MW394	Upgradient	No	0.298	N/A	-1.211	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

MW220

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-S/T Second Quarter 2020 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=** 36.363	**S=** 8.666	**CV(1)=** 0.238	**K factor**=** 2.523	**TL(1)=** 58.227	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.570	**S=** 0.222	**CV(2)=** 0.062	**K factor**=** 2.523	**TL(2)=** 4.129	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	35.4	3.567
1/15/2003	40.6	3.704
4/10/2003	51	3.932
7/14/2003	58.2	4.064
10/13/2003	38.1	3.640
1/13/2004	37	3.611
4/13/2004	43.2	3.766
7/21/2004	33.8	3.520

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	32.9	3.493
9/16/2002	29.9	3.398
10/16/2002	29	3.367
1/13/2003	27.1	3.300
4/10/2003	24.8	3.211
7/16/2003	35.6	3.572
10/14/2003	33.9	3.523
1/13/2004	31.3	3.444

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)
MW220	Upgradient	Yes	44	NO	3.784	N/A
MW221	Sidegradient	Yes	49.1	NO	3.894	N/A
MW222	Sidegradient	Yes	48.6	NO	3.884	N/A
MW223	Sidegradient	Yes	47.6	NO	3.863	N/A
MW224	Sidegradient	Yes	57.6	NO	4.054	N/A
MW369	Downgradient	Yes	62	YES	4.127	N/A
MW372	Downgradient	Yes	57.7	NO	4.055	N/A
MW384	Sidegradient	Yes	53	NO	3.970	N/A
MW387	Downgradient	Yes	58.3	YES	4.066	N/A
MW391	Downgradient	Yes	34.6	NO	3.544	N/A
MW394	Upgradient	Yes	33.4	NO	3.509	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
MW387

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-S/T Second Quarter 2020 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=** 10.481	**S=** 2.648	**CV(1)=** 0.253	**K factor**=** 2.523	**TL(1)=** 17.161	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.322	**S=** 0.239	**CV(2)=** 0.103	**K factor**=** 2.523	**TL(2)=** 2.925	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	10.4	2.342
1/15/2003	9.8	2.282
4/10/2003	15.4	2.734
7/14/2003	14.9	2.701
10/13/2003	13.5	2.603
1/13/2004	10.3	2.332
4/13/2004	14.3	2.660
7/21/2004	10.5	2.351

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	11.2	2.416
9/16/2002	8.3	2.116
10/16/2002	8	2.079
1/13/2003	8.5	2.140
4/10/2003	7.9	2.067
7/16/2003	8.4	2.128
10/14/2003	8.2	2.104
1/13/2004	8.1	2.092

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)
MW220	Upgradient	Yes	22.2	YES	3.100	N/A
MW221	Sidegradient	Yes	14.6	NO	2.681	N/A
MW222	Sidegradient	Yes	14.5	NO	2.674	N/A
MW223	Sidegradient	Yes	21.1	YES	3.049	N/A
MW224	Sidegradient	Yes	14.9	NO	2.701	N/A
MW369	Downgradient	Yes	9.41	NO	2.242	N/A
MW372	Downgradient	Yes	102	YES	4.625	N/A
MW384	Sidegradient	Yes	24.5	YES	3.199	N/A
MW387	Downgradient	Yes	23.4	YES	3.153	N/A
MW391	Downgradient	Yes	21	YES	3.045	N/A
MW394	Upgradient	Yes	12.7	NO	2.542	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

MW220
MW223
MW372
MW384
MW387
MW391

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-S/T Second Quarter 2020 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=** 9.354	**S=** 9.280	**CV(1)=** 0.992	**K factor**=** 2.523	**TL(1)=** 32.768	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.270	**S=** 0.849	**CV(2)=** 0.374	**K factor**=** 2.523	**TL(2)=** 3.262	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	19.7	2.981
1/15/2003	26.1	3.262
4/10/2003	3.56	1.270
7/14/2003	0	#Func!
10/13/2003	21	3.045
1/13/2004	6.32	1.844
4/13/2004	3	1.099
7/21/2004	14.6	2.681

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	14	2.639
9/16/2002	5.45	1.696
10/16/2002	2.49	0.912
1/13/2003	18.3	2.907
4/10/2003	-1.45	#Func!
7/16/2003	-1.71	#Func!
10/14/2003	18.3	2.907
1/13/2004	0	#Func!

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)
MW220	Upgradient	Yes	18.7	NO	2.929	N/A
MW221	Sidegradient	No	12.8	N/A	2.549	N/A
MW222	Sidegradient	No	0.923	N/A	-0.080	N/A
MW223	Sidegradient	No	5.66	N/A	1.733	N/A
MW224	Sidegradient	No	10.7	N/A	2.370	N/A
MW369	Downgradient	Yes	29.8	NO	3.395	N/A
MW372	Downgradient	Yes	46.5	YES	3.839	N/A
MW384	Sidegradient	Yes	83.9	YES	4.430	N/A
MW387	Downgradient	Yes	335	YES	5.814	N/A
MW391	Downgradient	No	-1.36	N/A	#Error	N/A
MW394	Upgradient	No	6.29	N/A	1.839	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
MW384
MW387

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-S/T Second Quarter 2020 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=** 63.475	**S=** 163.135	**CV(1)=** 2.570	**K factor**=** 2.523	**TL(1)=** 475.063	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.103	**S=** 1.145	**CV(2)=** 0.369	**K factor**=** 2.523	**TL(2)=** 5.992	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	50	3.912
1/15/2003	10	2.303
4/10/2003	10	2.303
7/14/2003	10	2.303
10/13/2003	10	2.303
1/13/2004	10	2.303
4/13/2004	10	2.303
7/21/2004	10	2.303

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	672	6.510
10/16/2002	50	3.912
1/13/2003	36.1	3.586
4/10/2003	10	2.303
7/16/2003	42.7	3.754
10/14/2003	22	3.091
1/13/2004	12.8	2.549

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)
MW220	Upgradient	Yes	8.04	N/A	2.084	NO
MW221	Sidegradient	Yes	5.78	N/A	1.754	NO
MW222	Sidegradient	Yes	10.5	N/A	2.351	NO
MW223	Sidegradient	Yes	3.76	N/A	1.324	NO
MW224	Sidegradient	Yes	8.14	N/A	2.097	NO
MW369	Downgradient	Yes	36.9	N/A	3.608	NO
MW372	Downgradient	Yes	12.5	N/A	2.526	NO
MW384	Sidegradient	Yes	7.62	N/A	2.031	NO
MW387	Downgradient	Yes	8.66	N/A	2.159	NO
MW391	Downgradient	Yes	12.5	N/A	2.526	NO
MW394	Upgradient	Yes	11.4	N/A	2.434	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

Trichloroethene 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=** 8.813	**S=** 8.376	**CV(1)=** 0.951	**K factor**=** 2.523	**TL(1)=** 29.946	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.395	**S=** 1.449	**CV(2)=** 1.039	**K factor**=** 2.523	**TL(2)=** 5.052	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	1	0.000
1/15/2003	1	0.000
4/10/2003	1	0.000
7/14/2003	1	0.000
10/13/2003	1	0.000
1/13/2004	1	0.000
4/13/2004	1	0.000
7/21/2004	1	0.000

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	16	2.773
9/30/2002	20	2.996
10/16/2002	17	2.833
1/13/2003	15	2.708
4/10/2003	10	2.303
7/16/2003	19	2.944
10/14/2003	20	2.996
1/13/2004	16	2.773

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)
MW220	Upgradient	No	1	N/A	0.000	N/A
MW221	Sidegradient	No	1	N/A	0.000	N/A
MW222	Sidegradient	No	1	N/A	0.000	N/A
MW223	Sidegradient	No	1	N/A	0.000	N/A
MW224	Sidegradient	No	1	N/A	0.000	N/A
MW369	Downgradient	Yes	0.67	N/A	-0.400	N/A
MW372	Downgradient	Yes	3.45	N/A	1.238	N/A
MW384	Sidegradient	Yes	0.56	N/A	-0.580	N/A
MW387	Downgradient	Yes	0.77	N/A	-0.261	N/A
MW391	Downgradient	Yes	11.5	NO	2.442	N/A
MW394	Upgradient	Yes	1.91	N/A	0.647	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

Zinc 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=** 0.036	**S=** 0.026	**CV(1)=** 0.722	**K factor**=** 2.523	**TL(1)=** 0.101	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.485	**S=** 0.525	**CV(2)=** -0.151	**K factor**=** 2.523	**TL(2)=** -2.162	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
10/14/2002	0.025	-3.689
1/15/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/14/2003	0.0389	-3.247
10/13/2003	0.026	-3.650
1/13/2004	0.02	-3.912
4/13/2004	0.02	-3.912
7/21/2004	0.02	-3.912

Well Number:	MW394	
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	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)
MW220	Upgradient	Yes	0.00352	NO	-5.649	N/A
MW221	Sidegradient	Yes	0.00452	NO	-5.399	N/A
MW222	Sidegradient	Yes	0.00371	NO	-5.597	N/A
MW223	Sidegradient	Yes	0.00406	NO	-5.507	N/A
MW224	Sidegradient	No	0.02	N/A	-3.912	N/A
MW369	Downgradient	Yes	0.00687	NO	-4.981	N/A
MW372	Downgradient	Yes	0.00503	NO	-5.292	N/A
MW384	Sidegradient	Yes	0.00549	NO	-5.205	N/A
MW387	Downgradient	Yes	0.0037	NO	-5.599	N/A
MW391	Downgradient	Yes	0.00336	NO	-5.696	N/A
MW394	Upgradient	Yes	0.00487	NO	-5.325	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-S/T Second Quarter 2020 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=** 0.258	**S=** 0.221	**CV(1)=** 0.856	**K factor**=** 2.523	**TL(1)=** 0.815	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -2.266	**S=** 2.485	**CV(2)=** -1.097	**K factor**=** 2.523	**TL(2)=** 4.003	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.0002	-8.517
1/13/2003	0.737	-0.305
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.824	-0.194
9/16/2002	0.2	-1.609
10/17/2002	0.0002	-8.517
1/13/2003	0.363	-1.013
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

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)
MW370	Downgradient	No	0.05	N/A	-2.996	N/A
MW373	Downgradient	No	0.05	N/A	-2.996	N/A
MW385	Sidegradient	Yes	0.0341	NO	-3.378	N/A
MW388	Downgradient	No	0.05	N/A	-2.996	N/A
MW392	Downgradient	No	0.05	N/A	-2.996	N/A
MW395	Upgradient	Yes	0.0249	NO	-3.693	N/A
MW397	Upgradient	Yes	0.231	NO	-1.465	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-S/T Second Quarter 2020 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=** 7.183	**S=** 2.612	**CV(1)=** 0.364	**K factor**=** 2.523	**TL(1)=** 13.773	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.870	**S=** 0.552	**CV(2)=** 0.295	**K factor**=** 2.523	**TL(2)=** 3.261	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	1.09	0.086
9/16/2002	5.79	1.756
10/16/2002	6.82	1.920
1/13/2003	5.01	1.611
4/10/2003	6.1	1.808
7/16/2003	8.51	2.141
10/14/2003	4.99	1.607
1/13/2004	6.58	1.884

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	9.57	2.259
9/16/2002	11	2.398
10/17/2002	9.3	2.230
1/13/2003	8.63	2.155
4/8/2003	10	2.303
7/16/2003	6.89	1.930
10/14/2003	10.1	2.313
1/13/2004	4.55	1.515

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)
MW370	Downgradient	Yes	53	YES	3.970	N/A
MW373	Downgradient	No	4.74	N/A	1.556	N/A
MW385	Sidegradient	Yes	59.8	YES	4.091	N/A
MW388	Downgradient	Yes	77.4	YES	4.349	N/A
MW392	Downgradient	No	3.13	N/A	1.141	N/A
MW395	Upgradient	No	7.55	N/A	2.022	N/A
MW397	Upgradient	No	8.69	N/A	2.162	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
MW385
MW388

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-S/T Second Quarter 2020 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=** 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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/17/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.302	N/A	-1.197	NO
MW373	Downgradient	Yes	1.83	N/A	0.604	NO
MW385	Sidegradient	Yes	0.0794	N/A	-2.533	NO
MW388	Downgradient	Yes	0.0298	N/A	-3.513	NO
MW392	Downgradient	Yes	0.0287	N/A	-3.551	NO
MW395	Upgradient	Yes	0.0223	N/A	-3.803	NO
MW397	Upgradient	Yes	0.0112	N/A	-4.492	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.*

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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: MW395

Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/16/2002	1	0.000
1/13/2003	1	0.000
4/10/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	1	0.000

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/17/2002	1	0.000
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	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)
MW370	Downgradient	Yes	0.436	NO	-0.830	N/A
MW373	Downgradient	Yes	0.515	NO	-0.664	N/A
MW385	Sidegradient	Yes	0.33	NO	-1.109	N/A
MW388	Downgradient	Yes	0.439	NO	-0.823	N/A
MW392	Downgradient	Yes	0.628	NO	-0.465	N/A
MW395	Upgradient	Yes	0.478	NO	-0.738	N/A
MW397	Upgradient	Yes	0.403	NO	-0.909	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.*

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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=** 23.103	**S=** 11.538	**CV(1)=** 0.499	**K factor**=** 2.523	**TL(1)=** 52.213	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.357	**S=** 2.411	**CV(2)=** 1.023	**K factor**=** 2.523	**TL(2)=** 8.439	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	32.2	3.472
9/16/2002	33	3.497
10/16/2002	0.0295	-3.523
1/13/2003	32.1	3.469
4/10/2003	40.2	3.694
7/16/2003	32.4	3.478
10/14/2003	33.9	3.523
1/13/2004	31.2	3.440

