



## Department of Energy

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

November 19, 2020

RECEIVED

By Miriam.Miller at 5:57 pm, Nov 19, 2020

Ms. Robin Green  
Division of Waste Management  
Kentucky Department for Environmental Protection  
300 Sower Boulevard, 2nd Floor  
Frankfort, Kentucky 40601

PPPO-02-10008603-21B

Mr. Todd Hendricks  
Division of Waste Management  
Kentucky Department for Environmental Protection  
300 Sower Boulevard, 2nd Floor  
Frankfort, Kentucky 40601

Dear Ms. Green and Mr. Hendricks:

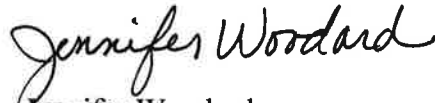
**C-746-U CONTAINED LANDFILL THIRD QUARTER CALENDAR YEAR 2020  
(JULY-SEPTEMBER) COMPLIANCE MONITORING REPORT, PADUCAH  
GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0151/V3,  
PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID  
NO. 3059**

Enclosed is the subject report for the third quarter calendar year (CY) 2020. This report is required in accordance with Permit Condition ACTV0006, Special Condition Number 3, of Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045 (Permit). This report includes groundwater analytical data, surface water analytical data, a validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results.

The statistical analyses on the third quarter CY 2020 monitoring well data collected from the C-746-U Landfill were performed in accordance with Monitoring Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). This report also serves as the statistical exceedance notification for the third quarter CY 2020, in accordance with Monitoring Condition GSTR0001, Standard Requirement 5, of the Permit.

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

Sincerely,



Jennifer Woodard  
Paducah Site Lead  
Portsmouth/Paducah Project Office

Enclosure:

C-746-U Contained Landfill Third Quarter CY 2020 (July–September) Compliance  
Monitoring Report, FRNP-RPT-0151/V3

cc w/enclosure:

abigail.parish@pppo.gov, PPPO  
april.webb@ky.gov, KDEP  
arcorrespondence@pad.pppo.gov, FRNP  
brian.begley@ky.gov, KDEP  
bruce.ford@pad.pppo.gov, FRNP  
bryan.smith@pad.pppo.gov, FRNP  
christopher.travis@ky.gov, KDEP  
dave.dollins@pppo.gov, PPPO  
dennis.greene@pad.pppo.gov, FRNP  
frnp\_correspondence@pad.pppo.gov, FRNP  
jennifer.woodard@pppo.gov, PPPO  
joel.bradburne@pppo.gov, PPPO  
ken.davis@pad.pppo.gov, FRNP  
lauren.linehan@ky.gov, KDEP  
leo.williamson@ky.gov, KDEP  
lisa.crabtree@pad.pppo.gov, FRNP  
myrna.redfield@pad.pppo.gov, FRNP  
pad.rmc@pad.pppo.gov  
robert.edwards@pppo.gov, PPPO  
robinc.green@ky.gov, KDEP  
stephaniec.brock@ky.gov, KYRHB  
teresa.osborne@ky.gov, KDEP  
todd.hendricks@ky.gov, KDEP  
tracey.duncan@pppo.gov, PPPO

**C-746-U Contained Landfill  
Third Quarter Calendar Year 2020  
(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

11-18-2020  
Date



**C-746-U Contained Landfill  
Third Quarter Calendar Year 2020  
(July–September)  
Compliance Monitoring Report  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—November 2020

