

**C-746-U Contained Landfill
Third Quarter Calendar Year 2018
(July–September)
Compliance Monitoring Report
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



This document is approved for public release per review by:

David Hayden
FRNP Classification Support

11-15-18
Date

**C-746-U Contained Landfill
Third Quarter Calendar Year 2018
(July–September)
Compliance Monitoring Report
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—November 2018

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

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

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1. INTRODUCTION

This report, *C-746-U Contained Landfill Third Quarter Calendar Year 2018 (July–September) 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 MCL exceedances and exceedances of the historical background UTL that have occurred, beginning in the fourth quarter calendar year (CY) 2002. Methane monitoring results are documented on the approved C-746-U Landfill Methane Monitoring Report form provided in Appendix H. The form includes pertinent remarks/observations as required by 401 KAR 48:090 § 5. Surface water results are provided in Appendix I.

1.1 BACKGROUND

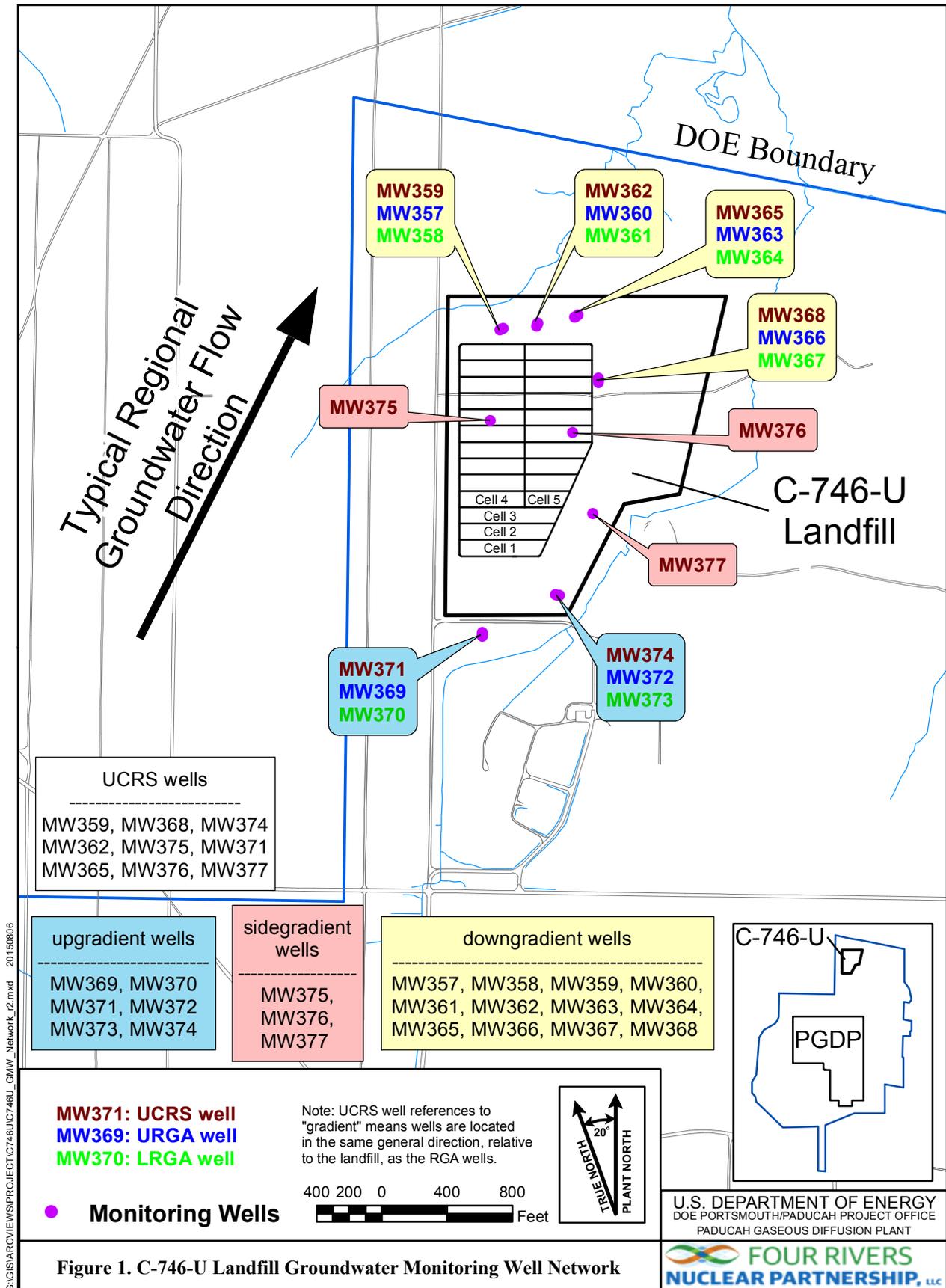
The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Site and north of the C-746-S&T Landfills. Construction and operation of the C-746-U Landfill were permitted in November 1996. The operation is regulated under Solid Waste Landfill Permit Number SW07300014, SW07300015,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

1.2 MONITORING PERIOD ACTIVITIES

1.2.1 Groundwater Monitoring

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

Consistent with the approved *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (Groundwater Monitoring Plan) UCRS wells are included in the monitoring program (LATA Kentucky 2014). Groundwater flow gradients are downward through the UCRS, but flow in the underlying Regional Gravel Aquifer (RGA) is lateral. Groundwater flow in the



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RGA typically is in a northeasterly direction in the vicinity of the C-746-U Landfill. The Ohio River and lower reaches of Little Bayou Creek are the discharge areas for the RGA flow system from the vicinity of the landfills.

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

Groundwater sampling was conducted within the third quarter 2018 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor, procedure CP4-ES-2101, *Groundwater Sampling*. The analytical laboratory used U.S. Environmental Protection Agency-approved methods, as applicable. Appropriate sample containers and preservatives were used. The parameters specified in Permit Condition GSTR0001, Special Condition 1, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on July 24, 2018, in MWs of the C-746-U Landfill (see Table E.1), in MWs of the C-746-S&T Landfills, and in MWs of the surrounding region (shown on Figure E.4). Water level measurements in 39 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During July, RGA groundwater flow in the area of the landfill was oriented north to northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in July was 5.93×10^{-4} ft/ft. The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were 6.22×10^{-4} ft/ft and 7.25×10^{-4} ft/ft, respectively. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.06 to 1.81 ft/day for the URGA and 1.23 to 2.10 ft/day for the LRGA (see Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 KAR 48:090 § 5 and the approved Explosive Gas Monitoring Program (KEEC 2011), which is Technical Application Attachment 12, of the Solid Waste Landfill permit. Landfill operations staff monitored for the occurrence of methane in four on-site building locations and four locations along the landfill boundary on August 20, 2018. See Appendix H for a map (Figure H.1) of the monitoring locations. Monitoring identified 0% of the lower explosive limit (LEL) of methane at all locations, which is compliant with the regulatory requirement of < 100% LEL at boundary locations and < 25% LEL at all other locations. The results are documented on the C-746-U Landfill Methane Log provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water was monitored, as specified in 401 KAR 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24, of the Solid Waste Landfill Permit. Sampling was performed at three locations (see Figure 2) monitored for the C-746-U Landfill. The C-746-U Landfill has an upstream location, L154; a downstream location, L351;

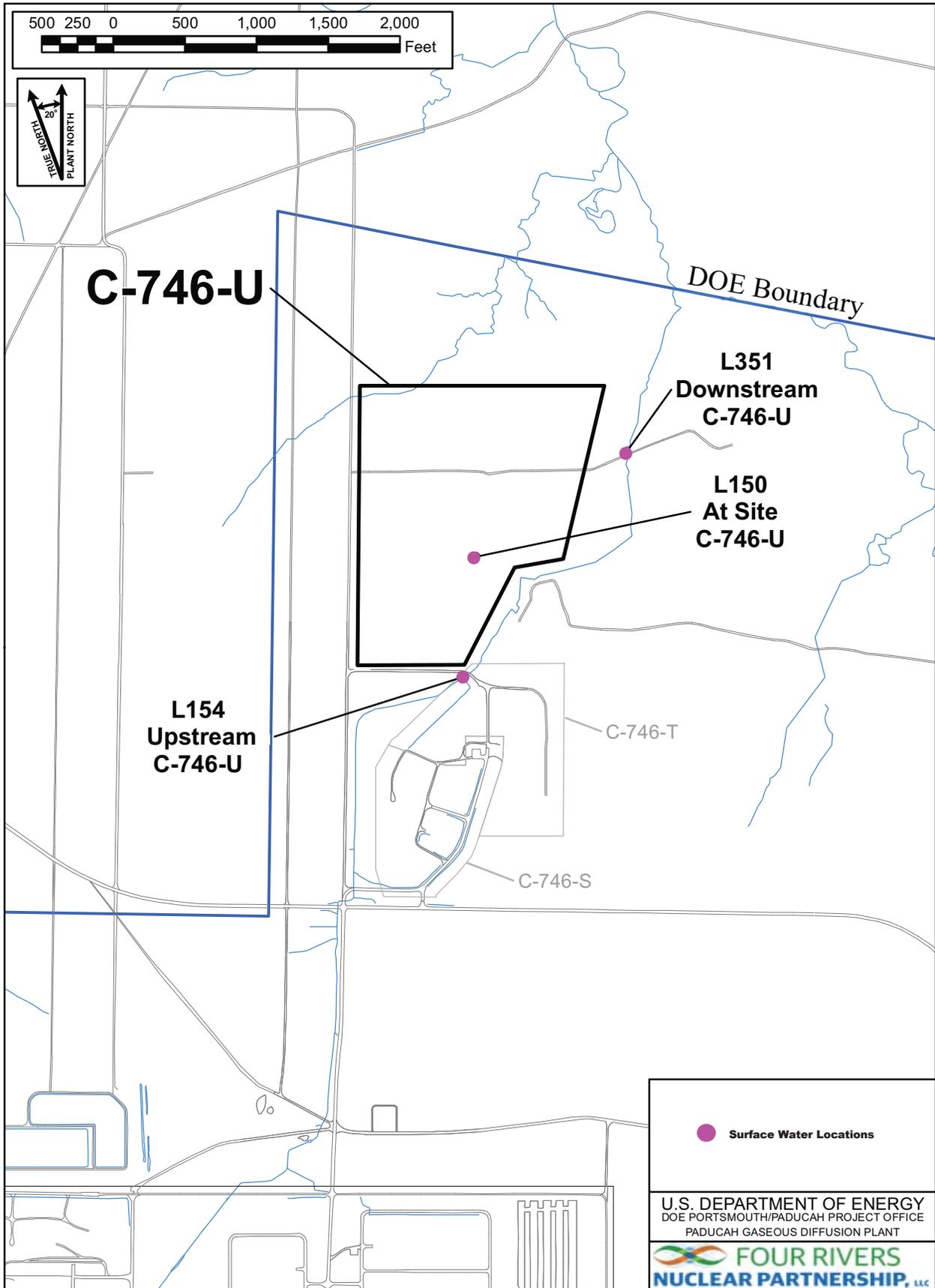


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

and a location capturing runoff from the landfill surface, L150. 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 Landfill 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 (without MCLs) with concentrations that exceeded the statistically derived historical background UTL¹ during the third quarter 2018, as well as parameters that exceeded their MCL and also exceeded their historical background UTL. Those constituents (present in downgradient wells) that exceed their historical background UTL were evaluated against their current UTL-derived background using the most recent eight quarters of data from wells considered to be upgradient (Table 3).

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW366: Trichloroethene	MW361: Trichloroethene
	MW372: Trichloroethene	MW364: Trichloroethene
		MW370: Beta activity
		MW373: Trichloroethene

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW359: Dissolved oxygen, oxidation-reduction potential, pH**, sulfate	MW357: Oxidation-reduction potential	MW358: Oxidation-reduction potential, pH**
MW362: Dissolved oxygen, oxidation-reduction potential, sulfate	MW360: Oxidation-reduction potential, sodium	MW361: Oxidation-reduction potential, pH**
MW365: Dissolved oxygen, oxidation-reduction potential, sulfate	MW363: Oxidation-reduction potential, pH**	MW364: Oxidation-reduction potential, pH**
MW368: Calcium, dissolved oxygen, magnesium, oxidation-reduction potential, sulfate	MW366: Oxidation-reduction potential, pH**	MW367: Oxidation-reduction potential
MW371: Dissolved oxygen, oxidation-reduction potential, sulfate	MW369: Oxidation-reduction potential	MW370: Beta activity, oxidation-reduction potential, technetium-99
MW374: Oxidation-reduction potential	MW372: Oxidation-reduction potential, technetium-99	MW373: Oxidation-reduction potential
MW375: Oxidation-reduction potential, sulfate		

*Gradients in the UCRS are downward. UCRS gradient designations are identified using the same gradient reference (relative to the landfill) that is attributed to nearby RGA wells.

**pH concentration is less than the LTL.

Sidegradient wells: MW375, MW376, MW377

Downgradient wells: MW357, MW358, MW359, MW360, MW361, MW362, MW363, MW364, MW365, MW366, MW367, MW368

Upgradient wells: MW369, MW370, MW371, MW372, MW373, MW374

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

Table 3. Exceedances of Current Background UTL in Downgradient Wells

URGA	LRGA
MW360: Sodium	MW358: pH*
MW363: pH*	MW361: pH*
MW366: pH*	MW364: pH*

*pH concentration is less than the LTL.

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

The constituents that exceeded their MCL in a downgradient well were subjected to a comparison against the UTL concentrations calculated using historical concentrations from wells identified as background. In accordance with the approved Groundwater Monitoring Plan, the MCL exceedances for trichloroethene in MW361, MW364, and MW366 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

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

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

The constituents listed in Table 3 that exceed both the historical UTL and the current UTL, sodium in MW360 and pH in MW358, MW361, MW363, MW364, and MW366, do not have an identified source and are considered preliminarily to be a Type 2 exceedance, per the approved Groundwater Monitoring Plan. To evaluate the 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. All but two of these preliminary Type 2 exceedances in downgradient wells did not have an increasing or decreasing trend and are considered to be Type 1 exceedances (not attributable to the landfills).

The Mann-Kendall statistical test indicates that there is a decreasing trend of the LTL of pH in MW361 over the past eight quarters. In accordance with the Groundwater Monitoring Plan, this is considered a Type 2 exceedance (source unknown). The source of the trend is believed to be unrelated to the C-746-U Landfill because the shallower, collocated (URGA) well, MW360, did not show a statistically significant exceedance. The adjacent LRGA well, MW358, did not show a statistically significant exceedance and adjacent LRGA well, MW364, did not show the decreasing Mann-Kendall trend (refer to Table 4).

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

Location	Well ID	Parameter	Sample Size	Alpha ¹	p-Value ²	S ³	Decision ⁴
C-746-U Landfill	MW358	pH ⁵	8	0.05	0.193	-8	No Trend
	MW360	Sodium	8	0.05	0.133	-10	No Trend
	MW361	pH ⁵	8	0.05	0.012	-19	Decreasing Trend
	MW363	pH ⁵	8	0.05	0.005	-22	Decreasing Trend
	MW364	pH ⁵	8	0.05	0.548	0	No Trend
	MW366	pH ⁵	8	0.05	0.227	-7	No Trend

Footnotes:

¹ An alpha of 0.05 represents a 95% confidence interval.

² The p-value represents the risk of acceptance the H_a hypothesis of a trend, in terms of a percentage.

³ The initial value of the Mann-Kendall statistic, S, is assumed to be 0 (e.g., no trend). If a data value from a later time period is higher than a data value from an earlier time period, S is incremented by 1. On the other hand, if the data value from a later time period is lower than a data value sampled earlier, S is decremented by 1. The net result of all such increments and decrements yields the final value of S. A very high positive value of S is an indicator of an increasing trend, and a very low negative value indicates a decreasing trend.

⁴ The Mann-Kendall decision operates on two hypotheses, the H₀ and H_a. H₀ assumes there is no trend in the data, whereas H_a assumes either a positive or negative trend.

⁵ pH concentration is less than the LTL.

Note: Statistics generated using ProUCL.

The Mann-Kendall statistical test indicates that there is a decreasing trend of the LTL of pH in MW363 over the past eight quarters. In accordance with the Groundwater Monitoring Plan, this is considered a Type 2 exceedance (source unknown). The source of the trend is believed to be unrelated to the C-746-U Landfill because the adjacent URGA wells, MW357 and MW360, do not show a statistically significant exceedance.

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

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

UCRS
MW359: pH**
MW368: Calcium, magnesium, sulfate

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

**pH concentration is less than the LTL.

All MCL and UTL exceedances, except for pH in MW361 and MW363, reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-U Landfill. The decreasing trend for pH in MW361 and MW363 do not appear to be landfill-related. The pH in MW361 and MW363 will continue to be evaluated in the context of these observations.

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2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2018 groundwater data collected from the C-746-U Landfill MWs were performed in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014). The statistical analyses for this report use data from the first eight quarters that were sampled for each parameter, beginning with the baseline sampling events in 2002, when available. The sampling dates associated with background data are listed next to the result in the statistical analysis sheets in Appendix D (Attachments D1 and D2).

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

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

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

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

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

Table 6. Monitoring Wells Included in Statistical Analysis*

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

*A map showing the monitoring well locations is shown on Figure 1.

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

***MW376 and MW377 had insufficient water to permit a water sample for laboratory analysis.

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

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

2.1.1 Upper Continental Recharge System

In this quarter, 29 parameters, including those with MCLs, required statistical analysis in the UCRS. During the third quarter, calcium, dissolved oxygen, magnesium, oxidation-reduction potential, pH, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Calcium, magnesium, pH, and sulfate exceeded the current background UTL and are included in Table 5.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 30 parameters, including those with MCLs, required statistical analysis in the URGA. During the third quarter, oxidation-reduction potential, pH, sodium, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. The pH and sodium exceeded the current background UTL and are included in Table 3.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 28 parameters, including those with MCLs, required statistical analysis in the LRGA. During the third quarter, beta activity, oxidation-reduction potential, pH, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. The pH exceeded the current background UTL and is included in Table 3.

2.2 DATA VERIFICATION AND VALIDATION

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

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

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

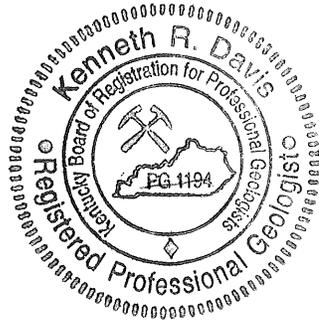
Data verification and validation results for this data set indicated that all data were considered usable.

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3. PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: *C-746-U Contained Landfill
Third Quarter Calendar Year 2018 (July-September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky (FRNP-RPT-0027/V3)*

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



*PG 113927
K.R. Davis
11/14/18*

Kenneth R. Davis
Kenneth R. Davis

PG113927

November 14, 2018
Date

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4. REFERENCES

- KEEC (Kentucky Energy and Environment Cabinet) 2011. Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Division of Waste Management, Solid Waste Branch, Technical Application Attachment 12, “Explosive Gas Monitoring Program,” January 21.
- LATA Kentucky (LATA Environmental Services of Kentucky, LLC) 2014. *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, PAD-PROJ-0139, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 25, LATA Environmental Services of Kentucky, LLC, Kevil, KY, June.
- PRS (Paducah Remediation Services, LLC) 2008. *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Paducah Remediation Services, LLC, Kevil, KY, June.

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APPENDIX A

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

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

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

Facility Name: U.S. DOE-Paducah Gaseous Diffusion Plant Activity: C-746-U Contained Landfill
(As officially shown on DWM Permit Face)

Permit No: SW07300014,
SW07300015,
SW07300045 Finds/Unit No: _____ Quarter & Year 3rd Qtr. CY 2018

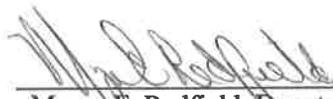
Please check the following as applicable:

 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.

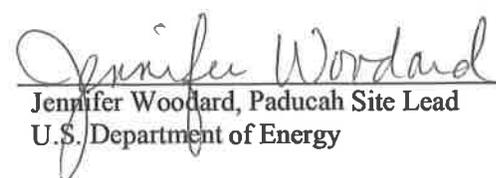
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible 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, Deputy Program Manager
Four Rivers Nuclear Partnership, LLC

11/29/18

Date



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

11/29/18

Date

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APPENDIX B
FACILITY INFORMATION SHEET

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FACILITY INFORMATION SHEET

Groundwater: July 2018
Surface water: September 2018
Methane: August 2018

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 Kevil, Kentucky 42053
Street City/State Zip

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

OWNER INFORMATION

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

Contact Person: James Miller Phone No: (270) 441-5068
Director, Waste, Materials, and Environmental Services Project

Contact Person Title: Four Rivers Nuclear Partnership, LLC

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

SAMPLING PERSONNEL (IF OTHER THAN LANDFILL OR LABORATORY)

Company: GEO Consultants, LLC

Contact Person: Sam Martin Phone No: (270) 441-6755

Mailing Address: 199 Kentucky Avenue Kevil, Kentucky 42053
Street City/State 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 Charleston, South Carolina 29407
Street City/State Zip

LABORATORY RECORD #2

Laboratory: N/A Lab ID No: N/A

Contact Person: N/A Phone No: N/A

Mailing Address: N/A
Street City/State Zip

LABORATORY RECORD #3

Laboratory: N/A Lab ID No: N/A

Contact Person: N/A Phone No: N/A

Mailing Address: N/A
Street City/State Zip

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APPENDIX C
GROUNDWATER SAMPLE ANALYSES
AND WRITTEN COMMENTS

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-4798	8004-4799	8004-0981	8004-4800								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	357	358	359	360								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA								
Sample Date and Time (Month/Day/Year hour: minutes)	7/16/2018 09:56	7/17/2018 07:33	7/16/2018 10:36	7/16/2018 08:56								
Duplicate ("Y" or "N") ²	N	N	N	N								
Split ("Y" or "N") ³	N	N	N	N								
Facility Sample ID Number (if applicable)	MW357UG4-18	MW358UG4-18	MW359UG4-18	MW360UG4-18								
Laboratory Sample ID Number (if applicable)	454677003	454816005	454677005	454677001								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/18/2018	7/19/2018	7/18/2018	7/18/2018								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.406		0.452		<0.2		0.163	J
16887-00-6	Chloride(s)	T	mg/L	9056	36.1	*	38.5	*	1.11	*	11.6	*
16984-48-8	Fluoride	T	mg/L	9056	0.134		0.235		<0.1		0.413	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.23		1.08		1.15		0.0782	J
14808-79-8	Sulfate	T	mg/L	9056	49.2	*	64		53.2	*	14.1	*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	29.99		30		29.99		29.99	
S0145- -	Specific Conductance	T	µMHO/cm	Field	439		484		239		595	

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					357	358	359	360				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	326.42		326.41		334.5		326.39	
N238	Dissolved Oxygen	T	mg/L	Field	3.48		0.87		4.47		2.94	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	227		264	*	164		279	
S0296- -	pH	T	Units	Field	5.77		5.66		5.66		6.24	
NS215	Eh	T	mV	Field	298		282		316		237	
S0907 - -	Temperature	T	°C	Field	19.94		20.17		21.11		19.11	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		<0.05		0.106		<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		0.00241	J
7440-39-3	Barium	T	mg/L	6020	0.0652		0.0453	*	0.0293		0.165	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.392		0.444	B	0.00901	J	0.0398	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	25.1		29.7		6.84		27.5	
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		0.00257		<0.001		0.0171	
7440-50-8	Copper	T	mg/L	6020	0.000512	J	0.000464	J	0.00123		0.000354	J
7439-89-6	Iron	T	mg/L	6020	<0.1		0.707		0.118		4.65	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	10.8		14.7		3.82		9.46	
7439-96-5	Manganese	T	mg/L	6020	0.00188	J	0.128		0.00177	J	0.251	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		<0.0005		<0.0005		0.000552	
7440-02-0	Nickel	T	mg/L	6020	<0.002		0.0104		0.00122	J	0.00241	
7440-09-7	Potassium	T	mg/L	6020	1.58		2.22		0.134	J	0.711	
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	36.9		41.7		33.6		84.5	
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		0.000098	J	0.00104	
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		0.00846	J	<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		0.00476	J	0.01	J	<0.01	
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	0.00189	J	<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	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
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	0.00439		0.0049		0.00072	J	0.00099	J

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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		<0.0000198		<0.0000195		<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	<0.099		<0.099		<0.104		<0.1	
12674-11-2	PCB-1016	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
11104-28-2	PCB-1221	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
11141-16-5	PCB-1232	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
53469-21-9	PCB-1242	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
12672-29-6	PCB-1248	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
11096-82-5	PCB-1260	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
11100-14-4	PCB-1268	T	ug/L	8082	<0.099		<0.099		<0.104		<0.1	
12587-46-1	Gross Alpha	T	pCi/L	9310	-0.193	*	1.91	*	-0.784	*	0.227	*
12587-47-2	Gross Beta	T	pCi/L	9310	26.8	*	29.2	*	4.46	*	-1.23	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.0617	*	0.852	*	0.534	*	0.245	*
10098-97-2	Strontium-90	T	pCi/L	905.0	4.68	*	-3.08	*	-0.529	*	1.36	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	41.2	*	42.8	*	0.558	*	4.99	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.15	*	0.684	*	-0.276	*	-0.0504	*
10028-17-8	Tritium	T	pCi/L	906.0	123	*	-3.85	*	68.2	*	154	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	37.6		35		34		26.7	
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	*	0.173	*J
S0268- -	Total Organic Carbon	T	mg/L	9060	0.578	J	0.819	J	1.28	J	2.06	
S0586- -	Total Organic Halides	T	mg/L	9020	0.00514	J	0.00392	J	0.0062	J	0.02	

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-4795	8004-0986	8004-4796	8004-4797								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	361	362	363	364								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA								
Sample Date and Time (Month/Day/Year hour: minutes)	7/16/2018 07:38	7/16/2018 08:17	7/17/2018 08:41	7/17/2018 10:04								
Duplicate ("Y" or "N") ²	N	N	N	N								
Split ("Y" or "N") ³	N	N	N	N								
Facility Sample ID Number (if applicable)	MW361UG4-18	MW362UG4-18	MW363UG4-18	MW364UG4-18								
Laboratory Sample ID Number (if applicable)	454677007	454677009	454816007	454816009								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/18/2018	7/18/2018	7/19/2018	7/19/2018								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.437		0.0863	J	0.145	J	0.421	
16887-00-6	Chloride(s)	T	mg/L	9056	37.1	*	5.76	*	23.2	*	35.6	*
16984-48-8	Fluoride	T	mg/L	9056	0.137		0.377		0.324		0.148	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.23		0.593		4.7		0.975	
14808-79-8	Sulfate	T	mg/L	9056	80.1	*	32.7	*	36.8		74.6	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	29.98		30		30.01		30.01	
S0145- -	Specific Conductance	T	µMHO/cm	Field	490		747		405		484	

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					361	362	363	364				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	326.4		338.97		326.23		325.43	
N238	Dissolved Oxygen	T	mg/L	Field	2.79		4.07		1.13		1.87	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	263		424		239	*	251	*
S0296- -	pH	T	Units	Field	5.59		6.5		5.66		5.58	
NS215	Eh	T	mV	Field	387		367		282		317	
S0907 - -	Temperature	T	°C	Field	18.56		18.94		20.5		21.17	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		0.219		<0.05		<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	0.0547		0.103		0.15	*	0.0621	*
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.343		0.0189		0.0594	B	0.0321	B
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	30.2		21		25		28.9	
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		0.000754	J	0.000393	J
7440-50-8	Copper	T	mg/L	6020	0.000814	J	0.00171		0.000304	J	0.0004	J
7439-89-6	Iron	T	mg/L	6020	<0.1		0.179		0.0653	J	0.0671	J
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	13.2		9.24		11		13.6	
7439-96-5	Manganese	T	mg/L	6020	0.00333	J	0.00238	J	0.168		0.0143	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361	362	363	364				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		0.000536		<0.0005		0.000411	J
7440-02-0	Nickel	T	mg/L	6020	<0.002		0.0011	J	0.00107	J	0.000906	J
7440-09-7	Potassium	T	mg/L	6020	1.83		0.338		1.39		1.99	
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	38.2		131		41.5		43.6	
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		0.00439		<0.0002		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		<0.01		<0.01		0.0334	
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	0.00254	J	<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	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361	362	363	364				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
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	0.00718		0.00115		0.00147		0.00612	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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		<0.0000196		<0.0000195		<0.0000194	
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4	Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3	PCB, Total	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
11104-28-2	PCB-1221	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
53469-21-9	PCB-1242	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361	362	363	364				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
11096-82-5	PCB-1260	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
11100-14-4	PCB-1268	T	ug/L	8082	<0.0962		<0.1		<0.102		<0.0962	
12587-46-1	Gross Alpha	T	pCi/L	9310	-2.34	*	0.0246	*	1.76	*	3.28	*
12587-47-2	Gross Beta	T	pCi/L	9310	28.2	*	3.17	*	6.93	*	23.4	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.294	*	0.398	*	-0.0127	*	0.364	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-3.41	*	-1.01	*	-0.771	*	0.688	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	43.2	*	-1.21	*	11.3	*	30.7	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.0421	*	0.469	*	0.781	*	-0.0867	*
10028-17-8	Tritium	T	pCi/L	906.0	124	*	29.6	*	-65	*	-51	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	41.3		24.9		21.8		65.2	
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	*	0.172	J	<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	0.688	J	2.28		0.807	J	0.731	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.0087	J	0.0185		0.007	J	0.0055	J