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	19.4	2.965
9/16/2002	19	2.944
10/17/2002	0.0179	-4.023
1/13/2003	17.8	2.879
4/8/2003	20.3	3.011
7/16/2003	19.4	2.965
10/14/2003	19.9	2.991
1/13/2004	18.8	2.934

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)
MW370	Downgradient	Yes	33.5	NO	3.512	N/A
MW373	Downgradient	Yes	74.6	YES	4.312	N/A
MW385	Sidegradient	Yes	29.6	NO	3.388	N/A
MW388	Downgradient	Yes	31.8	NO	3.459	N/A
MW392	Downgradient	Yes	31.4	NO	3.447	N/A
MW395	Upgradient	Yes	24	NO	3.178	N/A
MW397	Upgradient	Yes	18.1	NO	2.896	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.*

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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=** 35.313	**S=** 1.250	**CV(1)=** 0.035	**K factor**=** 2.523	**TL(1)=** 38.466	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.564	**S=** 0.033	**CV(2)=** 0.009	**K factor**=** 2.523	**TL(2)=** 3.648	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	35	3.555
9/16/2002	35	3.555
10/16/2002	35	3.555
1/13/2003	35	3.555
4/10/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	35	3.555

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	40	3.689
9/16/2002	35	3.555
10/17/2002	35	3.555
1/13/2003	35	3.555
4/8/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	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)
MW370	Downgradient	No	20	N/A	2.996	N/A
MW373	Downgradient	Yes	27.2	NO	3.303	N/A
MW385	Sidegradient	Yes	14.2	NO	2.653	N/A
MW388	Downgradient	Yes	11.7	NO	2.460	N/A
MW392	Downgradient	Yes	34.6	NO	3.544	N/A
MW395	Upgradient	Yes	24.2	NO	3.186	N/A
MW397	Upgradient	Yes	38	NO	3.638	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-S/T Second Quarter 2020 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=** 51.844	**S=** 11.652	**CV(1)=** 0.225	**K factor**=** 2.523	**TL(1)=** 81.242	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.924	**S=** 0.229	**CV(2)=** 0.058	**K factor**=** 2.523	**TL(2)=** 4.501	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	62.2	4.130
9/16/2002	64.7	4.170
10/16/2002	62.2	4.130
1/13/2003	63.5	4.151
4/10/2003	64.1	4.160
7/16/2003	64	4.159
10/14/2003	63.2	4.146
1/13/2004	60.6	4.104

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	38.9	3.661
9/16/2002	39.8	3.684
10/17/2002	39.3	3.671
1/13/2003	40.5	3.701
4/8/2003	42.1	3.740
7/16/2003	42	3.738
10/14/2003	40.8	3.709
1/13/2004	41.6	3.728

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)
MW370	Downgradient	Yes	36.7	NO	3.603	N/A
MW373	Downgradient	Yes	19	NO	2.944	N/A
MW385	Sidegradient	Yes	28.6	NO	3.353	N/A
MW388	Downgradient	Yes	34.4	NO	3.538	N/A
MW392	Downgradient	Yes	48.5	NO	3.882	N/A
MW395	Upgradient	Yes	39.4	NO	3.674	N/A
MW397	Upgradient	Yes	35.4	NO	3.567	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

cis-1,2-Dichloroethene 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=** 5.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 5.000	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.609	**S=** 0.000	**CV(2)=** 0.000	**K factor**=** 2.523	**TL(2)=** 1.609	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/17/2002	5	1.609
1/13/2003	5	1.609
4/8/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

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)
MW370	Downgradient	No	1	N/A	0.000	N/A
MW373	Downgradient	No	1	N/A	0.000	N/A
MW385	Sidegradient	No	1	N/A	0.000	N/A
MW388	Downgradient	No	1	N/A	0.000	N/A
MW392	Downgradient	Yes	1.23	NO	0.207	N/A
MW395	Upgradient	No	1	N/A	0.000	N/A
MW397	Upgradient	No	1	N/A	0.000	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-S/T Second Quarter 2020 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=** 0.007	**S=** 0.011	**CV(1)=** 1.515	**K factor**=** 2.523	**TL(1)=** 0.034	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -6.053	**S=** 1.416	**CV(2)=** -0.234	**K factor**=** 2.523	**TL(2)=** -2.480	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00148	-6.516
4/10/2003	0.00151	-6.496
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/17/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/8/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

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)
MW370	Downgradient	Yes	0.000469	N/A	-7.665	NO
MW373	Downgradient	Yes	0.000573	N/A	-7.465	NO
MW385	Sidegradient	No	0.001	N/A	-6.908	N/A
MW388	Downgradient	No	0.001	N/A	-6.908	N/A
MW392	Downgradient	No	0.001	N/A	-6.908	N/A
MW395	Upgradient	No	0.001	N/A	-6.908	N/A
MW397	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-S/T Second Quarter 2020 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=** 377.875	**S=**	52.101	**CV(1)=** 0.138	**K factor**=** 2.523	**TL(1)=** 509.326	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 5.926	**S=**	0.136	**CV(2)=** 0.023	**K factor**=** 2.523	**TL(2)=** 6.270	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	405	6.004
9/16/2002	401	5.994
10/16/2002	392	5.971
1/13/2003	404	6.001
4/10/2003	488	6.190
7/16/2003	450	6.109
10/14/2003	410	6.016
1/13/2004	413	6.023

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	322	5.775
9/16/2002	315	5.753
10/17/2002	317	5.759
1/13/2003	320	5.768
4/8/2003	390	5.966
7/16/2003	354	5.869
10/14/2003	331	5.802
1/13/2004	334	5.811

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)
MW370	Downgradient	Yes	474	NO	6.161	N/A
MW373	Downgradient	Yes	827	YES	6.718	N/A
MW385	Sidegradient	Yes	453	NO	6.116	N/A
MW388	Downgradient	Yes	513	YES	6.240	N/A
MW392	Downgradient	Yes	433	NO	6.071	N/A
MW395	Upgradient	Yes	350	NO	5.858	N/A
MW397	Upgradient	Yes	319	NO	5.765	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
MW388

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-S/T Second Quarter 2020 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=** 0.028	**S=** 0.013	**CV(1)=** 0.474	**K factor**=** 2.523	**TL(1)=** 0.061	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.662	**S=** 0.406	**CV(2)=** -0.111	**K factor**=** 2.523	**TL(2)=** -2.638	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.0281	-3.572
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/17/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	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)
MW370	Downgradient	Yes	0.000905	NO	-7.008	N/A
MW373	Downgradient	Yes	0.000882	NO	-7.033	N/A
MW385	Sidegradient	Yes	0.000665	NO	-7.316	N/A
MW388	Downgradient	Yes	0.000487	NO	-7.627	N/A
MW392	Downgradient	Yes	0.00203	NO	-6.200	N/A
MW395	Upgradient	Yes	0.00052	NO	-7.562	N/A
MW397	Upgradient	Yes	0.000614	NO	-7.396	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-S/T Second Quarter 2020 Statistical Analysis Historical Background Comparison

Cyanide 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=** 0.020	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 0.020	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.912	**S=** 0.000	**CV(2)=** 0.000	**K factor**=** 2.523	**TL(2)=** -3.912	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.02	-3.912
9/16/2002	0.02	-3.912
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.02	-3.912
9/16/2002	0.02	-3.912
10/17/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	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)
MW370	Downgradient	Yes	0.00209	NO	-6.171	N/A
MW373	Downgradient	No	0.2	N/A	-1.609	N/A
MW385	Sidegradient	No	0.2	N/A	-1.609	N/A
MW388	Downgradient	No	0.2	N/A	-1.609	N/A
MW392	Downgradient	No	0.2	N/A	-1.609	N/A
MW395	Upgradient	No	0.2	N/A	-1.609	N/A
MW397	Upgradient	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-S/T Second Quarter 2020 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=** 4.678	**S=** 2.431	**CV(1)=** 0.520	**K factor**=** 2.523	**TL(1)=** 10.812	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.414	**S=** 0.550	**CV(2)=** 0.389	**K factor**=** 2.523	**TL(2)=** 2.802	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	7.29	1.987
9/30/2002	4.03	1.394
10/16/2002	3.85	1.348
1/13/2003	2.36	0.859
4/10/2003	1.14	0.131
7/16/2003	1.76	0.565
10/14/2003	4.05	1.399
1/13/2004	4.26	1.449

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	11.56	2.448
9/16/2002	5.86	1.768
10/17/2002	5.94	1.782
1/13/2003	4.66	1.539
4/8/2003	3.77	1.327
7/16/2003	3.47	1.244
10/14/2003	5.34	1.675
1/13/2004	5.51	1.707

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)
MW370	Downgradient	Yes	2.72	NO	1.001	N/A
MW373	Downgradient	Yes	1.18	NO	0.166	N/A
MW385	Sidegradient	Yes	2.95	NO	1.082	N/A
MW388	Downgradient	Yes	3.03	NO	1.109	N/A
MW392	Downgradient	Yes	1.53	NO	0.425	N/A
MW395	Upgradient	Yes	4.48	NO	1.500	N/A
MW397	Upgradient	Yes	5.2	NO	1.649	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-S/T Second Quarter 2020 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=** 219.250	**S=**	34.107	**CV(1)=** 0.156	**K factor**=** 2.523	**TL(1)=** 305.301	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 5.379	**S=**	0.152	**CV(2)=** 0.028	**K factor**=** 2.523	**TL(2)=** 5.762	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	249	5.517
9/16/2002	272	5.606
10/16/2002	255	5.541
1/13/2003	211	5.352
4/10/2003	289	5.666
7/16/2003	236	5.464
10/14/2003	224	5.412
1/13/2004	235	5.460

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	187	5.231
9/16/2002	197	5.283
10/17/2002	183	5.209
1/13/2003	182	5.204
4/8/2003	217	5.380
7/16/2003	196	5.278
10/14/2003	198	5.288
1/13/2004	177	5.176

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)
MW370	Downgradient	Yes	246	NO	5.505	N/A
MW373	Downgradient	Yes	471	YES	6.155	N/A
MW385	Sidegradient	Yes	247	NO	5.509	N/A
MW388	Downgradient	Yes	206	NO	5.328	N/A
MW392	Downgradient	Yes	219	NO	5.389	N/A
MW395	Upgradient	Yes	199	NO	5.293	N/A
MW397	Upgradient	Yes	160	NO	5.075	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-S/T Second Quarter 2020 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=** 0.400	**S=** 0.514	**CV(1)=** 1.286	**K factor**=** 2.523	**TL(1)=** 1.698	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -2.197	**S=** 2.634	**CV(2)=** -1.199	**K factor**=** 2.523	**TL(2)=** 4.449	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	0.294	-1.224
9/16/2002	0.2	-1.609
10/16/2002	0.0002	-8.517
1/13/2003	1.33	0.285
4/10/2003	1.31	0.270
7/16/2003	0.2	-1.609
10/14/2003	0.1	-2.303
1/13/2004	0.1	-2.303

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	1.58	0.457
9/16/2002	0.232	-1.461
10/17/2002	0.0002	-8.517
1/13/2003	0.453	-0.792
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.1	-2.303
1/13/2004	0.1	-2.303

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)
MW370	Downgradient	Yes	0.0608	N/A	-2.800	NO
MW373	Downgradient	Yes	0.192	N/A	-1.650	NO
MW385	Sidegradient	Yes	0.0495	N/A	-3.006	NO
MW388	Downgradient	Yes	0.107	N/A	-2.235	NO
MW392	Downgradient	Yes	0.269	N/A	-1.313	NO
MW395	Upgradient	Yes	0.0693	N/A	-2.669	NO
MW397	Upgradient	Yes	0.4	N/A	-0.916	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-S/T Second Quarter 2020 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=** 9.102	**S=** 4.685	**CV(1)=** 0.515	**K factor**=** 2.523	**TL(1)=** 20.922	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.423	**S=** 2.408	**CV(2)=** 1.692	**K factor**=** 2.523	**TL(2)=** 7.500	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	12.5	2.526
9/16/2002	13	2.565
10/16/2002	0.0127	-4.366
1/13/2003	11.2	2.416
4/10/2003	17.5	2.862
7/16/2003	12.9	2.557
10/14/2003	13.4	2.595
1/13/2004	12.4	2.518

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	7.83	2.058
9/16/2002	7.64	2.033
10/17/2002	0.00658	-5.024
1/13/2003	6.69	1.901
4/8/2003	7.28	1.985
7/16/2003	7.82	2.057
10/14/2003	7.94	2.072
1/13/2004	7.51	2.016

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)
MW370	Downgradient	Yes	14.1	NO	2.646	N/A
MW373	Downgradient	Yes	27.8	YES	3.325	N/A
MW385	Sidegradient	Yes	12.2	NO	2.501	N/A
MW388	Downgradient	Yes	14.2	NO	2.653	N/A
MW392	Downgradient	Yes	12.2	NO	2.501	N/A
MW395	Upgradient	Yes	10.2	NO	2.322	N/A
MW397	Upgradient	Yes	7.81	NO	2.055	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-S/T Second Quarter 2020 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=** 0.131	**S=** 0.195	**CV(1)=** 1.487	**K factor**=** 2.523	**TL(1)=** 0.624	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.104	**S=** 1.529	**CV(2)=** -0.493	**K factor**=** 2.523	**TL(2)=** 0.755	**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: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.361	-1.019
9/16/2002	0.028	-3.576
10/16/2002	0.026	-3.650
1/13/2003	0.0713	-2.641
4/10/2003	0.629	-0.464
7/16/2003	0.297	-1.214
10/14/2003	0.0198	-3.922
1/13/2004	0.0126	-4.374