U.S. DEPARTMENT OF ENERGY  
Office of Environmental Management

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

**THIS PAGE INTENTIONALLY LEFT BLANK**

# CONTENTS

FIGURES.....	v
TABLES .....	v
ACRONYMS.....	vii
1. INTRODUCTION.....	1
1.1 BACKGROUND.....	1
1.2 MONITORING PERIOD ACTIVITIES .....	1
1.2.1 Groundwater Monitoring.....	1
1.2.2 Methane Monitoring .....	3
1.2.3 Surface Water Monitoring .....	3
1.3 KEY RESULTS.....	5
2. DATA EVALUATION/STATISTICAL SYNOPSIS.....	7
2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA.....	8
2.1.1 Upper Continental Recharge System.....	8
2.1.2 Upper Regional Gravel Aquifer .....	8
2.1.3 Lower Regional Gravel Aquifer .....	8
2.2 DATA VERIFICATION AND VALIDATION.....	9
3. PROFESSIONAL GEOLOGIST AUTHORIZATION.....	11
4. REFERENCES.....	13
APPENDIX A: GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM.....	A-1
APPENDIX B: FACILITY INFORMATION SHEET .....	B-1
APPENDIX C: GROUNDWATER SAMPLE ANALYSES AND WRITTEN COMMENTS .....	C-1
APPENDIX D: STATISTICAL ANALYSES AND QUALIFICATION STATEMENT .....	D-1
APPENDIX E: GROUNDWATER FLOW RATE AND DIRECTION.....	E-1
APPENDIX F: NOTIFICATIONS .....	F-1
APPENDIX G: CHART OF MCL AND UTL EXCEEDANCES .....	G-1
APPENDIX H: METHANE MONITORING DATA.....	H-1
APPENDIX I: SURFACE WATER ANALYSES AND WRITTEN COMMENTS.....	I-1
APPENDIX J: ANALYTICAL LABORATORY CERTIFICATION.....	J-1

APPENDIX K:	LABORATORY ANALYTICAL METHODS.....	K-1
APPENDIX L:	MICRO-PURGING STABILITY PARAMETERS.....	L-1



## FIGURES

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

## TABLES

1. Summary of MCL Exceedances .....	5
2. Exceedances of Statistically Derived Historical Background Concentrations .....	5
3. Exceedances of Current Background UTL in Downgradient Wells .....	6
4. Monitoring Wells Included in Statistical Analysis .....	8

**THIS PAGE INTENTIONALLY LEFT BLANK**

## 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

**THIS PAGE INTENTIONALLY LEFT BLANK**

# 1. INTRODUCTION

This report, *C-746-U Contained Landfill Third Quarter Calendar Year 2020 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Permit Number SW07300014, SW07300015, SW07300045.

The Groundwater, Surface Water, Leachate, and Methane Monitoring Sample Data Reporting Form is provided in Appendix A. The facility information sheet is provided in Appendix B. Groundwater analytical results are recorded on the Kentucky Division of Waste Management (KDWM) Groundwater Sample Analyses forms, which are presented in Appendix C. The statistical analyses and qualification statement are provided in Appendix D. The groundwater flow rate and direction determinations are provided in Appendix E. Appendix F contains the notifications for all permit required parameters whose concentrations exceed the maximum contaminant level (MCL) for Kentucky solid waste facilities provided in 401 *KAR* 47:030 § 6 and for all permit required parameters listed in 40 *CFR* § 302.4, Appendix A, that do not have an MCL and whose concentrations exceed the historical background concentrations [upper tolerance limit (UTL), or both UTL and lower tolerance limit (LTL) for pH, as established at a 95% confidence]. Appendix G provides a chart of MCL and historical background UTL exceedances 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 analyses and written comments are provided in Appendix I. Analytical laboratory certification is provided in Appendix J. Laboratory analytical methods used to analyze the included data set are provided in Appendix K. Micropurging stability parameter results are provided in Appendix L.