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-0984	8004-0982	8004-4793	8004-0983								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	365	366	367	368								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA								
Sample Date and Time (Month/Day/Year hour: minutes)	7/17/2018 09:21	7/17/2018 12:41	7/17/2018 12:00	7/18/2018 07:27								
Duplicate ("Y" or "N") ²	N	N	N	N								
Split ("Y" or "N") ³	N	N	N	N								
Facility Sample ID Number (if applicable)	MW365UG4-18	MW366UG4-18	MW367UG4-18	MW368UG4-18								
Laboratory Sample ID Number (if applicable)	454816011	454816001	454816013	454896003								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/19/2018	7/19/2018	7/19/2018	7/25/2018								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*	0.474			*	0.146	J
16887-00-6	Chloride(s)	T	mg/L	9056		*	40.1	*		*	9.21	*
16984-48-8	Fluoride	T	mg/L	9056		*	0.171			*	0.262	
S0595- -	Nitrate & Nitrite	T	mg/L	9056		*	1.04			*	0.0447	J
14808-79-8	Sulfate	T	mg/L	9056		*	69.3			*	200	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.01		30.01		30.01		30.03	
S0145- -	Specific Conductance	T	µMHO/cm	Field	427		510		347		830	

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					365	366	367	368				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	332.75		326.33		326.29		332.98	
N238	Dissolved Oxygen	T	mg/L	Field	2.8		2.17		3.07		5.49	
S0266- -	Total Dissolved Solids	T	mg/L	160.1		*	276	*		*	536	
S0296- -	pH	T	Units	Field	5.79		5.54		5.3		6.42	
NS215	Eh	T	mV	Field	284		250		306		389	
S0907 - -	Temperature	T	°C	Field	20.78		23.11		22.78		18.83	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05		0.441	
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		0.00216	J	0.00401	J
7440-39-3	Barium	T	mg/L	6020	0.108	*	0.112	*	0.173	*	0.0468	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.0194	B	0.295	B	0.038	B	0.00966	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	22.8		32.8		18.6		76.9	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00212		<0.001		0.014		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00322		0.000445	J	0.000446	J	0.0013	
7439-89-6	Iron	T	mg/L	6020	<0.1		0.0395	J	6.08		0.241	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	11.5		15.6		10.3		24.3	
7439-96-5	Manganese	T	mg/L	6020	0.0198		0.00749		1.49		0.00938	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		<0.0005		<0.0005		0.000975	
7440-02-0	Nickel	T	mg/L	6020	0.00544		0.000686	J	0.00527		0.00096	J
7440-09-7	Potassium	T	mg/L	6020	0.251	J	1.99		3.08		1.03	
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	49.3		44.9		27.1		61.4	
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	0.000195	J	<0.0002		<0.0002		0.000573	
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	0.00907	J	0.00403	J	0.0135		0.00578	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	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
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	0.00043	J	0.00575		0.00279		0.00055	J

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
100-41-4	Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6	2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4	Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1	Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5	Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2	Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1	Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8	Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000197		<0.0000197		<0.0000197		<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		*	<0.099			*	0.13	
12674-11-2	PCB-1016	T	ug/L	8082		*	<0.099			*	<0.0943	*
11104-28-2	PCB-1221	T	ug/L	8082		*	<0.099			*	<0.0943	
11141-16-5	PCB-1232	T	ug/L	8082		*	<0.099			*	<0.0943	
53469-21-9	PCB-1242	T	ug/L	8082		*	<0.099			*	0.13	
12672-29-6	PCB-1248	T	ug/L	8082		*	<0.099			*	<0.0943	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.099		*	<0.0943		
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.099		*	<0.0943		
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.099		*	<0.0943		
12587-46-1	Gross Alpha	T	pCi/L	9310	4.1	*	2.07	*	-0.203	*	8.37	*
12587-47-2	Gross Beta	T	pCi/L	9310	1.22	*	33.6	*	8.73	*	3.55	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.218	*	0.222	*	0.472	*	0.276	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-0.163	*	3.85	*	-0.408	*	-0.627	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	-6.87	*	46.8	*	1.73	*	-19.6	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.431	*	0.777	*	0.438	*	0.705	*
10028-17-8	Tritium	T	pCi/L	906.0	-29.1	*	10.1	*	-52.9	*	201	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4		*	14.3	J		*	19.4	*J
57-12-5	Cyanide	T	mg/L	9012		*	<0.2			*	<0.2	
20461-54-5	Iodide	T	mg/L	300.0		*	<0.5			*	<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060		*	0.735	J		*	2.06	B
S0586- -	Total Organic Halides	T	mg/L	9020		*	<0.01			*	0.00488	J

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-4820	8004-4818	8004-4819	8004-4808								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	369	370	371	372								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA								
Sample Date and Time (Month/Day/Year hour: minutes)	7/18/2018 12:39	7/18/2018 14:09	7/18/2018 13:22	7/18/2018 09:07								
Duplicate ("Y" or "N") ²	N	N	N	N								
Split ("Y" or "N") ³	N	N	N	N								
Facility Sample ID Number (if applicable)	MW369UG4-18	MW370UG4-18	MW371UG4-18	MW372UG4-18								
Laboratory Sample ID Number (if applicable)	454896005	454896007	454896009	454896011								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/25/2018	7/25/2018	7/25/2018	7/25/2018								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	UP	UP								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.397		0.371		<0.2		0.614	
16887-00-6	Chloride(s)	T	mg/L	9056	36.1	*	36	*	1.8	*	46.6	*
16984-48-8	Fluoride	T	mg/L	9056	0.221		0.172		0.219		0.125	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.59		1.1		<0.4		0.336	
14808-79-8	Sulfate	T	mg/L	9056	6.71		21.5		47.7		81.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.03		30.02		30.03		30.05	
S0145- -	Specific Conductance	T	µMHO/cm	Field	372		427		512		597	

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819	8004-4808				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					369	370	371	372				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	327.38		327.35		343.22		327.37	
N238	Dissolved Oxygen	T	mg/L	Field	2.46		3.36		4.89		0.88	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	197		179		306		323	
S0296- -	pH	T	Units	Field	6.19		6.09		6.54		6.13	
NS215	Eh	T	mV	Field	338		369		342		371	
S0907 - -	Temperature	T	°C	Field	21.44		20.83		20.78		20.28	
7429-90-5	Aluminum	T	mg/L	6020	0.0345	J	<0.05		0.355		0.0361	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		0.00268	J	<0.005	
7440-39-3	Barium	T	mg/L	6020	0.373		0.209		0.0603		0.101	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.0133	J	0.031		0.0121	J	0.474	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	15.6		26.2		58.4		38.4	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00501		0.000325	J	<0.001		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00165		0.00091	J	0.00167		0.00136	
7439-89-6	Iron	T	mg/L	6020	0.0807	J	<0.1		0.222		0.22	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	6.5		11.1		11.3		16.2	
7439-96-5	Manganese	T	mg/L	6020	0.00736		0.00167	J	0.00419	J	0.00372	J
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819	8004-4808				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370	371	372				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		<0.0005		0.000418	J	<0.0005	
7440-02-0	Nickel	T	mg/L	6020	0.0091		<0.002		0.00126	J	<0.002	
7440-09-7	Potassium	T	mg/L	6020	0.509		2.37		0.673		1.76	
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	48.8		38.1		31.2		39	
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		0.000731		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		0.00374	J	<0.01	
7440-66-6	Zinc	T	mg/L	6020	0.00393	J	0.0042	J	0.00492	J	0.00541	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		0.00423	J	0.00809		0.00725	
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	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819	8004-4808				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370	371	372				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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	0.00076	J	0.00079	J	<0.001		0.00532	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819	8004-4808				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370	371	372				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
100-41-4	Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6	2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4	Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1	Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5	Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2	Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1	Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8	Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000197		<0.0000197		<0.0000196		<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	0.0402	J	<0.0962		<0.0952		<0.0952	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0962	*	<0.0962	*	<0.0952	*	<0.0952	*
11104-28-2	PCB-1221	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	
53469-21-9	PCB-1242	T	ug/L	8082	0.0402	J	<0.0962		<0.0952		<0.0952	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819	8004-4808				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370	371	372				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	
11096-82-5	PCB-1260	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	
11100-14-4	PCB-1268	T	ug/L	8082	<0.0962		<0.0962		<0.0952		<0.0952	
12587-46-1	Gross Alpha	T	pCi/L	9310	-1.52	*	8.3	*	14.1	*	10.5	*
12587-47-2	Gross Beta	T	pCi/L	9310	14.9	*	102	*	4.53	*	27.7	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	-0.0135	*	0.484	*	0.174	*	0.527	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-0.265	*	1.63	*	0.597	*	0.975	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	31.4	*	96.2	*	6.52	*	70.9	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.213	*	0.22	*	0.727	*	-0.212	*
10028-17-8	Tritium	T	pCi/L	906.0	157	*	193	*	117	*	85.4	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	14.5	*J	19.4	*J	19.4	*J	39.1	*
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		0.169	J
S0268- -	Total Organic Carbon	T	mg/L	9060	1.47	BJ	1.3	BJ	1.88	BJ	1.2	BJ
S0586- -	Total Organic Halides	T	mg/L	9020	0.0133		0.0125		0.00552	J	0.00954	J

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-4792	8004-0990	8004-0985	8004-0988								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	373	374	375	376								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	NA	NA	NA								
Sample Date and Time (Month/Day/Year hour: minutes)	7/18/2018 11:53	7/18/2018 09:50	7/18/2018 08:16	NA								
Duplicate ("Y" or "N") ²	N	N	N	N								
Split ("Y" or "N") ³	N	N	N	N								
Facility Sample ID Number (if applicable)	MW373UG4-18	MW374UG4-18	MW375UG4-18	NA								
Laboratory Sample ID Number (if applicable)	454896013	454896015	454896001	NA								
Date of Analysis (Month/Day/Year) For <u>Volatiles Organics</u> Analysis	7/25/2018	7/25/2018	7/25/2018	NA								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	SIDE	SIDE								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.573		0.742		<0.2			*
16887-00-6	Chloride(s)	T	mg/L	9056	45	*	66	*	4.74	*		*
16984-48-8	Fluoride	T	mg/L	9056	0.178		0.189		0.291			*
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.2		<0.1		1.27			*
14808-79-8	Sulfate	T	mg/L	9056	81.3		7.69		25.9			*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.03		30.05		30.03			*
S0145- -	Specific Conductance	T	µMH0/cm	Field	622		667		340			*

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					373	374	375	376				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	327.32		338.48		336.64			*
N238	Dissolved Oxygen	T	mg/L	Field	2.52		0.52		2.23			*
S0266- -	Total Dissolved Solids	T	mg/L	160.1	340		351		181			*
S0296- -	pH	T	Units	Field	6.14		6.7		6.47			*
NS215	Eh	T	mV	Field	318		269		373			*
S0907 - -	Temperature	T	°C	Field	21.17		20.72		19.17			*
7429-90-5	Aluminum	T	mg/L	6020	<0.05		<0.05		0.031	J		*
7440-36-0	Antimony	T	mg/L	6020	<0.003		<0.003		<0.003			*
7440-38-2	Arsenic	T	mg/L	6020	<0.005		0.00207	J	<0.005			*
7440-39-3	Barium	T	mg/L	6020	0.0308		0.145		0.167			*
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8	Boron	T	mg/L	6020	1.62		0.0129	J	0.0117	J		*
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2	Calcium	T	mg/L	6020	49.3		19.9		13.1			*
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4	Cobalt	T	mg/L	6020	<0.001		0.00303		<0.001			*
7440-50-8	Copper	T	mg/L	6020	0.000523	J	0.000443	J	0.000647	J		*
7439-89-6	Iron	T	mg/L	6020	<0.1		1.08		0.0381	J		*
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002			*
7439-95-4	Magnesium	T	mg/L	6020	18		5.09		5.51			*
7439-96-5	Manganese	T	mg/L	6020	0.00263	J	0.733		0.00224	J		*
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002			*

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	374	375	376				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-02-0	Nickel	T	mg/L	6020	<0.002		0.00205		0.000895	J		*
7440-09-7	Potassium	T	mg/L	6020	2.19		0.401		0.272	J		*
7440-16-6	Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005			*
7782-49-2	Selenium	T	mg/L	6020	<0.005		<0.005		0.00228	J		*
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5	Sodium	T	mg/L	6020	40.9		109		53			*
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		0.000221		0.00009	J		*
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		0.00435	J		*
7440-66-6	Zinc	T	mg/L	6020	0.00413	J	<0.01		0.00549	J		*
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		0.00366	J		*
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			*

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	374	375	376				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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	0.00553		<0.001		0.00039	J		*

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	374	375	376				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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		<0.0000194		<0.0000196			*
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-69-4	Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			*
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
1336-36-3	PCB, Total	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
12674-11-2	PCB-1016	T	ug/L	8082	<0.0943	*	<0.0952	*	<0.0952	*		*
11104-28-2	PCB-1221	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
11141-16-5	PCB-1232	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
53469-21-9	PCB-1242	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
12672-29-6	PCB-1248	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	374	375	376				
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
11096-82-5	PCB-1260	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
11100-14-4	PCB-1268	T	ug/L	8082	<0.0943		<0.0952		<0.0952			*
12587-46-1	Gross Alpha	T	pCi/L	9310	6.23	*	5.44	*	5.5	*		*
12587-47-2	Gross Beta	T	pCi/L	9310	30.6	*	-3.46	*	4.97	*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.108	*	0.729	*	0.558	*		*
10098-97-2	Strontium-90	T	pCi/L	905.0	0.994	*	1.41	*	1.29	*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	-15.9	*	-2.44	*	-2.38	*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.306	*	0.679	*	0.301	*		*
10028-17-8	Tritium	T	pCi/L	906.0	190	*	70.2	*	79.1	*		*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	30.9	*	19.4	*J	19.4	*J		*
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	1.14	BJ	2.59	B	1.18	BJ		*
S0586- -	Total Organic Halides	T	mg/L	9020	0.0199		0.0202		0.006	J		*

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	8004-0989	0000-0000	0000-0000	0000-0000								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	377	E. BLANK	F. BLANK	T. BLANK 1								
Sample Sequence #	1	1	1	1								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA	E	F	T								
Sample Date and Time (Month/Day/Year hour: minutes)	NA	7/17/2018 06:45	7/17/2018 07:35	7/16/2018 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)	NA	RI1UG4-18	FB1UG4-18	TB2UG4-18								
Laboratory Sample ID Number (if applicable)	NA	454816016	454816015	454677011								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	NA	7/20/2018	7/20/2018	7/18/2018								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	SIDE	NA	NA	NA								
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHO D	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
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		*		*		*		*

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					377	E. BLANK	F. BLANK	T. BLANK 1				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		*
N238	Dissolved Oxygen	T	mg/L	Field		*		*		*		*
S0266- -	Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -	pH	T	Units	Field		*		*		*		*
NS215	Eh	T	mV	Field		*		*		*		*
S0907 - -	Temperature	T	°C	Field		*		*		*		*
7429-90-5	Aluminum	T	mg/L	6020		*	<0.05		<0.05			*
7440-36-0	Antimony	T	mg/L	6020		*	<0.003		<0.003			*
7440-38-2	Arsenic	T	mg/L	6020		*	<0.005		<0.005			*
7440-39-3	Barium	T	mg/L	6020		*	<0.002	*	<0.002	*		*
7440-41-7	Beryllium	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-42-8	Boron	T	mg/L	6020		*	0.00858	BJ	0.0101	BJ		*
7440-43-9	Cadmium	T	mg/L	6020		*	<0.001		<0.001			*
7440-70-2	Calcium	T	mg/L	6020		*	<0.2		<0.2			*
7440-47-3	Chromium	T	mg/L	6020		*	<0.01		<0.01			*
7440-48-4	Cobalt	T	mg/L	6020		*	<0.001		<0.001			*
7440-50-8	Copper	T	mg/L	6020		*	<0.001		<0.001			*
7439-89-6	Iron	T	mg/L	6020		*	<0.1		<0.1			*
7439-92-1	Lead	T	mg/L	6020		*	<0.002		<0.002			*
7439-95-4	Magnesium	T	mg/L	6020		*	<0.03		<0.03			*
7439-96-5	Manganese	T	mg/L	6020		*	<0.005		<0.005			*
7439-97-6	Mercury	T	mg/L	7470		*	<0.0002		<0.0002			*

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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 - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK	F. BLANK	T. BLANK 1				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-02-0	Nickel	T	mg/L	6020		*	<0.002		<0.002			*
7440-09-7	Potassium	T	mg/L	6020		*	<0.3		<0.3			*
7440-16-6	Rhodium	T	mg/L	6020		*	<0.005		<0.005			*
7782-49-2	Selenium	T	mg/L	6020		*	<0.005		<0.005			*
7440-22-4	Silver	T	mg/L	6020		*	<0.001		<0.001			*
7440-23-5	Sodium	T	mg/L	6020		*	<0.25		<0.25			*
7440-25-7	Tantalum	T	mg/L	6020		*	<0.005		<0.005			*
7440-28-0	Thallium	T	mg/L	6020		*	<0.002		<0.002			*
7440-61-1	Uranium	T	mg/L	6020		*	<0.0002		<0.0002			*
7440-62-2	Vanadium	T	mg/L	6020		*	<0.01		<0.01			*
7440-66-6	Zinc	T	mg/L	6020		*	<0.01		<0.01			*
108-05-4	Vinyl acetate	T	mg/L	8260		*	<0.005	*	<0.005	*	<0.005	*
67-64-1	Acetone	T	mg/L	8260		*	0.00663		0.00518		0.00783	
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	

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

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

C-36

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK	F. BLANK	T. BLANK 1				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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		*	<0.0000198		<0.0000196		<0.0000196	
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-69-4	Trichlorofluoromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1336-36-3	PCB, Total	T	ug/L	8082		*	<0.1		<0.0962			*
12674-11-2	PCB-1016	T	ug/L	8082		*	<0.1		<0.0962			*
11104-28-2	PCB-1221	T	ug/L	8082		*	<0.1		<0.0962			*
11141-16-5	PCB-1232	T	ug/L	8082		*	<0.1		<0.0962			*
53469-21-9	PCB-1242	T	ug/L	8082		*	<0.1		<0.0962			*
12672-29-6	PCB-1248	T	ug/L	8082		*	<0.1		<0.0962			*

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK	F. BLANK	T. BLANK 1				
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.1		<0.0962			*
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.1		<0.0962			*
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.1		<0.0962			*
12587-46-1	Gross Alpha	T	pCi/L	9310		*	-1.85	*	0.783	*		*
12587-47-2	Gross Beta	T	pCi/L	9310		*	2.17	*	-4.03	*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300		*	0.202	*	0.0763	*		*
10098-97-2	Strontium-90	T	pCi/L	905.0		*	0.325	*	1.96	*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*	-7.26	*	0.435	*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*	0.107	*	0.641	*		*
10028-17-8	Tritium	T	pCi/L	906.0		*	64.1	*	10.7	*		*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4		*		*		*		*
57-12-5	Cyanide	T	mg/L	9012		*		*		*		*
20461-54-5	Iodide	T	mg/L	300.0		*	<0.5		<0.5			*
S0268- -	Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number	0000-0000	0000-0000	8004-4799									
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	T. BLANK 2	T. BLANK 3	358									
Sample Sequence #	1	1	2									
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	T	T	NA									
Sample Date and Time (Month/Day/Year hour: minutes)	7/17/2018 06:40	7/18/2018 06:30	7/17/2018 07:33									
Duplicate ("Y" or "N") ²	N	N	Y									
Split ("Y" or "N") ³	N	N	N									
Facility Sample ID Number (if applicable)	TB3UG4-18	TB4UG4-18	MW358DUG4-18									
Laboratory Sample ID Number (if applicable)	454816017	454896017	454816003									
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/20/2018	7/25/2018	7/19/2018									
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	NA	NA	DOWN									
CAS RN ⁴	CONSTITUENT	T D S ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*		*	0.447			
16887-00-6	Chloride(s)	T	mg/L	9056		*		*	38.7	*		
16984-48-8	Fluoride	T	mg/L	9056		*		*	0.168			
S0595- -	Nitrate & Nitrite	T	mg/L	9056		*		*	1.08			
14808-79-8	Sulfate	T	mg/L	9056		*		*	64.3			
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field		*		*	30			
S0145- -	Specific Conductance	T	µMH0/cm	Field		*		*	484			

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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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4799					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					T. BLANK 2	T. BLANK 3	358					
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field		*		*	326.41			
N238	Dissolved Oxygen	T	mg/L	Field		*		*	0.87			
S0266- -	Total Dissolved Solids	T	mg/L	160.1		*		*	259	*		
S0296- -	pH	T	Units	Field		*		*	5.66			
NS215	Eh	T	mV	Field		*		*	282			
S0907 - -	Temperature	T	°C	Field		*		*	20.17			
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		*		*	0.0452	*		
7440-41-7	Beryllium	T	mg/L	6020		*		*	<0.0005			
7440-42-8	Boron	T	mg/L	6020		*		*	0.483	B		
7440-43-9	Cadmium	T	mg/L	6020		*		*	<0.001			
7440-70-2	Calcium	T	mg/L	6020		*		*	30.2			
7440-47-3	Chromium	T	mg/L	6020		*		*	<0.01			
7440-48-4	Cobalt	T	mg/L	6020		*		*	0.00239			
7440-50-8	Copper	T	mg/L	6020		*		*	0.00046	J		
7439-89-6	Iron	T	mg/L	6020		*		*	0.713			
7439-92-1	Lead	T	mg/L	6020		*		*	<0.002			
7439-95-4	Magnesium	T	mg/L	6020		*		*	14.9			
7439-96-5	Manganese	T	mg/L	6020		*		*	0.122			
7439-97-6	Mercury	T	mg/L	7470		*		*	<0.0002			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4799					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	358					
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020		*		*	<0.0005			
7440-02-0	Nickel	T	mg/L	6020		*		*	0.0102			
7440-09-7	Potassium	T	mg/L	6020		*		*	2.27			
7440-16-6	Rhodium	T	mg/L	6020		*		*	<0.005			
7782-49-2	Selenium	T	mg/L	6020		*		*	<0.005			
7440-22-4	Silver	T	mg/L	6020		*		*	<0.001			
7440-23-5	Sodium	T	mg/L	6020		*		*	42			
7440-25-7	Tantalum	T	mg/L	6020		*		*	<0.005			
7440-28-0	Thallium	T	mg/L	6020		*		*	<0.002			
7440-61-1	Uranium	T	mg/L	6020		*		*	<0.0002			
7440-62-2	Vanadium	T	mg/L	6020		*		*	<0.01			
7440-66-6	Zinc	T	mg/L	6020		*		*	0.00452	J		
108-05-4	Vinyl acetate	T	mg/L	8260	<0.005	*	<0.005		<0.005	*		
67-64-1	Acetone	T	mg/L	8260	0.00615		<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			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4799					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	358					
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001			
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001			
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001			
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001		<0.001		0.00409			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4799					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	358					
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
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		<0.0000197		<0.0000194			
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
75-69-4	Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		0.00037	J	<0.001			
1336-36-3	PCB, Total	T	ug/L	8082		*		*	<0.101			
12674-11-2	PCB-1016	T	ug/L	8082		*		*	<0.101			
11104-28-2	PCB-1221	T	ug/L	8082		*		*	<0.101			
11141-16-5	PCB-1232	T	ug/L	8082		*		*	<0.101			
53469-21-9	PCB-1242	T	ug/L	8082		*		*	<0.101			
12672-29-6	PCB-1248	T	ug/L	8082		*		*	<0.101			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4799					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	358					
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*	<0.101			
11096-82-5	PCB-1260	T	ug/L	8082		*		*	<0.101			
11100-14-4	PCB-1268	T	ug/L	8082		*		*	<0.101			
12587-46-1	Gross Alpha	T	pCi/L	9310		*		*	0.286	*		
12587-47-2	Gross Beta	T	pCi/L	9310		*		*	24.1	*		
10043-66-0	Iodine-131	T	pCi/L			*		*		*		
13982-63-3	Radium-226	T	pCi/L	HASL 300		*		*	0.0537	*		
10098-97-2	Strontium-90	T	pCi/L	905.0		*		*	-1.05	*		
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*		*	34.4	*		
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*		*	0.811	*		
10028-17-8	Tritium	T	pCi/L	906.0		*		*	18.4	*		
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4		*		*	25.6			
57-12-5	Cyanide	T	mg/L	9012		*		*	<0.2			
20461-54-5	Iodide	T	mg/L	300.0		*		*	<0.5			
S0268- -	Total Organic Carbon	T	mg/L	9060		*		*	0.792	J		
S0586- -	Total Organic Halides	T	mg/L	9020		*		*	0.00416	J		

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RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Vinyl acetate	LY1	LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.4. Rad error is 3.39.
		Gross beta		TPU is 9.71. Rad error is 8.68.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.277. Rad error is 0.277.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.4. Rad error is 3.32.
		Technetium-99		TPU is 12.8. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.756. Rad error is 0.754.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. Rad error is 115.
		Iodide	W	Post-digestion spike recovery out of control limits.
		8004-4799 MW358	MW358UG4-18	Chloride
Total Dissolved Solids	*			Duplicate analysis not within control limits.
Barium	E			Result estimated due to matrix interferences.
Vinyl acetate	L			LCS or LCSD recovery outside of control limits
Gross alpha	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.77. Rad error is 5.76.
Gross beta				TPU is 9.18. Rad error is 7.85.
Iodine-131				Analysis of constituent not required and not performed.
Radium-226	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.711. Rad error is 0.703.
Strontium-90	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.97. Rad error is 3.97.
Technetium-99				TPU is 11.6. Rad error is 10.6.
Thorium-230	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.915. Rad error is 0.904.
Tritium	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 144. Rad error is 144.

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LAB ID: None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0981 MW359	MW359UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Vinyl acetate	LY1	LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.59. Rad error is 2.59.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.99. Rad error is 7.96.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.57. Rad error is 0.567.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.28. Rad error is 2.28.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.9. Rad error is 10.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.353. Rad error is 0.352.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 118. Rad error is 117.
		Iodide	W	Post-digestion spike recovery out of control limits.
		8004-4800 MW360	MW360UG4-18	Chloride
Sulfate	W			Post-digestion spike recovery out of control limits.
Vinyl acetate	LY1			LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
Gross alpha	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.57. Rad error is 3.57.
Gross beta	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.62. Rad error is 5.62.
Iodine-131				Analysis of constituent not required and not performed.
Radium-226	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.494. Rad error is 0.494.
Strontium-90	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.74. Rad error is 1.73.
Technetium-99	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.8. Rad error is 10.7.
Thorium-230	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.609. Rad error is 0.608.
Tritium	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 121.
Iodide	W			Post-digestion spike recovery out of control limits.

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LAB ID: None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4795 MW361	MW361UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Vinyl acetate	LY1	LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.42. Rad error is 3.41.
		Gross beta		TPU is 9.79. Rad error is 8.66.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.442. Rad error is 0.441.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.68. Rad error is 2.68.
		Technetium-99		TPU is 12.5. Rad error is 11.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.759. Rad error is 0.757.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 120. Rad error is 118.
		Iodide	W	Post-digestion spike recovery out of control limits.
		8004-0986 MW362	MW362UG4-18	Chloride
Sulfate	W			Post-digestion spike recovery out of control limits.
Vinyl acetate	LY1			LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
Gross alpha	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.8. Rad error is 4.8.
Gross beta	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.69. Rad error is 6.67.
Iodine-131				Analysis of constituent not required and not performed.
Radium-226	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.402. Rad error is 0.397.
Strontium-90	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.95. Rad error is 1.95.
Technetium-99	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.8. Rad error is 10.8.
Thorium-230	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.804. Rad error is 0.796.
Tritium	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 112. Rad error is 111.
Iodide	W			Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.16. Rad error is 5.15.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.04. Rad error is 5.93.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.454. Rad error is 0.454.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.95. Rad error is 1.95.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.6. Rad error is 8.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.856. Rad error is 0.843.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
		8004-4797 MW364	MW364UG4-18	Chloride
Total Dissolved Solids	*			Duplicate analysis not within control limits.
Barium	E			Result estimated due to matrix interferences.
Vinyl acetate	L			LCS or LCSD recovery outside of control limits
Gross alpha	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.91. Rad error is 4.87.
Gross beta				TPU is 8.4. Rad error is 7.44.
Iodine-131				Analysis of constituent not required and not performed.
Radium-226	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.37. Rad error is 0.363.
Strontium-90	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.52. Rad error is 2.52.
Technetium-99				TPU is 10.3. Rad error is 9.68.
Thorium-230	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.863. Rad error is 0.862.
Tritium	U			Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG4-18	Bromide		A resample was collected - sample shipment delayed by FedEx.
		Chloride		A resample was collected - sample shipment delayed by FedEx.
		Fluoride		A resample was collected - sample shipment delayed by FedEx.
		Nitrate & Nitrite		A resample was collected - sample shipment delayed by FedEx.
		Sulfate		A resample was collected - sample shipment delayed by FedEx.
		Total Dissolved Solids		A resample was collected - sample shipment delayed by FedEx.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		PCB, Total		A resample was collected - sample shipment delayed by FedEx.
		PCB-1016		A resample was collected - sample shipment delayed by FedEx.
		PCB-1221		A resample was collected - sample shipment delayed by FedEx.
		PCB-1232		A resample was collected - sample shipment delayed by FedEx.
		PCB-1242		A resample was collected - sample shipment delayed by FedEx.
		PCB-1248		A resample was collected - sample shipment delayed by FedEx.
		PCB-1254		A resample was collected - sample shipment delayed by FedEx.
		PCB-1260		A resample was collected - sample shipment delayed by FedEx.
		PCB-1268		A resample was collected - sample shipment delayed by FedEx.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.37. Rad error is 5.33.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.89. Rad error is 4.88.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.317. Rad error is 0.313.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.68. Rad error is 1.68.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.79. Rad error is 8.79.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.893. Rad error is 0.887.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		A resample was collected - sample shipment delayed by FedEx.
		Iodide		A resample was collected - sample shipment delayed by FedEx.
		Total Organic Carbon		A resample was collected - sample shipment delayed by FedEx.
		Total Organic Halides		A resample was collected - sample shipment delayed by FedEx.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0982 MW366	MW366UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.8. Rad error is 5.79.
		Gross beta		TPU is 9.84. 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 0.448. Rad error is 0.448.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.61. Rad error is 3.56.
		Technetium-99		TPU is 17.6. Rad error is 16.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.865. Rad error is 0.851.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 140. Rad error is 140.