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.466	-0.764
9/16/2002	0.077	-2.564
10/17/2002	0.028	-3.576
1/13/2003	0.0164	-4.110
4/8/2003	0.0407	-3.202
7/16/2003	0.0167	-4.092
10/14/2003	0.00555	-5.194
1/13/2004	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.0121	N/A	-4.415	NO
MW373	Downgradient	Yes	0.0235	N/A	-3.751	NO
MW385	Sidegradient	Yes	0.00149	N/A	-6.509	NO
MW388	Downgradient	Yes	0.003	N/A	-5.809	NO
MW392	Downgradient	Yes	0.0231	N/A	-3.768	NO
MW395	Upgradient	Yes	0.00143	N/A	-6.550	NO
MW397	Upgradient	Yes	0.00807	N/A	-4.820	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-S/T Second Quarter 2020 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=** 0.018	**S=** 0.020	**CV(1)=** 1.089	**K factor**=** 2.523	**TL(1)=** 0.068	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.540	**S=** 1.020	**CV(2)=** -0.225	**K factor**=** 2.523	**TL(2)=** -1.965	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.00702	-4.959
1/13/2003	0.029	-3.540
4/10/2003	0.0091	-4.699
7/16/2003	0.00627	-5.072
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/17/2002	0.005	-5.298
1/13/2003	0.00502	-5.294
4/8/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	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)
MW370	Downgradient	Yes	0.000725	N/A	-7.229	NO
MW373	Downgradient	Yes	0.00111	N/A	-6.803	NO
MW385	Sidegradient	Yes	0.000721	N/A	-7.235	NO
MW388	Downgradient	Yes	0.000641	N/A	-7.352	NO
MW392	Downgradient	No	0.002	N/A	-6.215	N/A
MW395	Upgradient	Yes	0.0068	N/A	-4.991	NO
MW397	Upgradient	Yes	0.000827	N/A	-7.098	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-S/T Second Quarter 2020 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=** 157.250 **S=** 52.376 **CV(1)=** 0.333 **K factor**=** 2.523 **TL(1)=** 289.395 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.003 **S=** 0.348 **CV(2)=** 0.069 **K factor**=** 2.523 **TL(2)=** 5.880 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	80	4.382
9/16/2002	145	4.977
10/16/2002	125	4.828
1/13/2003	85	4.443
4/10/2003	159	5.069
7/16/2003	98	4.585
10/14/2003	138	4.927
1/13/2004	233	5.451

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	115	4.745
9/30/2002	140	4.942
10/17/2002	185	5.220
1/13/2003	230	5.438
4/8/2003	155	5.043
7/16/2003	188	5.236
10/14/2003	187	5.231
1/13/2004	253	5.533

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)
MW370	Downgradient	Yes	448	YES	6.105	N/A
MW373	Downgradient	Yes	409	YES	6.014	N/A
MW385	Sidegradient	Yes	414	YES	6.026	N/A
MW388	Downgradient	Yes	392	YES	5.971	N/A
MW392	Downgradient	Yes	450	YES	6.109	N/A
MW395	Upgradient	Yes	419	YES	6.038	N/A
MW397	Upgradient	Yes	420	YES	6.040	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
MW373
MW385
MW388
MW392
MW395
MW397

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-S/T Second Quarter 2020 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=** 6.048	**S=** 0.248	**CV(1)=** 0.041	**K factor**=** 2.904	**TL(1)=** 6.767	**LL(1)=**5.3289
Statistics-Transformed Background Data	**X=** 1.799	**S=** 0.042	**CV(2)=** 0.023	**K factor**=** 2.904	**TL(2)=** 1.920	**LL(2)=**1.6782

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	5.8	1.758
9/16/2002	6	1.792
10/16/2002	5.47	1.699
1/13/2003	6	1.792
4/10/2003	6.18	1.821
7/16/2003	6	1.792
10/14/2003	6.31	1.842
1/13/2004	6.24	1.831

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	5.84	1.765
9/30/2002	6	1.792
10/17/2002	5.75	1.749
1/13/2003	6	1.792
4/8/2003	6.3	1.841
7/16/2003	6.2	1.825
10/14/2003	6.36	1.850
1/13/2004	6.32	1.844

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)?
MW370	Downgradient	Yes	6.08	NO	1.805	N/A
MW373	Downgradient	Yes	6.15	NO	1.816	N/A
MW385	Sidegradient	Yes	6.07	NO	1.803	N/A
MW388	Downgradient	Yes	6.14	NO	1.815	N/A
MW392	Downgradient	Yes	6.15	NO	1.816	N/A
MW395	Upgradient	Yes	6	NO	1.792	N/A
MW397	Upgradient	Yes	6.05	NO	1.800	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-S/T Second Quarter 2020 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=** 1.590	**S=** 0.642	**CV(1)=** 0.404	**K factor**=** 2.523	**TL(1)=** 3.208	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.306	**S=** 2.457	**CV(2)=** -8.028	**K factor**=** 2.523	**TL(2)=** 5.892	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.00129	-6.653
1/13/2003	1.51	0.412
4/10/2003	1.67	0.513
7/16/2003	1.73	0.548
10/14/2003	1.7	0.531
1/13/2004	1.58	0.457

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	2.03	0.708
9/16/2002	2	0.693
10/17/2002	0.00145	-6.536
1/13/2003	1.69	0.525
4/8/2003	1.73	0.548
7/16/2003	2	0.693
10/14/2003	1.92	0.652
1/13/2004	1.87	0.626

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)
MW370	Downgradient	Yes	2.77	NO	1.019	N/A
MW373	Downgradient	Yes	2.92	NO	1.072	N/A
MW385	Sidegradient	Yes	1.97	NO	0.678	N/A
MW388	Downgradient	Yes	2.12	NO	0.751	N/A
MW392	Downgradient	Yes	1.97	NO	0.678	N/A
MW395	Upgradient	Yes	1.55	NO	0.438	N/A
MW397	Upgradient	Yes	1.82	NO	0.599	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-S/T Second Quarter 2020 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=** 29.560	**S=** 13.894	**CV(1)=** 0.470	**K factor**=** 2.523	**TL(1)=** 64.616	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.615	**S=** 2.411	**CV(2)=** 0.922	**K factor**=** 2.523	**TL(2)=** 8.699	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	27	3.296
9/16/2002	27.2	3.303
10/16/2002	0.0253	-3.677
1/13/2003	22.6	3.118
4/10/2003	53.9	3.987
7/16/2003	30	3.401
10/14/2003	29.1	3.371
1/13/2004	26.4	3.273

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	35.2	3.561
9/16/2002	34.3	3.535
10/17/2002	0.0336	-3.393
1/13/2003	31.3	3.444
4/8/2003	46.1	3.831
7/16/2003	38.4	3.648
10/14/2003	37.1	3.614
1/13/2004	34.3	3.535

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)
MW370	Downgradient	Yes	49.4	NO	3.900	N/A
MW373	Downgradient	Yes	64.8	YES	4.171	N/A
MW385	Sidegradient	Yes	51.8	NO	3.947	N/A
MW388	Downgradient	Yes	48.9	NO	3.890	N/A
MW392	Downgradient	Yes	37.6	NO	3.627	N/A
MW395	Upgradient	Yes	29.4	NO	3.381	N/A
MW397	Upgradient	Yes	34.2	NO	3.532	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-S/T Second Quarter 2020 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=** 10.756	**S=** 2.147	**CV(1)=** 0.200	**K factor**=** 2.523	**TL(1)=** 16.173	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.356	**S=** 0.203	**CV(2)=** 0.086	**K factor**=** 2.523	**TL(2)=** 2.869	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	10.3	2.332
9/16/2002	9.1	2.208
10/16/2002	8.8	2.175
1/13/2003	9	2.197
4/10/2003	8.3	2.116
7/16/2003	8.2	2.104
10/14/2003	8.3	2.116
1/13/2004	8.2	2.104

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	14	2.639
9/16/2002	12.8	2.549
10/17/2002	12.3	2.510
1/13/2003	12.7	2.542
4/8/2003	12.8	2.549
7/16/2003	13.1	2.573
10/14/2003	12.1	2.493
1/13/2004	12.1	2.493

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)
MW370	Downgradient	Yes	21	YES	3.045	N/A
MW373	Downgradient	Yes	73.5	YES	4.297	N/A
MW385	Sidegradient	Yes	24.3	YES	3.190	N/A
MW388	Downgradient	Yes	29.2	YES	3.374	N/A
MW392	Downgradient	Yes	22.6	YES	3.118	N/A
MW395	Upgradient	Yes	12.4	NO	2.518	N/A
MW397	Upgradient	Yes	11	NO	2.398	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
MW373
MW385
MW388
MW392

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.*

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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=** 11.359	**S=** 9.138	**CV(1)=** 0.805	**K factor**=** 2.523	**TL(1)=** 34.414	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.398	**S=** 0.859	**CV(2)=** 0.358	**K factor**=** 2.523	**TL(2)=** 3.246	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	20.8	3.035
9/16/2002	16.2	2.785
10/16/2002	8.28	2.114
1/13/2003	13	2.565
4/10/2003	-9.37	#Func!
7/16/2003	0.826	-0.191
10/14/2003	14.1	2.646
1/13/2004	0	#Func!

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	6.06	1.802
9/16/2002	17.3	2.851
10/17/2002	25.7	3.246
1/13/2003	20.9	3.040
4/8/2003	20.1	3.001
7/16/2003	9.2	2.219
10/14/2003	10.1	2.313
1/13/2004	8.54	2.145

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)
MW370	Downgradient	Yes	60.4	YES	4.101	N/A
MW373	Downgradient	No	13.8	N/A	2.625	N/A
MW385	Sidegradient	Yes	80.8	YES	4.392	N/A
MW388	Downgradient	Yes	106	YES	4.663	N/A
MW392	Downgradient	No	-2.16	N/A	#Error	N/A
MW395	Upgradient	No	8.44	N/A	2.133	N/A
MW397	Upgradient	No	15	N/A	2.708	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
MW385
MW388

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.*

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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=** 31.513	**S=** 18.609	**CV(1)=** 0.591	**K factor**=** 2.523	**TL(1)=** 78.462	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.240	**S=** 0.707	**CV(2)=** 0.218	**K factor**=** 2.523	**TL(2)=** 5.024	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	50	3.912
10/16/2002	50	3.912
1/13/2003	18.3	2.907
4/10/2003	51.2	3.936
7/16/2003	42.6	3.752
10/14/2003	12.3	2.510
1/13/2004	10	2.303

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	50	3.912
10/17/2002	50	3.912
1/13/2003	12	2.485
4/8/2003	19.9	2.991
7/16/2003	17.9	2.885
10/14/2003	10	2.303
1/13/2004	10	2.303

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)
MW370	Downgradient	Yes	13.1	NO	2.573	N/A
MW373	Downgradient	Yes	8.92	NO	2.188	N/A
MW385	Sidegradient	Yes	7.66	NO	2.036	N/A
MW388	Downgradient	Yes	5.48	NO	1.701	N/A
MW392	Downgradient	Yes	20.3	NO	3.011	N/A
MW395	Upgradient	Yes	3.52	NO	1.258	N/A
MW397	Upgradient	Yes	5.82	NO	1.761	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-S/T Second Quarter 2020 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=** 7.313	**S=** 5.701	**CV(1)=** 0.780	**K factor**=** 2.523	**TL(1)=** 21.695	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.467	**S=** 1.213	**CV(2)=** 0.827	**K factor**=** 2.523	**TL(2)=** 4.528	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	11	2.398
9/30/2002	14	2.639
10/16/2002	12	2.485
1/13/2003	14	2.639
4/10/2003	14	2.639
7/16/2003	13	2.565
10/14/2003	12	2.485
1/13/2004	11	2.398

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/17/2002	1	0.000
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	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)
MW370	Downgradient	Yes	0.66	N/A	-0.416	N/A
MW373	Downgradient	Yes	3.81	N/A	1.338	N/A
MW385	Sidegradient	Yes	0.58	N/A	-0.545	N/A
MW388	Downgradient	Yes	0.48	N/A	-0.734	N/A
MW392	Downgradient	Yes	15.8	NO	2.760	N/A
MW395	Upgradient	Yes	1.86	N/A	0.621	N/A
MW397	Upgradient	No	1	N/A	0.000	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-S/T Second Quarter 2020 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=** 0.044	**S=** 0.034	**CV(1)=** 0.760	**K factor**=** 2.523	**TL(1)=** 0.129	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.342	**S=** 0.659	**CV(2)=** -0.197	**K factor**=** 2.523	**TL(2)=** -1.679	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW395	
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Well Number:	MW397	
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/17/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/8/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	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)
MW370	Downgradient	Yes	0.00339	NO	-5.687	N/A
MW373	Downgradient	Yes	0.00349	NO	-5.658	N/A
MW385	Sidegradient	Yes	0.00469	NO	-5.362	N/A
MW388	Downgradient	Yes	0.0038	NO	-5.573	N/A
MW392	Downgradient	Yes	0.00592	NO	-5.129	N/A
MW395	Upgradient	Yes	0.00332	NO	-5.708	N/A
MW397	Upgradient	Yes	0.00433	NO	-5.442	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.*