## 1.1 BACKGROUND

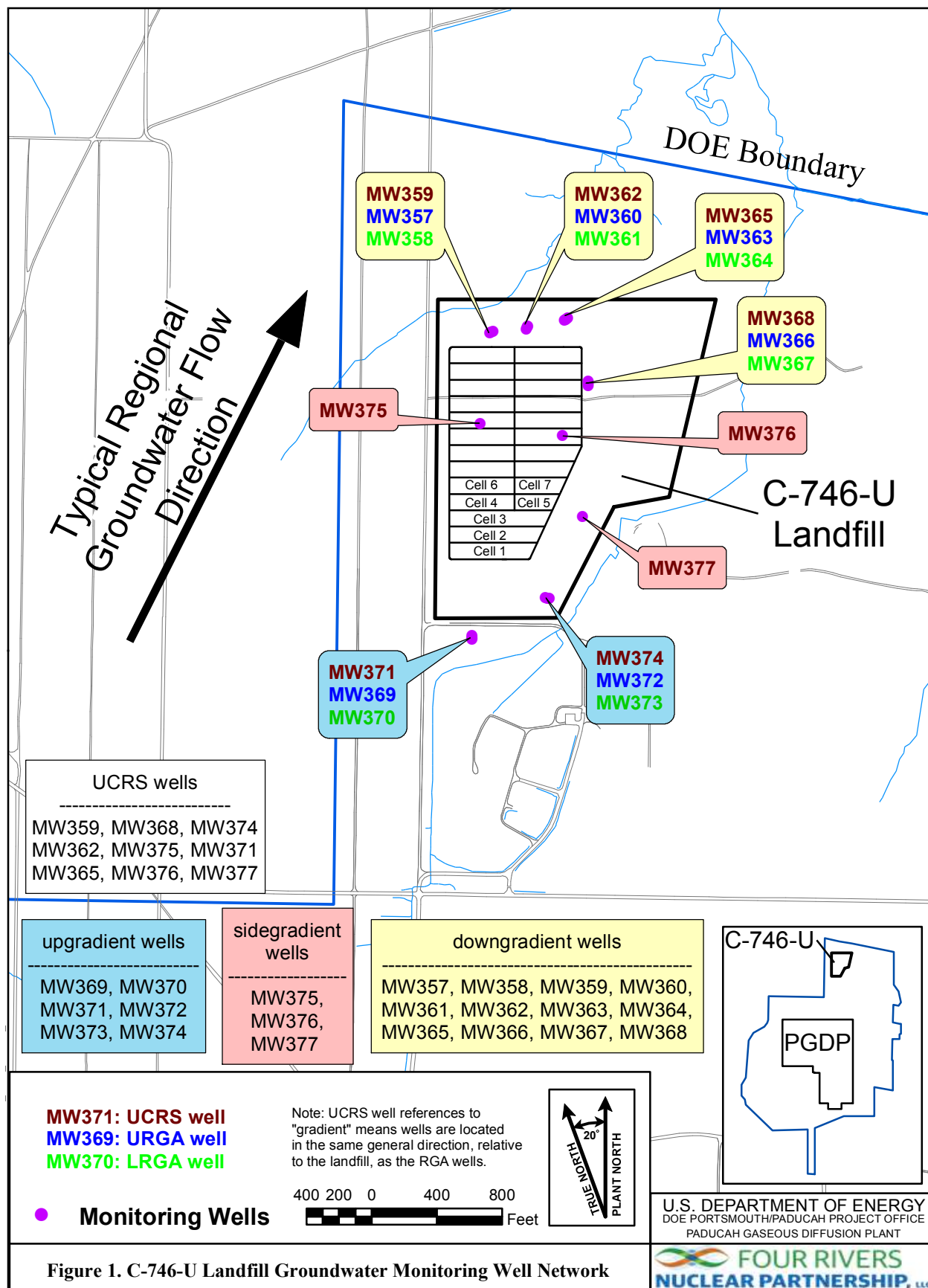
The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Site and north of the C-746-S&T Landfills. Construction and operation of the C-746-U Landfill were permitted in November 1996. The operation is regulated under Solid Waste Landfill Permit Number SW07300014, SW07300015,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

## 1.2 MONITORING PERIOD ACTIVITIES

### 1.2.1 Groundwater Monitoring

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

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



Map Source Information  
G:\GIS\ARCVIEWS\PROJECTS\C746U\_GMW\_Network 11032020  
Landfill Boundary: G:\GIS\SHAPES\BOUNDRIES\C746U.shp  
Streams: G:\GIS\ARCVIEWS\geodatabases\Paducah\_site.gdb\Base\_Map\streams Roads: G:\GIS\ARCVIEWS\geodatabases\cerda.gdb\roadrow