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LAB ID: None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG4-18	Bromide		A resample was collected - sample shipment delayed by FedEx.
		Chloride		A resample was collected - sample shipment delayed by FedEx.
		Fluoride		A resample was collected - sample shipment delayed by FedEx.
		Nitrate & Nitrite		A resample was collected - sample shipment delayed by FedEx.
		Sulfate		A resample was collected - sample shipment delayed by FedEx.
		Total Dissolved Solids		A resample was collected - sample shipment delayed by FedEx.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		PCB, Total		A resample was collected - sample shipment delayed by FedEx.
		PCB-1016		A resample was collected - sample shipment delayed by FedEx.
		PCB-1221		A resample was collected - sample shipment delayed by FedEx.
		PCB-1232		A resample was collected - sample shipment delayed by FedEx.
		PCB-1242		A resample was collected - sample shipment delayed by FedEx.
		PCB-1248		A resample was collected - sample shipment delayed by FedEx.
		PCB-1254		A resample was collected - sample shipment delayed by FedEx.
		PCB-1260		A resample was collected - sample shipment delayed by FedEx.
		PCB-1268		A resample was collected - sample shipment delayed by FedEx.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.58. Rad error is 3.58.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.36. Rad error is 6.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.442. Rad error is 0.424.
		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 9.13. Rad error is 9.13.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.764. Rad error is 0.757.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
		Chemical Oxygen Demand		A resample was collected - sample shipment delayed by FedEx.
		Cyanide		A resample was collected - sample shipment delayed by FedEx.
		Iodide		A resample was collected - sample shipment delayed by FedEx.
		Total Organic Carbon		A resample was collected - sample shipment delayed by FedEx.
		Total Organic Halides		A resample was collected - sample shipment delayed by FedEx.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0983 MW368	MW368UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.1. Rad error is 6.96.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.46. Rad error is 5.43.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.414. Rad error is 0.414.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.94. Rad error is 1.94.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 28.9. Rad error is 28.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.894. Rad error is 0.881.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 125.
8004-4820 MW369	MW369UG4-18	Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.43. Rad error is 4.43.
		Gross beta		TPU is 7.35. Rad error is 6.94.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.486. Rad error is 0.486.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.38. Rad error is 2.38.
		Technetium-99		TPU is 18.4. Rad error is 18.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.666. Rad error is 0.663.
8004-4818 MW370	MW370UG4-18	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.13. Rad error is 6.99.
		Gross beta		TPU is 21.1. Rad error is 13.1.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.709. Rad error is 0.707.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.72. Rad error is 1.7.
		Technetium-99		TPU is 21.7. Rad error is 18.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.864. Rad error is 0.862.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4819 MW371	MW371UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha		TPU is 8.35. Rad error is 8.02.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.83. Rad error is 6.78.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.438. Rad error is 0.437.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.59. Rad error is 1.59.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 18. Rad error is 18.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.84. Rad error is 0.828.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 120. Rad error is 118.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4808 MW372	MW372UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha		TPU is 7.63. Rad error is 7.44.
		Gross beta		TPU is 8.9. Rad error is 7.64.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.857. Rad error is 0.852.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.41. Rad error is 1.4.
		Technetium-99		TPU is 34.4. Rad error is 33.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.448. Rad error is 0.446.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 109. Rad error is 108.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4792 MW373	MW373UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.31. Rad error is 8.25.
		Gross beta		TPU is 10.6. Rad error is 9.24.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.417. Rad error is 0.417.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.66. Rad error is 1.65.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 18.2. Rad error is 18.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.833. Rad error is 0.829.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 120.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0990 MW374	MW374UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.39. Rad error is 8.34.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.19. Rad error is 7.19.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.93. Rad error is 0.914.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2. Rad error is 1.99.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.67. Rad error is 8.67.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.891. Rad error is 0.88.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. Rad error is 116.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-0985 MW375	MW375UG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		PCB-1016	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.37. Rad error is 6.31.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.6. Rad error is 5.54.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.541. Rad error is 0.54.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.63. Rad error is 2.62.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 23.5. Rad error is 23.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.75. Rad error is 0.746.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. Rad error is 116.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

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

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

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

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG4-18	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.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.88. Rad error is 2.87.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.27. Rad error is 5.26.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.399. Rad error is 0.393.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.23. Rad error is 2.23.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.27. Rad error is 9.27.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.614. Rad error is 0.612.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 142. Rad error is 141.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
Total Organic Halides		Analysis of constituent not required and not performed.		

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG4-18	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.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.1. Rad error is 5.1.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.13. Rad error is 5.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.343. Rad error is 0.342.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.72. Rad error is 2.7.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.14. Rad error is 9.14.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.852. Rad error is 0.841.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 142. Rad error is 142.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

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

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-18	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.		
Vanadium		Analysis of constituent not required and not performed.		

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-18	Zinc		Analysis of constituent not required and not performed.
		Vinyl acetate	LY1	LCS or LCSD recovery outside of control limits AND 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.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG4-18	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.
		Vanadium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG4-18	Zinc		Analysis of constituent not required and not performed.
		Vinyl acetate	L	LCS or LCSD recovery outside of 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		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

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

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4UG4-18	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.
		Vanadium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4UG4-18	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.		
8004-4799 MW358	MW358DUG4-18	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Barium	E	Result estimated due to matrix interferences.
		Vinyl acetate	L	LCS or LCSD recovery outside of control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.39. Rad error is 5.36.
		Gross beta		TPU is 10.1. Rad error is 9.33.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.241. Rad error is 0.241.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.7. Rad error is 2.7.
		Technetium-99		TPU is 10.7. Rad error is 10.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.939. Rad error is 0.924.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.

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

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

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

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-4793						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	367						
Sample Sequence #					1	1						
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA						
Sample Date and Time (Month/Day/Year hour: minutes)					7/19/2018 12:00	7/19/2018 12:33						
Duplicate ("Y" or "N") ²					N	N						
Split ("Y" or "N") ³					N	N						
Facility Sample ID Number (if applicable)					MW365UG4-18R	MW367UG4-18R						
Laboratory Sample ID Number (if applicable)					455034001	455034002						
Date of Analysis (Month/Day/Year) For <u>Volatiles Organics</u> Analysis												
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN						
CAS RN ⁴	CONSTITUENT	T D S ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056	<0.2		0.322			*		*
16887-00-6	Chloride(s)	T	mg/L	9056	3.57	*	25.9	*		*		*
16984-48-8	Fluoride	T	mg/L	9056	0.295		0.112			*		*
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.599		<0.4			*		*
14808-79-8	Sulfate	T	mg/L	9056	64.1		39			*		*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	29.94		29.94			*		*
S0145- -	Specific Conductance	T	µMH0/cm	Field	480		360			*		*

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

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical 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.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-4793						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					365	367						
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	331.72		326.27			*		*
N238	Dissolved Oxygen	T	mg/L	Field	2.62		0.96			*		*
S0266- -	Total Dissolved Solids	T	mg/L	160.1	274		179			*		*
S0296- -	pH	T	Units	Field	6.15		5.93			*		*
NS215	Eh	T	mV	Field	429		310			*		*
S0907 - -	Temperature	T	°C	Field	19.83		20.22			*		*
7429-90-5	Aluminum	T	mg/L	6020		*		*		*		*
7440-36-0	Antimony	T	mg/L	6020		*		*		*		*
7440-38-2	Arsenic	T	mg/L	6020		*		*		*		*
7440-39-3	Barium	T	mg/L	6020		*		*		*		*
7440-41-7	Beryllium	T	mg/L	6020		*		*		*		*
7440-42-8	Boron	T	mg/L	6020		*		*		*		*
7440-43-9	Cadmium	T	mg/L	6020		*		*		*		*
7440-70-2	Calcium	T	mg/L	6020		*		*		*		*
7440-47-3	Chromium	T	mg/L	6020		*		*		*		*
7440-48-4	Cobalt	T	mg/L	6020		*		*		*		*
7440-50-8	Copper	T	mg/L	6020		*		*		*		*
7439-89-6	Iron	T	mg/L	6020		*		*		*		*
7439-92-1	Lead	T	mg/L	6020		*		*		*		*
7439-95-4	Magnesium	T	mg/L	6020		*		*		*		*
7439-96-5	Manganese	T	mg/L	6020		*		*		*		*
7439-97-6	Mercury	T	mg/L	7470		*		*		*		*

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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 - (Cont.)

C-73

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984		8004-4793					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		367					
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
100-41-4	Ethylbenzene	T	mg/L	8260		*		*		*		*
591-78-6	2-Hexanone	T	mg/L	8260		*		*		*		*
74-88-4	Iodomethane	T	mg/L	8260		*		*		*		*
124-48-1	Methane, Dibromochloro-	T	mg/L	8260		*		*		*		*
56-23-5	Carbon Tetrachloride	T	mg/L	8260		*		*		*		*
75-09-2	Dichloromethane	T	mg/L	8260		*		*		*		*
108-10-1	Methyl isobutyl ketone	T	mg/L	8260		*		*		*		*
96-12-8	Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011		*		*		*		*
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260		*		*		*		*
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260		*		*		*		*
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260		*		*		*		*
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260		*		*		*		*
75-69-4	Trichlorofluoromethane	T	mg/L	8260		*		*		*		*
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260		*		*		*		*
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260		*		*		*		*
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260		*		*		*		*
1336-36-3	PCB, Total	T	ug/L	8082	0.122		<0.0962			*		*
12674-11-2	PCB-1016	T	ug/L	8082	<0.0943		<0.0962			*		*
11104-28-2	PCB-1221	T	ug/L	8082	<0.0943		<0.0962			*		*
11141-16-5	PCB-1232	T	ug/L	8082	<0.0943		<0.0962			*		*
53469-21-9	PCB-1242	T	ug/L	8082	0.122		<0.0962			*		*
12672-29-6	PCB-1248	T	ug/L	8082	<0.0943		<0.0962			*		*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984		8004-4793					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		367					
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S						
11097-69-1	PCB-1254	T	ug/L	8082	<0.0943		<0.0962			*		*
11096-82-5	PCB-1260	T	ug/L	8082	<0.0943		<0.0962			*		*
11100-14-4	PCB-1268	T	ug/L	8082	<0.0943		<0.0962			*		*
12587-46-1	Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2	Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2	Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8	Tritium	T	pCi/L	906.0		*		*		*		*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	17.8	BJ	24.3	B		*		*
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2			*		*
20461-54-5	Iodide	T	mg/L	300.0	0.168	*J	0.182	*J		*		*
S0268- -	Total Organic Carbon	T	mg/L	9060	1.89	BJ	0.468	J		*		*
S0586- -	Total Organic Halides	T	mg/L	9020	0.0218		0.00478	J		*		*

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RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG4-18R	Chloride	W	Post-digestion spike recovery out of control limits.
		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.
		Ethylbenzene		Analysis of constituent not required and not performed.
		2-Hexanone		Analysis of constituent not required and not performed.
		Iodomethane		Analysis of constituent not required and not performed.
		Dibromochloromethane		Analysis of constituent not required and not performed.
		Carbon tetrachloride		Analysis of constituent not required and not performed.
		Dichloromethane		Analysis of constituent not required and not performed.
		Methyl Isobutyl Ketone		Analysis of constituent not required and not performed.
		1,2-Dibromo-3-chloropropane		Analysis of constituent not required and not performed.
		1,2-Dichloropropane		Analysis of constituent not required and not performed.
		trans-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		cis-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		trans-1,2-Dichloroethene		Analysis of constituent not required and not performed.
		Trichlorofluoromethane		Analysis of constituent not required and not performed.
		1,2,3-Trichloropropane		Analysis of constituent not required and not performed.
		1,2-Dichlorobenzene		Analysis of constituent not required and not performed.
		1,4-Dichlorobenzene		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.
		Iodide	C-75 W	Post-digestion spike recovery out of control limits.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG4-18R	Chloride	W	Post-digestion spike recovery out of control limits.
		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.
		Ethylbenzene		Analysis of constituent not required and not performed.
		2-Hexanone		Analysis of constituent not required and not performed.
		Iodomethane		Analysis of constituent not required and not performed.
		Dibromochloromethane		Analysis of constituent not required and not performed.
		Carbon tetrachloride		Analysis of constituent not required and not performed.
		Dichloromethane		Analysis of constituent not required and not performed.
		Methyl Isobutyl Ketone		Analysis of constituent not required and not performed.
		1,2-Dibromo-3-chloropropane		Analysis of constituent not required and not performed.
		1,2-Dichloropropane		Analysis of constituent not required and not performed.
		trans-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		cis-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		trans-1,2-Dichloroethene		Analysis of constituent not required and not performed.
		Trichlorofluoromethane		Analysis of constituent not required and not performed.
		1,2,3-Trichloropropane		Analysis of constituent not required and not performed.
		1,2-Dichlorobenzene		Analysis of constituent not required and not performed.
		1,4-Dichlorobenzene		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.
		Iodide	C-76 W	Post-digestion spike recovery out of control limits.

APPENDIX D
STATISTICAL ANALYSES AND
QUALIFICATION STATEMENT

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GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the third quarter 2018 groundwater data collected from the C-746-U Landfill monitoring wells (MWs) were performed in accordance with Permit GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency (EPA) guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

The statistical evaluation was conducted separately for the three groundwater systems: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). For each groundwater system, data from wells considered to represent background conditions were compared with test wells (downgradient or sidegradient wells) (Exhibit D.1). The third quarter 2018 data used to conduct the statistical analyses were collected in July 2018. The statistical analyses for this report first used data from the first eight quarters that had been sampled for each parameter to develop the historical background value, beginning with the first two baseline sampling events in 2002, when available. Then a second set of statistical analyses was run on analytes that had at least one downgradient well that had exceeded the historical background (using the last eight quarters). The sampling dates associated with both the historical and the current background data are listed next to the result in the statistical analysis sheets of this appendix.

Statistical Analysis Process

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

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

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

**Exhibit D.1. Station Identification for Monitoring
Wells Analyzed**

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

^a **NOTE:** The gradients in UCRS wells are downward and, hydrogeologically, UCRS wells are not considered upgradient, downgradient, or sidegradient from the C-746-U Landfill. The UCRS wells identified as upgradient, sidegradient, or downgradient are those wells located in the same general direction as the RGA wells considered to be upgradient, sidegradient, or downgradient.

BG: upgradient or background wells

TW: downgradient 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. For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted, if required. The test well pH results are compared to both an upper and lower TL to determine if the current pH is different from the current background level to a statistically significant level. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

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

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

1. The TL is calculated for the background data (first using the first eight quarters, then using the last eight quarters, if required).
 - For each parameter, the background data are used to establish a baseline. On this data set, the mean (X) and the standard deviation (S) are computed.
 - The data set is checked for normality using coefficient of variation (CV). If $CV \leq 1.0$, then the data are assumed to be normally distributed. Data sets with $CV > 1.0$ are assumed to be log-normally distributed; for data sets with $CV > 1.0$, the data are log-transformed and analyzed.
 - The factor (K) for one-sided upper TL with 95% minimum coverage is determined (Table 5, Appendix B, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance*, 1989) based on the number of background data points.
 - The one-sided upper TL is calculated using the following equation:
$$TL = X + (K \times S)$$
2. Each observation from downgradient wells is compared to the calculated one-sided upper TL in Step 1. If an observation value exceeds the TL, then there is statistically significant evidence that the well concentration exceeds the historical background.

Type of Data Used

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

Exhibits D.3, D.4, and D.5 list the number of analyses (observations), nondetects (censored observations), and detects (uncensored observations), by parameter in the UCRS, the URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, third quarter 2018. The observations are representative of the current quarter data. Background data are presented in Attachments D1 and D2. The sampling dates associated with background data are listed next to the result in Attachments D1 and D2. When field duplicate data are available, the higher of the two readings is retained for further evaluation. When a data point has been rejected following data validation, this result is not used, and the next available data point is used for the background or current quarter data.

¹ For pH, two-sided TLs (upper and lower) were calculated with an adjusted K factor using the following equations:

$$\begin{aligned} \text{upper TL} &= X + (K \times S) \\ \text{lower TL} &= X - (K \times S) \end{aligned}$$

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

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

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

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

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

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	7	0	7	Yes
Oxidation-Reduction Potential	7	0	7	Yes
PCB, Total	7	5	2	Yes
PCB-1016	7	7	0	No
PCB-1221	7	7	0	No
PCB-1232	7	7	0	No
PCB-1242	7	5	2	Yes
PCB-1248	7	7	0	No
PCB-1254	7	7	0	No
PCB-1260	7	7	0	No
PCB-1268	7	7	0	No
pH	7	0	7	Yes
Potassium	7	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	7	0	No
Tetrachloroethene	7	7	0	No
Thallium	7	7	0	No
Thorium-230	7	7	0	No
Toluene	7	7	0	No
Total Organic Carbon (TOC)	7	3	4	Yes
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
Trichlorofluoromethane	7	7	0	No
Vanadium	7	4	3	Yes
Vinyl Acetate	7	7	0	No
Zinc	7	2	5	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	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	6	4	2	Yes
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	6	4	2	Yes
Antimony	6	6	0	No
Beryllium	6	6	0	No
Boron	6	1	5	Yes
Bromide	6	0	6	Yes
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	6	0	6	Yes
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	6	0	6	Yes
Chloride	6	0	6	Yes
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	6	3	3	Yes
Conductivity	6	0	6	Yes
Copper	6	0	6	Yes
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	6	0	6	Yes
Dissolved Solids	6	0	6	Yes
Ethylbenzene	6	6	0	No
Iodide	6	3	3	Yes
Iodomethane	6	6	0	No
Iron	6	1	5	Yes
Magnesium	6	0	6	Yes
Manganese	6	0	6	Yes
Methylene chloride	6	6	0	No
Molybdenum	6	5	1	Yes

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	6	2	4	Yes
Oxidation-Reduction Potential	6	0	6	Yes
PCB, Total	6	5	1	Yes
PCB-1016	6	6	0	No
PCB-1221	6	6	0	No
PCB-1232	6	6	0	No
PCB-1242	6	5	1	Yes
PCB-1248	6	6	0	No
PCB-1254	6	6	0	No
PCB-1260	6	6	0	No
PCB-1268	6	6	0	No
pH	6	0	6	Yes
Potassium	6	0	6	Yes
Radium-226	6	6	0	No
Rhodium	6	6	0	No
Sodium	6	0	6	Yes
Styrene	6	6	0	No
Sulfate	6	0	6	Yes
Tantalum	6	6	0	No
Technetium-99	6	2	4	Yes
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
Total Organic Carbon (TOC)	6	2	4	Yes
Total Organic Halides (TOX)	6	1	5	Yes
trans-1,2-Dichloroethene	6	6	0	No
trans-1,3-Dichloropropene	6	6	0	No
trans-1,4-Dichloro-2-Butene	6	6	0	No
Trichloroethene	6	1	5	Yes
Trichlorofluoromethane	6	6	0	No
Vanadium	6	6	0	No
Vinyl Acetate	6	6	0	No
Zinc	6	3	3	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	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	6	4	2	Yes
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	6	6	0	No
Antimony	6	6	0	No
Beryllium	6	6	0	No
Beta activity	6	1	5	Yes
Boron	6	0	6	Yes
Bromide	6	0	6	Yes
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	6	0	6	Yes
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	6	0	6	Yes
Chloride	6	0	6	Yes
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	6	2	4	Yes
Conductivity	6	0	6	Yes
Copper	6	0	6	Yes
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	6	0	6	Yes
Dissolved Solids	6	0	6	Yes
Ethylbenzene	6	6	0	No
Iodide	6	5	1	Yes
Iodomethane	6	6	0	No
Iron	6	3	3	Yes
Magnesium	6	0	6	Yes
Manganese	6	0	6	Yes
Methylene chloride	6	6	0	No

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

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

Bold denotes parameters with at least one uncensored observation.

Discussion of Results from Historical Background Comparison

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval test calculated using historical background and are presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 29, 30, and 28 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents (beta activity and trichloroethene) that exceeded their MCL. A summary of exceedances when compared to statistically derived historical upgradient background by well number is shown in Exhibit D.6.

UCRS

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

URGA

This quarter's results identified historical background exceedances for oxidation-reduction potential, pH, sodium, and technetium-99.

LRGA

This quarter's results identified historical background exceedances for beta activity, oxidation-reduction potential, pH, and technetium-99.

Statistical Summary

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

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

UCRS	URGA	LRGA
MW359: Dissolved Oxygen, Oxidation-Reduction Potential, pH*, Sulfate	MW357: Oxidation-Reduction Potential	MW358: Oxidation-Reduction Potential, pH*
MW362: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	MW360: Oxidation-Reduction Potential, Sodium	MW361: Oxidation-Reduction Potential, pH*
MW365: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	MW363: Oxidation-Reduction Potential, pH*	MW364: Oxidation-Reduction Potential, pH*
MW368: Calcium, Dissolved Oxygen, Magnesium, Oxidation-Reduction Potential, Sulfate	MW366: Oxidation-Reduction Potential, pH*	MW367: Oxidation-Reduction Potential
MW371: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	MW369: Oxidation-Reduction Potential	MW370: Beta activity, Oxidation-Reduction Potential, Technetium-99
MW374: Oxidation-Reduction Potential	MW372: Oxidation-Reduction Potential, Technetium-99	MW373: Oxidation-Reduction Potential
MW375: Oxidation-Reduction Potential, Sulfate		

*pH concentration is less than the LTL.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Acetone	Tolerance Interval	2.24	No exceedance of statistically derived historical background concentration.
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.40	Current results exceed statistically derived historical background concentration in MW368.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.97	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.31	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.45	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	1.27	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, and MW371.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iodide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	Current results exceed statistically derived historical background concentration in MW368.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, MW374, and MW375.
PCB, Total	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration.
PCB-1242	Tolerance Interval	1.41	No exceedance of statistically derived historical background concentration.
pH**	Tolerance Interval	0.04	Current results exceed statistically derived historical background concentration in MW359.
Potassium	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.49	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, and MW375.
Total Organic Carbon (TOC)	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	1.32	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

*If CV > 1.0, used log-transformed data.

**pH concentration is less than the LTL.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Acetone	Tolerance Interval	3.88	No exceedance of statistically derived historical background concentration.
Aluminum	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.12	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Iodide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW360, MW363, MW366, MW369, and MW372.
PCB, Total	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.
PCB-1242	Tolerance Interval	1.36	No exceedance of statistically derived historical background concentration.
pH**	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW363 and MW366.
Potassium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.26	Current results exceed statistically derived historical background concentration in MW360.
Sulfate	Tolerance Interval	0.75	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	0.87	Current results exceed statistically derived historical background concentration in MW372.
Total Organic Carbon (TOC)	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Trichloroethene ¹	Tolerance Interval	0.64	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	1.49	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

*If CV > 1.0, used log-transformed data.

**pH concentration is less than the LTL.

¹ A tolerance interval was calculated based on an MCL exceedance.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Acetone	Tolerance Interval	2.67	No exceedance of statistically derived historical background concentration.
Beta activity	Tolerance Interval	0.80	Current results exceed statistically derived historical background concentration in MW370.
Boron	Tolerance Interval	0.68	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.31	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.16	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.83	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Iodide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW358, MW361, MW364, MW367, MW370, and MW373.
pH**	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW358, MW361, and MW364.
Potassium	Tolerance Interval	0.18	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW370.
Total Organic Carbon (TOC)	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Trichloroethene ¹	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.67	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

*If CV > 1.0, used log-transformed data.

**pH concentration is less than the LTL.

¹ A tolerance interval was calculated based on an MCL exceedance.

Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGA, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the results of the one-sided tolerance interval test compared to current background, and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 6, 4, and 4 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

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

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

URGA	LRGA
MW360: Sodium	MW358: pH*
MW363: pH*	MW361: pH*
MW366: pH*	MW364: pH*

*pH concentration is less than the LTL.

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted; however, that pH in MW359 and calcium, magnesium, and sulfate in MW368 exceeded the current TL this quarter.

URGA

This quarter's results showed an exceedance of sodium in MW360 and pH in MW363 and MW366; these wells are located downgradient of the landfill.

LRGA

This quarter's results showed an exceedance of pH in MW358, MW361, and MW364; these wells are located downgradient of the landfill.

Statistical Summary

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

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

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Calcium	Tolerance Interval	0.38	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Oxygen	Tolerance Interval	0.65	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Magnesium	Tolerance Interval	0.46	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.31	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
pH	Tolerance Interval	0.04	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW359 exceeded the lower TL, which is evidence of a difference in concentration with respect to current background data.
Sulfate	Tolerance Interval	1.38	Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. However, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

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

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Oxidation-Reduction Potential	Tolerance Interval	0.17	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
pH	Tolerance Interval	0.02	MW363 and MW366 exceeded the lower TL, which is evidence of a difference in concentration with respect to current background data.
Sodium	Tolerance Interval	0.15	MW360 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	1.08	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation

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

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Beta activity	Tolerance Interval	0.69	MW370 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.16	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
pH	Tolerance Interval	0.02	MW358, MW361, and MW364 exceeded the lower TL, which is evidence of a difference in concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.68	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation

ATTACHMENT D1

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

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C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison

Acetone

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= 49.938 S= 111.751 CV(1)=2.238 **K factor**= 2.523** TL(1)= 331.886 LL(1)=N/A

Statistics-Transformed Background Data X= 2.847 S= 1.149 CV(2)=0.404 **K factor**= 2.523** TL(2)= 5.746 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	18	2.890
4/22/2002	10	2.303
7/15/2002	10	2.303
10/8/2002	15	2.708
1/8/2003	10	2.303
4/3/2003	10	2.303
7/9/2003	10	2.303
10/6/2003	10	2.303

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	200	5.298
1/7/2003	26	3.258
4/2/2003	10	2.303
7/9/2003	10	2.303
10/7/2003	430	6.064
1/6/2004	10	2.303
4/7/2004	10	2.303
7/14/2004	10	2.303

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	5	N/A	1.609	N/A
MW362	Downgradient	No	5	N/A	1.609	N/A
MW365	Downgradient	No	5	N/A	1.609	N/A
MW368	Downgradient	No	5	N/A	1.609	N/A
MW371	Upgradient	Yes	8.09	N/A	2.091	NO
MW374	Upgradient	No	5	N/A	1.609	N/A
MW375	Sidegradient	Yes	3.66	N/A	1.297	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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Aluminum

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.106	N/A	-2.244	NO
MW362	Downgradient	Yes	0.219	N/A	-1.519	NO
MW365	Downgradient	No	0.05	N/A	-2.996	N/A
MW368	Downgradient	Yes	0.441	N/A	-0.819	NO
MW371	Upgradient	Yes	0.355	N/A	-1.036	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	Yes	0.031	N/A	-3.474	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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Boron

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Dry/Partially Dry Wells

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: MW371

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

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.00901	N/A	-4.709	N/A
MW362	Downgradient	Yes	0.0189	N/A	-3.969	NO
MW365	Downgradient	Yes	0.0194	N/A	-3.942	NO
MW368	Downgradient	No	0.00966	N/A	-4.640	N/A
MW371	Upgradient	No	0.0121	N/A	-4.415	N/A
MW374	Upgradient	No	0.0129	N/A	-4.351	N/A
MW375	Sidegradient	No	0.0117	N/A	-4.448	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.