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ATTACHMENT D2

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

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C-746-S/T Second Quarter 2020 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=** 283.625 **S=** 106.767 **CV(1)=** 0.376 **K factor**=** 3.188 **TL(1)=** 623.997 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.580 **S=** 0.407 **CV(2)=** 0.073 **K factor**=** 3.188 **TL(2)=** 6.877 **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:	MW396	
Date Collected	Result	LN(Result)
4/19/2018	275	5.617
7/19/2018	353	5.866
10/22/2018	210	5.347
1/23/2019	231	5.442
4/22/2019	431	6.066
7/17/2019	415	6.028
10/10/2019	227	5.425
3/18/2020	127	4.844

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW386	Sidegradient	Yes	409	NO	6.014	N/A
MW390	Downgradient	Yes	424	NO	6.050	N/A
MW393	Downgradient	Yes	443	NO	6.094	N/A
MW396	Upgradient	Yes	401	NO	5.994	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-S/T Second Quarter 2020 Statistical Analysis Current Background Comparison

Technetium-99 UNITS: pCi/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=** -0.893	**S=** 6.481	**CV(1)=**-7.257	**K factor**=** 3.188	**TL(1)=** 19.767	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.348	**S=** 0.573	**CV(2)=**0.425	**K factor**=** 3.188	**TL(2)=** 1.828	**LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
4/19/2018	-10.3	#Func!
7/19/2018	1.84	0.610
10/22/2018	-3.72	#Func!
1/23/2019	6.22	1.828
4/22/2019	5.89	1.773
7/17/2019	-0.714	#Func!
10/10/2019	-9.62	#Func!
1/27/2020	3.26	1.182

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)
MW390	Downgradient	Yes	58.1	YES	4.062	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

MW390

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-S/T Second Quarter 2020 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=** 9.921	**S=** 5.527	**CV(1)=** 0.557	**K factor**=** 2.523	**TL(1)=** 23.865	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.138	**S=** 0.605	**CV(2)=** 0.283	**K factor**=** 2.523	**TL(2)=** 3.663	**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: MW220

Date Collected	Result	LN(Result)
4/17/2018	14.4	2.667
7/19/2018	8.64	2.156
10/15/2018	12.2	2.501
1/22/2019	23	3.135
4/16/2019	8.19	2.103
7/16/2019	12.7	2.542
10/8/2019	18.9	2.939
1/22/2020	8.34	2.121

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	8.1	2.092
7/19/2018	2.94	1.078
10/22/2018	11.1	2.407
1/23/2019	4.28	1.454
4/22/2019	2.82	1.037
7/17/2019	10.3	2.332
10/10/2019	8.14	2.097
1/27/2020	4.69	1.545

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW387	Downgradient	Yes	240	YES	5.481	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

MW387

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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 25.644	**S=** 3.392	**CV(1)=** 0.132	**K factor**=** 2.523	**TL(1)=** 34.201	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.237	**S=** 0.125	**CV(2)=** 0.039	**K factor**=** 2.523	**TL(2)=** 3.552	**LL(2)=** N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/17/2018	22.6	3.118
7/19/2018	25.5	3.239
10/15/2018	20.6	3.025
1/22/2019	26	3.258
4/16/2019	35.8	3.578
7/16/2019	25.4	3.235
10/8/2019	20.9	3.040
1/22/2020	26.3	3.270

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	25.4	3.235
7/19/2018	27.9	3.329
10/22/2018	25.4	3.235
1/23/2019	27.9	3.329
4/22/2019	24.7	3.207
7/17/2019	25.4	3.235
10/10/2019	25.2	3.227
1/27/2020	25.3	3.231

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)
MW372	Downgradient	Yes	62.7	YES	4.138	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-S/T Second Quarter 2020 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=** 22.144	**S=** 6.977	**CV(1)=** 0.315	**K factor**=** 2.523	**TL(1)=** 39.747	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.056	**S=** 0.295	**CV(2)=** 0.097	**K factor**=** 2.523	**TL(2)=** 3.799	**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: MW220

Date Collected	Result	LN(Result)
4/17/2018	26.3	3.270
7/19/2018	29.3	3.378
10/15/2018	20	2.996
1/22/2019	20	2.996
4/16/2019	16.4	2.797
7/16/2019	15.9	2.766
10/8/2019	20	2.996
1/22/2020	20	2.996

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	18.4	2.912
7/19/2018	27.6	3.318
10/22/2018	11.8	2.468
1/23/2019	20	2.996
4/22/2019	20.3	3.011
7/17/2019	18.3	2.907
10/10/2019	40.8	3.709
1/27/2020	29.2	3.374

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	114	YES	4.736	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

MW220

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-S/T Second Quarter 2020 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=** 388.438 **S=** 26.795 **CV(1)=** 0.069 **K factor**=** 2.523 **TL(1)=** 456.042 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.960 **S=** 0.069 **CV(2)=** 0.012 **K factor**=** 2.523 **TL(2)=** 6.134 **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: MW220

Date Collected	Result	LN(Result)
4/17/2018	388	5.961
7/19/2018	412	6.021
10/15/2018	342	5.835
1/22/2019	416	6.031
5/30/2019	424	6.050
7/16/2019	377	5.932
10/8/2019	346	5.846
3/18/2020	441	6.089

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	381	5.943
7/19/2018	392	5.971
10/22/2018	410	6.016
1/23/2019	381	5.943
5/29/2019	383	5.948
7/17/2019	370	5.914
10/10/2019	382	5.945
1/27/2020	370	5.914

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	687	YES	6.532	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-S/T Second Quarter 2020 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=** 213.625	**S=** 33.456	**CV(1)=** 0.157	**K factor**=** 2.523	**TL(1)=** 298.035	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 5.353	**S=** 0.153	**CV(2)=** 0.029	**K factor**=** 2.523	**TL(2)=** 5.740	**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: MW220

Date Collected	Result	LN(Result)
4/17/2018	183	5.209
7/19/2018	207	5.333
10/15/2018	226	5.421
1/22/2019	209	5.342
4/16/2019	273	5.609
7/16/2019	176	5.170
10/8/2019	176	5.170
1/22/2020	256	5.545

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	271	5.602
7/19/2018	204	5.318
10/22/2018	206	5.328
1/23/2019	197	5.283
4/22/2019	216	5.375
7/17/2019	167	5.118
10/10/2019	251	5.525
1/27/2020	200	5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	399	YES	5.989	N/A
MW387	Downgradient	Yes	304	YES	5.717	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
MW387

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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 10.609	**S=** 0.934	**CV(1)=** 0.088	**K factor**=** 2.523	**TL(1)=** 12.966	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.358	**S=** 0.092	**CV(2)=** 0.039	**K factor**=** 2.523	**TL(2)=** 2.589	**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: MW220

Date Collected	Result	LN(Result)
4/17/2018	9.63	2.265
7/19/2018	11.1	2.407
10/15/2018	8.8	2.175
1/22/2019	10.8	2.380
4/16/2019	10.3	2.332
7/16/2019	10	2.303
10/8/2019	8.71	2.164
1/22/2020	10.9	2.389

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	11.7	2.460
7/19/2018	12	2.485
10/22/2018	11.3	2.425
1/23/2019	11.4	2.434
4/22/2019	11	2.398
7/17/2019	10.8	2.380
10/10/2019	10.7	2.370
1/27/2020	10.6	2.361

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	22.4	YES	3.109	N/A
MW387	Downgradient	Yes	15.4	YES	2.734	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
MW387

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-S/T Second Quarter 2020 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=** 397.000 **S=** 58.358 **CV(1)=** 0.147 **K factor**=** 2.523 **TL(1)=** 544.236 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.974 **S=** 0.149 **CV(2)=** 0.025 **K factor**=** 2.523 **TL(2)=** 6.349 **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: MW220

Date Collected	Result	LN(Result)
4/17/2018	305	5.720
7/19/2018	390	5.966
10/15/2018	413	6.023
1/22/2019	361	5.889
5/30/2019	523	6.260
7/16/2019	407	6.009
10/8/2019	414	6.026
3/18/2020	378	5.935

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	310	5.737
7/19/2018	375	5.927
10/22/2018	386	5.956
1/23/2019	314	5.749
5/29/2019	463	6.138
7/17/2019	435	6.075
10/10/2019	438	6.082
1/27/2020	440	6.087

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	435	NO	6.075	N/A
MW221	Sidegradient	Yes	429	NO	6.061	N/A
MW222	Sidegradient	Yes	425	NO	6.052	N/A
MW223	Sidegradient	Yes	415	NO	6.028	N/A
MW224	Sidegradient	Yes	423	NO	6.047	N/A
MW384	Sidegradient	Yes	402	NO	5.996	N/A
MW387	Downgradient	Yes	402	NO	5.996	N/A
MW391	Downgradient	Yes	457	NO	6.125	N/A
MW394	Upgradient	Yes	432	NO	6.068	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-S/T Second Quarter 2020 Statistical Analysis Current Background Comparison

Radium-226 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=** 0.390	**S=** 0.374	**CV(1)=** 0.959	**K factor**=** 2.523	**TL(1)=** 1.335	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -1.160	**S=** 0.792	**CV(2)=** -0.683	**K factor**=** 2.523	**TL(2)=** 0.873	**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:	MW220	
Date Collected	Result	LN(Result)
4/17/2018	0	#Func!
7/19/2018	0.15	-1.897
10/15/2018	0.0489	-3.018
1/22/2019	0.169	-1.778
4/16/2019	0.313	-1.162
7/16/2019	0.215	-1.537
10/8/2019	0.739	-0.302
1/22/2020	0.446	-0.807

Well Number:	MW394	
Date Collected	Result	LN(Result)
4/19/2018	0.379	-0.970
7/19/2018	0.314	-1.158
10/22/2018	0.442	-0.816
1/23/2019	0.254	-1.370
4/22/2019	0.347	-1.058
7/17/2019	0.606	-0.501
10/10/2019	1.6	0.470
1/27/2020	0.224	-1.496

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	1.04	NO	0.039	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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 38.288	**S=** 7.009	**CV(1)=** 0.183	**K factor**=** 2.523	**TL(1)=** 55.972	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.630	**S=** 0.181	**CV(2)=** 0.050	**K factor**=** 2.523	**TL(2)=** 4.087	**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: MW220

Date Collected	Result	LN(Result)
4/17/2018	44.6	3.798
7/19/2018	49.6	3.904
10/15/2018	39	3.664
1/22/2019	45.1	3.809
4/16/2019	47.4	3.859
7/16/2019	43.4	3.770
10/8/2019	39.4	3.674
1/22/2020	47.6	3.863

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	30.4	3.414
7/19/2018	30.2	3.408
10/22/2018	33.4	3.509
1/23/2019	32.7	3.487
4/22/2019	30.8	3.428
7/17/2019	31.9	3.463
10/10/2019	33	3.497
1/27/2020	34.1	3.529

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW369	Downgradient	Yes	62	YES	4.127	N/A
MW387	Downgradient	Yes	58.3	YES	4.066	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

MW369
MW387

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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 15.675 **S=** 5.278 **CV(1)=** 0.337 **K factor**=** 2.523 **TL(1)=** 28.992 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 2.700 **S=** 0.331 **CV(2)=** 0.122 **K factor**=** 2.523 **TL(2)=** 3.534 **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: MW220

Date Collected	Result	LN(Result)
4/17/2018	21.1	3.049
7/19/2018	24.7	3.207
10/15/2018	16.9	2.827
1/22/2019	21.4	3.063
4/16/2019	24.1	3.182
7/16/2019	18.5	2.918
10/8/2019	15.6	2.747
1/22/2020	20.1	3.001

Well Number: MW394

Date Collected	Result	LN(Result)
4/19/2018	10.4	2.342
7/19/2018	10.5	2.351
10/22/2018	10.6	2.361
1/23/2019	11	2.398
4/22/2019	10.7	2.370
7/17/2019	11.1	2.407
10/10/2019	12	2.485
1/27/2020	12.1	2.493

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	22.2	NO	3.100	N/A
MW223	Sidegradient	Yes	21.1	NO	3.049	N/A
MW372	Downgradient	Yes	102	YES	4.625	N/A
MW384	Sidegradient	Yes	24.5	NO	3.199	N/A
MW387	Downgradient	Yes	23.4	NO	3.153	N/A
MW391	Downgradient	Yes	21	NO	3.045	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-S/T Second Quarter 2020 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=** 13.058 **S=** 8.844 **CV(1)=**0.677 **K factor**=** 2.523 **TL(1)=** 35.371 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.263 **S=** 1.299 **CV(2)=**0.574 **K factor**=** 2.523 **TL(2)=** 3.325 **LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW220	
Date Collected	Result	LN(Result)
4/17/2018	19.9	2.991
7/19/2018	14	2.639
10/15/2018	20.8	3.035
1/22/2019	19.4	2.965
4/16/2019	17.1	2.839
7/16/2019	27.8	3.325
10/8/2019	27	3.296
1/22/2020	12	2.485

Well Number:	MW394	
Date Collected	Result	LN(Result)
4/19/2018	0.158	-1.845
7/19/2018	10.6	2.361
10/22/2018	13.4	2.595
1/23/2019	11.5	2.442
4/22/2019	2.55	0.936
7/17/2019	4.74	1.556
10/10/2019	-2.22	#Func!
1/27/2020	10.2	2.322