DOE Boundary: G:\GIS\ARCVIEWS\geodatabases\cerda.gdb\doebnd  
Monitoring Wells: G:\GIS\SHAPES\STATIONS\Monitoring\_Wells\_Program\_Inventary\_EMP10.xls\Monitoring\_Wells\_Program\_Invent  
\$ Waste Cells: G:\GIS\SHAPES\BOUNDRIES\C746u phases.shp  
Groundwater Flow: As interpreted by FRNP Senior Geologist

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

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

Groundwater sampling was conducted within the third quarter 2020 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor, procedure CP4-ES-2101, *Groundwater Sampling*. Groundwater sampling for the third quarter 2020 was conducted in July and August 2020. Resampling was performed due to problems with the sample courier resulting in coolers being received outside temperature specifications. 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 27, 2020, in MWs of the C-746-U Landfill (see Appendix E, Table E.1), in MWs of the C-746-S&T Landfills, and in MWs of the surrounding region (shown on Appendix E, 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 northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in July was  $6.07 \times 10^{-4}$  ft/ft. The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were  $1.16 \times 10^{-3}$  ft/ft and  $1.15 \times 10^{-3}$  ft/ft, respectively. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.97 to 3.37 ft/day for the URGA and 1.95 to 3.33 ft/day for the LRGA (see Appendix E, Table E.3).

### **1.2.2 Methane Monitoring**

Methane monitoring was conducted in accordance with 401 KAR 48:090 § 5 and the approved Explosive Gas Monitoring Program (KEEC 2011), which is Technical Application Attachment 12, of the Solid Waste Permit. Landfill operations staff monitored for the occurrence of methane in four on-site building locations and four locations along the landfill boundary on September 9, 2020. See Appendix H for a map (see Appendix H, Figure H.1) of the monitoring locations. Monitoring identified all locations to be compliant with the regulatory requirement of < 100% lower explosive limit (LEL) at boundary locations and < 25% LEL at all other locations. The results are documented on the C-746-U Landfill Methane Log provided in Appendix H.