Well Number: MW374

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

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= 1.394 S= 0.474 CV(1)=0.340 K factor**= 2.523 TL(1)= 2.590 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.2	N/A	-1.609	N/A
MW362	Downgradient	Yes	0.0863	NO	-2.450	N/A
MW365	Downgradient	No	0.2	N/A	-1.609	N/A
MW368	Downgradient	Yes	0.146	NO	-1.924	N/A
MW371	Upgradient	No	0.2	N/A	-1.609	N/A
MW374	Upgradient	Yes	0.742	NO	-0.298	N/A
MW375	Sidegradient	No	0.2	N/A	-1.609	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

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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= 34.100 S= 13.637 CV(1)=0.400 **K factor**= 2.523** TL(1)= 68.505 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	6.84	NO	1.923	N/A
MW362	Downgradient	Yes	21	NO	3.045	N/A
MW365	Downgradient	Yes	22.8	NO	3.127	N/A
MW368	Downgradient	Yes	76.9	YES	4.343	N/A
MW371	Upgradient	Yes	58.4	NO	4.067	N/A
MW374	Upgradient	Yes	19.9	NO	2.991	N/A
MW375	Sidegradient	Yes	13.1	NO	2.573	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW368

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

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

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

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

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

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

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Chloride

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	1.11	NO	0.104	N/A
MW362	Downgradient	Yes	5.76	NO	1.751	N/A
MW365	Downgradient	Yes	3.57	NO	1.273	N/A
MW368	Downgradient	Yes	9.21	NO	2.220	N/A
MW371	Upgradient	Yes	1.8	NO	0.588	N/A
MW374	Upgradient	Yes	66	NO	4.190	N/A
MW375	Sidegradient	Yes	4.74	NO	1.556	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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Cobalt

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.001	-6.908
4/3/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/6/2003	0.001	-6.908

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.01	-4.605
1/7/2003	0.01	-4.605
4/2/2003	0.01	-4.605
7/9/2003	0.00161	-6.432
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	No	0.001	N/A	-6.908	N/A
MW365	Downgradient	Yes	0.00212	N/A	-6.156	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	No	0.001	N/A	-6.908	N/A
MW374	Upgradient	Yes	0.00303	N/A	-5.799	NO
MW375	Sidegradient	No	0.001	N/A	-6.908	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

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Copper

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00123	N/A	-6.701	NO
MW362	Downgradient	Yes	0.00171	N/A	-6.371	NO
MW365	Downgradient	Yes	0.00322	N/A	-5.738	NO
MW368	Downgradient	Yes	0.0013	N/A	-6.645	NO
MW371	Upgradient	Yes	0.00167	N/A	-6.395	NO
MW374	Upgradient	Yes	0.000443	N/A	-7.722	NO
MW375	Sidegradient	Yes	0.000647	N/A	-7.343	NO

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

Conclusion of Statistical Analysis on Historical Data

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 Oxygen

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	4.47	YES	1.497	N/A
MW362	Downgradient	Yes	4.07	YES	1.404	N/A
MW365	Downgradient	Yes	2.8	YES	1.030	N/A
MW368	Downgradient	Yes	5.49	YES	1.703	N/A
MW371	Upgradient	Yes	4.89	YES	1.587	N/A
MW374	Upgradient	Yes	0.52	NO	-0.654	N/A
MW375	Sidegradient	Yes	2.23	NO	0.802	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW359
MW362
MW365
MW368
MW371

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

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

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

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

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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= 590.000 S= 248.068 CV(1)=0.420 **K factor**= 2.523** TL(1)= 1215.876 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	164	NO	5.100	N/A
MW362	Downgradient	Yes	424	NO	6.050	N/A
MW365	Downgradient	Yes	274	NO	5.613	N/A
MW368	Downgradient	Yes	536	NO	6.284	N/A
MW371	Upgradient	Yes	306	NO	5.724	N/A
MW374	Upgradient	Yes	351	NO	5.861	N/A
MW375	Sidegradient	Yes	181	NO	5.198	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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Iodide

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= 2.000 S= 0.000 CV(1)=0.000 K factor**= 2.523 TL(1)= 2.000 LL(1)=N/A

Statistics-Transformed Background Data X= 0.693 S= 0.000 CV(2)=0.000 K factor**= 2.523 TL(2)= 0.693 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.5	N/A	-0.693	N/A
MW362	Downgradient	No	0.5	N/A	-0.693	N/A
MW365	Downgradient	Yes	0.168	NO	-1.784	N/A
MW368	Downgradient	No	0.5	N/A	-0.693	N/A
MW371	Upgradient	No	0.5	N/A	-0.693	N/A
MW374	Upgradient	No	0.5	N/A	-0.693	N/A
MW375	Sidegradient	No	0.5	N/A	-0.693	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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Iron

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371		
Date Collected	Result	LN(Result)
3/18/2002	1.31	0.270
4/22/2002	0.913	-0.091
7/15/2002	0.881	-0.127
10/8/2002	3.86	1.351
1/8/2003	1.88	0.631
4/3/2003	3.18	1.157
7/9/2003	0.484	-0.726
10/6/2003	2.72	1.001

Well Number: MW374		
Date Collected	Result	LN(Result)
10/8/2002	23	3.135
1/7/2003	13.9	2.632
4/2/2003	14	2.639
7/9/2003	14.2	2.653
10/7/2003	7.92	2.069
1/6/2004	7.86	2.062
4/7/2004	4.82	1.573
7/14/2004	4.87	1.583

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.118	NO	-2.137	N/A
MW362	Downgradient	Yes	0.179	NO	-1.720	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.241	NO	-1.423	N/A
MW371	Upgradient	Yes	0.222	NO	-1.505	N/A
MW374	Upgradient	Yes	1.08	NO	0.077	N/A
MW375	Sidegradient	Yes	0.0381	NO	-3.268	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= 11.347 S= 3.019 CV(1)=0.266 K factor**= 2.523 TL(1)= 18.963 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	7.1	1.960
4/22/2002	9.77	2.279
7/15/2002	10.4	2.342
10/8/2002	10.2	2.322
1/8/2003	10.7	2.370
4/3/2003	11.9	2.477
7/9/2003	10.8	2.380
10/6/2003	10.9	2.389

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	20	2.996
1/7/2003	16.1	2.779
4/2/2003	13.1	2.573
7/9/2003	10.3	2.332
10/7/2003	11.1	2.407
1/6/2004	11	2.398
4/7/2004	9.69	2.271
7/14/2004	8.49	2.139

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.82	NO	1.340	N/A
MW362	Downgradient	Yes	9.24	NO	2.224	N/A
MW365	Downgradient	Yes	11.5	NO	2.442	N/A
MW368	Downgradient	Yes	24.3	YES	3.190	N/A
MW371	Upgradient	Yes	11.3	NO	2.425	N/A
MW374	Upgradient	Yes	5.09	NO	1.627	N/A
MW375	Sidegradient	Yes	5.51	NO	1.707	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW368

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

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

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

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

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

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

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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= 0.248 S= 0.222 CV(1)=0.894 K factor**= 2.523 TL(1)= 0.809 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.063	-2.765
4/22/2002	0.067	-2.703
7/15/2002	0.074	-2.604
10/8/2002	0.0521	-2.955
1/8/2003	0.0385	-3.257
4/3/2003	0.0551	-2.899
7/9/2003	0.0546	-2.908
10/6/2003	0.0543	-2.913
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.596	-0.518
1/7/2003	0.565	-0.571
4/2/2003	0.675	-0.393
7/9/2003	0.397	-0.924
10/7/2003	0.312	-1.165
1/6/2004	0.299	-1.207
4/7/2004	0.329	-1.112
7/14/2004	0.342	-1.073

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00177	NO	-6.337	N/A
MW362	Downgradient	Yes	0.00238	NO	-6.041	N/A
MW365	Downgradient	Yes	0.0198	NO	-3.922	N/A
MW368	Downgradient	Yes	0.00938	NO	-4.669	N/A
MW371	Upgradient	Yes	0.00419	NO	-5.475	N/A
MW374	Upgradient	Yes	0.733	NO	-0.311	N/A
MW375	Sidegradient	Yes	0.00224	NO	-6.101	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= 0.006 S= 0.010 CV(1)= 1.650 K factor**= 2.523 TL(1)= 0.030 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.00121	-6.717
4/3/2003	0.001	-6.908
7/9/2003	0.00111	-6.803
10/6/2003	0.001	-6.908

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.00222	-6.110
1/7/2003	0.00201	-6.210
4/2/2003	0.00159	-6.444
7/9/2003	0.00242	-6.024
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.0005	N/A	-7.601	N/A
MW362	Downgradient	Yes	0.000536	N/A	-7.531	NO
MW365	Downgradient	No	0.0005	N/A	-7.601	N/A
MW368	Downgradient	Yes	0.000975	N/A	-6.933	NO
MW371	Upgradient	Yes	0.000418	N/A	-7.780	NO
MW374	Upgradient	No	0.0005	N/A	-7.601	N/A
MW375	Sidegradient	No	0.0005	N/A	-7.601	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison

Nickel

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00122	NO	-6.709	N/A
MW362	Downgradient	Yes	0.0011	NO	-6.812	N/A
MW365	Downgradient	Yes	0.00544	NO	-5.214	N/A
MW368	Downgradient	Yes	0.00096	NO	-6.949	N/A
MW371	Upgradient	Yes	0.00126	NO	-6.677	N/A
MW374	Upgradient	Yes	0.00205	NO	-6.190	N/A
MW375	Sidegradient	Yes	0.000895	NO	-7.019	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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PCB, Total

UNITS: UG/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.104	N/A	-2.263	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	Yes	0.122	NO	-2.104	N/A
MW368	Downgradient	Yes	0.13	NO	-2.040	N/A
MW371	Upgradient	No	0.0952	N/A	-2.352	N/A
MW374	Upgradient	No	0.0952	N/A	-2.352	N/A
MW375	Sidegradient	No	0.0952	N/A	-2.352	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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PCB-1242

UNITS: UG/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.104	N/A	-2.263	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	Yes	0.122	N/A	-2.104	NO
MW368	Downgradient	Yes	0.13	N/A	-2.040	NO
MW371	Upgradient	No	0.0952	N/A	-2.352	N/A
MW374	Upgradient	No	0.0952	N/A	-2.352	N/A
MW375	Sidegradient	No	0.0952	N/A	-2.352	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= 1.262 S= 0.907 CV(1)=0.718 K factor**= 2.523 TL(1)= 3.549 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371		
Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.408	-0.896
1/8/2003	0.384	-0.957
4/3/2003	0.368	-1.000
7/9/2003	0.587	-0.533
10/6/2003	0.382	-0.962
Well Number: MW374		
Date Collected	Result	LN(Result)
10/8/2002	3.04	1.112
1/7/2003	2.83	1.040
4/2/2003	2	0.693
7/9/2003	1.09	0.086
10/7/2003	0.802	-0.221
1/6/2004	0.897	-0.109
4/7/2004	0.689	-0.373
7/14/2004	0.716	-0.334

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.134	NO	-2.010	N/A
MW362	Downgradient	Yes	0.338	NO	-1.085	N/A
MW365	Downgradient	Yes	0.251	NO	-1.382	N/A
MW368	Downgradient	Yes	1.03	NO	0.030	N/A
MW371	Upgradient	Yes	0.673	NO	-0.396	N/A
MW374	Upgradient	Yes	0.401	NO	-0.914	N/A
MW375	Sidegradient	Yes	0.272	NO	-1.302	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= 183.063 S= 73.222 CV(1)=0.400 **K factor**= 2.523** TL(1)= 367.800 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	33.6	NO	3.515	N/A
MW362	Downgradient	Yes	131	NO	4.875	N/A
MW365	Downgradient	Yes	49.3	NO	3.898	N/A
MW368	Downgradient	Yes	61.4	NO	4.117	N/A
MW371	Upgradient	Yes	31.2	NO	3.440	N/A
MW374	Upgradient	Yes	109	NO	4.691	N/A
MW375	Sidegradient	Yes	53	NO	3.970	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= 6.469 S= 3.153 CV(1)=0.487 K factor**= 2.523 TL(1)= 14.423 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	53.2	YES	3.974	N/A
MW362	Downgradient	Yes	32.7	YES	3.487	N/A
MW365	Downgradient	Yes	64.1	YES	4.160	N/A
MW368	Downgradient	Yes	200	YES	5.298	N/A
MW371	Upgradient	Yes	47.7	YES	3.865	N/A
MW374	Upgradient	Yes	7.69	NO	2.040	N/A
MW375	Sidegradient	Yes	25.9	YES	3.254	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

- MW359
- MW362
- MW365
- MW368
- MW371
- MW375

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

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

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

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

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

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

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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= 17.631 S= 24.314 CV(1)=1.379 K factor**= 2.523 TL(1)= 78.977 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	1.28	N/A	0.247	NO
MW362	Downgradient	Yes	2.28	N/A	0.824	NO
MW365	Downgradient	No	1.89	N/A	0.637	N/A
MW368	Downgradient	Yes	2.06	N/A	0.723	NO
MW371	Upgradient	No	1.88	N/A	0.631	N/A
MW374	Upgradient	Yes	2.59	N/A	0.952	NO
MW375	Sidegradient	No	1.18	N/A	0.166	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= 214.094 S= 231.089 CV(1)= 1.079 **K factor**= 2.523** TL(1)= 797.131 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

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

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	6.2	N/A	1.825	NO
MW362	Downgradient	Yes	18.5	N/A	2.918	NO
MW365	Downgradient	Yes	21.8	N/A	3.082	NO
MW368	Downgradient	Yes	4.88	N/A	1.585	NO
MW371	Upgradient	Yes	5.52	N/A	1.708	NO
MW374	Upgradient	Yes	20.2	N/A	3.006	NO
MW375	Sidegradient	Yes	6	N/A	1.792	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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Vanadium

UNITS: mg/L

UCRS

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

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

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

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00846	N/A	-4.772	NO
MW362	Downgradient	No	0.01	N/A	-4.605	N/A
MW365	Downgradient	No	0.01	N/A	-4.605	N/A
MW368	Downgradient	No	0.01	N/A	-4.605	N/A
MW371	Upgradient	Yes	0.00374	N/A	-5.589	NO
MW374	Upgradient	No	0.01	N/A	-4.605	N/A
MW375	Sidegradient	Yes	0.00435	N/A	-5.438	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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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= 0.060 S= 0.083 CV(1)= 1.380 K factor**= 2.523 TL(1)= 0.270 LL(1)=N/A

Statistics-Transformed Background Data X= -3.259 S= 0.840 CV(2)=-0.258 K factor**= 2.523 TL(2)= -1.140 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/22/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/9/2003	0.0376	-3.281
10/6/2003	0.02	-3.912

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.025	-3.689
1/7/2003	0.35	-1.050
4/2/2003	0.035	-3.352
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.01	N/A	-4.605	NO
MW362	Downgradient	No	0.01	N/A	-4.605	N/A
MW365	Downgradient	Yes	0.00907	N/A	-4.703	NO
MW368	Downgradient	Yes	0.00578	N/A	-5.153	NO
MW371	Upgradient	Yes	0.00492	N/A	-5.314	NO
MW374	Upgradient	No	0.01	N/A	-4.605	N/A
MW375	Sidegradient	Yes	0.00549	N/A	-5.205	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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Acetone

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= 372.563 S= 1447.319 CV(1)= 3.885 **K factor**= 2.523** TL(1)= 4024.149 LL(1)=N/A

Statistics-Transformed Background Data X= 2.736 S= 1.603 CV(2)=0.586 **K factor**= 2.523** TL(2)= 6.780 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/22/2002	10	2.303
7/15/2002	14	2.639
10/8/2002	10	2.303
1/8/2003	10	2.303
4/3/2003	10	2.303
7/8/2003	10	2.303
10/6/2003	5800	8.666

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.89	N/A	0.637	NO
MW360	Downgradient	No	5	N/A	1.609	N/A
MW363	Downgradient	No	5	N/A	1.609	N/A
MW366	Downgradient	No	5	N/A	1.609	N/A
MW369	Upgradient	No	5	N/A	1.609	N/A
MW372	Upgradient	Yes	7.25	N/A	1.981	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	14	2.639
4/23/2002	10	2.303
7/16/2002	10	2.303
10/8/2002	10	2.303
1/7/2003	10	2.303
4/2/2003	10	2.303
7/9/2003	18	2.890
10/7/2003	10	2.303

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= 0.625 S= 0.774 CV(1)= 1.239 K factor**= 2.523 TL(1)= 2.578 LL(1)=N/A

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

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.05	N/A	-2.996	N/A
MW360	Downgradient	No	0.05	N/A	-2.996	N/A
MW363	Downgradient	No	0.05	N/A	-2.996	N/A
MW366	Downgradient	No	0.05	N/A	-2.996	N/A
MW369	Upgradient	Yes	0.0345	N/A	-3.367	NO
MW372	Upgradient	Yes	0.0361	N/A	-3.321	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.

Well Number: MW372

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

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

URGA

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

Statistics-Background Data X= 0.985 S= 0.825 CV(1)=0.838 K factor**= 2.523 TL(1)= 3.067 LL(1)=N/A

Statistics-Transformed Background Data X= -0.430 S= 0.990 CV(2)=-2.302 K factor**= 2.523 TL(2)= 2.068 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.392	NO	-0.936	N/A
MW360	Downgradient	Yes	0.0398	NO	-3.224	N/A
MW363	Downgradient	Yes	0.0594	NO	-2.823	N/A
MW366	Downgradient	Yes	0.295	NO	-1.221	N/A
MW369	Upgradient	No	0.0133	N/A	-4.320	N/A
MW372	Upgradient	Yes	0.474	NO	-0.747	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.492	-0.709
1/7/2003	0.492	-0.709
4/2/2003	0.6	-0.511
7/9/2003	0.57	-0.562
10/7/2003	0.604	-0.504

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

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

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

Well Number: MW369

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.406	NO	-0.901	N/A
MW360	Downgradient	Yes	0.163	NO	-1.814	N/A
MW363	Downgradient	Yes	0.145	NO	-1.931	N/A
MW366	Downgradient	Yes	0.474	NO	-0.747	N/A
MW369	Upgradient	Yes	0.397	NO	-0.924	N/A
MW372	Upgradient	Yes	0.614	NO	-0.488	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

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

URGA

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

Statistics-Background Data X= 32.763 S= 9.391 CV(1)=0.287 K factor**= 2.523 TL(1)= 56.456 LL(1)=N/A

Statistics-Transformed Background Data X= 3.449 S= 0.299 CV(2)=0.087 K factor**= 2.523 TL(2)= 4.202 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	29.5	3.384
4/22/2002	29.8	3.395
7/15/2002	25.3	3.231
10/8/2002	21.9	3.086
1/8/2003	20.9	3.040
4/3/2003	22.2	3.100
7/8/2003	22.9	3.131
10/6/2003	21.7	3.077

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	25.1	NO	3.223	N/A
MW360	Downgradient	Yes	27.5	NO	3.314	N/A
MW363	Downgradient	Yes	25	NO	3.219	N/A
MW366	Downgradient	Yes	32.8	NO	3.490	N/A
MW369	Upgradient	Yes	15.6	NO	2.747	N/A
MW372	Upgradient	Yes	38.4	NO	3.648	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	41.5	3.726
4/23/2002	43.6	3.775
7/16/2002	40.4	3.699
10/8/2002	38.8	3.658
1/7/2003	41.1	3.716
4/2/2003	42.9	3.759
7/9/2003	35.1	3.558
10/7/2003	46.6	3.842

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 URG

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

Statistics-Background Data X= 35.938 S= 3.750 CV(1)=0.104 K factor**= 2.523 TL(1)= 45.399 LL(1)=N/A

Statistics-Transformed Background Data X= 3.578 S= 0.089 CV(2)=0.025 K factor**= 2.523 TL(2)= 3.803 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	50	3.912
1/8/2003	35	3.555
4/3/2003	35	3.555
7/8/2003	35	3.555
10/6/2003	35	3.555

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	37.6	NO	3.627	N/A
MW360	Downgradient	Yes	26.7	NO	3.285	N/A
MW363	Downgradient	Yes	21.8	NO	3.082	N/A
MW366	Downgradient	Yes	14.3	NO	2.660	N/A
MW369	Upgradient	Yes	14.5	NO	2.674	N/A
MW372	Upgradient	Yes	39.1	NO	3.666	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	35	3.555
4/23/2002	35	3.555
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

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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Chloride

UNITS: mg/L

URGA

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

Statistics-Background Data X= 44.119 S= 4.554 CV(1)=0.103 K factor**= 2.523 TL(1)= 55.607 LL(1)=N/A

Statistics-Transformed Background Data X= 3.782 S= 0.099 CV(2)=0.026 K factor**= 2.523 TL(2)= 4.033 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
7/15/2002	48.3	3.877
10/8/2002	47.7	3.865
1/8/2003	45.7	3.822
4/3/2003	47.4	3.859
7/8/2003	55.9	4.024
10/6/2003	47.4	3.859
1/7/2004	45.5	3.818
4/7/2004	43.4	3.770

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	36.1	NO	3.586	N/A
MW360	Downgradient	Yes	11.6	NO	2.451	N/A
MW363	Downgradient	Yes	23.2	NO	3.144	N/A
MW366	Downgradient	Yes	40.1	NO	3.691	N/A
MW369	Upgradient	Yes	36.1	NO	3.586	N/A
MW372	Upgradient	Yes	46.6	NO	3.842	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.

Well Number: MW372

Date Collected	Result	LN(Result)
7/16/2002	39.8	3.684
10/8/2002	41	3.714
1/7/2003	39.4	3.674
4/2/2003	39.2	3.669
7/9/2003	39.8	3.684
10/7/2003	40	3.689
1/5/2004	43.4	3.770
4/5/2004	42	3.738

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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Cobalt

UNITS: mg/L

URGA

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

Statistics-Background Data X= 0.025 S= 0.021 CV(1)=0.845 K factor**= 2.523 TL(1)= 0.077 LL(1)=N/A

Statistics-Transformed Background Data X= -4.090 S= 1.006 CV(2)=-0.246 K factor**= 2.523 TL(2)= -1.553 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.00938	-4.669
1/8/2003	0.00548	-5.207
4/3/2003	0.00587	-5.138
7/8/2003	0.0541	-2.917
10/6/2003	0.0689	-2.675

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.00158	-6.450
1/7/2003	0.0147	-4.220
4/2/2003	0.0116	-4.457
7/9/2003	0.0653	-2.729
10/7/2003	0.00788	-4.843

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.001	N/A	-6.908	N/A
MW360	Downgradient	Yes	0.0171	NO	-4.069	N/A
MW363	Downgradient	Yes	0.000754	NO	-7.190	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00501	NO	-5.296	N/A
MW372	Upgradient	No	0.001	N/A	-6.908	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

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Conductivity

UNITS: umho/cm

URGA

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

Statistics-Background Data X= 482.856 S= 57.603 CV(1)=0.119 K factor**= 2.523 TL(1)= 628.189 LL(1)=N/A

Statistics-Transformed Background Data X= 6.173 S= 0.123 CV(2)=0.020 K factor**= 2.523 TL(2)= 6.484 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	388	5.961
4/22/2002	404	6.001
7/15/2002	394	5.976
10/8/2002	403	5.999
1/8/2003	520	6.254
4/3/2003	487	6.188
7/8/2003	478	6.170
10/6/2003	476	6.165

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	439	NO	6.084	N/A
MW360	Downgradient	Yes	595	NO	6.389	N/A
MW363	Downgradient	Yes	405	NO	6.004	N/A
MW366	Downgradient	Yes	510	NO	6.234	N/A
MW369	Upgradient	Yes	372	NO	5.919	N/A
MW372	Upgradient	Yes	597	NO	6.392	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	508	6.230
4/23/2002	501	6.217
7/16/2002	507	6.229
10/8/2002	495	6.205
1/7/2003	508.7	6.232
4/2/2003	515	6.244
7/9/2003	576	6.356
10/7/2003	565	6.337

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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Copper

UNITS: mg/L

URGA

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

Statistics-Background Data X= 0.025 S= 0.010 CV(1)=0.400 K factor**= 2.523 TL(1)= 0.050 LL(1)=N/A

Statistics-Transformed Background Data X= -3.742 S= 0.307 CV(2)=-0.082 K factor**= 2.523 TL(2)= -2.967 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000512	NO	-7.577	N/A
MW360	Downgradient	Yes	0.000354	NO	-7.946	N/A
MW363	Downgradient	Yes	0.000304	NO	-8.098	N/A
MW366	Downgradient	Yes	0.000445	NO	-7.717	N/A
MW369	Upgradient	Yes	0.00165	NO	-6.407	N/A
MW372	Upgradient	Yes	0.00136	NO	-6.600	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

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 Oxygen

UNITS: mg/L

URGA

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

Statistics-Background Data X= 1.781 S= 1.351 CV(1)=0.759 K factor**= 2.523 TL(1)= 5.190 LL(1)=N/A

Statistics-Transformed Background Data X= 0.228 S= 1.065 CV(2)=4.665 K factor**= 2.523 TL(2)= 2.915 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5.41	1.688
4/22/2002	1.57	0.451
7/15/2002	0.8	-0.223
10/8/2002	1.09	0.086
1/8/2003	2.69	0.990
4/3/2003	2.04	0.713
7/8/2003	1.19	0.174
10/6/2003	1.78	0.577

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.48	NO	1.247	N/A
MW360	Downgradient	Yes	2.94	NO	1.078	N/A
MW363	Downgradient	Yes	1.13	NO	0.122	N/A
MW366	Downgradient	Yes	2.17	NO	0.775	N/A
MW369	Upgradient	Yes	2.46	NO	0.900	N/A
MW372	Upgradient	Yes	0.88	NO	-0.128	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.89	1.358
4/23/2002	0.05	-2.996
7/16/2002	1.33	0.285
10/8/2002	2.66	0.978
1/7/2003	0.4	-0.916
4/2/2003	0.91	-0.094
7/9/2003	1.42	0.351
10/7/2003	1.26	0.231

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

URGA

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

Statistics-Background Data X= 285.188 S= 44.908 CV(1)=0.157 K factor**= 2.523 TL(1)= 398.489 LL(1)=N/A

Statistics-Transformed Background Data X= 5.640 S= 0.175 CV(2)=0.031 K factor**= 2.523 TL(2)= 6.080 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	173	5.153
4/22/2002	246	5.505
7/15/2002	232	5.447
10/8/2002	275	5.617
1/8/2003	269	5.595
4/3/2003	250	5.521
7/8/2003	295	5.687
10/6/2003	276	5.620

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	227	NO	5.425	N/A
MW360	Downgradient	Yes	279	NO	5.631	N/A
MW363	Downgradient	Yes	239	NO	5.476	N/A
MW366	Downgradient	Yes	276	NO	5.620	N/A
MW369	Upgradient	Yes	197	NO	5.283	N/A
MW372	Upgradient	Yes	323	NO	5.778	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	295	5.687
4/23/2002	322	5.775
7/16/2002	329	5.796
10/8/2002	290	5.670
1/7/2003	316	5.756
4/2/2003	311	5.740
7/9/2003	347	5.849
10/7/2003	337	5.820

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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Iodide

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= 2.000 S= 0.000 CV(1)=0.000 K factor**= 2.523 TL(1)= 2.000 LL(1)=N/A

Statistics-Transformed Background Data X= 0.693 S= 0.000 CV(2)=0.000 K factor**= 2.523 TL(2)= 0.693 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	2	0.693
1/8/2003	2	0.693
4/3/2003	2	0.693
7/8/2003	2	0.693
10/6/2003	2	0.693

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.5	N/A	-0.693	N/A
MW360	Downgradient	Yes	0.173	NO	-1.754	N/A
MW363	Downgradient	Yes	0.172	NO	-1.760	N/A
MW366	Downgradient	No	0.5	N/A	-0.693	N/A
MW369	Upgradient	No	0.5	N/A	-0.693	N/A
MW372	Upgradient	Yes	0.169	NO	-1.778	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	2	0.693
1/7/2003	2	0.693
4/2/2003	2	0.693
7/9/2003	2	0.693
10/7/2003	2	0.693

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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Iron

UNITS: mg/L

URGA

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

Statistics-Background Data X= 7.385 S= 6.991 CV(1)=0.947 K factor**= 2.523 TL(1)= 25.024 LL(1)=N/A

Statistics-Transformed Background Data X= 1.358 S= 1.323 CV(2)=0.974 K factor**= 2.523 TL(2)= 4.697 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.656	-0.422
4/22/2002	0.695	-0.364
7/15/2002	7.1	1.960
10/8/2002	21.5	3.068
1/8/2003	18.5	2.918
4/3/2003	14.9	2.701
7/8/2003	11.3	2.425
10/6/2003	14.9	2.701

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.1	N/A	-2.303	N/A
MW360	Downgradient	Yes	4.65	NO	1.537	N/A
MW363	Downgradient	Yes	0.0653	NO	-2.729	N/A
MW366	Downgradient	Yes	0.0395	NO	-3.231	N/A
MW369	Upgradient	Yes	0.0807	NO	-2.517	N/A
MW372	Upgradient	Yes	0.22	NO	-1.514	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.95	1.783
4/23/2002	0.792	-0.233
7/16/2002	1.78	0.577
10/8/2002	0.776	-0.254
1/7/2003	3.55	1.267
4/2/2003	5.02	1.613
7/9/2003	10	2.303
10/7/2003	0.733	-0.311

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

URGA

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

Statistics-Background Data X= 12.864 S= 3.505 CV(1)=0.272 K factor**= 2.523 TL(1)= 21.707 LL(1)=N/A

Statistics-Transformed Background Data X= 2.517 S= 0.290 CV(2)=0.115 K factor**= 2.523 TL(2)= 3.248 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	11.4	2.434
4/22/2002	12	2.485
7/15/2002	10	2.303
10/8/2002	8.62	2.154
1/8/2003	7.89	2.066
4/3/2003	7.97	2.076
7/8/2003	10.3	2.332
10/6/2003	9.14	2.213