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)
MW372	Downgradient	Yes	46.5	YES	3.839	N/A
MW384	Sidegradient	Yes	83.9	YES	4.430	N/A
MW387	Downgradient	Yes	335	YES	5.814	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
MW384
MW387

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-S/T Second Quarter 2020 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=** 7.586	**S=** 2.968	**CV(1)=** 0.391	**K factor**=** 2.523	**TL(1)=** 15.074	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.955	**S=** 0.391	**CV(2)=** 0.200	**K factor**=** 2.523	**TL(2)=** 2.942	**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:	MW395	
Date Collected	Result	LN(Result)
4/19/2018	5.4	1.686
7/19/2018	7.89	2.066
10/22/2018	9.41	2.242
1/23/2019	5.24	1.656
4/22/2019	3.8	1.335
7/17/2019	6.42	1.859
10/10/2019	3.67	1.300
1/27/2020	10.1	2.313

Well Number:	MW397	
Date Collected	Result	LN(Result)
4/17/2018	5.57	1.717
7/19/2018	13.8	2.625
10/15/2018	5.14	1.637
1/23/2019	8.19	2.103
4/16/2019	7.45	2.008
7/16/2019	6.74	1.908
10/9/2019	12.7	2.542
1/27/2020	9.86	2.288

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	53	YES	3.970	N/A
MW385	Sidegradient	Yes	59.8	YES	4.091	N/A
MW388	Downgradient	Yes	77.4	YES	4.349	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

MW370
MW385
MW388

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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 21.669	**S=** 3.750	**CV(1)=** 0.173	**K factor**=** 2.523	**TL(1)=** 31.129	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.062	**S=** 0.175	**CV(2)=** 0.057	**K factor**=** 2.523	**TL(2)=** 3.503	**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: MW395

Date Collected	Result	LN(Result)
4/19/2018	24.5	3.199
7/19/2018	27.1	3.300
10/22/2018	24.4	3.195
1/23/2019	27.3	3.307
4/22/2019	25.4	3.235
7/17/2019	24.2	3.186
10/10/2019	23.4	3.153
1/27/2020	24.4	3.195

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	16.8	2.821
7/19/2018	16.9	2.827
10/15/2018	19.3	2.960
1/23/2019	19	2.944
4/16/2019	16.9	2.827
7/16/2019	19.7	2.981
10/9/2019	18.8	2.934
1/27/2020	18.6	2.923

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	74.6	YES	4.312	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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 341.375 **S=** 26.954 **CV(1)=** 0.079 **K factor**=** 2.523 **TL(1)=** 409.380 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.830 **S=** 0.078 **CV(2)=** 0.013 **K factor**=** 2.523 **TL(2)=** 6.026 **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: MW395

Date Collected	Result	LN(Result)
4/19/2018	372	5.919
7/19/2018	396	5.981
10/22/2018	375	5.927
1/23/2019	359	5.883
5/29/2019	367	5.905
7/17/2019	344	5.841
10/10/2019	357	5.878
1/27/2020	348	5.852

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	307	5.727
8/21/2018	326	5.787
10/15/2018	321	5.771
1/23/2019	316	5.756
5/29/2019	318	5.762
7/16/2019	316	5.756
10/9/2019	319	5.765
3/18/2020	321	5.771

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	827	YES	6.718	N/A
MW388	Downgradient	Yes	513	YES	6.240	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

MW373
MW388

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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 191.438 **S=** 43.798 **CV(1)=** 0.229 **K factor**=** 2.523 **TL(1)=** 301.940 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.231 **S=** 0.220 **CV(2)=** 0.042 **K factor**=** 2.523 **TL(2)=** 5.787 **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: MW395

Date Collected	Result	LN(Result)
4/19/2018	257	5.549
7/19/2018	203	5.313
10/22/2018	176	5.170
1/23/2019	284	5.649
4/22/2019	173	5.153
7/17/2019	184	5.215
10/10/2019	146	4.984
1/27/2020	257	5.549

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	124	4.820
7/19/2018	160	5.075
10/15/2018	184	5.215
1/23/2019	160	5.075
4/16/2019	229	5.434
7/16/2019	176	5.170
10/9/2019	173	5.153
1/27/2020	177	5.176

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	471	YES	6.155	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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 9.348	**S=** 1.660	**CV(1)=**0.178	**K factor**=** 2.523	**TL(1)=** 13.537	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.220	**S=** 0.180	**CV(2)=**0.081	**K factor**=** 2.523	**TL(2)=** 2.675	**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: MW395

Date Collected	Result	LN(Result)
4/19/2018	11.4	2.434
7/19/2018	11.7	2.460
10/22/2018	10.7	2.370
1/23/2019	11.2	2.416
4/22/2019	11.1	2.407
7/17/2019	10.6	2.361
10/10/2019	9.88	2.291
1/27/2020	10.3	2.332

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	6.89	1.930
7/19/2018	7.38	1.999
10/15/2018	8.48	2.138
1/23/2019	7.84	2.059
4/16/2019	7.65	2.035
7/16/2019	8.63	2.155
10/9/2019	8	2.079
1/27/2020	7.81	2.055

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	27.8	YES	3.325	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-S/T Second Quarter 2020 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=** 393.188 **S=** 75.364 **CV(1)=** 0.192 **K factor**=** 2.523 **TL(1)=** 583.331 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 5.954 **S=** 0.217 **CV(2)=** 0.036 **K factor**=** 2.523 **TL(2)=** 6.501 **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: MW395

Date Collected	Result	LN(Result)
4/19/2018	367	5.905
7/19/2018	336	5.817
10/22/2018	237	5.468
1/23/2019	433	6.071
5/29/2019	477	6.168
7/17/2019	449	6.107
10/10/2019	443	6.094
1/27/2020	457	6.125

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	319	5.765
8/21/2018	404	6.001
10/15/2018	407	6.009
1/23/2019	394	5.976
5/29/2019	488	6.190
7/16/2019	395	5.979
10/9/2019	439	6.084
3/18/2020	246	5.505

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	448	NO	6.105	N/A
MW373	Downgradient	Yes	409	NO	6.014	N/A
MW385	Sidegradient	Yes	414	NO	6.026	N/A
MW388	Downgradient	Yes	392	NO	5.971	N/A
MW392	Downgradient	Yes	450	NO	6.109	N/A
MW395	Upgradient	Yes	419	NO	6.038	N/A
MW397	Upgradient	Yes	420	NO	6.040	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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 31.850	**S=** 2.413	**CV(1)=** 0.076	**K factor**=** 2.523	**TL(1)=** 37.937	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.458	**S=** 0.076	**CV(2)=** 0.022	**K factor**=** 2.523	**TL(2)=** 3.650	**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: MW395

Date Collected	Result	LN(Result)
4/19/2018	30.8	3.428
7/19/2018	30.7	3.424
10/22/2018	28.5	3.350
1/23/2019	30.3	3.411
4/22/2019	30.6	3.421
7/17/2019	28.3	3.343
10/10/2019	28.7	3.357
1/27/2020	30.1	3.405

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	34.7	3.547
7/19/2018	32.4	3.478
10/15/2018	33.2	3.503
1/23/2019	33.8	3.520
4/16/2019	36.2	3.589
7/16/2019	33.8	3.520
10/9/2019	33.5	3.512
1/27/2020	34	3.526

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	64.8	YES	4.171	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-S/T Second Quarter 2020 Statistical Analysis Current 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 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=** 10.597 **S=** 0.708 **CV(1)=**0.067 **K factor**=** 2.523 **TL(1)=** 12.384 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.358 **S=** 0.066 **CV(2)=**0.028 **K factor**=** 2.523 **TL(2)=** 2.526 **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: MW395

Date Collected	Result	LN(Result)
4/19/2018	10.5	2.351
7/19/2018	10.4	2.342
10/22/2018	10.2	2.322
1/23/2019	10.6	2.361
4/22/2019	10.5	2.351
7/17/2019	10.9	2.389
10/10/2019	12.1	2.493
1/27/2020	11.7	2.460

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	9.21	2.220
7/19/2018	9.94	2.297
10/15/2018	10.4	2.342
1/23/2019	10.1	2.313
4/16/2019	10	2.303
7/16/2019	10.7	2.370
10/9/2019	11.4	2.434
1/27/2020	10.9	2.389

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	21	YES	3.045	N/A
MW373	Downgradient	Yes	73.5	YES	4.297	N/A
MW385	Sidegradient	Yes	24.3	YES	3.190	N/A
MW388	Downgradient	Yes	29.2	YES	3.374	N/A
MW392	Downgradient	Yes	22.6	YES	3.118	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

MW370
MW373
MW385
MW388
MW392

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-S/T Second Quarter 2020 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=** 12.028	**S=** 7.759	**CV(1)=** 0.645	**K factor**=** 2.523	**TL(1)=** 31.603	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.290	**S=** 0.670	**CV(2)=** 0.292	**K factor**=** 2.523	**TL(2)=** 3.980	**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: MW395

Date Collected	Result	LN(Result)
4/19/2018	9.83	2.285
7/19/2018	9.05	2.203
10/22/2018	13.2	2.580
1/23/2019	10.3	2.332
4/22/2019	11.2	2.416
7/17/2019	4.92	1.593
10/10/2019	8.31	2.117
1/27/2020	3.14	1.144

Well Number: MW397

Date Collected	Result	LN(Result)
4/17/2018	18.9	2.939
7/19/2018	21.9	3.086
10/15/2018	18.3	2.907
1/23/2019	7.12	1.963
4/16/2019	32.1	3.469
7/16/2019	5.83	1.763
10/9/2019	15.3	2.728
1/27/2020	3.04	1.112

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	60.4	YES	4.101	N/A
MW385	Sidegradient	Yes	80.8	YES	4.392	N/A
MW388	Downgradient	Yes	106	YES	4.663	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

MW370
MW385
MW388

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

July 29, 2020

Mr. Dennis Greene
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

Dear Mr. Greene:

As an Environmental Scientist, with a bachelor's degree in Earth Sciences/Geology, I have over 30 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 reviewed by a qualified independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the second quarter 2020 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,

Bryan Smith

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APPENDIX E

GROUNDWATER FLOW RATE AND DIRECTION

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GROUNDWATER FLOW RATE AND DIRECTION

Whenever monitoring wells (MWs) are sampled, 401 *KAR* 48:300 § 11, requires determination of groundwater flow rate and direction of flow in the uppermost aquifer. The uppermost aquifer below the C-746-S&T Landfills 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 second quarter 2020 and to determine the groundwater flow rate and direction.

Water levels during this reporting period were measured on April 14 and 15, 2020. As shown on Figure E.1, MW389, screened in the Upper Continental Recharge System (UCRS), is usually dry, while other UCRS wells have recordable water levels. During this reporting period, MW389 had insufficient water for both measurement of the water level and for sampling.

The UCRS has a strong vertical hydraulic gradient; therefore, the limited number of available UCRS wells, screened over different elevations, is not sufficient for mapping the potentiometric surface. Figure E.1 shows the location of UCRS MWs. The Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA) data were corrected for barometric pressure, if necessary, and converted to elevations to plot the potentiometric surface of the RGA, as a whole, as shown on Table E.1. Figure E.2 is a composite or average map of the URGA and LRGA elevations where well clusters exist. The contour lines are placed based on the average water level elevations of the clusters.[1] Based on the site potentiometric map (Figure E.2), the hydraulic gradient beneath the landfill, as measured along the defined groundwater flow directions, is 3.32×10^{-4} ft/ft. Additional water level measurements in April (Figure E.3) document the vicinity groundwater hydraulic gradient for the RGA to be 5.09×10^{-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. 073-00045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA effective porosity is assumed to be 25%. Vicinity and site flow velocities were calculated using the low and high values for hydraulic conductivity, as shown in Table E.3.

Regional groundwater flow near the C-746-S&T Landfills typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric map for April 2020, RGA groundwater flow within the area of the landfill was directed to the northeast.

[1] Additional 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), were used to contour the RGA potentiometric surface.