### **1.2.3 Surface Water Monitoring**

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

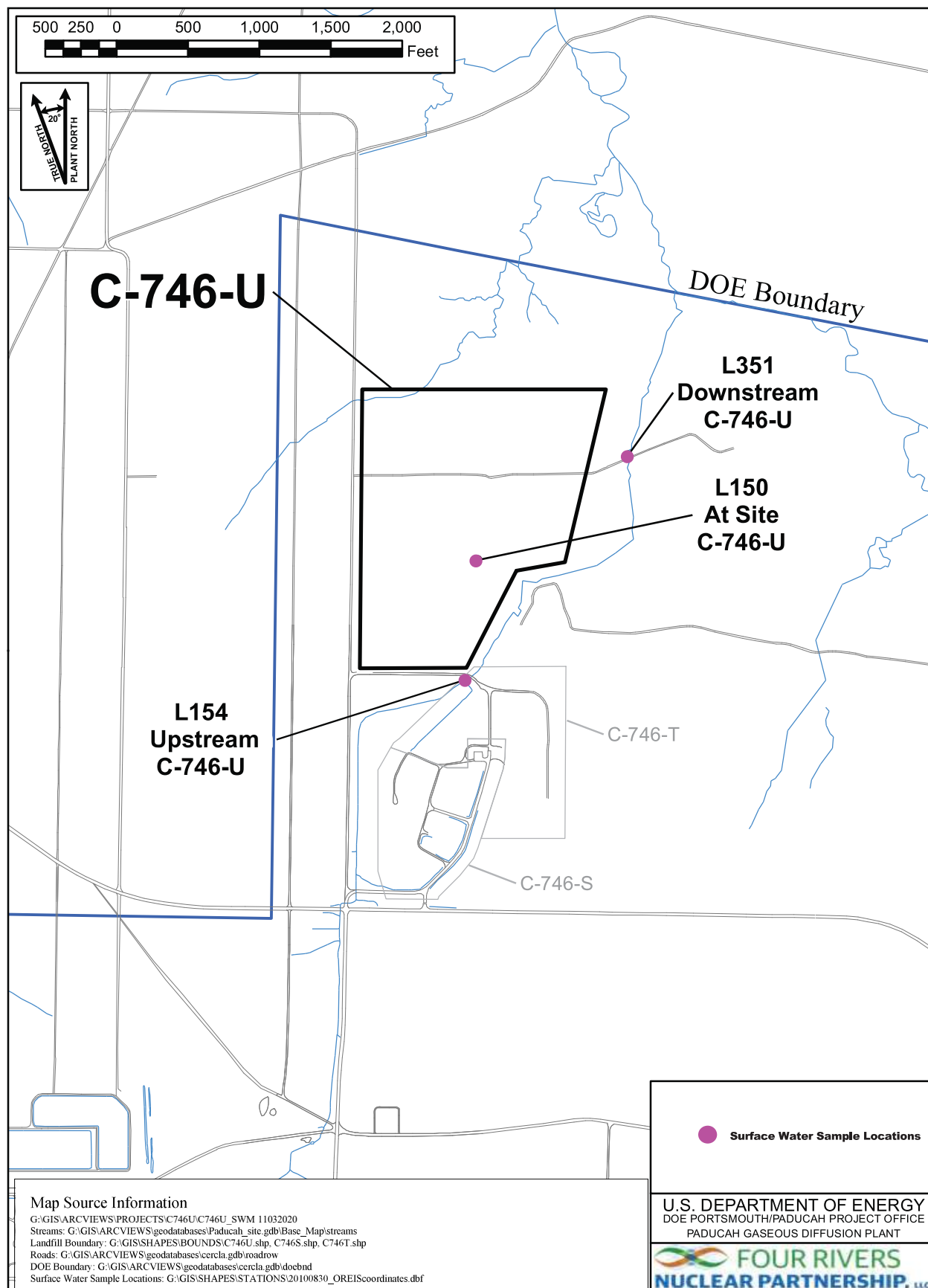


Figure 2. C-746-U Landfill Surface Water Monitoring Locations



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

### 1.3 KEY RESULTS

Groundwater data were evaluated in accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), which is Technical Application Attachment 25, of the Solid Waste Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were evaluated further against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL<sup>1</sup> during the third quarter 2020, as well as parameters that exceeded their MCL and also exceeded their historical background UTL. Those constituents (present in downgradient wells) that exceed their historical background UTL were evaluated against their current UTL-derived background using the most recent eight quarters of data from wells considered to be background. Constituents in downgradient wells that exceeded current background UTL are shown on Table 3.

**Table 1. Summary of MCL Exceedances**

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

**Table 2. Exceedances of Statistically Derived Historical Background Concentrations**

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

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

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

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

Sidegradient wells: MW375, MW376, MW377

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

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

**Table 3. Exceedances of Current Background UTL in Downgradient Wells**

URGA	LRGA
None	None

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 and MW364 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

This report is 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 background in order to determine if the current downgradient (compliance) well concentrations are consistent with current background values. Table 3 summarizes the evaluation against current background UTL for those constituents present in downgradient RGA wells with historical UTL exceedances. In accordance with the approved Groundwater Monitoring Plan, constituents in downgradient wells that exceed the historical UTL, but do not exceed the current UTL, are considered not to have a C-746-U Landfill source; therefore, they are a Type 1 exceedance (not attributable to the C-746-U Landfill).

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

## 2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2020 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).

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

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

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

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

A stepwise list of the one-sided tolerance interval statistical procedures applied to the data is provided in Appendix D under Statistical Analysis Process. The statistical analysis was conducted separately for each parameter in each well. The MWs included historically in the statistical analyses are listed in Table 4.

**Table 4. Monitoring Wells Included in Statistical Analysis<sup>a</sup>**

<b>UCRS</b>	<b>URGA</b>	<b>LRGA</b>
MW359	MW357	MW358
MW362	MW360	MW361
MW365	MW363	MW364
MW368	MW366	MW367
MW371 <sup>b</sup>	MW369 (background)	MW370 (background)
MW374 <sup>b</sup>	MW372 (background)	MW373 (background)
MW375		
MW376 <sup>c</sup>		
MW377 <sup>c</sup>		

<sup>a</sup> map showing the monitoring well locations is shown on Figure 1.