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	10.8	NO	2.380	N/A
MW360	Downgradient	Yes	9.46	NO	2.247	N/A
MW363	Downgradient	Yes	11	NO	2.398	N/A
MW366	Downgradient	Yes	15.6	NO	2.747	N/A
MW369	Upgradient	Yes	6.5	NO	1.872	N/A
MW372	Upgradient	Yes	16.2	NO	2.785	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	15.7	2.754
4/23/2002	16.6	2.809
7/16/2002	15.4	2.734
10/8/2002	15.8	2.760
1/7/2003	15.8	2.760
4/2/2003	16.4	2.797
7/9/2003	15.2	2.721
10/7/2003	17.6	2.868

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

URGA

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

Statistics-Background Data X= 0.413 S= 0.274 CV(1)=0.664 K factor**= 2.523 TL(1)= 1.105 LL(1)=N/A

Statistics-Transformed Background Data X= -1.226 S= 1.008 CV(2)=-0.822 K factor**= 2.523 TL(2)= 1.317 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.034	-3.381
4/22/2002	0.062	-2.781
7/15/2002	0.436	-0.830
10/8/2002	0.867	-0.143
1/8/2003	0.828	-0.189
4/3/2003	0.672	-0.397
7/8/2003	0.321	-1.136
10/6/2003	0.714	-0.337

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00188	NO	-6.276	N/A
MW360	Downgradient	Yes	0.251	NO	-1.382	N/A
MW363	Downgradient	Yes	0.168	NO	-1.784	N/A
MW366	Downgradient	Yes	0.00749	NO	-4.894	N/A
MW369	Upgradient	Yes	0.00736	NO	-4.912	N/A
MW372	Upgradient	Yes	0.00372	NO	-5.594	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.205	-1.585
4/23/2002	0.345	-1.064
7/16/2002	0.21	-1.561
10/8/2002	0.0539	-2.921
1/7/2003	0.537	-0.622
4/2/2003	0.415	-0.879
7/9/2003	0.654	-0.425
10/7/2003	0.254	-1.370

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

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= 0.010 S= 0.012 CV(1)= 1.199 K factor**= 2.523 TL(1)= 0.040 LL(1)=N/A

Statistics-Transformed Background Data X= -5.698 S= 1.607 CV(2)=-0.282 K factor**= 2.523 TL(2)= -1.643 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.0005	N/A	-7.601	N/A
MW360	Downgradient	Yes	0.000552	N/A	-7.502	NO
MW363	Downgradient	No	0.0005	N/A	-7.601	N/A
MW366	Downgradient	No	0.0005	N/A	-7.601	N/A
MW369	Upgradient	No	0.0005	N/A	-7.601	N/A
MW372	Upgradient	No	0.0005	N/A	-7.601	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.00105	-6.859
10/7/2003	0.001	-6.908

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

URGA

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

Statistics-Background Data X= 0.024 S= 0.021 CV(1)=0.910 K factor**= 2.523 TL(1)= 0.078 LL(1)=N/A

Statistics-Transformed Background Data X= -4.246 S= 1.075 CV(2)=-0.253 K factor**= 2.523 TL(2)= -1.535 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/22/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/8/2003	0.013	-4.343
10/6/2003	0.0104	-4.566

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.002	N/A	-6.215	N/A
MW360	Downgradient	Yes	0.00241	NO	-6.028	N/A
MW363	Downgradient	Yes	0.00107	NO	-6.840	N/A
MW366	Downgradient	Yes	0.000686	NO	-7.285	N/A
MW369	Upgradient	Yes	0.0091	NO	-4.699	N/A
MW372	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.019	-3.963
10/7/2003	0.005	-5.298

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

URGA

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

Statistics-Background Data X= 74.563 S= 94.243 CV(1)=1.264 K factor**= 2.523 TL(1)= 312.337 LL(1)=N/A

Statistics-Transformed Background Data X= 4.554 S= 0.784 CV(2)=0.172 K factor**= 2.523 TL(2)= 5.371 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	215	5.371
4/22/2002	110	4.700
7/15/2002	20	2.996
1/8/2003	-5	#Func!
4/3/2003	-18	#Func!
7/8/2003	-67	#Func!
10/6/2003	-1	#Func!
1/7/2004	55	4.007

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	210	5.347
4/23/2002	65	4.174
7/16/2002	215	5.371
10/8/2002	185	5.220
1/7/2003	45	3.807
4/2/2003	65	4.174
7/9/2003	-39	#Func!
10/7/2003	138	4.927

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

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	298	N/A	5.697	YES
MW360	Downgradient	Yes	237	N/A	5.468	YES
MW363	Downgradient	Yes	282	N/A	5.642	YES
MW366	Downgradient	Yes	250	N/A	5.521	YES
MW369	Upgradient	Yes	338	N/A	5.823	YES
MW372	Upgradient	Yes	371	N/A	5.916	YES

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW357
MW360
MW363
MW366
MW369
MW372

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

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

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

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

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

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

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PCB, Total

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= 0.390 S= 0.350 CV(1)=0.897 K factor**= 2.523 TL(1)= 1.272 LL(1)=N/A

Statistics-Transformed Background Data X= -1.238 S= 0.737 CV(2)=-0.595 K factor**= 2.523 TL(2)= 0.622 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	0.17	-1.772
7/15/2002	0.17	-1.772
7/8/2003	1.15	0.140
10/6/2003	0.605	-0.503
7/13/2004	0.42	-0.868
7/20/2005	0.28	-1.273
4/4/2006	0.23	-1.470

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.099	N/A	-2.313	N/A
MW360	Downgradient	No	0.1	N/A	-2.303	N/A
MW363	Downgradient	No	0.102	N/A	-2.283	N/A
MW366	Downgradient	No	0.099	N/A	-2.313	N/A
MW369	Upgradient	Yes	0.0402	NO	-3.214	N/A
MW372	Upgradient	No	0.0952	N/A	-2.352	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	0.17	-1.772
7/16/2002	0.17	-1.772
7/9/2003	0.17	-1.772
10/7/2003	0.17	-1.772
7/14/2004	0.18	-1.715
7/21/2005	0.17	-1.772
4/5/2006	0.18	-1.715

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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PCB-1242

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= 0.281 S= 0.383 CV(1)= 1.361 K factor**= 2.523 TL(1)= 1.247 LL(1)=N/A

Statistics-Transformed Background Data X= -1.835 S= 0.938 CV(2)=-0.511 K factor**= 2.523 TL(2)= 0.532 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/22/2002	0.11	-2.207
7/15/2002	0.11	-2.207
7/8/2003	1.15	0.140
10/6/2003	0.09	-2.408
7/13/2004	0.1	-2.303
7/20/2005	0.1	-2.303
4/4/2006	0.1	-2.303

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.099	N/A	-2.313	N/A
MW360	Downgradient	No	0.1	N/A	-2.303	N/A
MW363	Downgradient	No	0.102	N/A	-2.283	N/A
MW366	Downgradient	No	0.099	N/A	-2.313	N/A
MW369	Upgradient	Yes	0.0402	N/A	-3.214	NO
MW372	Upgradient	No	0.0952	N/A	-2.352	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	0.11	-2.207
7/16/2002	0.11	-2.207
7/9/2003	0.13	-2.040
10/7/2003	0.09	-2.408
7/14/2004	0.1	-2.303
7/21/2005	0.1	-2.303
4/5/2006	0.1	-2.303

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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pH

UNITS: Std Unit

URGA

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

Statistics-Background Data X= 6.274 S= 0.194 CV(1)=0.031 K factor**= 2.904 TL(1)= 6.837 LL(1)=5.7114

Statistics-Transformed Background Data X= 1.836 S= 0.031 CV(2)=0.017 K factor**= 2.904 TL(2)= 1.925 LL(2)=1.7467

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	6.1	1.808
4/22/2002	6.1	1.808
7/15/2002	6.1	1.808
10/8/2002	6.5	1.872
1/8/2003	6.5	1.872
4/3/2003	6.6	1.887
7/8/2003	6.5	1.872
10/6/2003	6.5	1.872

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW357	Downgradient	Yes	5.77	NO	1.753	N/A
MW360	Downgradient	Yes	6.24	NO	1.831	N/A
MW363	Downgradient	Yes	5.66	YES	1.733	N/A
MW366	Downgradient	Yes	5.54	YES	1.712	N/A
MW369	Upgradient	Yes	6.19	NO	1.823	N/A
MW372	Upgradient	Yes	6.13	NO	1.813	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	6.1	1.808
4/23/2002	6.12	1.812
7/16/2002	6.1	1.808
10/8/2002	6.06	1.802
1/7/2003	6.26	1.834
4/2/2003	6.15	1.816
7/9/2003	6.3	1.841
10/7/2003	6.4	1.856

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW363
MW366

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

URGA

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

Statistics-Background Data X= 1.663 S= 0.488 CV(1)=0.293 K factor**= 2.523 TL(1)= 2.895 LL(1)=N/A

Statistics-Transformed Background Data X= 0.456 S= 0.362 CV(2)=0.794 K factor**= 2.523 TL(2)= 1.368 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2.21	0.793
7/15/2002	2	0.693
10/8/2002	0.966	-0.035
1/8/2003	0.727	-0.319
4/3/2003	0.8	-0.223
7/8/2003	1.62	0.482
10/6/2003	1.14	0.131

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.58	NO	0.457	N/A
MW360	Downgradient	Yes	0.711	NO	-0.341	N/A
MW363	Downgradient	Yes	1.39	NO	0.329	N/A
MW366	Downgradient	Yes	1.99	NO	0.688	N/A
MW369	Upgradient	Yes	0.509	NO	-0.675	N/A
MW372	Upgradient	Yes	1.76	NO	0.565	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.04	0.713
4/23/2002	2.03	0.708
7/16/2002	2	0.693
10/8/2002	1.54	0.432
1/7/2003	1.88	0.631
4/2/2003	2.09	0.737
7/9/2003	1.78	0.577
10/7/2003	1.79	0.582

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

URGA

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

Statistics-Background Data X= 45.100 S= 11.875 CV(1)=0.263 K factor**= 2.523 TL(1)= 75.061 LL(1)=N/A

Statistics-Transformed Background Data X= 3.780 S= 0.242 CV(2)=0.064 K factor**= 2.523 TL(2)= 4.390 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	35.7	3.575
4/22/2002	37.6	3.627
7/15/2002	42.4	3.747
10/8/2002	66.9	4.203
1/8/2003	67.9	4.218
4/3/2003	61.8	4.124
7/8/2003	45.6	3.820
10/6/2003	59.1	4.079

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	36.9	NO	3.608	N/A
MW360	Downgradient	Yes	84.5	YES	4.437	N/A
MW363	Downgradient	Yes	41.5	NO	3.726	N/A
MW366	Downgradient	Yes	44.9	NO	3.804	N/A
MW369	Upgradient	Yes	48.8	NO	3.888	N/A
MW372	Upgradient	Yes	39	NO	3.664	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	37.2	3.616
4/23/2002	38.6	3.653
7/16/2002	35.6	3.572
10/8/2002	37.5	3.624
1/7/2003	34.1	3.529
4/2/2003	34.4	3.538
7/9/2003	44.1	3.786
10/7/2003	43.1	3.764

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

MW360

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

URGA

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

Statistics-Background Data X= 45.031 S= 33.919 CV(1)=0.753 K factor**= 2.523 TL(1)= 130.609 LL(1)=N/A

Statistics-Transformed Background Data X= 3.420 S= 0.981 CV(2)=0.287 K factor**= 2.523 TL(2)= 5.894 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	15.5	2.741
4/22/2002	15.8	2.760
7/15/2002	13.8	2.625
10/8/2002	6.9	1.932
1/8/2003	10.5	2.351
4/3/2003	10.5	2.351
7/8/2003	10.9	2.389
10/6/2003	16.3	2.791

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	49.2	NO	3.896	N/A
MW360	Downgradient	Yes	14.1	NO	2.646	N/A
MW363	Downgradient	Yes	36.8	NO	3.605	N/A
MW366	Downgradient	Yes	69.3	NO	4.238	N/A
MW369	Upgradient	Yes	6.71	NO	1.904	N/A
MW372	Upgradient	Yes	81.5	NO	4.401	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	71.7	4.272
4/23/2002	74.7	4.313
7/16/2002	74.1	4.305
10/8/2002	70.5	4.256
1/7/2003	75.8	4.328
4/2/2003	81.8	4.404
7/9/2003	83.6	4.426
10/7/2003	88.1	4.478

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

URGA

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

Statistics-Background Data X= 20.821 S= 18.044 CV(1)=0.867 K factor**= 2.523 TL(1)= 66.344 LL(1)=N/A

Statistics-Transformed Background Data X= 2.770 S= 1.150 CV(2)=0.415 K factor**= 2.523 TL(2)= 3.972 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	41.7	3.731
4/22/2002	53.1	3.972
7/15/2002	18.1	2.896
10/8/2002	16.4	2.797
1/8/2003	3.49	1.250
4/3/2003	9.34	2.234
7/8/2003	17.5	2.862
10/6/2003	17	2.833

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	44.8	3.802
4/23/2002	0.802	-0.221
7/16/2002	19.8	2.986
10/8/2002	46.1	3.831
1/7/2003	-0.973	#Func!
4/2/2003	9.07	2.205
7/9/2003	0	#Func!
10/7/2003	36.9	3.608

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

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	41.2	NO	3.718	N/A
MW360	Downgradient	No	4.99	N/A	1.607	N/A
MW363	Downgradient	No	11.3	N/A	2.425	N/A
MW366	Downgradient	Yes	46.8	NO	3.846	N/A
MW369	Upgradient	Yes	31.4	NO	3.447	N/A
MW372	Upgradient	Yes	70.9	YES	4.261	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.

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Total Organic Carbon (TOC)

UNITS: mg/L

URGA

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

Statistics-Background Data X= 3.513 S= 4.307 CV(1)=1.226 K factor**= 2.523 TL(1)= 14.378 LL(1)=N/A

Statistics-Transformed Background Data X= 0.851 S= 0.828 CV(2)=0.973 K factor**= 2.523 TL(2)= 2.940 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.7	0.531
4/22/2002	1.6	0.470
7/15/2002	3.1	1.131
10/8/2002	17.7	2.874
1/8/2003	9	2.197
4/3/2003	4	1.386
7/8/2003	4.9	1.589
10/6/2003	2.4	0.875

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.578	N/A	-0.548	NO
MW360	Downgradient	Yes	2.06	N/A	0.723	NO
MW363	Downgradient	Yes	0.807	N/A	-0.214	NO
MW366	Downgradient	Yes	0.735	N/A	-0.308	NO
MW369	Upgradient	No	1.47	N/A	0.385	N/A
MW372	Upgradient	No	1.2	N/A	0.182	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1.2	0.182
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1.6	0.470
4/2/2003	1.5	0.405
7/9/2003	3	1.099
10/7/2003	1.5	0.405

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

URGA

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

Statistics-Background Data X= 67.963 S= 64.316 CV(1)=0.946 K factor**= 2.523 TL(1)= 230.231 LL(1)=N/A

Statistics-Transformed Background Data X= 3.772 S= 1.023 CV(2)=0.271 K factor**= 2.523 TL(2)= 6.353 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/22/2002	50	3.912
7/15/2002	81	4.394
10/8/2002	202	5.308
1/8/2003	177	5.176
4/3/2003	93.1	4.534
7/8/2003	17.5	2.862
10/6/2003	37.5	3.624

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	5.14	NO	1.637	N/A
MW360	Downgradient	Yes	20	NO	2.996	N/A
MW363	Downgradient	Yes	7	NO	1.946	N/A
MW366	Downgradient	No	10	N/A	2.303	N/A
MW369	Upgradient	Yes	13.3	NO	2.588	N/A
MW372	Upgradient	Yes	9.54	NO	2.255	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	184	5.215
4/23/2002	50	3.912
7/16/2002	50	3.912
10/8/2002	50	3.912
1/7/2003	10	2.303
4/2/2003	12.7	2.542
7/9/2003	10	2.303
10/7/2003	12.6	2.534

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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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= 5.625 S= 3.594 CV(1)=0.639 K factor**= 2.523 TL(1)= 14.693 LL(1)=N/A

Statistics-Transformed Background Data X= 1.571 S= 0.565 CV(2)=0.360 K factor**= 2.523 TL(2)= 2.995 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	11	2.398
4/22/2002	16	2.773
7/15/2002	8	2.079
10/8/2002	3	1.099
1/8/2003	2	0.693
4/3/2003	3	1.099
7/8/2003	3	1.099
10/6/2003	2	0.693

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.39	N/A	1.479	N/A
MW360	Downgradient	Yes	0.99	N/A	-0.010	N/A
MW363	Downgradient	Yes	1.47	N/A	0.385	N/A
MW366	Downgradient	Yes	5.75	NO	1.749	N/A
MW369	Upgradient	No	0.76	N/A	-0.274	N/A
MW372	Upgradient	Yes	5.32	NO	1.671	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5	1.609
4/23/2002	5	1.609
7/16/2002	4	1.386
10/8/2002	6	1.792
1/7/2003	5	1.609
4/2/2003	6	1.792
7/9/2003	5	1.609
10/7/2003	6	1.792

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

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=0.116 S= 0.173 CV(1)=1.490 K factor**= 2.523 TL(1)= 0.552 LL(1)=N/A

Statistics-Transformed Background Data X= -2.729 S= 1.014 CV(2)=-0.371 K factor**= 2.523 TL(2)= -0.172 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/22/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.01	N/A	-4.605	N/A
MW360	Downgradient	No	0.01	N/A	-4.605	N/A
MW363	Downgradient	No	0.01	N/A	-4.605	N/A
MW366	Downgradient	Yes	0.00403	N/A	-5.514	NO
MW369	Upgradient	Yes	0.00393	N/A	-5.539	NO
MW372	Upgradient	Yes	0.00541	N/A	-5.220	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.725	-0.322
4/23/2002	0.1	-2.303
7/16/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/7/2003	0.035	-3.352
4/2/2003	0.035	-3.352
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

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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Acetone

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= 51.625 S= 137.818 CV(1)=2.670 K factor**= 2.523 TL(1)= 399.340 LL(1)=N/A

Statistics-Transformed Background Data X= 2.777 S= 1.127 CV(2)=0.406 K factor**= 2.523 TL(2)= 5.621 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	18	2.890
4/23/2002	110	4.700
7/15/2002	10	2.303
10/8/2002	18	2.890
1/8/2003	10	2.303
4/3/2003	10	2.303
7/9/2003	10	2.303
10/6/2003	10	2.303

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	5	N/A	1.609	N/A
MW361	Downgradient	Yes	2.54	N/A	0.932	NO
MW364	Downgradient	No	5	N/A	1.609	N/A
MW367	Downgradient	No	5	N/A	1.609	N/A
MW370	Upgradient	Yes	4.23	N/A	1.442	NO
MW373	Upgradient	No	5	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	9	2.197
4/23/2002	560	6.328
7/16/2002	10	2.303
10/8/2002	10	2.303
1/7/2003	10	2.303
4/2/2003	10	2.303
7/9/2003	10	2.303
10/7/2003	11	2.398

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

LRGA

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

Statistics-Background Data X=9.815 S= 7.838 CV(1)=0.799 K factor**= 2.523 TL(1)= 29.591 LL(1)=N/A

Statistics-Transformed Background Data X= 2.072 S= 0.630 CV(2)=0.304 K factor**= 2.523 TL(2)= 3.662 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.1	2.313
4/23/2002	4.46	1.495
7/15/2002	6.58	1.884
10/8/2002	4.9	1.589
1/8/2003	4.47	1.497
4/3/2003	8.65	2.158
7/9/2003	3.66	1.297
10/6/2003	5.38	1.683

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	29.2	N/A	3.374	N/A
MW361	Downgradient	Yes	28.2	N/A	3.339	N/A
MW364	Downgradient	Yes	23.4	N/A	3.153	N/A
MW367	Downgradient	No	8.73	N/A	2.167	N/A
MW370	Upgradient	Yes	102	YES	4.625	N/A
MW373	Upgradient	Yes	30.6	N/A	3.421	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	15.1	2.715
4/23/2002	6.26	1.834
7/16/2002	6.22	1.828
10/8/2002	4.06	1.401
1/7/2003	11.2	2.416
4/2/2003	18.5	2.918
7/9/2003	13.3	2.588
10/7/2003	34.2	3.532

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW370

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

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

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

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

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

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

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Boron

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 1.140 S= 0.780 CV(1)=0.684 K factor**= 2.523 TL(1)= 3.108 LL(1)=N/A

Statistics-Transformed Background Data X= -0.235 S= 1.006 CV(2)=-4.287 K factor**= 2.523 TL(2)= 2.303 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2	0.693
4/23/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.483	NO	-0.728	N/A
MW361	Downgradient	Yes	0.343	NO	-1.070	N/A
MW364	Downgradient	Yes	0.0321	NO	-3.439	N/A
MW367	Downgradient	Yes	0.038	NO	-3.270	N/A
MW370	Upgradient	Yes	0.031	NO	-3.474	N/A
MW373	Upgradient	Yes	1.62	NO	0.482	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.79	-0.236
1/7/2003	0.807	-0.214
4/2/2003	1.13	0.122
7/9/2003	1.28	0.247
10/7/2003	1.24	0.215

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

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1	0.000
4/23/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/9/2003	1	0.000
10/6/2003	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.452	NO	-0.794	N/A
MW361	Downgradient	Yes	0.437	NO	-0.828	N/A
MW364	Downgradient	Yes	0.421	NO	-0.865	N/A
MW367	Downgradient	Yes	0.322	NO	-1.133	N/A
MW370	Upgradient	Yes	0.371	NO	-0.992	N/A
MW373	Upgradient	Yes	0.573	NO	-0.557	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison

Calcium

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 43.413 S= 13.444 CV(1)=0.310 K factor**= 2.523 TL(1)= 77.331 LL(1)=N/A

Statistics-Transformed Background Data X= 3.723 S= 0.323 CV(2)=0.087 K factor**= 2.523 TL(2)= 4.539 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	34.8	3.550
4/23/2002	43.4	3.770
7/15/2002	33.2	3.503
10/8/2002	29.2	3.374
1/8/2003	31.3	3.444
4/3/2003	32.4	3.478
7/9/2003	22.9	3.131
10/6/2003	28	3.332

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	30.2	NO	3.408	N/A
MW361	Downgradient	Yes	30.2	NO	3.408	N/A
MW364	Downgradient	Yes	28.9	NO	3.364	N/A
MW367	Downgradient	Yes	18.6	NO	2.923	N/A
MW370	Upgradient	Yes	26.2	NO	3.266	N/A
MW373	Upgradient	Yes	49.3	NO	3.898	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	61.9	4.126
4/23/2002	59.2	4.081
7/16/2002	47.6	3.863
10/8/2002	46.1	3.831
1/7/2003	49.2	3.896
4/2/2003	57.8	4.057
7/9/2003	52.7	3.965
10/7/2003	64.9	4.173

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison
Chemical Oxygen Demand (COD) UNITS: mg/L LRGA

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

Statistics-Background Data	X = 41.938	S = 24.732	CV(1) =0.590	K factor** = 2.523	TL(1) = 104.336	LL(1) =N/A
Statistics-Transformed Background Data	X = 3.658	S = 0.339	CV(2) =0.093	K factor** = 2.523	TL(2) = 4.512	LL(2) =N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	35	3.555
4/23/2002	134	4.898
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	35	NO	3.555	N/A
MW361	Downgradient	Yes	41.3	NO	3.721	N/A
MW364	Downgradient	Yes	65.2	NO	4.177	N/A
MW367	Downgradient	Yes	24.3	NO	3.190	N/A
MW370	Upgradient	Yes	19.4	NO	2.965	N/A
MW373	Upgradient	Yes	30.9	NO	3.431	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/23/2002	47	3.850
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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Chloride

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 45.919 S= 7.524 CV(1)=0.164 K factor**= 2.523 TL(1)= 64.901 LL(1)=N/A

Statistics-Transformed Background Data X= 3.814 S= 0.165 CV(2)=0.043 K factor**= 2.523 TL(2)= 4.231 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
7/15/2002	55.5	4.016
10/8/2002	53.6	3.982
1/8/2003	52.9	3.968
4/3/2003	53.6	3.982
7/9/2003	51.9	3.949
10/6/2003	53	3.970
1/7/2004	53	3.970
4/7/2004	51.6	3.944

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	38.7	NO	3.656	N/A
MW361	Downgradient	Yes	37.1	NO	3.614	N/A
MW364	Downgradient	Yes	35.6	NO	3.572	N/A
MW367	Downgradient	Yes	25.9	NO	3.254	N/A
MW370	Upgradient	Yes	36	NO	3.584	N/A
MW373	Upgradient	Yes	45	NO	3.807	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.

Well Number: MW373

Date Collected	Result	LN(Result)
7/16/2002	40.6	3.704
10/8/2002	38.8	3.658
1/7/2003	39	3.664
4/2/2003	38.4	3.648
7/9/2003	38.1	3.640
10/7/2003	38	3.638
1/6/2004	37.9	3.635
4/7/2004	38.8	3.658

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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Cobalt

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 0.027 S= 0.032 CV(1)= 1.165 K factor**= 2.523 TL(1)= 0.108 LL(1)=N/A

Statistics-Transformed Background Data X= -4.058 S= 1.011 CV(2)=-0.249 K factor**= 2.523 TL(2)= -1.507 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.0174	-4.051
1/8/2003	0.0105	-4.556
4/3/2003	0.00931	-4.677
7/9/2003	0.137	-1.988
10/6/2003	0.0463	-3.073

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00257	N/A	-5.964	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	Yes	0.000393	N/A	-7.842	NO
MW367	Downgradient	Yes	0.014	N/A	-4.269	NO
MW370	Upgradient	Yes	0.000325	N/A	-8.032	NO
MW373	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.034	-3.381
7/16/2002	0.025	-3.689
10/8/2002	0.00411	-5.494
1/7/2003	0.00344	-5.672
4/2/2003	0.00368	-5.605
7/9/2003	0.0405	-3.206
10/7/2003	0.00843	-4.776

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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Conductivity

UNITS: umho/cm

LRGA

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

Statistics-Background Data X= 608.719 S= 156.157 CV(1)=0.257 **K factor**= 2.523** TL(1)= 1002.702 LL(1)=N/A

Statistics-Transformed Background Data X= 6.380 S= 0.260 CV(2)=0.041 **K factor**= 2.523** TL(2)= 7.036 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	406	6.006
4/23/2002	543	6.297
7/15/2002	476	6.165
10/8/2002	441	6.089
1/8/2003	486	6.186
4/3/2003	466	6.144
7/9/2003	479	6.172
10/6/2003	435	6.075

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	484	NO	6.182	N/A
MW361	Downgradient	Yes	490	NO	6.194	N/A
MW364	Downgradient	Yes	484	NO	6.182	N/A
MW367	Downgradient	Yes	360	NO	5.886	N/A
MW370	Upgradient	Yes	427	NO	6.057	N/A
MW373	Upgradient	Yes	622	NO	6.433	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	661	6.494
4/23/2002	801	6.686
7/16/2002	774	6.652
10/8/2002	680	6.522
1/7/2003	686.5	6.532
4/2/2003	763	6.637
7/9/2003	828	6.719
10/7/2003	814	6.702

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison

Copper

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 0.025 S= 0.010 CV(1)=0.399 K factor**= 2.523 TL(1)= 0.050 LL(1)=N/A

Statistics-Transformed Background Data X= -3.739 S= 0.308 CV(2)=-0.082 K factor**= 2.523 TL(2)= -2.963 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.026	-3.650
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.000464	NO	-7.676	N/A
MW361	Downgradient	Yes	0.000814	NO	-7.114	N/A
MW364	Downgradient	Yes	0.0004	NO	-7.824	N/A
MW367	Downgradient	Yes	0.000446	NO	-7.715	N/A
MW370	Upgradient	Yes	0.00091	NO	-7.002	N/A
MW373	Upgradient	Yes	0.000523	NO	-7.556	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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Dissolved Oxygen

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 1.387 S= 1.153 CV(1)=0.831 K factor**= 2.523 TL(1)= 4.295 LL(1)=N/A

Statistics-Transformed Background Data X= -0.115 S= 1.207 CV(2)=-10.514 K factor**= 2.523 TL(2)= 2.930 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	4.32	1.463
4/23/2002	1.24	0.215
7/15/2002	0.75	-0.288
10/8/2002	0.94	-0.062
1/8/2003	3.08	1.125
4/3/2003	1.45	0.372
7/9/2003	1.22	0.199
10/6/2003	1.07	0.068

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.87	NO	-0.139	N/A
MW361	Downgradient	Yes	2.79	NO	1.026	N/A
MW364	Downgradient	Yes	1.87	NO	0.626	N/A
MW367	Downgradient	Yes	3.07	NO	1.122	N/A
MW370	Upgradient	Yes	3.36	NO	1.212	N/A
MW373	Upgradient	Yes	2.52	NO	0.924	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.04	1.112
4/23/2002	0.03	-3.507
7/16/2002	0.23	-1.470
10/8/2002	0.86	-0.151
1/7/2003	0.21	-1.561
4/2/2003	1.19	0.174
7/9/2003	1.1	0.095
10/7/2003	1.46	0.378

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

LRGA

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

Statistics-Background Data X= 356.188 S= 106.752 CV(1)=0.300 K factor**= 2.523 TL(1)= 625.523 LL(1)=N/A