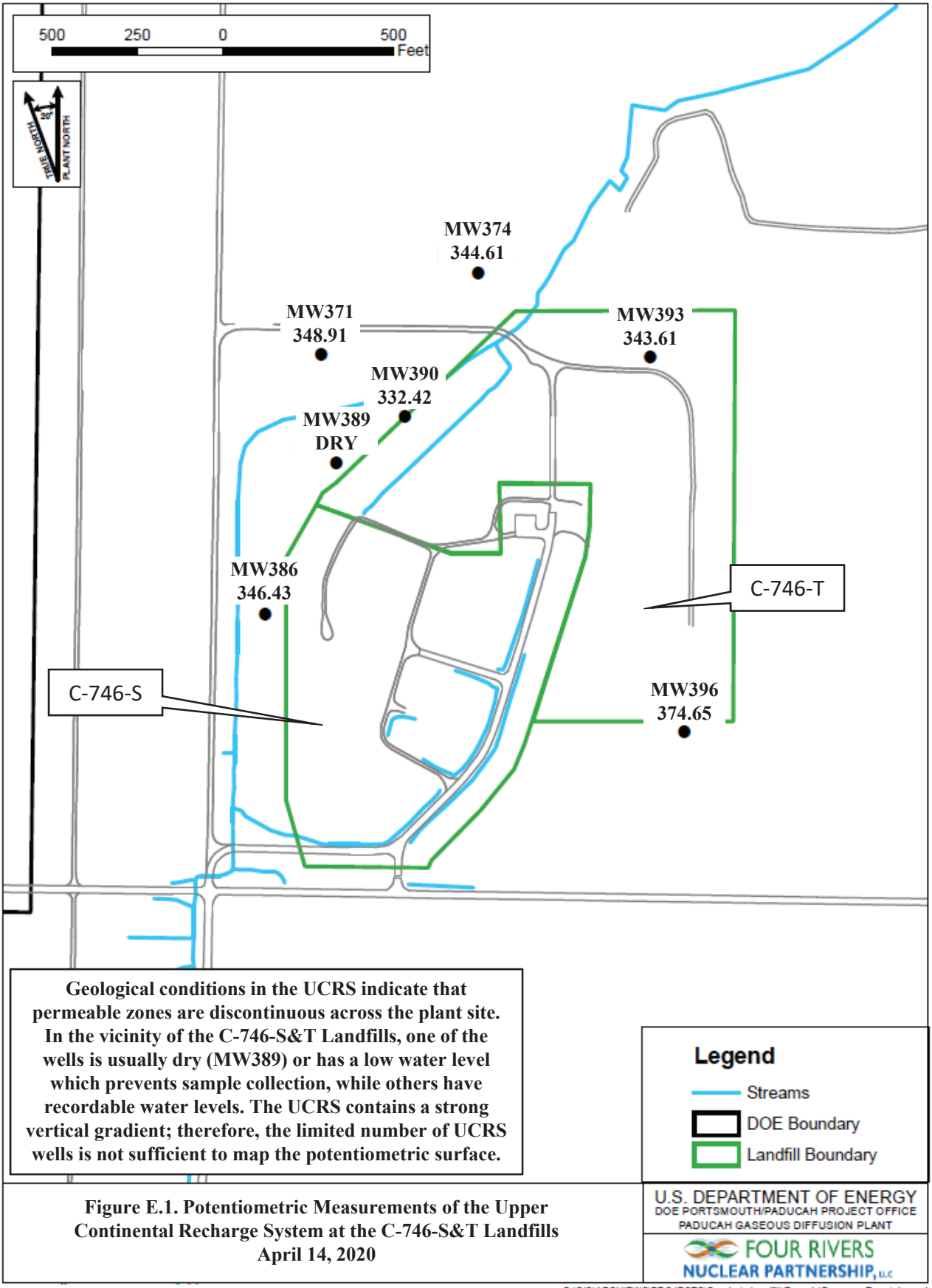

Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-S&T Landfills April 14, 2020

Table E.1. C-746-S&T Landfills Second Quarter 2020 (April) Water Levels

C-746-S&T Landfills (April 2020) Water Levels										
							Raw Data		*Corrected Data	
Date	Time	Well	Formation	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H20)	DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
4/14/2020	10:28	MW220	URGA	382.06	30.30	0.00	49.53	332.53	49.53	332.53
4/14/2020	10:33	MW221	URGA	391.43	30.30	0.00	59.03	332.40	59.03	332.40
4/14/2020	10:36	MW222	URGA	395.32	30.30	0.00	62.94	332.38	62.94	332.38
4/14/2020	10:35	MW223	URGA	394.43	30.30	0.00	61.99	332.44	61.99	332.44
4/14/2020	10:38	MW224	URGA	395.74	30.30	0.00	63.27	332.47	63.27	332.47
4/14/2020	10:30	MW225	URGA	385.78	30.30	0.00	53.37	332.41	53.37	332.41
4/14/2020	10:42	MW353	LRGA	375.09	30.30	0.00	42.66	332.43	42.66	332.43
4/14/2020	10:25	MW384	URGA	365.34	30.30	0.00	32.87	332.47	32.87	332.47
4/15/2020	6:53	MW385	LRGA	365.79	30.15	0.17	33.11	332.68	33.28	332.51
4/14/2020	10:26	MW386	UCRS	365.37	30.30	0.00	18.94	346.43	18.94	346.43
4/14/2020	10:22	MW387	URGA	363.53	30.30	0.00	31.08	332.45	31.08	332.45
4/14/2020	10:23	MW388	LRGA	363.50	30.30	0.00	31.05	332.45	31.05	332.45
4/14/2020	0:00	MW389	UCRS	364.16			NA			
4/14/2020	10:20	MW390	UCRS	360.44	30.30	0.00	28.02	332.42	28.02	332.42
4/14/2020	10:06	MW391	URGA	366.72	30.30	0.00	34.30	332.42	34.30	332.42
4/14/2020	10:08	MW392	LRGA	365.90	30.30	0.00	33.50	332.40	33.50	332.40
4/14/2020	10:07	MW393	UCRS	366.67	30.30	0.00	23.06	343.61	23.06	343.61
4/14/2020	10:13	MW394	URGA	378.64	30.30	0.00	45.97	332.67	45.97	332.67
4/14/2020	10:15	MW395	LRGA	379.34	30.30	0.00	46.65	332.69	46.65	332.69
4/14/2020	10:14	MW396	UCRS	378.84	30.30	0.00	4.19	374.65	4.19	374.65
4/14/2020	10:17	MW397	LRGA	387.05	30.30	0.00	54.53	332.52	54.53	332.52
4/14/2020	10:10	MW418	URGA	367.26	30.30	0.00	34.74	332.52	34.74	332.52
4/14/2020	10:11	MW419	LRGA	367.10	30.30	0.00	34.59	332.51	34.59	332.51
Reference Barometric Pressure				**30.30**						
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										
*Assumes a barometric efficiency of 1.0										

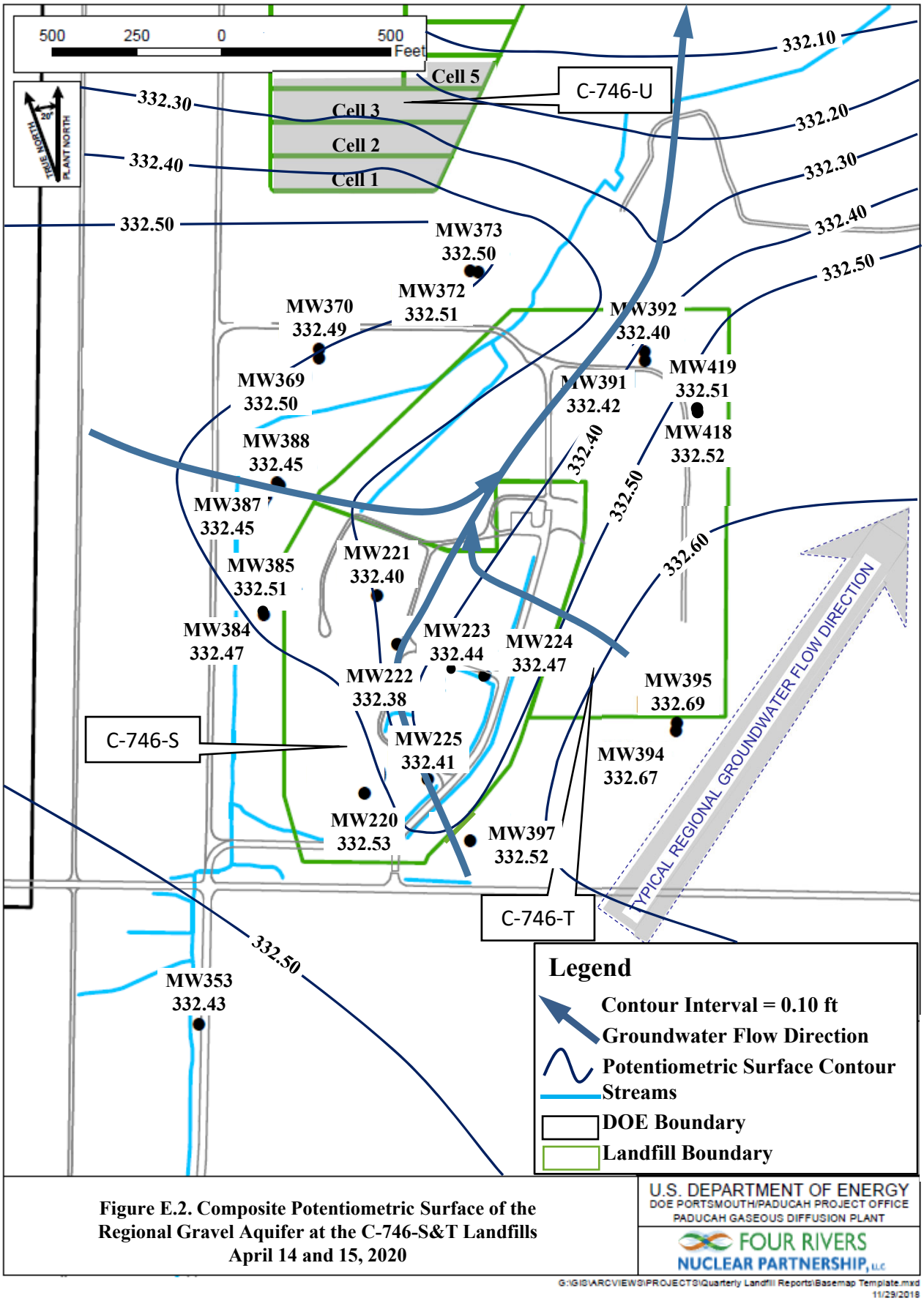

Figure E.2. Composite Potentiometric Surface of the Regional Gravel Aquifer at the C-746-S&T Landfills April 14 and 15, 2020

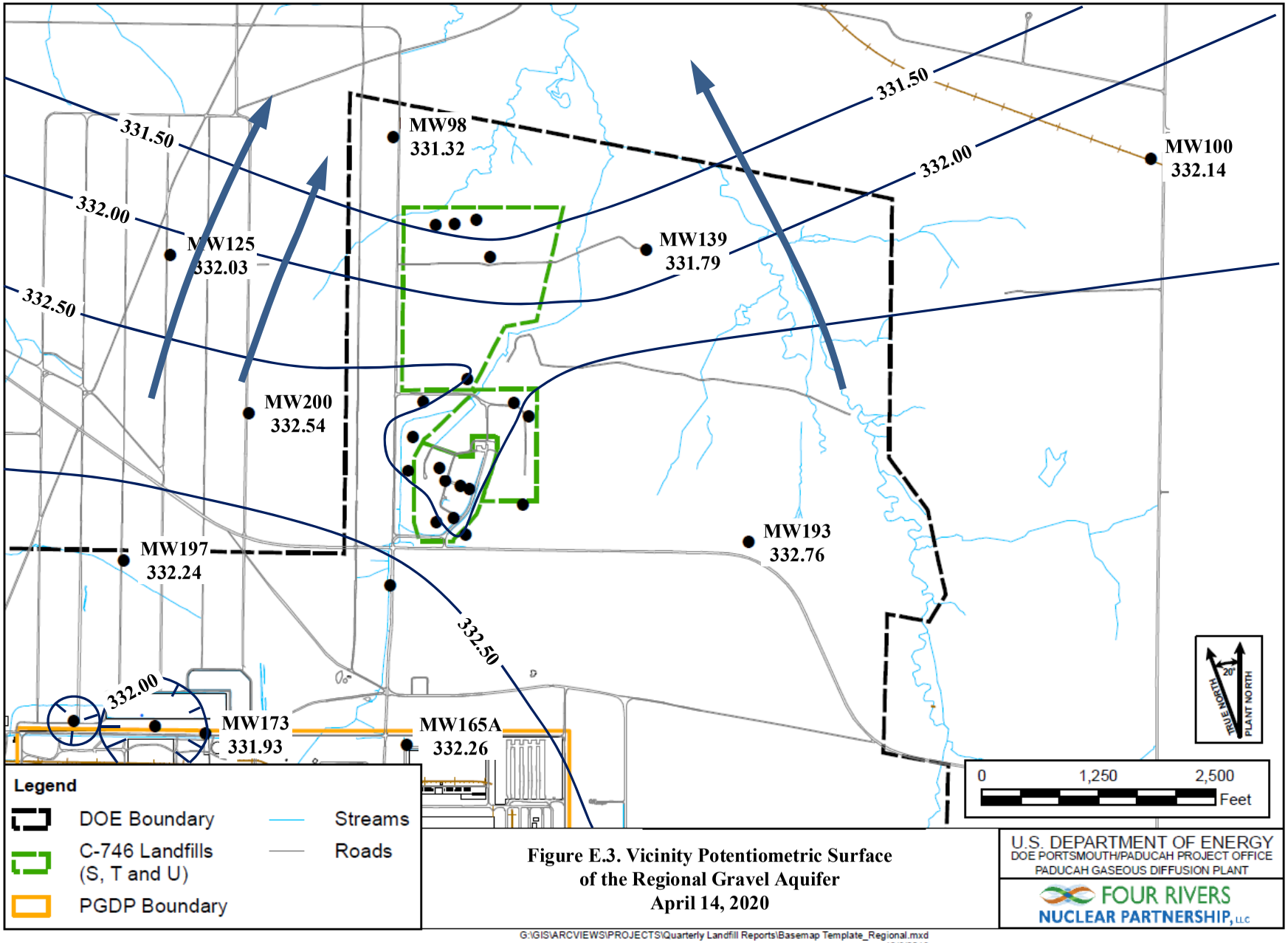

Figure E.3. Vicinity Potentiometric Surface of the Regional Gravel Aquifer April 14, 2020

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
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-S&T Landfills Hydraulic Gradients

Area	Gradient (ft/ft)
Beneath Landfill Mound	3.32×10^{-4}
Vicinity	5.09×10^{-4}

Table E.3. C-746-S&T Landfills 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
Beneath Landfill Mound					
725	0.256	0.241	8.51×10^{-5}	0.964	3.40×10^{-4}
425	0.150	0.141	4.99×10^{-5}	0.565	1.99×10^{-4}
Vicinity					
725	0.256	0.369	1.30×10^{-4}	1.48	5.21×10^{-4}
425	0.150	0.216	7.64×10^{-5}	0.866	3.05×10^{-4}

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 are listed on the 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 second quarter 2020 groundwater data collected from the C-746-S&T Landfills 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	Technetium-99	MW390
Upper Regional Gravel Aquifer	Sodium	MW369, MW387
	Technetium-99	MW372, MW384, MW387
Lower Regional Gravel Aquifer	Sodium	MW373
	Technetium-99	MW370, MW385, MW388

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.