<sup>b</sup> In the same direction (relative to the landfill) as RGA wells considered to be upgradient.

<sup>c</sup> Well had insufficient water to permit a water sample for laboratory analysis.

## **2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA**

Parameters requiring statistical analysis are summarized in Appendix D for each hydrogeological unit. A stepwise list for determining exceedances of statistically derived historical background concentrations is provided in Appendix D under Statistical Analysis Process. A comparison of the current quarter's results to the statistically derived historical background was conducted for parameters that do not have MCLs and also for those parameters whose concentrations exceed MCLs. Appendix G summarizes the occurrences (by well and by quarter) of 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, 28 parameters, including those with MCLs, required statistical analysis in the UCRS. During the third quarter, calcium, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. There were no constituents that exceeded the current background UTL in downgradient wells.

### **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, beta activity, calcium, conductivity, dissolved solids, oxidation-reduction potential and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. There were no constituents that exceeded the current background UTL in downgradient wells.

### **2.1.3 Lower Regional Gravel Aquifer**

In this quarter, 29 parameters, including those with MCLs, required statistical analysis in the LRGA. During the third quarter, beta activity, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. There were no constituents that exceeded the current background UTL in downgradient wells.

## **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.

**THIS PAGE INTENTIONALLY LEFT BLANK**

### 3. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** *C-746-U Contained Landfill  
Third Quarter Calendar Year 2020 (July–September)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky (FRNP-RPT-0151/V3)*

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



*PG 113927  
KD 11-18-2020*

*Kenneth R. Davis*  
Kenneth R. Davis

PG113927

*November 18, 2020*  
Date

**THIS PAGE INTENTIONALLY LEFT BLANK**



## 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.

**APPENDIX A**

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

**THIS PAGE INTENTIONALLY LEFT BLANK**

**THIS PAGE INTENTIONALLY LEFT BLANK**

**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, Finds/Unit No: \_\_\_\_\_ Quarter & Year 3rd Qtr. CY 2020  
SW07300015,  
SW07300045

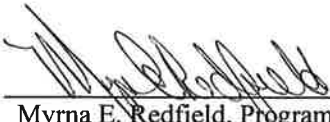
*Please check the following as applicable:*

\_\_\_\_\_ Characterization X Quarterly \_\_\_\_\_ Semiannual \_\_\_\_\_ Annual \_\_\_\_\_ Assessment

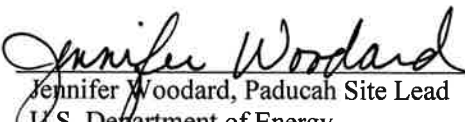
*Please check applicable submittal(s):* X Groundwater X Surface Water  
\_\_\_\_\_ Leachate X Methane Monitoring

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 Statutes Chapter 224) to conduct groundwater and surface water monitoring under the jurisdiction of the Division of Waste Management. **You must report any indication of contamination within forty-eight (48) hours of making the determination using statistical analyses, direct comparison, or other similar techniques. Submitting the lab report is NOT considered notification.** Instructions for completing the form are attached. Do not submit the instruction pages.

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

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

11/19/2020  
\_\_\_\_\_  
Date

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

11/19/2020  
\_\_\_\_\_  
Date

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX B**  
**FACILITY INFORMATION SHEET**

**THIS PAGE INTENTIONALLY LEFT BLANK**



## FACILITY INFORMATION SHEET

Groundwater: July and August 2020  
Surface water: September 2020  
Sampling Date: Methane: September 2020 County: McCracken Permit Nos. SW07300014,  
SW07300015,  
SW07300045

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

Site Address: 5600 Hobbs Road 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: Bruce Ford Phone No: (270) 441-5357  
Director, Environmental Services