Statistics-Transformed Background Data X= 5.831 S= 0.311 CV(2)=0.053 K factor**= 2.523 TL(2)= 6.616 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	236	5.464
4/23/2002	337	5.820
7/15/2002	266	5.583
10/8/2002	240	5.481
1/8/2003	282	5.642
4/3/2003	238	5.472
7/9/2003	248	5.513
10/6/2003	224	5.412

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	264	NO	5.576	N/A
MW361	Downgradient	Yes	263	NO	5.572	N/A
MW364	Downgradient	Yes	251	NO	5.525	N/A
MW367	Downgradient	Yes	179	NO	5.187	N/A
MW370	Upgradient	Yes	179	NO	5.187	N/A
MW373	Upgradient	Yes	340	NO	5.829	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	427	6.057
4/23/2002	507	6.229
7/16/2002	464	6.140
10/8/2002	408	6.011
1/7/2003	404	6.001
4/2/2003	450	6.109
7/9/2003	487	6.188
10/7/2003	481	6.176

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-U Third Quarter 2018 Statistical Analysis Historical Background Comparison

Iodide

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 2.000 S= 0.000 CV(1)=0.000 K factor**= 2.523 TL(1)= 2.000 LL(1)=N/A

Statistics-Transformed Background Data X= 0.693 S= 0.000 CV(2)=0.000 K factor**= 2.523 TL(2)= 0.693 LL(2)=N/A

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: MW370

Date Collected	Result	LN(Result)
3/17/2002	2	0.693
4/23/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	2	0.693
1/8/2003	2	0.693
4/3/2003	2	0.693
7/9/2003	2	0.693
10/6/2003	2	0.693

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	0.5	N/A	-0.693	N/A
MW361	Downgradient	No	0.5	N/A	-0.693	N/A
MW364	Downgradient	No	0.5	N/A	-0.693	N/A
MW367	Downgradient	Yes	0.182	NO	-1.704	N/A
MW370	Upgradient	No	0.5	N/A	-0.693	N/A
MW373	Upgradient	No	0.5	N/A	-0.693	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	2	0.693
1/7/2003	2	0.693
4/2/2003	2	0.693
7/9/2003	2	0.693
10/7/2003	2	0.693

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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Iron

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 9.230 S= 8.841 CV(1)=0.958 K factor**= 2.523 TL(1)= 31.535 LL(1)=N/A

Statistics-Transformed Background Data X= 1.942 S= 0.713 CV(2)=0.367 K factor**= 2.523 TL(2)= 3.740 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	9.34	2.234
4/23/2002	4.33	1.466
7/15/2002	3.52	1.258
10/8/2002	7.45	2.008
1/8/2003	7.04	1.952
4/3/2003	4.64	1.535
7/9/2003	15.8	2.760
10/6/2003	6.49	1.870

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.713	NO	-0.338	N/A
MW361	Downgradient	No	0.1	N/A	-2.303	N/A
MW364	Downgradient	Yes	0.0671	NO	-2.702	N/A
MW367	Downgradient	Yes	6.08	NO	1.805	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	No	0.1	N/A	-2.303	N/A

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

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	37.6	3.627
4/23/2002	19	2.944
7/16/2002	10.7	2.370
10/8/2002	3.75	1.322
1/7/2003	3.87	1.353
4/2/2003	3.5	1.253
7/9/2003	7.72	2.044
10/7/2003	2.93	1.075

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

LRGA

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

Statistics-Background Data X= 17.544 S= 5.911 CV(1)=0.337 K factor**= 2.523 TL(1)= 32.458 LL(1)=N/A

Statistics-Transformed Background Data X= 2.810 S= 0.343 CV(2)=0.122 K factor**= 2.523 TL(2)= 3.676 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	12.1	2.493
4/23/2002	15.1	2.715
7/15/2002	12.4	2.518
10/8/2002	12.2	2.501
1/8/2003	11.5	2.442
4/3/2003	12.3	2.510
7/9/2003	10	2.303
10/6/2003	12.1	2.493

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	14.9	NO	2.701	N/A
MW361	Downgradient	Yes	13.2	NO	2.580	N/A
MW364	Downgradient	Yes	13.6	NO	2.610	N/A
MW367	Downgradient	Yes	10.3	NO	2.332	N/A
MW370	Upgradient	Yes	11.1	NO	2.407	N/A
MW373	Upgradient	Yes	18	NO	2.890	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	24.8	3.211
4/23/2002	22.7	3.122
7/16/2002	18.8	2.934
10/8/2002	21.1	3.049
1/7/2003	19.9	2.991
4/2/2003	25.5	3.239
7/9/2003	23.3	3.148
10/7/2003	26.9	3.292

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

LRGA

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

Statistics-Background Data X= 1.080 S= 0.674 CV(1)=0.624 K factor**= 2.523 TL(1)= 2.780 LL(1)=N/A

Statistics-Transformed Background Data X= -0.114 S= 0.658 CV(2)=-5.762 K factor**= 2.523 TL(2)= 1.547 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.244	-1.411
4/23/2002	1.82	0.599
7/15/2002	1.22	0.199
10/8/2002	0.988	-0.012
1/8/2003	0.729	-0.316
4/3/2003	0.637	-0.451
7/9/2003	2.51	0.920
10/6/2003	1.05	0.049

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.128	NO	-2.056	N/A
MW361	Downgradient	Yes	0.00333	NO	-5.705	N/A
MW364	Downgradient	Yes	0.0143	NO	-4.247	N/A
MW367	Downgradient	Yes	1.49	NO	0.399	N/A
MW370	Upgradient	Yes	0.00167	NO	-6.395	N/A
MW373	Upgradient	Yes	0.00263	NO	-5.941	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.355	-1.036
4/23/2002	2.16	0.770
7/16/2002	1.39	0.329
10/8/2002	0.717	-0.333
1/7/2003	0.587	-0.533
4/2/2003	0.545	-0.607
7/9/2003	1.76	0.565
10/7/2003	0.57	-0.562

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

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= 0.010 S= 0.012 CV(1)= 1.198 K factor**= 2.523 TL(1)= 0.040 LL(1)=N/A

Statistics-Transformed Background Data X= -5.693 S= 1.604 CV(2)=-0.282 K factor**= 2.523 TL(2)= -1.647 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.00113	-6.786
1/8/2003	0.001	-6.908
4/3/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/6/2003	0.001	-6.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	0.0005	N/A	-7.601	N/A
MW361	Downgradient	No	0.0005	N/A	-7.601	N/A
MW364	Downgradient	Yes	0.000411	N/A	-7.797	NO
MW367	Downgradient	No	0.0005	N/A	-7.601	N/A
MW370	Upgradient	No	0.0005	N/A	-7.601	N/A
MW373	Upgradient	No	0.0005	N/A	-7.601	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/7/2003	0.001	-6.908

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

LRGA

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

Statistics-Background Data X= 0.024 S= 0.022 CV(1)=0.901 K factor**= 2.523 TL(1)= 0.078 LL(1)=N/A

Statistics-Transformed Background Data X= -4.239 S= 1.087 CV(2)=-0.256 K factor**= 2.523 TL(2)= -1.497 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.0264	-3.634
10/6/2003	0.00971	-4.635

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0104	NO	-4.566	N/A
MW361	Downgradient	No	0.002	N/A	-6.215	N/A
MW364	Downgradient	Yes	0.000906	NO	-7.006	N/A
MW367	Downgradient	Yes	0.00527	NO	-5.246	N/A
MW370	Upgradient	No	0.002	N/A	-6.215	N/A
MW373	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.0112	-4.492
10/7/2003	0.005	-5.298

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

LRGA

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

Statistics-Background Data X= 46.688 S= 60.986 CV(1)= 1.306 K factor**= 2.523 TL(1)= 200.555 LL(1)=N/A

Statistics-Transformed Background Data X= 3.829 S= 1.151 CV(2)=0.301 K factor**= 2.523 TL(2)= 4.942 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	140	4.942
4/23/2002	-15	#Func!
7/15/2002	5	1.609
4/3/2003	49	3.892
7/9/2003	-35	#Func!
10/6/2003	40	3.689
1/7/2004	101	4.615
4/7/2004	105	4.654

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	140	4.942
4/23/2002	-20	#Func!
10/8/2002	10	2.303
1/7/2003	10	2.303
4/2/2003	67	4.205
7/9/2003	-29	#Func!
10/7/2003	127	4.844
1/6/2004	52	3.951

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

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	282	N/A	5.642	YES
MW361	Downgradient	Yes	387	N/A	5.958	YES
MW364	Downgradient	Yes	317	N/A	5.759	YES
MW367	Downgradient	Yes	310	N/A	5.737	YES
MW370	Upgradient	Yes	369	N/A	5.911	YES
MW373	Upgradient	Yes	318	N/A	5.762	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

- MW358
- MW361
- MW364
- MW367
- MW370
- MW373

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

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

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

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

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

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

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pH

UNITS: Std Unit

LRGA

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

Statistics-Background Data X= 6.283 S= 0.159 CV(1)=0.025 K factor**= 2.904 TL(1)= 6.745 LL(1)=5.8202

Statistics-Transformed Background Data X= 1.837 S= 0.025 CV(2)=0.014 K factor**= 2.904 TL(2)= 1.911 LL(2)=1.7634

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	6.3	1.841
4/23/2002	6.4	1.856
7/15/2002	6.3	1.841
10/8/2002	6.3	1.841
1/8/2003	6.4	1.856
4/3/2003	6.5	1.872
7/9/2003	6.3	1.841
10/6/2003	6.5	1.872

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	5.66	YES	1.733	N/A
MW361	Downgradient	Yes	5.59	YES	1.721	N/A
MW364	Downgradient	Yes	5.58	YES	1.719	N/A
MW367	Downgradient	Yes	5.93	NO	1.780	N/A
MW370	Upgradient	Yes	6.09	NO	1.807	N/A
MW373	Upgradient	Yes	6.14	NO	1.815	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	6	1.792
4/23/2002	6.3	1.841
7/16/2002	6.45	1.864
10/8/2002	6.18	1.821
1/7/2003	6.35	1.848
4/2/2003	6.14	1.815
7/9/2003	6.1	1.808
10/7/2003	6	1.792

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

- MW358
- MW361
- MW364

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

LRGA

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

Statistics-Background Data X= 2.823 S= 0.522 CV(1)=0.185 K factor**= 2.523 TL(1)= 4.139 LL(1)=N/A

Statistics-Transformed Background Data X= 1.024 S= 0.167 CV(2)=0.163 K factor**= 2.523 TL(2)= 1.445 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.22	1.169
4/23/2002	3.43	1.233
7/15/2002	2.98	1.092
10/8/2002	2.46	0.900
1/8/2003	2.41	0.880
4/3/2003	2.43	0.888
7/9/2003	2.44	0.892
10/6/2003	2.48	0.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.27	NO	0.820	N/A
MW361	Downgradient	Yes	1.83	NO	0.604	N/A
MW364	Downgradient	Yes	1.99	NO	0.688	N/A
MW367	Downgradient	Yes	3.08	NO	1.125	N/A
MW370	Upgradient	Yes	2.37	NO	0.863	N/A
MW373	Upgradient	Yes	2.19	NO	0.784	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34	1.468
4/23/2002	3.04	1.112
7/16/2002	2.93	1.075
10/8/2002	2.3	0.833
1/7/2003	2.45	0.896
4/2/2003	2.7	0.993
7/9/2003	2.68	0.986
10/7/2003	2.88	1.058

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

LRGA

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

Statistics-Background Data X= 51.544 S= 15.227 CV(1)=0.295 K factor**= 2.523 TL(1)= 89.962 LL(1)=N/A

Statistics-Transformed Background Data X= 3.906 S= 0.272 CV(2)=0.070 K factor**= 2.523 TL(2)= 4.592 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	31.8	3.459
4/23/2002	50	3.912
7/15/2002	44.7	3.800
10/8/2002	40	3.689
1/8/2003	44.6	3.798
4/3/2003	41.9	3.735
7/9/2003	40	3.689
10/6/2003	38.1	3.640

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	42	NO	3.738	N/A
MW361	Downgradient	Yes	38.2	NO	3.643	N/A
MW364	Downgradient	Yes	43.6	NO	3.775	N/A
MW367	Downgradient	Yes	27.1	NO	3.300	N/A
MW370	Upgradient	Yes	38.1	NO	3.640	N/A
MW373	Upgradient	Yes	40.9	NO	3.711	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	43.4	3.770
4/23/2002	79.8	4.380
7/16/2002	87.7	4.474
10/8/2002	61.6	4.121
1/7/2003	59.3	4.083
4/2/2003	62.1	4.129
7/9/2003	50.1	3.914
10/7/2003	49.6	3.904

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

LRGA

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

Statistics-Background Data X= 122.381 S= 195.095 CV(1)=1.594 **K factor**= 2.523** TL(1)= 614.606 LL(1)=N/A

Statistics-Transformed Background Data X= 3.985 S= 1.323 CV(2)=0.332 **K factor**= 2.523** TL(2)= 7.322 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	17.4	2.856
4/23/2002	37.9	3.635
7/15/2002	15.7	2.754
10/8/2002	13.4	2.595
1/8/2003	14.4	2.667
4/3/2003	18.1	2.896
7/9/2003	9.6	2.262
10/6/2003	16.5	2.803

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	64.3	N/A	4.164	NO
MW361	Downgradient	Yes	80.1	N/A	4.383	NO
MW364	Downgradient	Yes	74.6	N/A	4.312	NO
MW367	Downgradient	Yes	39	N/A	3.664	NO
MW370	Upgradient	Yes	21.5	N/A	3.068	NO
MW373	Upgradient	Yes	81.3	N/A	4.398	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	163.3	5.096
4/23/2002	809.6	6.697
7/16/2002	109.4	4.695
10/8/2002	110.6	4.706
1/7/2003	113.7	4.734
4/2/2003	133	4.890
7/9/2003	182.1	5.205
10/7/2003	193.4	5.265

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

LRGA

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

Statistics-Background Data X= 7.655 S= 13.274 CV(1)=1.734 K factor**= 2.523 TL(1)= 41.146 LL(1)=N/A

Statistics-Transformed Background Data X= 1.946 S= 0.939 CV(2)=0.483 K factor**= 2.523 TL(2)= 3.833 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.8	2.380
4/23/2002	8.53	2.144
7/15/2002	5.09	1.627
10/8/2002	4.78	1.564
1/8/2003	-5.12	#Func!
4/3/2003	5.11	1.631
7/9/2003	4.25	1.447
10/6/2003	6.54	1.878

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	16.5	2.803
4/23/2002	3.49	1.250
7/16/2002	1.42	0.351
10/8/2002	-6.06	#Func!
1/7/2003	-8.41	#Func!
4/2/2003	26.3	3.270
7/9/2003	3.06	1.118
10/7/2003	46.2	3.833

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

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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	42.8	N/A	3.757	NO
MW361	Downgradient	Yes	43.2	N/A	3.766	NO
MW364	Downgradient	Yes	30.7	N/A	3.424	NO
MW367	Downgradient	No	1.73	N/A	0.548	N/A
MW370	Upgradient	Yes	96.2	N/A	4.566	YES
MW373	Upgradient	No	-15.9	N/A	#Error	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW370

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

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

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

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

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

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

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Total Organic Carbon (TOC)

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 6.169 S= 12.072 CV(1)=1.957 K factor**= 2.523 TL(1)= 36.626 LL(1)=N/A

Statistics-Transformed Background Data X= 1.069 S= 1.014 CV(2)=0.948 K factor**= 2.523 TL(2)= 3.626 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.2	0.182
4/23/2002	4.3	1.459
7/15/2002	2.6	0.956
10/8/2002	2.3	0.833
1/8/2003	3	1.099
4/3/2003	1.2	0.182
7/9/2003	2.6	0.956
10/6/2003	1.7	0.531

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.819	N/A	-0.200	NO
MW361	Downgradient	Yes	0.688	N/A	-0.374	NO
MW364	Downgradient	Yes	0.731	N/A	-0.313	NO
MW367	Downgradient	Yes	0.468	N/A	-0.759	NO
MW370	Upgradient	No	1.3	N/A	0.262	N/A
MW373	Upgradient	No	1.14	N/A	0.131	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.1	0.095
4/23/2002	17.5	2.862
7/16/2002	49	3.892
10/8/2002	2.9	1.065
1/7/2003	3.9	1.361
4/2/2003	2.5	0.916
7/9/2003	1.7	0.531
10/7/2003	1.2	0.182

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

LRGA

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

Statistics-Background Data X= 79.819 S= 78.470 CV(1)=0.983 K factor**= 2.523 TL(1)= 277.798 LL(1)=N/A

Statistics-Transformed Background Data X= 3.971 S= 0.950 CV(2)=0.239 K factor**= 2.523 TL(2)= 6.368 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	50	3.912
4/23/2002	228	5.429
7/15/2002	88	4.477
10/8/2002	58	4.060
1/8/2003	72.4	4.282
4/3/2003	26.6	3.281
7/9/2003	16.4	2.797
10/6/2003	31.1	3.437

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.16	NO	1.426	N/A
MW361	Downgradient	Yes	8.7	NO	2.163	N/A
MW364	Downgradient	Yes	5.5	NO	1.705	N/A
MW367	Downgradient	Yes	4.78	NO	1.564	N/A
MW370	Upgradient	Yes	12.5	NO	2.526	N/A
MW373	Upgradient	Yes	19.9	NO	2.991	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/23/2002	276	5.620
7/16/2002	177	5.176
10/8/2002	76	4.331
1/7/2003	45.9	3.826
4/2/2003	57.8	4.057
7/9/2003	10	2.303
10/7/2003	13.9	2.632

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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Trichloroethene

UNITS: ug/L

LRGA

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

Statistics-Background Data X= 12.188 S= 6.950 CV(1)=0.570 K factor**= 2.523 TL(1)= 29.721 LL(1)=N/A

Statistics-Transformed Background Data X= 2.305 S= 0.687 CV(2)=0.298 K factor**= 2.523 TL(2)= 4.039 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	19	2.944
4/23/2002	17	2.833
7/15/2002	15	2.708
10/8/2002	18	2.890
1/8/2003	17	2.833
4/3/2003	18	2.890
7/9/2003	15	2.708
10/6/2003	16	2.773

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.9	N/A	1.589	N/A
MW361	Downgradient	Yes	7.18	NO	1.971	N/A
MW364	Downgradient	Yes	6.12	NO	1.812	N/A
MW367	Downgradient	Yes	2.79	N/A	1.026	N/A
MW370	Upgradient	No	0.79	N/A	-0.236	N/A
MW373	Upgradient	Yes	5.53	NO	1.710	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/23/2002	25	3.219
7/16/2002	3	1.099
10/8/2002	4	1.386
1/7/2003	6	1.792
4/2/2003	5	1.609
7/9/2003	6	1.792
10/7/2003	6	1.792

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

LRGA

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

Statistics-Background Data X= 0.055 S= 0.037 CV(1)=0.673 K factor**= 2.523 TL(1)= 0.147 LL(1)=N/A

Statistics-Transformed Background Data X= -3.131 S= 0.691 CV(2)=-0.221 K factor**= 2.523 TL(2)= -1.388 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.1	-2.303
4/23/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00476	NO	-5.348	N/A
MW361	Downgradient	No	0.01	N/A	-4.605	N/A
MW364	Downgradient	Yes	0.0334	NO	-3.399	N/A
MW367	Downgradient	Yes	0.0135	NO	-4.305	N/A
MW370	Upgradient	Yes	0.0042	NO	-5.473	N/A
MW373	Upgradient	Yes	0.00413	NO	-5.489	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/23/2002	0.1	-2.303
7/16/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/7/2003	0.035	-3.352
4/2/2003	0.035	-3.352
7/9/2003	0.0234	-3.755
10/7/2003	0.02	-3.912

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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Calcium

UNITS: mg/L

UCRS

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

Statistics-Background Data X= 32.919 S= 12.357 CV(1)=0.375 **K factor**= 2.523** TL(1)= 64.096 LL(1)=N/A

Statistics-Transformed Background Data X= 3.431 S= 0.363 CV(2)=0.106 **K factor**= 2.523** TL(2)= 4.347 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	42.2	3.742
10/19/2016	42.1	3.740
1/18/2017	43.1	3.764
4/18/2017	39.1	3.666
7/20/2017	40.3	3.696
10/3/2017	42.1	3.740
1/22/2018	38.1	3.640
4/12/2018	62.5	4.135

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW368	Downgradient	Yes	76.9	YES	4.343	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	21	3.045
10/19/2016	21.7	3.077
1/19/2017	23.8	3.170
4/18/2017	21.6	3.073
7/20/2017	21.5	3.068
10/3/2017	22	3.091
1/22/2018	24.2	3.186
4/12/2018	21.4	3.063

Conclusion of Statistical Analysis on Current Data

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

Wells with Exceedances

MW368

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

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

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

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

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

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

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Current Background Comparison

Dissolved Oxygen

UNITS: mg/L

UCRS

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

Statistics-Background Data X= 2.571 S= 1.667 CV(1)=0.648 K factor**= 2.523 TL(1)= 6.777 LL(1)=N/A

Statistics-Transformed Background Data X= 0.798 S= 0.534 CV(2)=0.670 K factor**= 2.523 TL(2)= 2.145 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	3.65	1.295
10/19/2016	2.2	0.788
1/18/2017	2.41	0.880
4/18/2017	3.43	1.233
7/20/2017	3.51	1.256
10/3/2017	1.82	0.599
1/22/2018	2.8	1.030
4/12/2018	7.85	2.061

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	1	0.000
10/19/2016	3.39	1.221
1/19/2017	1.43	0.358
4/18/2017	1.52	0.419
7/20/2017	1.95	0.668
10/3/2017	1.12	0.113
1/22/2018	1.39	0.329
4/12/2018	1.67	0.513

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	4.47	NO	1.497	N/A
MW362	Downgradient	Yes	4.07	NO	1.404	N/A
MW365	Downgradient	Yes	2.8	NO	1.030	N/A
MW368	Downgradient	Yes	5.49	NO	1.703	N/A
MW371	Upgradient	Yes	4.89	NO	1.587	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.

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Current Background Comparison

Magnesium

UNITS: mg/L

UCRS

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

Statistics-Background Data X= 9.798 S= 4.505 CV(1)=0.460 **K factor**= 2.523** TL(1)= 21.163 LL(1)=N/A

Statistics-Transformed Background Data X= 2.175 S= 0.483 CV(2)=0.222 **K factor**= 2.523** TL(2)= 3.395 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	13.4	2.595
10/19/2016	15	2.708
1/18/2017	16.1	2.779
4/18/2017	14.2	2.653
7/20/2017	13.8	2.625
10/3/2017	14.8	2.695
1/22/2018	14.4	2.667
4/12/2018	10.3	2.332

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW368	Downgradient	Yes	24.3	YES	3.190	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	5.33	1.673
10/19/2016	5.83	1.763
1/19/2017	6.04	1.798
4/18/2017	5.08	1.625
7/20/2017	5.32	1.671
10/3/2017	6.22	1.828
1/22/2018	5.91	1.777
4/12/2018	5.03	1.615

Conclusion of Statistical Analysis on Current Data

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

Wells with Exceedances

MW368

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

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

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

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

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

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

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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= 290.875 S= 91.502 CV(1)=0.315 **K factor**= 2.523** TL(1)= 521.735 LL(1)=N/A

Statistics-Transformed Background Data X= 5.625 S= 0.324 CV(2)=0.058 **K factor**= 2.523** TL(2)= 6.442 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	441	6.089
10/19/2016	370	5.914
1/18/2017	410	6.016
4/18/2017	257	5.549
7/20/2017	364	5.897
10/3/2017	375	5.927
1/22/2018	339	5.826
4/12/2018	365	5.900

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	316	NO	5.756	N/A
MW362	Downgradient	Yes	367	NO	5.905	N/A
MW365	Downgradient	Yes	429	NO	6.061	N/A
MW368	Downgradient	Yes	389	NO	5.964	N/A
MW371	Upgradient	Yes	342	NO	5.835	N/A
MW374	Upgradient	Yes	269	NO	5.595	N/A
MW375	Sidegradient	Yes	373	NO	5.922	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	193	5.263
10/19/2016	241	5.485
1/19/2017	187	5.231
4/18/2017	193	5.263
7/20/2017	188	5.236
10/3/2017	194	5.268
1/22/2018	206	5.328
4/12/2018	331	5.802

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.

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

Statistics-Background Data X= 6.664 S= 0.238 CV(1)=0.036 **K factor**= 2.904** TL(1)= 7.355 LL(1)=5.9733

Statistics-Transformed Background Data X= 1.896 S= 0.036 CV(2)=0.019 **K factor**= 2.904** TL(2)= 2.000 LL(2)=1.7925

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	6.45	1.864
10/19/2016	6.64	1.893
1/18/2017	6.62	1.890
4/18/2017	6.67	1.898
7/20/2017	6.7	1.902
10/3/2017	6.59	1.886
1/22/2018	6.64	1.893
4/12/2018	6.1	1.808

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW359	Downgradient	Yes	5.66	YES	1.733	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	7.26	1.982
10/19/2016	6.89	1.930
1/19/2017	6.5	1.872
4/18/2017	6.71	1.904
7/20/2017	6.85	1.924
10/3/2017	6.73	1.907
1/22/2018	6.65	1.895
4/12/2018	6.63	1.892

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Lower Tolerance Limit, which is evidence of lowered concentration with respect to current background data.

Wells with Exceedances

MW359

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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Current Background Comparison

Sulfate

UNITS: mg/L

UCRS

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

Statistics-Background Data X= 15.353 S= 21.124 CV(1)=1.376 **K factor**= 2.523** TL(1)= 68.649 LL(1)=N/A

Statistics-Transformed Background Data X= 2.352 S= 0.745 CV(2)=0.317 **K factor**= 2.523** TL(2)= 4.231 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
7/18/2016	27.6	3.318
10/19/2016	14.8	2.695
1/18/2017	13.1	2.573
4/18/2017	13.9	2.632
7/20/2017	14	2.639
10/3/2017	10	2.303
1/22/2018	11	2.398
4/12/2018	91.6	4.517

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	53.2	N/A	3.974	NO
MW362	Downgradient	Yes	32.7	N/A	3.487	NO
MW365	Downgradient	Yes	64.1	N/A	4.160	NO
MW368	Downgradient	Yes	200	N/A	5.298	YES
MW371	Upgradient	Yes	47.7	N/A	3.865	NO
MW375	Sidegradient	Yes	25.9	N/A	3.254	NO

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2016	6.25	1.833
10/19/2016	6.18	1.821
1/19/2017	4.83	1.575
4/18/2017	5.71	1.742
7/20/2017	6.31	1.842
10/3/2017	6.78	1.914
1/22/2018	6.34	1.847
4/12/2018	7.24	1.980

Conclusion of Statistical Analysis on Current Data

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

Wells with Exceedances

MW368

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

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

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

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

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

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

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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= 321.750 S= 56.187 CV(1)=0.175 K factor**= 2.523 TL(1)= 463.510 LL(1)=N/A

Statistics-Transformed Background Data X= 5.759 S= 0.179 CV(2)=0.031 K factor**= 2.523 TL(2)= 6.210 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
7/14/2016	323	5.778
10/19/2016	365	5.900
1/18/2017	381	5.943
4/18/2017	271	5.602
7/20/2017	376	5.930
10/3/2017	399	5.989
1/22/2018	346	5.846
4/11/2018	397	5.984

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	298	NO	5.697	N/A
MW360	Downgradient	Yes	237	NO	5.468	N/A
MW363	Downgradient	Yes	282	NO	5.642	N/A
MW366	Downgradient	Yes	250	NO	5.521	N/A
MW369	Upgradient	Yes	338	NO	5.823	N/A
MW372	Upgradient	Yes	371	NO	5.916	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2016	248	5.513
10/19/2016	242	5.489
1/19/2017	263	5.572
4/18/2017	256	5.545
7/20/2017	300	5.704
10/3/2017	358	5.881
1/22/2018	275	5.617
4/12/2018	348	5.852

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.

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

Statistics-Background Data	X= 6.257	S= 0.155	CV(1)=0.025	K factor**= 2.904	TL(1)= 6.706	LL(1)=5.8080
Statistics-Transformed Background Data	X= 1.833	S= 0.025	CV(2)=0.013	K factor**= 2.904	TL(2)= 1.905	LL(2)=1.7621

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/14/2016	6.42	1.859
10/19/2016	6.4	1.856
1/18/2017	6.23	1.829
4/18/2017	6.01	1.793
7/20/2017	6.2	1.825
10/3/2017	6.12	1.812
1/22/2018	6.21	1.826
4/11/2018	6.34	1.847

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2016	6.64	1.893
10/19/2016	6.34	1.847
1/19/2017	6.02	1.795
4/18/2017	6.25	1.833
7/20/2017	6.24	1.831
10/3/2017	6.22	1.828
1/22/2018	6.29	1.839
4/12/2018	6.18	1.821

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)?
MW363	Downgradient	Yes	5.66	YES	1.733	N/A
MW366	Downgradient	Yes	5.54	YES	1.712	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Lower Tolerance Limit, which is evidence of lowered concentration with respect to current background data.