5/26/2020

Four Rivers Nuclear Partnership, LLC
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM
C-746-S&T LANDFILLS
SOLID WASTE PERMIT NUMBER SW07300014, SW07300015, SW07300045
MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE REPORT
Quarterly Groundwater Sampling

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4818	MW370	Beta activity	9310	53	pCi/L	50
8004-4810	MW385	Beta activity	9310	59.8	pCi/L	50
8004-4815	MW387	Beta activity	9310	240	pCi/L	50
8004-4816	MW388	Beta activity	9310	77.4	pCi/L	50
8004-4805	MW391	Trichloroethene	8260B	11.5	ug/L	5
8004-4806	MW392	Trichloroethene	8260B	15.8	ug/L	5

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-S&T Landfills

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
ACETONE																							
Quarter 3, 2003							✱					✱											
Quarter 4, 2003											✱								✱				
Quarter 1, 2005									✱														
Quarter 4, 2019																✱							
ALPHA ACTIVITY																							
Quarter 4, 2002				■	■								■										
Quarter 4, 2008										■													
Quarter 4, 2010										■													
ALUMINUM																							
Quarter 1, 2003			✱				✱					✱	✱	✱									
Quarter 2, 2003			✱				✱						✱	✱									
Quarter 3, 2003			✱				✱	✱					✱	✱									
Quarter 4, 2003							✱	✱			✱			✱									
Quarter 1, 2004			✱				✱	✱			✱												
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Quarter 2, 2005			✱				✱																
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Quarter 4, 2005			✱				✱				✱												
Quarter 1, 2006							✱						✱										
Quarter 2, 2006			✱				✱																
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Quarter 4, 2006			✱				✱																
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Quarter 1, 2011							✱				✱												
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BARIUM																							
Quarter 3, 2003							■	■															
Quarter 4, 2003							■	■															
BETA ACTIVITY																							
Quarter 4, 2002													■										
Quarter 1, 2003													■				■						

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
BETA ACTIVITY																							
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										■		■	■				■			■			
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Quarter 3, 2009										■		■	■				■			■			
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Quarter 4, 2010										■		■	■				■						
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Quarter 4, 2016										■	■		■				■			■			
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Quarter 3, 2017										■			■				■	■		■			

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
BETA ACTIVITY																							
Quarter 4, 2017										■		■	■				■	■		■			
Quarter 1, 2018			■							■			■				■	■		■			
Quarter 2, 2018			■							■	■		■				■			■			
Quarter 3, 2018			■							■			■				■	■		■			
Quarter 4, 2018										■		■	■					■		■			
Quarter 1, 2019										■			■				■	■		■			
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Quarter 3, 2019										■	■	■	■				■	■					
Quarter 4, 2019			■							■		■	■				■	■		■			
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Quarter 2, 2020													■				■	■		■			
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CALCIUM																							
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Quarter 1, 2012												✱							✱				
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Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CALCIUM																							
Quarter 4, 2012												*							*				
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CARBON DISULFIDE																							
Quarter 4, 2010											*												
Quarter 1, 2011												*									*		
Quarter 2, 2017												*	*						*				
CHEMICAL OXYGEN DEMAND																							
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Quarter 2, 2003				*																			
Quarter 3, 2003				*			*			*													
Quarter 4, 2003				*																			
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Quarter 3, 2005	*									*		*									*		
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Quarter 2, 2009	*																			*			
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Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CHEMICAL OXYGEN DEMAND																							
Quarter 4, 2009	*																						
Quarter 1, 2010	*																						
Quarter 2, 2010	*																						
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Quarter 4, 2019	*			*				*			*	*				*							
Quarter 1, 2020					*				*												*		
Quarter 2, 2020															*								
CHLORIDE																							
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Quarter 3, 2010			*																				
Quarter 4, 2010			*																				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CHLORIDE																							
Quarter 2, 2011			*																				
Quarter 3, 2011			*																				
Quarter 4, 2011			*																				
Quarter 3, 2012			*																				
Quarter 3, 2013			*																				
Quarter 4, 2013			*																				
Quarter 4, 2014			*																				
Quarter 2, 2019																					*		
CHROMIUM																							
Quarter 4, 2002								■															
Quarter 1, 2003								■														■	
Quarter 2, 2003							■	■															
Quarter 3, 2009						■																	
Quarter 1, 2019						■																	
COBALT																							
Quarter 3, 2003							*																
CONDUCTIVITY																							
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										*		*							*				
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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												*							*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CONDUCTIVITY																							
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																			*				
Quarter 4, 2019												*							*				
Quarter 1, 2020												*							*				
Quarter 2, 2020												*							*	*			
DISSOLVED OXYGEN																							
Quarter 3, 2006			*					*															
DISSOLVED SOLIDS																							
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												*	*						*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
DISSOLVED SOLIDS																							
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												*	*						*				
Quarter 4, 2019												*							*				
Quarter 1, 2020												*	*						*				
Quarter 2, 2020												*	*						*				
IODIDE																							
Quarter 4, 2002																					*		
Quarter 2, 2003						*																	
Quarter 3, 2003													*										
Quarter 1, 2004				*																			
Quarter 3, 2010																					*		
Quarter 2, 2013										*													
IRON																							
Quarter 1, 2003							*			*	*			*									
Quarter 2, 2003										*	*	*	*										
Quarter 3, 2003							*	*	*	*	*	*											
Quarter 4, 2003											*												
Quarter 1, 2004											*												
Quarter 2, 2004										*	*												
Quarter 3, 2004										*													
Quarter 4, 2004										*													

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
IRON																							
Quarter 1, 2005												*											
Quarter 2, 2005											*	*											
Quarter 1, 2006							*																
Quarter 2, 2006												*											
Quarter 3, 2006											*												
Quarter 1, 2007											*	*											
Quarter 2, 2007											*												
Quarter 2, 2008												*											
Quarter 3, 2008												*											
MAGNESIUM																							
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 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																		*	*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
MAGNESIUM																							
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												*	*						*				
Quarter 4, 2019												*	*						*				
Quarter 1, 2020												*	*						*				
Quarter 2, 2020												*	*						*				
MANGANESE																							
Quarter 4, 2002																					*		
Quarter 3, 2003							*	*															
Quarter 4, 2003							*	*															
Quarter 1, 2004							*																
Quarter 2, 2004							*																
Quarter 4, 2004							*	*															
Quarter 1, 2005							*																
Quarter 3, 2005																					*		
Quarter 3, 2009	*																						
OXIDATION-REDUCTION POTENTIAL																							
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 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 3, 2009			*	*		*											*	*	*	*			
Quarter 4, 2009			*			*			*									*		*			
Quarter 1, 2010	*		*																	*			
Quarter 2, 2010	*		*	*					*				*				*	*		*			
Quarter 3, 2010	*		*	*		*											*	*	*	*			

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
OXIDATION-REDUCTION POTENTIAL																							
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	*		*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2019	*		*	*	*				*	*			*		*	*	*	*	*	*	*	*	*
Quarter 1, 2020	*		*	*	*	*	*	*	*				*			*	*	*	*	*	*	*	
Quarter 2, 2020	*		*	*	*	*	*	*	*	*			*	*	*	*	*	*	*	*	*	*	*
PCB-1016																							
Quarter 4, 2003							*	*	*		*							*					
Quarter 3, 2004											*												
Quarter 3, 2005							*				*												
Quarter 1, 2006											*												
Quarter 2, 2006											*												
Quarter 4, 2006											*												
Quarter 1, 2007											*	*											
Quarter 2, 2007												*											
Quarter 3, 2007											*												
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											*												

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
PCB-1232																							
Quarter 1, 2011											*												
PCB-1248																							
Quarter 2, 2008												*											
PCB-1260																							
Quarter 2, 2006																		*					
pH																							
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 4, 2005										*							*						
Quarter 1, 2006																	*						
Quarter 2, 2006																	*						
Quarter 3, 2006																	*						
Quarter 3, 2007																	*						
Quarter 4, 2007																	*						
Quarter 4, 2008																	*						
Quarter 1, 2009																	*						
Quarter 1, 2011																	*						
Quarter 2, 2011											*												
Quarter 3, 2011											*												
Quarter 1, 2012														*									
Quarter 1, 2013										*			*				*						
Quarter 4, 2014																					*		
Quarter 2, 2016																		*	*				
POTASSIUM																							
Quarter 4, 2002																		*	*				
Quarter 3, 2004																			*				
Quarter 2, 2005																			*				
Quarter 3, 2005																			*				
Quarter 4, 2005																			*				
Quarter 2, 2006																			*				
Quarter 3, 2006																			*				
Quarter 4, 2006																			*				
Quarter 4, 2008																			*				
Quarter 3, 2012																			*				
Quarter 1, 2013																			*				
Quarter 2, 2013																			*				
Quarter 3, 2013																			*				
RADIUM-226																							
Quarter 4, 2002			*										*	*							*		
Quarter 2, 2004																			*				
Quarter 2, 2005									*														
Quarter 1, 2009											*												
Quarter 3, 2014									*			*											
Quarter 4, 2014			*								*							*					
Quarter 1, 2015			*				*			*		*						*					
Quarter 2, 2015			*				*			*		*						*					
Quarter 3, 2015			*																				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
RADIUM-226																							
Quarter 4, 2015					*	*									*		*				*	*	
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 4, 2018													*				*						
Quarter 1, 2020																	*						
Quarter 2, 2020															*								
RADIUM-228																							
Quarter 2, 2005							■				■												
Quarter 3, 2005			■																				
Quarter 4, 2005							■		■														
Quarter 1, 2006					■																		
SELENIUM																							
Quarter 4, 2002			■		■																		
Quarter 1, 2003					■																	■	
Quarter 2, 2003			■																				
Quarter 3, 2003			■		■																		
Quarter 4, 2003			■																				
SODIUM																							
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 3, 2008												*											
Quarter 4, 2008									*	*													
Quarter 1, 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 4, 2011																			*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
SODIUM																							
Quarter 1, 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 2, 2016											✱												
Quarter 3, 2016											✱												✱
Quarter 1, 2017										✱	✱		✱					✱					
Quarter 2, 2017									✱	✱	✱												
Quarter 2, 2018													✱										
Quarter 3, 2018														✱									
Quarter 1, 2019													✱										
Quarter 2, 2019													✱										
Quarter 4, 2019												✱											
Quarter 1, 2020											✱	✱							✱				
Quarter 2, 2020											✱		✱						✱				
STRONTIUM-90																							
Quarter 2, 2003										■													
Quarter 1, 2004										■													
SULFATE																							
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	✱								✱	✱		✱	✱				✱		✱				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
SULFATE																							
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			*					*		*		*	*	*	*		*	*	*	*	*		
Quarter 4, 2019			*							*		*	*	*			*	*	*	*	*		
Quarter 1, 2020								*		*		*	*	*	*		*	*	*	*	*		
Quarter 2, 2020								*		*		*	*	*	*		*	*	*	*	*		
TECHNETIUM-99																							
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			*							*			*				*		*	*			

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TECHNETIUM-99																							
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			*							*	*	*	*				*	*		*			
Quarter 4, 2019			*							*		*	*				*	*	*	*			
Quarter 1, 2020			*							*		*	*				*	*		*			
Quarter 2, 2020			*							*		*	*				*	*		*			
THORIUM-230																							
Quarter 1, 2012	*								*					*									
Quarter 4, 2014	*		*																				
Quarter 3, 2015	*								*	*			*		*								
Quarter 1, 2017			*							*							*						
THORIUM-234																							
Quarter 2, 2003						*			*					*									
Quarter 4, 2007									*														

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TOLUENE																							
Quarter 2, 2014										*	*		*										
TOTAL ORGANIC CARBON																							
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 4, 2006																	*						
Quarter 1, 2007	*									*													
Quarter 3, 2007	*					*	*	*	*	*			*	*			*						
Quarter 2, 2011											*												
Quarter 3, 2012	*																						
Quarter 3, 2016																			*				
TOTAL ORGANIC HALIDES																							
Quarter 4, 2002																		*	*		*		
Quarter 1, 2003				*														*			*		
Quarter 3, 2003				*																	*		
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 4, 2006																	*						
Quarter 1, 2007	*																						
Quarter 2, 2007	*																						
Quarter 3, 2007	*																						
Quarter 4, 2007	*																				*		
Quarter 1, 2008	*																						
Quarter 4, 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 3, 2013																					*		

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TRICHLOROETHENE																							
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 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											■			■					■		■		

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TRICHLOROETHENE																							
Quarter 1, 2018												■		■		■			■		■		
Quarter 2, 2018												■	■	■					■		■		
Quarter 3, 2018												■		■					■		■		
Quarter 4, 2018												■		■					■		■		
Quarter 1, 2019												■		■							■		
Quarter 2, 2019														■					■		■		
Quarter 3, 2019														■							■		
Quarter 4, 2019														■							■		
Quarter 1, 2020												■		■							■		
Quarter 2, 2020														■							■		
TURBIDITY																							
Quarter 4, 2002																					✱		
Quarter 1, 2003							✱					✱		✱									
URANIUM																							
Quarter 4, 2002																		✱	✱				
Quarter 1, 2003																			✱				
Quarter 4, 2003							✱																
Quarter 1, 2004							✱	✱	✱					✱			✱						
Quarter 4, 2004																	✱						
Quarter 4, 2006																			✱		✱		
ZINC																							
Quarter 3, 2003												✱											
Quarter 4, 2003							✱		✱			✱											
Quarter 4, 2004							✱																
Quarter 4, 2007							✱	✱	✱														

✱ Statistical test results indicate an elevated concentration (i.e., a statistically significant increase).