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 Corporation

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

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

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX C**  
**GROUNDWATER SAMPLE ANALYSES**  
**AND WRITTEN COMMENTS**

**THIS PAGE INTENTIONALLY LEFT BLANK**

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 <sup>1</sup> , 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)					7/21/2020 08:06	7/21/2020 09:03	7/21/2020 10:05	7/21/2020 06:03					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW357UG4-20	MW358UG4-20	MW359UG4-20	MW360UG4-20					
Laboratory Sample ID Number (if applicable)					516426001	516426005	516426007	516426009					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/24/2020	7/24/2020	7/24/2020	7/24/2020					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.37		0.449		<0.2		0.151	J
16887-00-6		Chloride(s)	T	mg/L	9056	32.1		35.4		1.45		9.64	
16984-48-8		Fluoride	T	mg/L	9056	0.187		0.195		<0.1		0.254	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.22		0.957		0.506		0.477	
14808-79-8		Sulfate	T	mg/L	9056	41.1		65.2		45.4		12	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.04		30.04		30.04		30.03	
S0145- -		Specific Conductance	T	µMH0/cm	Field	417		537		221		427	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis  
of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	326.98		326.98		335.19		327	
N238		Dissolved Oxygen	T	mg/L	Field	3.49		0.75		3.59		1.03	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	237	*	274	*	146	*	219	*
S0296- -		pH	T	Units	Field	6.17		6.25		6.23		6.28	
NS215		Eh	T	mV	Field	362		104		171		382	
S0907 - -		Temperature	T	°C	Field	17.78		17		17.11		16.72	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0277	J	<0.05		0.19	
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		0.00204	J	<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.0674		0.0555		0.0235		0.176	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.338		0.372		0.00521	J	0.0366	
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		33.7		5.77		21.2	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.00657		<0.001		0.00433	
7440-50-8		Copper	T	mg/L	6020	0.000343	J	<0.002		0.000962	J	0.00121	J
7439-89-6		Iron	T	mg/L	6020	<0.1		3.39		0.0364	J	0.57	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	10.3		14.3		3.12		7.71	
7439-96-5		Manganese	T	mg/L	6020	0.00517		0.495		0.00114	J	0.0784	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		0.000217	J
7440-02-0		Nickel	T	mg/L	6020	0.00303		0.0142		0.00324		0.00461	
7440-09-7		Potassium	T	mg/L	6020	1.6		2.42		<0.3		0.668	
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	43.9		41.7		34.9		71	
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		0.000069	J	0.000131	J
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00639	J	0.00817	J	0.00581	J	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	

**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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00053	J	<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	0.0034		0.00181		<0.001		<0.001	



## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		<0.0000195		<0.0000193		<0.0000194	
78-87-5			Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6			trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5			cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5			trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4			Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4			1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1			Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7			Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3			PCB, Total	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
12674-11-2			PCB-1016	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
11104-28-2			PCB-1221	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
11141-16-5			PCB-1232	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
53469-21-9			PCB-1242	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
12672-29-6			PCB-1248	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0939		<0.0953		<0.0997		<0.0937	
12587-46-1		Gross Alpha	T	pCi/L	9310	0.914	*	6.28	*	-1.14	*	4.21	*
12587-47-2		Gross Beta	T	pCi/L	9310	20.1	*	23.3	*	0.828	*	6.42	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.225	*	0.428	*	0.514	*	0.108	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.46	*	-1.13	*	2.72	*	1.46	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	34.3	*	49.9	*	-8.72	*	4.16	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.336	*	0.424	*	0.226	*	-0.44	*
10028-17-8		Tritium	T	pCi/L	906.0	29.9	*	-82.3	*	4.88	*	-110	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		10.1	J	<20		<20	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.753	J	7.76		1.12	J	1.28	J
S0586- -		Total Organic Halides	T	mg/L	9020	<0.01		<0.01		<0.01		0.00526	J