Wells with Exceedances

MW363
MW366

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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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= 51.181 S= 7.527 CV(1)=0.147 **K factor**= 2.523** TL(1)= 70.173 LL(1)=N/A

Statistics-Transformed Background Data X= 3.926 S= 0.136 CV(2)=0.035 **K factor**= 2.523** TL(2)= 4.268 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
7/14/2016	58.9	4.076
10/19/2016	52.2	3.955
1/18/2017	72	4.277
4/18/2017	62	4.127
7/20/2017	54	3.989
10/3/2017	50.3	3.918
1/22/2018	48.5	3.882
4/11/2018	49.2	3.896

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW360	Downgradient	Yes	84.5	YES	4.437	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2016	48.5	3.882
10/19/2016	49.7	3.906
1/19/2017	43.4	3.770
4/18/2017	48	3.871
7/20/2017	42.8	3.757
10/3/2017	47.5	3.861
1/22/2018	45.5	3.818
4/12/2018	46.4	3.837

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

MW360

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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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= 48.442 S= 52.160 CV(1)=1.077 **K factor**= 2.523** TL(1)= 180.041 LL(1)=N/A

Statistics-Transformed Background Data X= 3.451 S= 0.934 CV(2)=0.271 **K factor**= 2.523** TL(2)= 5.806 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

Date Collected	Result	LN(Result)
7/14/2016	10.7	2.370
10/19/2016	83.3	4.422
1/18/2017	27	3.296
4/18/2017	9.22	2.221
7/20/2017	34.2	3.532
10/3/2017	70.8	4.260
1/22/2018	38.8	3.658
4/11/2018	142	4.956

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	70.9	N/A	4.261	NO

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2016	35.4	3.567
10/19/2016	10.3	2.332
1/19/2017	24.7	3.207
4/18/2017	9.55	2.257
7/20/2017	30.2	3.408
10/3/2017	195	5.273
1/22/2018	17.3	2.851
4/12/2018	36.6	3.600

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.

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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= 37.187 S= 25.685 CV(1)=0.691 **K factor**= 2.523** TL(1)= 101.990 LL(1)=N/A

Statistics-Transformed Background Data X= 3.354 S= 0.792 CV(2)=0.236 **K factor**= 2.523** TL(2)= 5.352 LL(2)=N/A

Current 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: MW370

Date Collected	Result	LN(Result)
7/18/2016	58	4.060
10/19/2016	19.1	2.950
1/18/2017	44.8	3.802
4/18/2017	65.7	4.185
7/20/2017	84.6	4.438
10/3/2017	69	4.234
1/22/2018	71.9	4.275
4/11/2018	50	3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	102	YES	4.625	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2016	18.1	2.896
10/19/2016	17.8	2.879
1/19/2017	15.6	2.747
4/18/2017	14.6	2.681
7/20/2017	16.7	2.815
10/3/2017	20.6	3.025
1/22/2018	23.5	3.157
4/12/2018	4.99	1.607

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

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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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= 350.563 S= 57.412 CV(1)=0.164 **K factor**= 2.523** TL(1)= 495.413 LL(1)=N/A

Statistics-Transformed Background Data X= 5.847 S= 0.162 CV(2)=0.028 **K factor**= 2.523** TL(2)= 6.257 LL(2)=N/A

Current 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: MW370

Date Collected	Result	LN(Result)
7/18/2016	483	6.180
10/19/2016	402	5.996
1/18/2017	412	6.021
4/18/2017	278	5.628
7/20/2017	343	5.838
10/3/2017	392	5.971
1/22/2018	334	5.811
4/11/2018	368	5.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	282	NO	5.642	N/A
MW361	Downgradient	Yes	387	NO	5.958	N/A
MW364	Downgradient	Yes	317	NO	5.759	N/A
MW367	Downgradient	Yes	310	NO	5.737	N/A
MW370	Upgradient	Yes	369	NO	5.911	N/A
MW373	Upgradient	Yes	318	NO	5.762	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2016	337	5.820
10/19/2016	322	5.775
1/19/2017	279	5.631
4/18/2017	260	5.561
7/20/2017	309	5.733
10/3/2017	347	5.849
1/22/2018	393	5.974
4/12/2018	350	5.858

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.

pH

UNITS: Std Unit

LRGA

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

Statistics-Background Data X= 6.201 S= 0.144 CV(1)=0.023 **K factor**= 2.904** TL(1)= 6.620 LL(1)=5.7827

Statistics-Transformed Background Data X= 1.824 S= 0.023 CV(2)=0.013 **K factor**= 2.904** TL(2)= 1.893 LL(2)=1.7562

Current 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: MW370

Date Collected	Result	LN(Result)
7/18/2016	5.8	1.758
10/19/2016	6.29	1.839
1/18/2017	6.16	1.818
4/18/2017	6.31	1.842
7/20/2017	6.19	1.823
10/3/2017	6.13	1.813
1/22/2018	6.12	1.812
4/11/2018	6.1	1.808

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	5.66	YES	1.733	N/A
MW361	Downgradient	Yes	5.59	YES	1.721	N/A
MW364	Downgradient	Yes	5.58	YES	1.719	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2016	6.5	1.872
10/19/2016	6.31	1.842
1/19/2017	6.25	1.833
4/18/2017	6.21	1.826
7/20/2017	6.24	1.831
10/3/2017	6.24	1.831
1/22/2018	6.19	1.823
4/12/2018	6.18	1.821

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Lower Tolerance Limit, which is evidence of lowered concentration with respect to current background data.

Wells with Exceedances

- MW358
- MW361
- MW364

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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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= 56.745 S= 38.319 CV(1)=0.675 **K factor**= 2.523** TL(1)= 153.424 LL(1)=N/A

Statistics-Transformed Background Data X= 3.785 S= 0.773 CV(2)=0.204 **K factor**= 2.523** TL(2)= 5.735 LL(2)=N/A

Current 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: MW370

Date Collected	Result	LN(Result)
7/18/2016	93.2	4.535
10/19/2016	31.7	3.456
1/18/2017	82.8	4.416
4/18/2017	99.1	4.596
7/20/2017	120	4.787
10/3/2017	103	4.635
1/22/2018	73.9	4.303
4/11/2018	107	4.673

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	96.2	NO	4.566	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2016	23.7	3.165
10/19/2016	19.9	2.991
1/19/2017	33.1	3.500
4/18/2017	26.8	3.288
7/20/2017	9.12	2.210
10/3/2017	29.6	3.388
1/22/2018	24.8	3.211
4/12/2018	30.2	3.408

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

ATTACHMENT D3
STATISTICIAN QUALIFICATION STATEMENT

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October 8, 2018

Ms. Kelly Layne
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

Dear Ms. Layne:

This statement is submitted in response to your request that it be included with the completed statistical analysis that I have performed on the groundwater data for the C-746-S&T and C-746-U Landfills at the Paducah Gaseous Diffusion Plant.

As an Environmental Scientist, with a bachelor's degree in science, I have over 20 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was observed and reviewed by a senior chemist and geologist with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the third quarter 2018 monitoring well data collected from the C-746-S&T and C-746-U Landfills were performed in accordance with guidance provided in the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Sincerely,



Jennifer R. Watson

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APPENDIX E
GROUNDWATER FLOW RATE AND DIRECTION

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GROUNDWATER FLOW RATE AND DIRECTION

Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently are recorded in several wells at the landfill on a quarterly basis. These measurements were used to plot the potentiometric surface of the RGA for the third quarter 2018 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on July 24, 2018. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling for laboratory analysis.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradients for the URGA and LRGA at the C-746-U Landfill, as measured along the defined groundwater flow directions, were 6.22×10^{-4} ft/ft and 7.25×10^{-4} ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was 5.93×10^{-4} ft/ft. The hydraulic gradients are shown in Table E.2.

The average linear groundwater flow velocity (v) is determined by multiplying the hydraulic gradient (i) by the hydraulic conductivity (K) [resulting in the specific discharge (q)] and dividing by the effective porosity (n_e). The RGA hydraulic conductivity values used are reported in the Administrative Application for the New Solid Waste Landfill Permit No. SW07300045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA (both URGA and LRGA) effective porosity is assumed to be 25%. Flow velocities were calculated for the URGA and LRGA using the low and high values for hydraulic conductivity, as shown in the Table E.3.

Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for July 2018, the groundwater flow direction in the immediate area of the landfill ranges from north to northeastward.

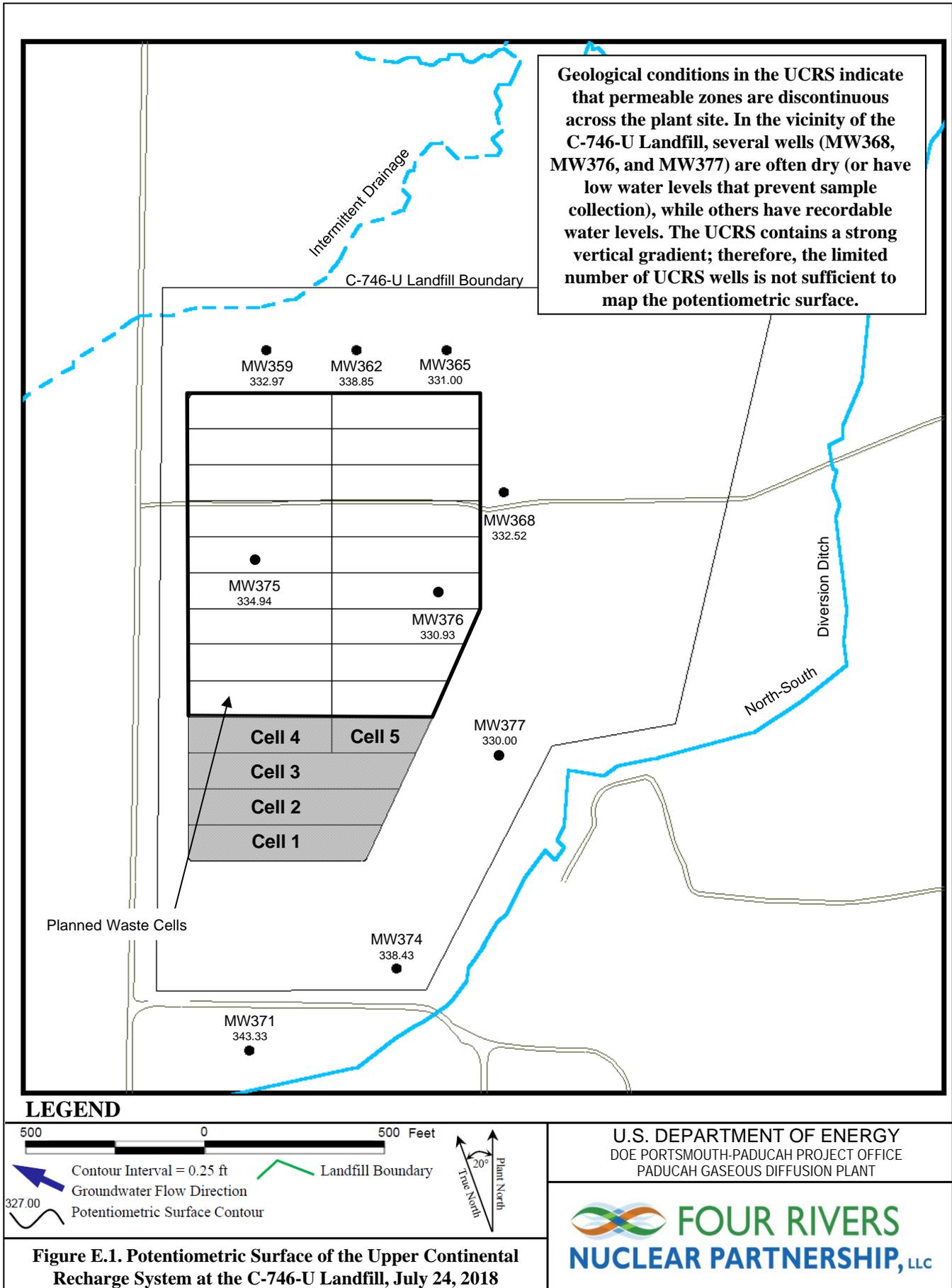
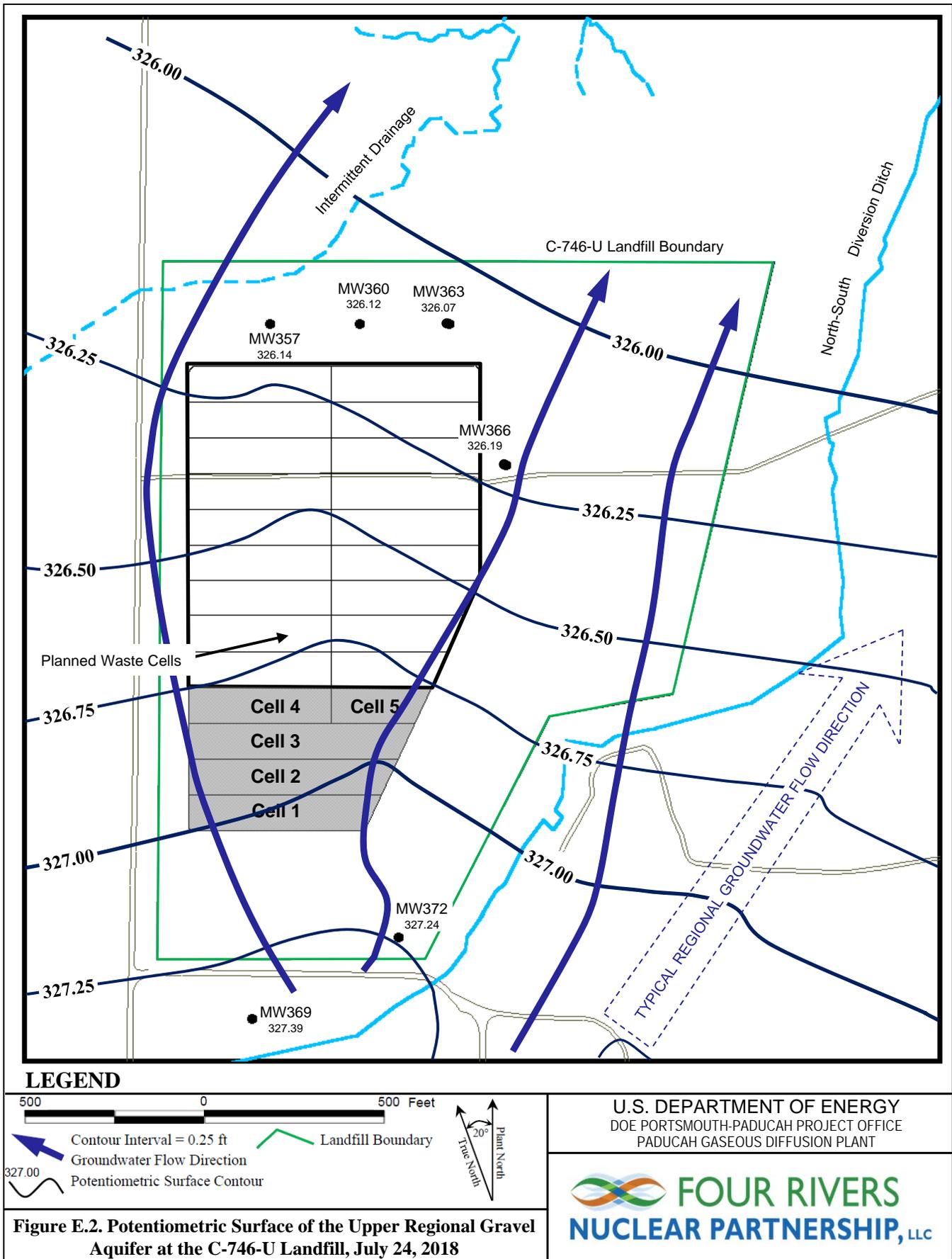
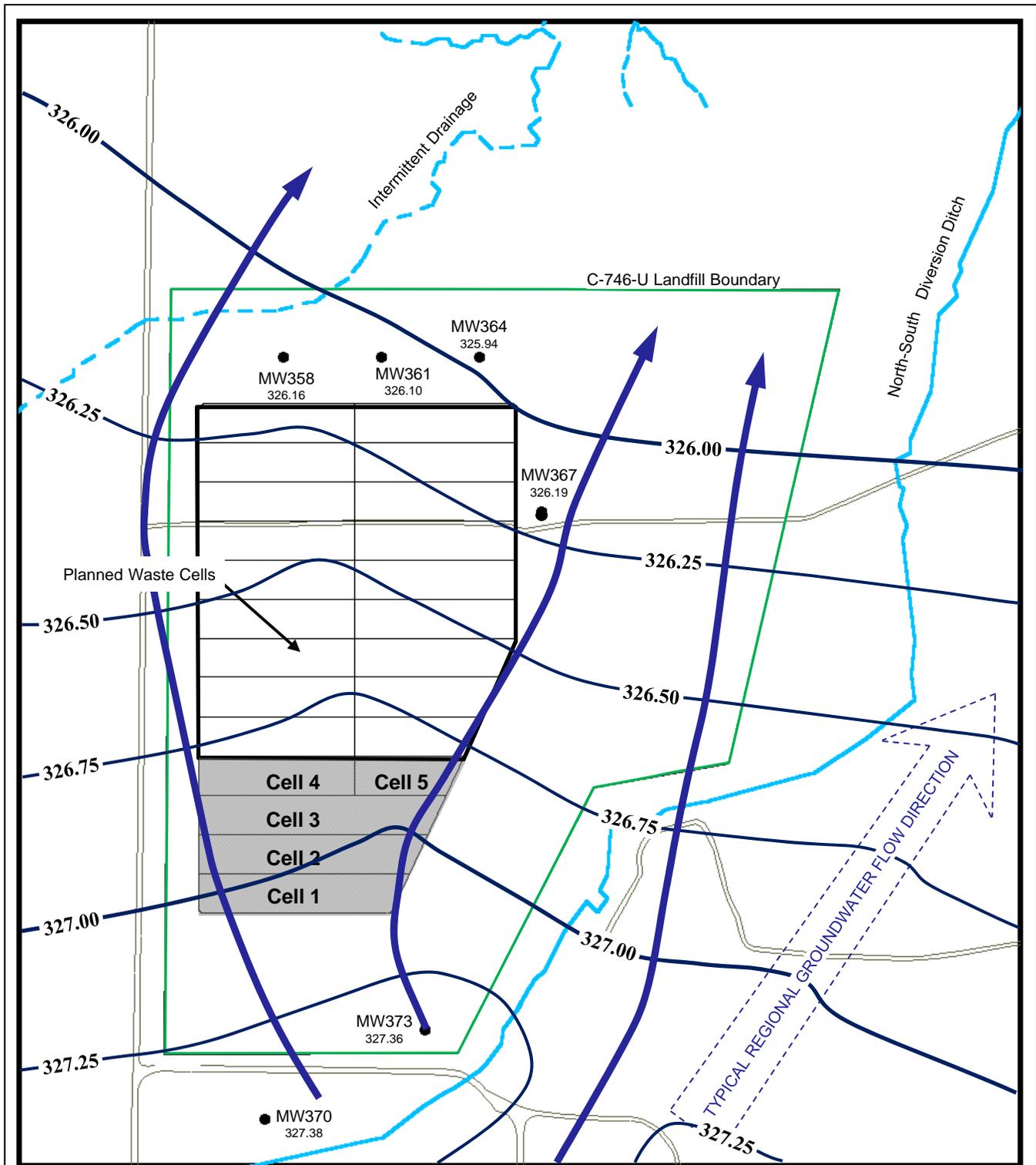


Figure E.1. Potentiometric Surface of the Upper Continental Recharge System at the C-746-U Landfill, July 24, 2018

Table E.1. C-746-U Landfill Third Quarter 2018 (July) Water Levels

C-746-U Landfill (July 2018) Water Levels										
Date	Time	Well	Aquifer	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H2O)	Raw Data		*Corrected Data	
							DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
7/24/2018	7:13	MW357	URGA	368.99	29.99	0.00	42.85	326.14	42.85	326.14
7/24/2018	7:15	MW358	LRGA	369.13	29.99	0.00	42.97	326.16	42.97	326.16
7/24/2018	7:14	MW359	UCRS	369.11	29.99	0.00	36.14	332.97	36.14	332.97
7/24/2018	7:11	MW360	URGA	362.30	29.99	0.00	36.18	326.12	36.18	326.12
7/24/2018	7:09	MW361	LRGA	361.54	29.99	0.00	35.44	326.10	35.44	326.10
7/24/2018	7:10	MW362	UCRS	362.04	29.99	0.00	23.19	338.85	23.19	338.85
7/24/2018	6:58	MW363	URGA	368.84	29.99	0.00	42.77	326.07	42.77	326.07
7/24/2018	6:54	MW364	LRGA	368.45	29.99	0.00	42.51	325.94	42.51	325.94
7/24/2018	6:56	MW365	UCRS	368.37	29.99	0.00	37.37	331.00	37.37	331.00
7/24/2018	7:04	MW366	URGA	369.27	29.99	0.00	43.08	326.19	43.08	326.19
7/24/2018	7:03	MW367	LRGA	369.66	29.99	0.00	43.47	326.19	43.47	326.19
7/24/2018	7:01	MW368	UCRS	369.27	29.99	0.00	36.75	332.52	36.75	332.52
7/24/2018	7:24	MW369	URGA	364.48	29.99	0.00	37.09	327.39	37.09	327.39
7/24/2018	7:26	MW370	LRGA	365.35	29.99	0.00	37.97	327.38	37.97	327.38
7/24/2018	7:25	MW371	UCRS	364.88	29.99	0.00	21.55	343.33	21.55	343.33
7/24/2018	7:23	MW372	URGA	359.52	29.99	0.00	32.28	327.24	32.28	327.24
7/24/2018	7:21	MW373	LRGA	359.95	29.99	0.00	32.59	327.36	32.59	327.36
7/24/2018	7:22	MW374	UCRS	359.71	29.99	0.00	21.28	338.43	21.28	338.43
7/24/2018	7:19	MW375	UCRS	370.53	29.99	0.00	35.59	334.94	35.59	334.94
7/24/2018	8:08	MW376	UCRS	370.61	30.00	-0.01	39.69	330.92	39.68	330.93
7/24/2018	7:17	MW377	UCRS	365.92	29.99	0.00	35.92	330.00	35.92	330.00
Initial Barometric Pressure			29.99							
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										





LEGEND

500 0 500 Feet

Contour Interval = 0.25 ft
 Groundwater Flow Direction
 Potentiometric Surface Contour
 Landfill Boundary

327.00

20°
Plant North
True North

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



Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer at the C-746-U Landfill, July 24, 2018

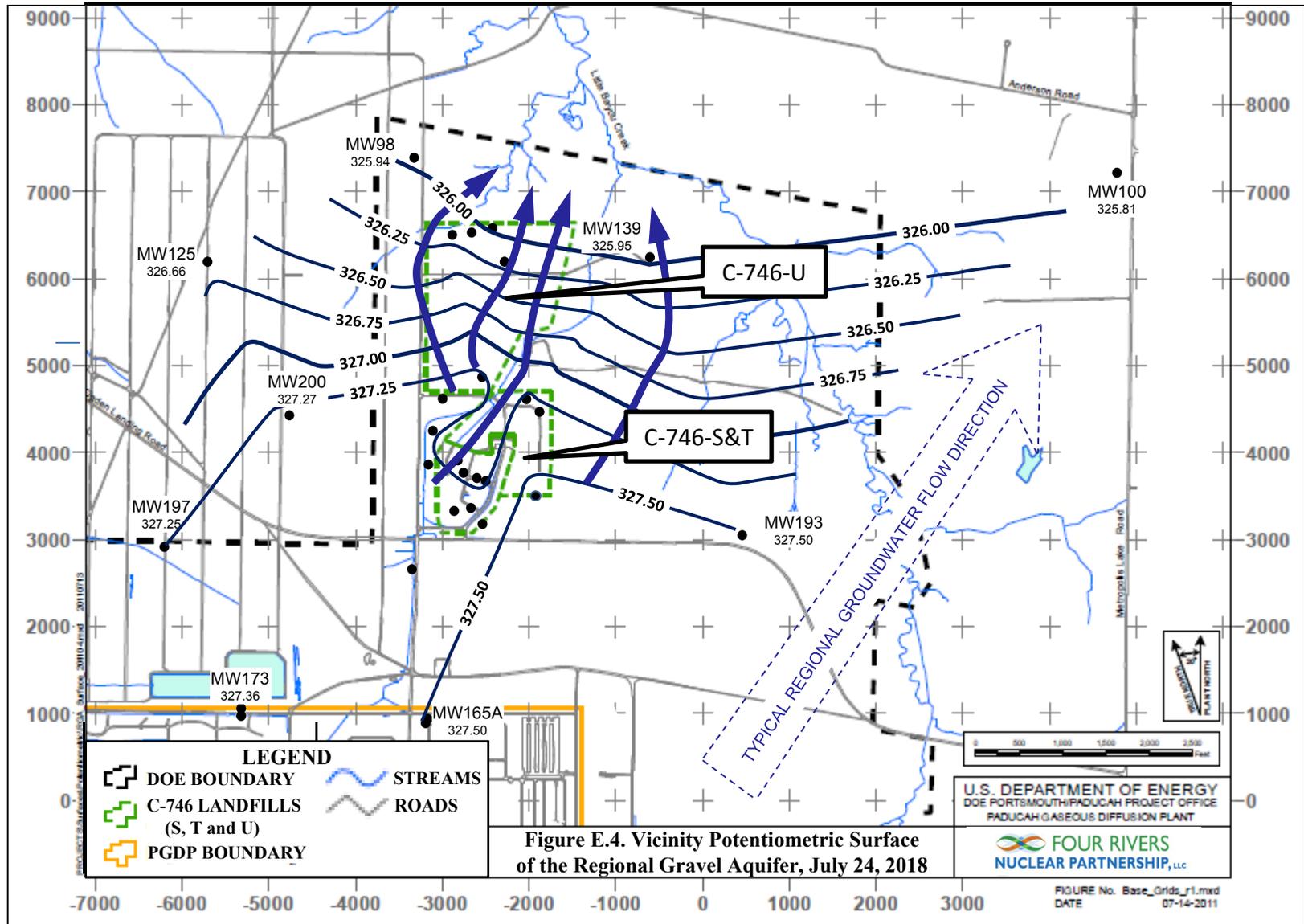


Table E.2. C-746-U Landfill Hydraulic Gradients

	ft/ft
Beneath Landfill—Upper RGA	6.22×10^{-4}
Beneath Landfill—Lower RGA	7.25×10^{-4}
Vicinity	5.93×10^{-4}

Table E.3. C-746-U Landfill Groundwater Flow Rate

Hydraulic Conductivity (K)		Specific Discharge (q)		Average Linear Velocity (v)	
ft/day	cm/s	ft/day	cm/s	ft/day	cm/s
<u>Upper RGA</u>					
725	0.256	0.451	1.59×10^{-4}	1.81	6.37×10^{-4}
425	0.150	0.265	9.34×10^{-5}	1.06	3.73×10^{-4}
<u>Lower RGA</u>					
725	0.256	0.525	1.86×10^{-4}	2.10	7.42×10^{-4}
425	0.150	0.308	1.09×10^{-4}	1.23	4.35×10^{-4}

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APPENDIX F
NOTIFICATIONS

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NOTIFICATIONS

In accordance with 401 KAR 48:300 § 7, the notification for parameters that exceed the maximum contaminant level (MCL) has been submitted to the Kentucky Division of Waste Management. The parameters submitted are listed on page F-4. The notification for parameters that do not have MCLs, but had statistically significant increased concentrations relative to historical background concentrations, is provided below.

Statistical Analysis of Parameters Notification

The statistical analyses conducted on the third quarter 2018 groundwater data collected from the C-746-U Landfill monitoring wells were performed in accordance with *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (LATA Kentucky 2014).

The following are the permit required parameters in 40 CFR § 302.4, Appendix A, which had statistically significant increased concentrations relative to historical background concentrations.

	<u>Parameter</u>	<u>Monitoring Well</u>
Upper Continental Recharge System	None	
Upper Regional Gravel Aquifer	Sodium Technetium-99	MW360 MW372
Lower Regional Gravel Aquifer	Technetium-99	MW370

NOTE: Although technetium-99 is not cited in 40 CFR § 302.4, Appendix A, this radionuclide is being reported along with the parameters of this regulation.