■ 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

S = Sidegradient; D = Downgradient; U = Upgradient

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APPENDIX H

METHANE MONITORING DATA

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CP3-WM-0017-F03 - C-746-S & T LANDFILL METHANE MONITORING REPORT

Date:	06/03/20	Time:	0615	Monitor:	Robert Kirby

Weather Conditions:
Sunny, Cool, Slight Wind and 71 Degrees

Monitoring Equipment::
RAE Systems, Multi-RAE Serial # 7970

Monitoring Location		Reading (% LEL)
Ogden Landing Road Entrance	Checked at ground level	0
North Landfill Gate	Checked at ground level	0
West Side of Landfill: North 37° 07.652' West 88° 48.029'	Checked at ground level	0
East Side of Landfill: North 37° 07.628' West 88° 47.798'	Checked at ground level	0
Cell 1 Gas Vent (17)	1 0, 2 0, 3 0, 4 0, 5 0, 6 0, 7 0, 8 0, 9 0, 10 0, 11 0, 12 0, 13 0, 14 0, 15 0, 16 0, 17 0	0
Cell 2 Gas Vent (3)	1 0, 2 0, 3 0	0
Cell 3 Gas Vent (7)	1 0, 2 0, 3 0, 4 0, 5 0, 6 0, 7 0	0
Landfill Office	Checked at floor level	0
Suspect or Problem Areas	No reasons noted	NA

Remarks:

ALL VENTS CHECKED 1" FROM THE MOUTH OF VENT

Performed by: /Robert Kirby — Signature — 07/23/2020 — Date

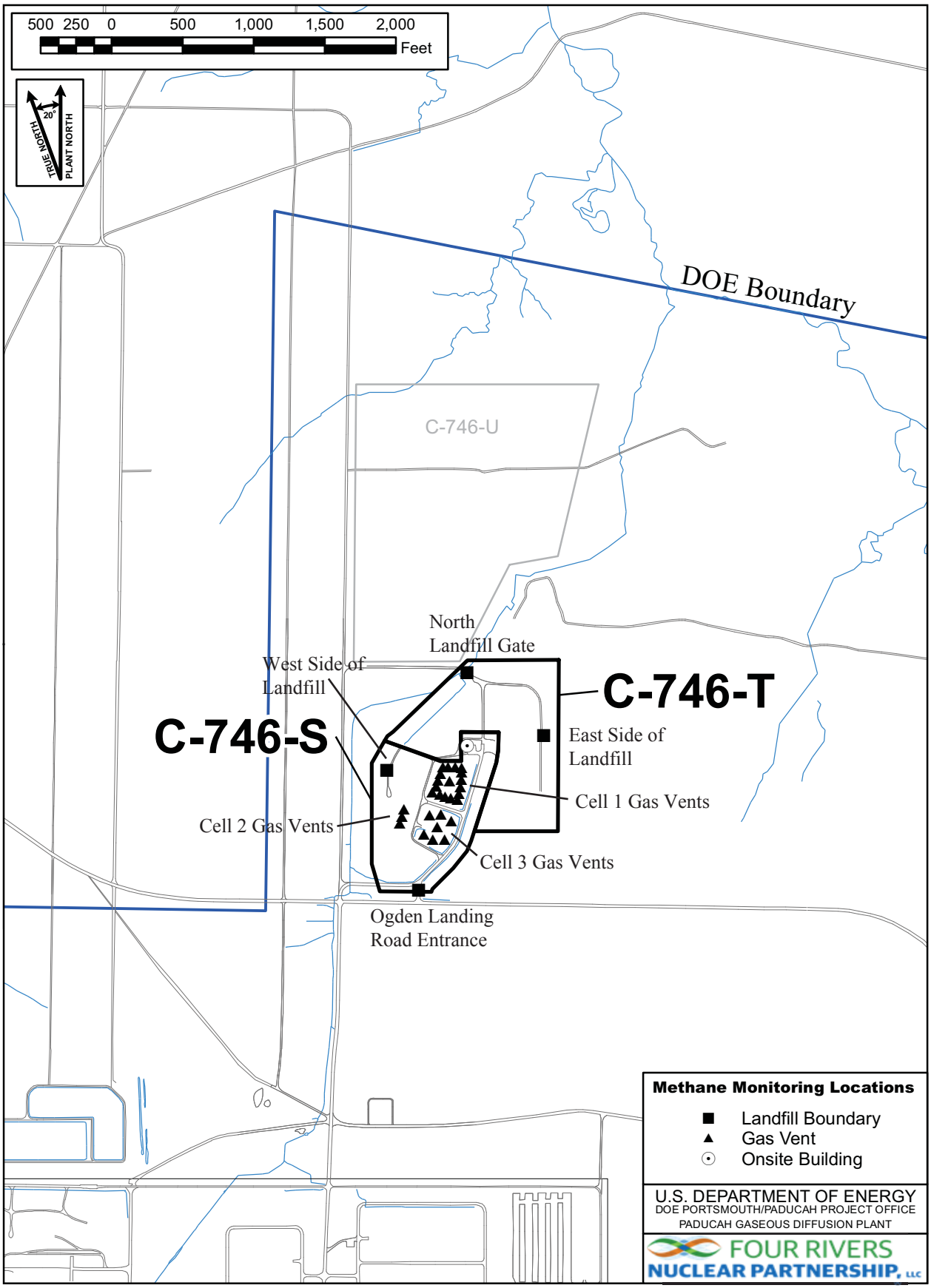

Figure H.1. C-746-S&T Methane Monitoring Locations

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")	L135 UPSTREAM	L154 DOWNSTREAM	L136 AT SITE
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)	4/29/2020 09:11	4/29/2020 08:42	4/29/2020 08:58
Duplicate ("Y" or "N")[1]	N	N	N
Split ('Y' or "N")[2]	N	N	N
Facility Sample ID Number (if applicable)	L135SS3-20	L154US3-20	L136SS3-20
Laboratory Sample ID Number (if applicable)	510452001	510448002	510452002
Date of Analysis (Month/Day/Year)	5/12/2020	5/8/2020	5/8/2020

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	1.91		1.4		0.464			
14808-79-8	0	Sulfate	T	MG/L	300.0	3.12		1.32		5.49			
7439-89-6	0	Iron	T	MG/L	200.8	1.03		0.815		0.442			
7440-23-5	0	Sodium	T	MG/L	200.8	2.7		1.86		0.925			
S0268- -	0	Organic Carbon[6]	T	MG/L	9060	10.9		12.6		10.7			
S0097- -	0	BOD[6]	T	MG/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	MG/L	410.4	34.5	B	37	B	49.5	B		

[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")						L135 UPSTREAM		L154 DOWNSTREAM		L136 AT SITE			
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	µHMS/CM	Field	115		80		109			
S0270- -	0	Total Suspended Solids	T	MG/L	160.2	74	*	212	*	12.2	*		
S0266- -	0	Total Dissolved Solids	T	MG/L	160.1	14.3	J	40		45.7			
S0269- -	0	Total Solids	T	MG/L	SM-2540 B 17	171		244		77			
S0296- -	0	pH	T	Units	Field	7.24		7.54		7.34			
7440-61-1		Uranium	T	MG/L	200.8	0.00594		0.00436		0.000384			
12587-46-1		Gross Alpha (α)	T	pCi/L	9310	8.3	*	8.53	*	4.22	*		
12587-47-2		Gross Beta (β)	T	pCi/L	9310	15.9	*	8.21	*	-1.11	*		

RESIDENTIAL/INERT – 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
L135	L135SS3-20	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.48. Rad error is 6.33.
		Beta activity		TPU is 7.18. Rad error is 6.65.
L154	L154US3-20	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.15. Rad error is 7.01.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.35. Rad error is 6.19.
L136	L136SS3-20	Flow Rate		Insufficient flow to collect a sample.
		Biochemical Oxygen Demand (BOD		Insufficient flow to collect a sample.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.07. Rad error is 6.03.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.75. Rad error is 8.75.

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APPENDIX J

ANALYTICAL LABORATORY CERTIFICATION

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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.

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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

MICROPURGING STABILITY PARAMETERS

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Micro-Purge Stability Parameters
for the C-746-S&T Landfills

	Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW220					
Date Collected: 4/21/2020					
0708	59.7	457	6.36	3.81	0.3
0711	59.7	431	6.14	3.46	0.0
0714	59.9	435	6.16	3.44	0.0
MW222					
Date Collected: 4/16/2020					
0820	61.2	389	6.32	3.85	0.0
0823	60.2	384	6.16	3.05	0.0
0826	60.0	388	6.15	2.97	0.0
MW224					
Date Collected: 4/16/2020					
0916	61.1	442	6.25	5.60	0.0
0919	60.7	430	6.21	3.23	0.0
0922	60.6	427	6.21	3.19	0.0
MW370					
Date Collected: 4/6/2020					
1149	64.1	475	6.03	3.73	6.0
1152	64.7	475	6.09	2.74	0.0
1155	65.0	474	6.08	2.72	0.0
MW373					
Date Collected: 4/6/2020					
0839	60.4	815	6.37	2.07	3.9
0842	61.2	822	6.15	1.12	3.3
0845	61.4	827	6.15	1.18	3.0
MW385					
Date Collected: 4/20/2020					
0825	61.3	455	6.21	3.87	7.2
0828	59.7	457	6.08	3.01	4.0
0831	59.7	453	6.07	2.95	3.5
MW387					
Date Collected: 4/20/2020					
0627	58.5	573	5.51	3.93	28.2
0630	59.4	565	6.01	1.83	30.5
0633	59.5	566	6.03	1.80	30.0
MW390					
Date Collected: 4/21/2020					
0625	58.7	675	5.81	5.78	3.6
0628	58.7	660	6.18	3.66	0.5
0631	58.6	667	6.21	3.52	0.3
MW392					
Date Collected: 4/21/2020					
0840	59.8	430	6.25	3.99	3.3
0843	60.0	434	6.18	1.56	1.8
0846	60.0	433	6.15	1.53	1.0
MW394					
Date Collected: 4/22/2020					
0633	57.9	381	5.46	5.22	4.7
0636	58.2	366	5.84	4.58	3.0
0639	58.2	367	5.82	4.53	2.2
MW396					
Date Collected: 4/22/2020					
0750	60.7	678	6.49	4.07	0.0
0753	59.7	711	6.65	2.64	0.0
0756	59.7	708	6.67	2.60	0.0

	Temperature (°C)	Conductivity (umho/cm)	pH (Std. Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW221					
Date Collected: 4/16/2020					
0633	57.2	422	5.33	4.45	4.1
0636	57.5	396	5.80	3.89	4.7
0639	57.4	400	5.82	3.83	4.4
MW223					
Date Collected: 4/16/2020					
0738	59.5	417	6.16	4.73	3.3
0741	59.2	410	6.19	3.68	1.2
0744	58.8	414	6.14	3.61	0.8
MW369					
Date Collected: 4/6/2020					
1001	63.2	450	6.54	4.27	0.0
1004	63.9	403	6.25	0.72	0.0
1007	63.9	407	6.23	0.65	0.0
MW372					
Date Collected: 4/6/2020					
0756	59.7	696	6.21	2.89	6.1
0759	60.3	690	6.16	0.87	3.0
0802	60.4	687	6.17	0.83	1.5
MW384					
Date Collected: 4/20/2020					
0746	61.1	470	6.27	4.33	0.8
0749	60.8	455	6.10	3.85	0.0
0752	60.7	458	6.09	3.80	0.0
MW386					
Date Collected: 4/20/2020					
0901	60.2	550	6.77	6.15	0.0
0904	59.6	549	6.88	5.62	0.0
0907	59.6	550	6.93	5.55	0.0
MW388					
Date Collected: 4/20/2020					
0717	61.1	520	6.30	4.01	6.1
0720	61.7	519	6.16	3.06	2.4
0723	61.7	513	6.14	3.03	2.0
MW391					
Date Collected: 4/21/2020					
0801	59.2	424	6.29	4.51	2.1
0804	59.3	416	6.08	3.39	0.1
0807	59.2	412	6.10	3.45	0.7
MW393					
Date Collected: 4/21/2020					
0916	60.3	440	6.50	5.22	8.2
0919	60.2	437	6.33	1.81	6.3
0922	60.5	441	6.30	1.75	6.0
MW395					
Date Collected: 4/22/2020					
0714	59.3	355	6.05	5.24	1.5
0717	59.4	350	6.03	4.52	0.8
0720	59.4	350	6.00	4.48	0.3
MW397					
Date Collected: 4/22/2020					
0833	61.5	331	6.68	6.00	19.6
0836	60.7	318	6.06	5.26	10.1
0839	60.7	319	6.05	5.20	9.5

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