8/27/2018

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

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4795	MW361	Trichloroethene	8260B	7.18	ug/L	5
8004-4797	MW364	Trichloroethene	8260B	6.12	ug/L	5
8004-0982	MW366	Trichloroethene	8260B	5.75	ug/L	5
8004-4818	MW370	Beta activity	9310	102	pCi/L	50
8004-4808	MW372	Trichloroethene	8260B	5.32	ug/L	5
8004-4792	MW373	Trichloroethene	8260B	5.53	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-U Contained Landfill**

Groundwater Flow System	UCRS										URGA					LRGA					
	D	S	S	S	D	D	D	U	U		D	D	D	D	U	U	D	D	D	D	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
ACETONE																					
Quarter 3, 2002										*	*	*									
Quarter 4, 2002										*	*	*									
Quarter 1, 2003											*	*									
Quarter 2, 2003											*	*									
Quarter 3, 2003	*									*	*	*		*	*			*			
Quarter 4, 2003						*	*				*	*		*	*						
Quarter 3, 2004						*										*					
Quarter 3, 2005						*															
Quarter 4, 2005						*															
ALPHA ACTIVITY																					
Quarter 1, 2004																					■
Quarter 2, 2004							■														
Quarter 3, 2009							■														
ALUMINUM																					
Quarter 3, 2003											*										
BETA ACTIVITY																					
Quarter 1, 2004															■						
Quarter 2, 2004															■						■
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CALCIUM																					
Quarter 3, 2003										*											
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Quarter 3, 2006															*						
Quarter 2, 2008															*						
Quarter 3, 2009															*						

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA					LRGA						
	D	S	S	S	D	D	U	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CALCIUM																					
Quarter 4, 2009														*							
Quarter 1, 2010														*							
Quarter 2, 2010														*							
Quarter 3, 2010														*							
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CARBON DISULFIDE																					
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Quarter 2, 2006						*															
Quarter 3, 2010		*								*											
Quarter 4, 2010													*								
Quarter 1, 2011														*							
CHEMICAL OXYGEN DEMAND																					
Quarter 3, 2002										*	*	*	*	*	*						
Quarter 4, 2002										*	*										
Quarter 1, 2003										*	*										
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Quarter 2, 2014														*							
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Quarter 2, 2016														*							
CONDUCTIVITY																					
Quarter 4, 2002										*											
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Quarter 2, 2005														*							
Quarter 3, 2005						*												*			*
Quarter 4, 2005														*			*				*
Quarter 1, 2006														*							*

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA					LRGA						
	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CONDUCTIVITY																					
Quarter 2, 2006															*						
Quarter 3, 2006															*						
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DISSOLVED OXYGEN																					
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Quarter 2, 2010					*	*		*	*										*	*	
Quarter 3, 2010					*	*															
Quarter 4, 2010							*				*								*		
Quarter 1, 2011					*	*		*	*												
Quarter 2, 2011					*	*	*	*	*				*								

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA					LRGA					
	D	S	S	S	D	D	U	U	U	U	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
DISSOLVED OXYGEN																					
Quarter 3, 2011						*			*												
Quarter 1, 2012							*		*												
Quarter 2, 2012	*			*	*	*		*	*												
Quarter 3, 2012						*															
Quarter 4, 2012									*												
Quarter 1, 2013						*			*												
Quarter 2, 2013								*	*												
Quarter 3, 2013	*				*		*	*	*												
Quarter 4, 2013									*											*	
Quarter 2, 2014	*				*	*	*	*	*									*			
Quarter 3, 2014	*				*	*	*														
Quarter 4, 2014						*															
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	*				*	*	*	*													
DISSOLVED SOLIDS																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 3, 2003							*			*	*										
Quarter 4, 2003										*											
Quarter 3, 2005					*																
Quarter 4, 2006															*						
Quarter 1, 2007															*						
Quarter 2, 2007															*						
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 4, 2014															*						
Quarter 2, 2015															*						
Quarter 3, 2015															*						
Quarter 4, 2015															*						
Quarter 1, 2016															*						
IODIDE																					
Quarter 2, 2003															*						
Quarter 3, 2003	*									*											
Quarter 4, 2003							*														
Quarter 3, 2010					*		*					*					*				
IODINE-131																					
Quarter 3, 2010																		■			

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS								URGA					LRGA							
	D	S	S	S	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
IODOMETHANE																					
Quarter 4, 2003						*															
IRON																					
Quarter 4, 2002						*															
Quarter 3, 2003																					
Quarter 4, 2003																*					
Quarter 1, 2004										*						*					
Quarter 2, 2004										*											
Quarter 3, 2004										*											
Quarter 3, 2005																*					
MAGNESIUM																					
Quarter 2, 2005															*						*
Quarter 3, 2005						*															*
Quarter 2, 2006															*						*
Quarter 3, 2006															*						
Quarter 1, 2007															*						
Quarter 2, 2008															*						
Quarter 2, 2009															*						
Quarter 3, 2009															*						
Quarter 4, 2009															*						
Quarter 1, 2010															*						
Quarter 2, 2010															*						
Quarter 3, 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 2, 2014															*						
Quarter 4, 2014															*						
Quarter 2, 2015															*						
Quarter 3, 2015															*						
Quarter 4, 2015															*						
Quarter 1, 2016															*						
Quarter 2, 2016															*						
Quarter 3, 2016	*														*						
Quarter 4, 2016	*														*						
Quarter 2, 2017	*														*						
Quarter 3, 2017	*														*						
Quarter 1, 2018	*														*						
Quarter 3, 2018	*														*						
MANGANESE																					
Quarter 3, 2002										*		*									
Quarter 4, 2002		*				*	*			*		*		*							
Quarter 2, 2003										*		*									
Quarter 3, 2003										*	*	*	*			*	*	*	*		
Quarter 4, 2003										*	*	*	*			*	*	*	*		
Quarter 1, 2004										*	*	*	*			*	*	*	*		
Quarter 2, 2004						*				*	*	*	*			*	*	*	*		
Quarter 3, 2004						*				*	*	*	*			*	*	*	*		
Quarter 4, 2004										*	*	*	*			*	*	*	*		
Quarter 1, 2005										*	*	*	*			*	*	*	*		
Quarter 2, 2005										*	*	*	*			*	*	*	*		
Quarter 3, 2005										*	*	*	*			*	*	*	*		
Quarter 4, 2005										*	*	*	*			*	*	*	*		
Quarter 1, 2006										*	*	*	*			*	*	*	*		
Quarter 2, 2006						*				*	*	*	*			*	*	*	*		
Quarter 3, 2006										*	*	*	*			*	*	*	*		
Quarter 4, 2006										*	*	*	*			*	*	*	*		
Quarter 1, 2007										*	*	*	*			*	*	*	*		
Quarter 2, 2007										*	*	*	*			*	*	*	*		
Quarter 3, 2007						*				*	*	*	*			*	*	*	*		
Quarter 3, 2008						*				*	*	*	*			*	*	*	*		
Quarter 4, 2008						*				*	*	*	*			*	*	*	*		

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS								URGA						LRGA						
	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
MANGANESE																					
Quarter 3, 2009							*														
Quarter 3, 2011							*														
Quarter 2, 2016													*								
Quarter 3, 2016									*												
NICKEL																					
Quarter 3, 2003										*											
OXIDATION-REDUCTION POTENTIAL																					
Quarter 4, 2002																	*		*		
Quarter 1, 2003																	*		*		
Quarter 2, 2003																			*		
Quarter 3, 2003	*																				
Quarter 4, 2003					*																
Quarter 2, 2004													*				*			*	
Quarter 3, 2004					*			*					*	*	*		*			*	
Quarter 4, 2004												*								*	
Quarter 1, 2005																	*		*	*	
Quarter 2, 2005								*					*				*		*	*	
Quarter 3, 2005					*	*		*			*	*	*				*		*	*	
Quarter 4, 2005		*						*			*	*	*				*		*	*	
Quarter 1, 2006					*			*	*								*			*	
Quarter 2, 2006					*		*	*					*				*			*	
Quarter 3, 2006					*		*	*					*				*			*	
Quarter 4, 2006					*		*	*		*		*	*				*		*	*	
Quarter 1, 2007		*			*		*	*					*				*		*	*	
Quarter 2, 2007					*		*	*					*				*		*	*	
Quarter 3, 2007					*		*	*									*		*	*	
Quarter 4, 2007					*		*	*									*		*	*	
Quarter 1, 2008					*		*	*			*	*						*	*	*	
Quarter 2, 2008					*		*	*		*		*	*					*	*	*	
Quarter 3, 2008					*		*	*	*	*	*	*	*				*	*	*	*	
Quarter 4, 2008					*		*	*	*	*	*	*	*				*	*	*	*	
Quarter 1, 2009					*		*	*	*	*	*	*	*				*	*	*	*	
Quarter 2, 2009					*		*	*	*	*	*	*	*				*	*	*	*	
Quarter 3, 2009		*			*	*	*	*	*	*	*	*	*	*			*	*	*	*	
Quarter 4, 2009		*			*	*	*	*	*	*	*	*	*	*			*	*	*	*	
Quarter 1, 2010		*			*	*	*	*	*	*	*	*	*	*			*	*	*	*	
Quarter 2, 2010					*	*	*	*	*	*	*	*	*	*			*	*	*	*	
Quarter 3, 2010		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2010		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2011		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2011		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2011		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2011		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2012		*			*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2012	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2012	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2012	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2013	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2013	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2013	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2013	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2014	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2014	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2014	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2014	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2015	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2015	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2015	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2015	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2016	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2016	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2016	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2016	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2017	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2017	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2017	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2017	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 1, 2018	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 2, 2018	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	
Quarter 3, 2018	*	*		*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA					LRGA						
	D	S	S	S	D	D	U	U	U	D	D	D	U	U	D	D	D	U	U		
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
PCB, TOTAL																					
Quarter 4, 2003																	*				
Quarter 3, 2004												*									
Quarter 3, 2005							*														
Quarter 2, 2006							*														
Quarter 3, 2006							*														
Quarter 1, 2007							*														
Quarter 2, 2007							*														
Quarter 3, 2007							*														
Quarter 1, 2008							*														
Quarter 2, 2008							*														
Quarter 4, 2008							*														
Quarter 3, 2009							*														
Quarter 1, 2010							*														
Quarter 2, 2010							*														
Quarter 4, 2010							*														
PCB-1016																					
Quarter 3, 2004												*									
Quarter 2, 2006							*					*									
Quarter 1, 2007							*														
Quarter 2, 2007							*														
Quarter 3, 2007							*														
Quarter 2, 2008							*														
Quarter 4, 2008							*														
Quarter 3, 2009							*														
Quarter 1, 2010							*														
Quarter 2, 2010							*														
Quarter 4, 2010							*														
PCB-1242																					
Quarter 3, 2006							*					*									
Quarter 4, 2006										*											
Quarter 1, 2008							*														
Quarter 2, 2012							*														
PCB-1248																					
Quarter 2, 2008							*														
PCB-1260																					
Quarter 2, 2006							*														
pH																					
Quarter 3, 2002										*											
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 3, 2003	*						*			*											
Quarter 4, 2003							*									*					
Quarter 1, 2004							*									*					
Quarter 3, 2005						*												*	*		
Quarter 4, 2005					*														*	*	
Quarter 3, 2006																*					
Quarter 2, 2011														*							
Quarter 3, 2011														*							
Quarter 4, 2011														*							
Quarter 1, 2012															*	*					
Quarter 2, 2012												*									
Quarter 1, 2013										*		*				*					
Quarter 3, 2015																*					
Quarter 2, 2016																				*	*
Quarter 3, 2016																				*	*
Quarter 2, 2017																*					
Quarter 3, 2018					*					*		*				*	*	*			
POTASSIUM																					
Quarter 1, 2014																*					
RADIUM-228																					
Quarter 2, 2005																					
Quarter 4, 2005						■						■		■				■			
SELENIUM																					
Quarter 4, 2003									■												

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA						LRGA					
	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
SODIUM																					
Quarter 3, 2002										*	*		*								
Quarter 4, 2002										*	*		*								
Quarter 1, 2003										*	*										
Quarter 2, 2003										*	*										
Quarter 3, 2003										*	*										
Quarter 1, 2007										*											
Quarter 1, 2012													*								
Quarter 1, 2014															*						
Quarter 3, 2014										*											
Quarter 4, 2014										*											
Quarter 4, 2015										*											
Quarter 1, 2016										*											
Quarter 2, 2016										*											
Quarter 3, 2016										*											
Quarter 4, 2016										*											
Quarter 1, 2017										*											
Quarter 2, 2017										*											
Quarter 3, 2017										*											
Quarter 4, 2017										*											
Quarter 1, 2018										*											
Quarter 3, 2018										*											
STRONTIUM-90																					
Quarter 4, 2008									■												
SULFATE																					
Quarter 1, 2003									*												
Quarter 2, 2003								*	*												
Quarter 3, 2003	*							*	*												
Quarter 4, 2003					*			*	*												
Quarter 1, 2004					*			*	*	*											
Quarter 2, 2004					*			*	*	*											
Quarter 3, 2004					*			*	*	*											
Quarter 1, 2005					*			*	*		*										
Quarter 2, 2005					*			*	*		*								*		
Quarter 3, 2005					*			*	*		*										
Quarter 4, 2005					*			*	*		*								*		
Quarter 1, 2006					*			*	*		*										
Quarter 2, 2006					*			*	*		*								*		
Quarter 3, 2006					*			*	*		*										
Quarter 1, 2007					*			*	*		*										
Quarter 2, 2007					*			*	*		*										
Quarter 3, 2007					*			*	*		*										
Quarter 4, 2007		*			*			*	*		*										
Quarter 1, 2008	*				*			*	*	*											
Quarter 2, 2008	*				*			*	*	*											
Quarter 3, 2008	*				*			*	*	*											
Quarter 4, 2008	*				*			*	*	*											
Quarter 1, 2009	*				*			*	*	*											
Quarter 2, 2009	*				*			*	*	*											
Quarter 3, 2009	*				*			*	*	*									*		
Quarter 4, 2009	*				*			*	*	*									*		
Quarter 1, 2010	*				*			*	*	*									*		
Quarter 2, 2010	*				*			*	*	*									*		
Quarter 3, 2010	*				*			*	*	*									*		
Quarter 4, 2010	*				*			*	*	*									*		
Quarter 1, 2011	*				*			*	*	*									*		
Quarter 2, 2011	*				*			*	*	*									*		
Quarter 3, 2011	*				*			*	*	*	*								*		
Quarter 4, 2011	*				*			*	*	*	*								*		
Quarter 1, 2012	*				*			*	*	*	*								*		
Quarter 2, 2012	*	*		*	*	*	*	*	*	*	*								*		
Quarter 3, 2012	*	*		*	*	*	*	*	*	*	*								*		
Quarter 4, 2012	*	*		*	*	*	*	*	*	*	*								*		
Quarter 1, 2013	*	*		*	*	*	*	*	*	*	*								*		
Quarter 2, 2013	*	*		*	*	*	*	*	*	*	*								*		
Quarter 3, 2013	*	*		*	*	*	*	*	*	*	*								*		
Quarter 4, 2013	*	*		*	*	*	*	*	*	*	*								*		
Quarter 1, 2014	*	*		*	*	*	*	*	*	*	*								*		
Quarter 2, 2014	*	*		*	*	*	*	*	*	*	*								*		
Quarter 3, 2014	*	*		*	*	*	*	*	*	*	*								*		
Quarter 4, 2014	*	*		*	*	*	*	*	*	*	*								*		
Quarter 1, 2015	*	*		*	*	*	*	*	*	*	*								*		

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA						LRGA					
	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
SULFATE																					
Quarter 2, 2015	*	*			*		*								*						
Quarter 3, 2015		*			*	*	*								*						
Quarter 4, 2015	*	*			*	*	*	*													
Quarter 1, 2016	*	*			*	*	*														
Quarter 2, 2016	*	*			*	*	*														
Quarter 3, 2016	*	*			*	*	*	*													
Quarter 4, 2016	*	*			*	*	*	*													
Quarter 1, 2017	*	*			*	*	*														
Quarter 2, 2017	*	*			*	*	*														
Quarter 3, 2017	*	*			*	*	*														
Quarter 4, 2017	*	*			*	*	*														
Quarter 1, 2018	*	*			*	*	*														
Quarter 2, 2018	*	*			*	*	*	*													
Quarter 3, 2018	*	*			*	*	*	*													
TECHNETIUM-99																					
Quarter 4, 2002																	*	*	*		
Quarter 2, 2003							*					*				*	*	*	*		*
Quarter 3, 2003																	*				
Quarter 4, 2003																	*				*
Quarter 1, 2004															*		*				*
Quarter 2, 2004															*						*
Quarter 3, 2004															*						*
Quarter 4, 2004															*		*				*
Quarter 3, 2005															*		*				*
Quarter 1, 2006															*						*
Quarter 2, 2006		*						*													*
Quarter 3, 2006																					*
Quarter 4, 2006															*						*
Quarter 1, 2007																					*
Quarter 2, 2007												*		*			*				*
Quarter 3, 2007														*	*		*	*			
Quarter 4, 2007									*					*	*				*		*
Quarter 1, 2008														*	*					*	*
Quarter 2, 2008						*	*						*	*	*		*		*		
Quarter 3, 2008														*	*						
Quarter 4, 2008									*					*	*		*		*		
Quarter 1, 2009									*					*	*						
Quarter 2, 2009								*						*	*			*			
Quarter 3, 2009							*							*	*			*	*		
Quarter 4, 2009														*	*			*	*		
Quarter 2, 2010														*	*		*	*	*		
Quarter 3, 2010														*	*		*	*	*		
Quarter 4, 2010														*	*			*			
Quarter 1, 2011		*							*					*	*		*	*	*		
Quarter 2, 2011														*	*		*	*	*		
Quarter 1, 2012								*						*	*		*	*	*		
Quarter 2, 2012								*						*	*		*	*	*		
Quarter 3, 2012														*	*		*	*	*		
Quarter 4, 2012														*	*		*	*	*		*
Quarter 1, 2013														*	*		*	*	*		*
Quarter 2, 2013														*	*		*	*	*		*
Quarter 3, 2013									*					*	*		*	*	*		*
Quarter 4, 2013														*	*		*	*	*		*
Quarter 1, 2014														*	*		*	*	*		
Quarter 2, 2014														*	*		*	*	*		
Quarter 3, 2014														*	*		*	*	*		
Quarter 4, 2014														*	*		*	*	*		
Quarter 1, 2015														*	*		*	*	*		
Quarter 2, 2015														*	*		*	*	*		
Quarter 3, 2015														*	*		*	*	*	*	*
Quarter 4, 2015														*	*		*	*	*	*	*
Quarter 1, 2016														*	*		*	*	*	*	*
Quarter 2, 2016														*	*		*	*	*	*	*
Quarter 3, 2016														*	*		*	*	*	*	*
Quarter 4, 2016									*				*	*		*	*	*	*	*	
Quarter 1, 2017													*	*		*	*	*	*	*	*
Quarter 2, 2017													*	*		*	*	*	*	*	*
Quarter 3, 2017													*	*		*	*	*	*	*	*
Quarter 4, 2017													*	*		*	*	*	*	*	*
Quarter 1, 2018													*	*		*	*	*	*	*	*
Quarter 2, 2018													*	*		*	*	*	*	*	*
Quarter 3, 2018													*	*		*	*	*	*	*	*

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA					LRGA					
	D	S	S	S	D	D	U	U	U	U	D	D	D	D	U	U	D	D	D	D	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
THORIUM-230																					
Quarter 4, 2015																*					
Quarter 2, 2016										*											
Quarter 4, 2016	*											*				*			*		
Quarter 4, 2017													*								
Quarter 2, 2018										*			*								
TOLUENE																					
Quarter 2, 2014										*				*							
TOTAL ORGANIC CARBON																					
Quarter 3, 2002										*	*	*		*							*
Quarter 4, 2002										*	*			*							
Quarter 1, 2003											*	*		*							
Quarter 3, 2003	*									*	*					*					
Quarter 4, 2003										*	*										
Quarter 1, 2004											*										
Quarter 3, 2005						*				*				*	*				*	*	
Quarter 4, 2005						*												*	*		
Quarter 1, 2006																			*	*	
TOTAL ORGANIC HALIDES																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 1, 2004																*					
TRICHLOROETHENE																					
Quarter 3, 2002														■							■
Quarter 4, 2002															■						■
Quarter 1, 2003																					■
Quarter 2, 2003															■						■
Quarter 3, 2003							■														■
Quarter 4, 2003															■						■
Quarter 1, 2004															■						■
Quarter 2, 2004															■						■
Quarter 3, 2004															■						■
Quarter 4, 2004															■						■
Quarter 1, 2005															■						■
Quarter 2, 2005															■						■
Quarter 3, 2005															■						■
Quarter 4, 2005															■						■
Quarter 1, 2006															■						■
Quarter 2, 2006															■						■
Quarter 3, 2006															■						■
Quarter 4, 2006															■						■
Quarter 1, 2007															■						■
Quarter 2, 2007															■						■
Quarter 3, 2007															■						■
Quarter 4, 2007															■						■
Quarter 1, 2008															■						■
Quarter 2, 2008															■				■		■
Quarter 3, 2008															■						■
Quarter 4, 2008															■						■
Quarter 1, 2009															■						■
Quarter 2, 2009															■						■
Quarter 3, 2009															■						■
Quarter 4, 2009							■	■			■	■	■	■	■		■				■
Quarter 1, 2010															■						■
Quarter 2, 2010															■						■
Quarter 3, 2010															■						■
Quarter 4, 2010															■						■
Quarter 2, 2011															■				■		■
Quarter 3, 2011															■				■		■
Quarter 4, 2011															■						■
Quarter 1, 2012															■				■		■
Quarter 2, 2012															■						■
Quarter 3, 2012															■						■
Quarter 4, 2012														■							■
Quarter 1, 2013														■							■
Quarter 2, 2013														■					■		■
Quarter 3, 2013														■							■
Quarter 4, 2013														■					■		■
Quarter 1, 2014														■							■
Quarter 2, 2014														■			■		■		

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS									URGA						LRGA					
	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
TRICHLOROETHENE																					
Quarter 3, 2014													■		■					■	■
Quarter 4, 2014													■		■					■	■
Quarter 1, 2015													■		■						■
Quarter 2, 2015					■										■				■		■
Quarter 3, 2015													■		■			■			■
Quarter 4, 2015													■		■						■
Quarter 1, 2016													■		■			■	■		■
Quarter 2, 2016												■	■		■			■		■	■
Quarter 3, 2016													■		■			■	■		■
Quarter 4, 2016													■		■			■	■		■
Quarter 1, 2017													■		■			■	■		■
Quarter 2, 2017															■			■	■		■
Quarter 3, 2017															■			■	■		■
Quarter 4, 2017											■		■	■	■			■	■		■
Quarter 1, 2018															■			■	■		■
Quarter 2, 2018													■		■			■	■	■	■
Quarter 3, 2018											■				■			■	■		■
TURBIDITY																					
Quarter 1, 2003										*											
URANIUM																					
Quarter 4, 2002		*			*	*	*			*	*	*	*	*	*	*		*	*	*	*
Quarter 4, 2006																					*
ZINC																					
Quarter 3, 2005																				*	
* Statistical test results indicate an elevated concentration (i.e., a statistical exceedance).																					
■ MCL Exceedance																					
■ Previously reported as an MCL exceedance; however, result was equal to MCL.																					
UCRS Upper Continental Recharge System																					
URGA Upper Regional Gravel Aquifer																					
LRGA Lower Regional Gravel Aquifer																					

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APPENDIX H
METHANE MONITORING DATA

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CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

Date:	08/20/2018	Time:	0900am	Monitor:	Michael Hideg
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Weather Conditions:
Mostly cloudy at 82 degrees with scattered showers

Monitoring Equipment:
RAE Systems, Multi-RAE, Serial# 4497

Monitoring Location		Reading (% LEL)
C-746-U1	Checked at floor level	0
C-746-U2	Checked at floor level	0
C-746-U-T-14	Checked at floor level	0
C-746-U15	Checked at floor level	0
MG1	Dry casing	0
MG2	Dry casing	0
MG3	Dry casing	0
MG4	Dry casing	0
Suspect or Problem Areas	No problems noted	N/A

Remarks:

Performed by:

Tommy Smith
Signature

8/20/18
Date

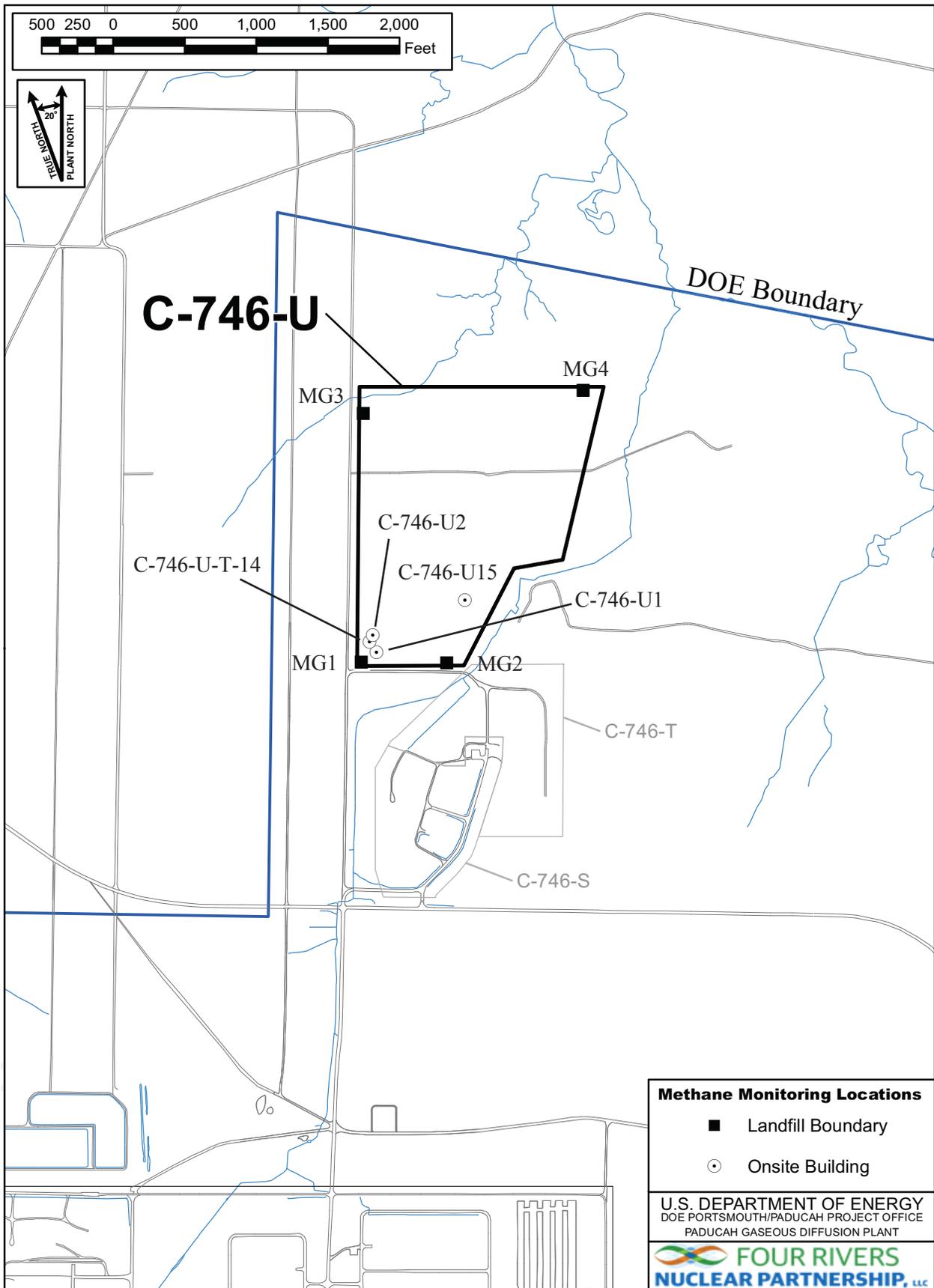


Figure H.1. C-746-U Methane Monitoring Locations

APPENDIX I

SURFACE WATER ANALYSES AND WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED-QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: 073-00045

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

SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")				L150 AT SITE	L154 UPSTREAM	L351 DOWNSTREAM							
Sample Sequence #				1	1	1							
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment				NA	NA	NA							
Sample Date and Time (Month/Day/Year hour: minutes)				9/24/2018 06:55	9/8/2018 13:35	9/8/2018 13:15							
Duplicate ("Y" or "N") ¹				N	N	N							
Split ('Y' or "N") ²				N	N	N							
Facility Sample ID Number (if applicable)				L150US4-18	L154US4-18	L351US4-18							
Laboratory Sample ID Number (if applicable)				460062001	459145001	459145002							
Date of Analysis (Month/Day/Year)				10/4/2018	9/26/2018	9/26/2018							
CAS RN ³		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁵	F L A G S ⁷						
A200-00-0	0	Flow	T	MGD	Field	0.03		0.21		0.65			
16887-00-6	2	Chloride(s)	T	mg/L	300.0	2.35		4.31		3.75			
14808-79-8	0	Sulfate	T	mg/L	300.0	22.7		10		7.27			
7439-89-6	0	Iron	T	mg/L	200.8	0.802		0.377		1.08			
7440-23-5	0	Sodium	T	mg/L	200.8	2.64		3.02		2.21			
S0268- -	0	Organic Carbon ⁶	T	mg/L	9060	13.5		17.7		19.2			
S0097- -	0	BOD ⁶	T	mg/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	70.1	*B	81.2		95.4			

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¹Respond "Y" if the sample was a duplicate of another sample in this report

²Respond "Y" if the sample was split and analyzed by separate laboratories.

³Chemical 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

⁶Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

⁷Flags 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

RESIDENTIAL/CONTAINED – QUARTERLY**Facility: US DOE - Paducah Gaseous Diffusion Plant****Permit Numbers: 073-00045****Finds/Unit: KY8-890-008-982 / 1****LAB ID: None****For Official Use Only**

SURFACE WATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US4-18	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand (COD)	N	Sample spike (MS/MSD) recovery not within control limits
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.84. Rad error is 4.77.
		Beta activity		TPU is 7.61. Rad error is 7.31.
L154	L154US4-18	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.62. Rad error is 1.61.
		Beta activity		TPU is 4.24. Rad error is 3.61.
L351	L351US4-18	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.97. Rad error is 1.97.
		Beta activity		TPU is 5.45. Rad error is 3.64.

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