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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)					7/21/2020 06:45	7/21/2020 07:24	7/30/2020 06:28	8/6/2020 06:45					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW361UG4-20	MW362UG4-20	MW363UG4-20R	MW364UG4-20R2					
Laboratory Sample ID Number (if applicable)					516426011	516426013	517254001	517763002					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/24/2020	7/24/2020	NA	8/11/2020					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.475		0.0936	J	0.0944	J	0.428	
16887-00-6		Chloride(s)	T	mg/L	9056	36.3		3.89		27.5		34.8	
16984-48-8		Fluoride	T	mg/L	9056	0.188		0.392		0.164		0.147	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.05		0.467		6.25		1.06	
14808-79-8		Sulfate	T	mg/L	9056	84.1		32.3		27.3		71.5	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.03		30.04		29.86		30.08	
S0145- -		Specific Conductance	T	µMH0/cm	Field	510		697		429		478	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	327		340.24		326.59		325.22	
N238		Dissolved Oxygen	T	mg/L	Field	2.63		3.03		2		3.39	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	211	*	377	*	251		256	
S0296- -		pH	T	Units	Field	6.08		6.93		5.97		6.03	
NS215		Eh	T	mV	Field	353		340		384		405	
S0907 - -		Temperature	T	°C	Field	16.39		16.33		17.83		15.56	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.022	J	0.0251	BJ	<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		0.0963		0.144		0.0641	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0945		0.0195		0.0234		0.0338	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	33.2		21.8		30	*	34.2	*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001		0.00102		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.000612	J	0.00102	J	0.000629	J	0.000878	J
7439-89-6		Iron	T	mg/L	6020	0.0393	J	0.044	J	0.0546	J	<0.1	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	14.3		9.32		12.5	*	14.3	*
7439-96-5		Manganese	T	mg/L	6020	0.0186		<0.005		0.166	*	0.00257	*J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.000458	J	<0.001		0.000233	J
7440-02-0		Nickel	T	mg/L	6020	0.00276		0.00272		0.0158		0.0111	
7440-09-7		Potassium	T	mg/L	6020	2.37		0.29	J	2.06		2.12	
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	46.5		137		45.2	*	44.8	*
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		0.00346		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00483	J	0.00479	J	0.00561	BJ	0.0131	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			*	<0.005	
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	

**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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.0069		<0.001			*	0.00698	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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			*	0.00175	J
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	<0.0000192		<0.000019			*	<0.0000193	
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	<0.0945		<0.0951		0.0382	J	<0.1	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0945		<0.0951		0.0382	J	<0.1	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0945		<0.0951		<0.1		<0.1	
12587-46-1		Gross Alpha	T	pCi/L	9310	0.364	*	0.738	*	0.595	*	1.96	*
12587-47-2		Gross Beta	T	pCi/L	9310	46.1	*	-7.02	*	11.1	*	40.7	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.135	*	0.162	*	0.171	*	0.123	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.83	*	-3.49	*	0.265	*	-4.58	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	48.7	*	2.34	*	13.6	*	47.7	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.755	*	-0.0711	*	0.209	*	0.224	*
10028-17-8		Tritium	T	pCi/L	906.0	32.2	*	-42.6	*	36.5	*	58.7	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		<20		31.4		29.4	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.785	J	2.27		1.06	J	0.727	J
S0586- -		Total Organic Halides	T	mg/L	9020	<0.01		0.014		0.00774	J	0.00498	J



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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)					7/30/2020 07:55	8/6/2020 08:07	7/30/2020 09:16	7/30/2020 09:53					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW365UG4-20R	MW366UG4-20R2	MW367UG4-20R	MW368UG4-20R					
Laboratory Sample ID Number (if applicable)					517254003	517763005	517254005	517254007					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA	8/11/2020	NA	NA					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S		
24959-67-9		Bromide	T	mg/L	9056	<0.2		0.441		0.173	J	<0.2	
16887-00-6		Chloride(s)	T	mg/L	9056	2.82		38.9		15.2		2.75	
16984-48-8		Fluoride	T	mg/L	9056	0.268		0.161		0.0953	J	0.189	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.561		0.832		<0.1		0.0651	J
14808-79-8		Sulfate	T	mg/L	9056	57.3		42.3		28.6		81	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.84		30.1		29.84		29.84	
S0145- -		Specific Conductance	T	µMH0/cm	Field	442		462		292		571	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	330.55		325.97		326.79		333.05	
N238		Dissolved Oxygen	T	mg/L	Field	2.4		3.8		2.39		2	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	270		244		163		330	
S0296- -		pH	T	Units	Field	6.25		6.18		5.93		6.42	
NS215		Eh	T	mV	Field	360		398		262		255	
S0907 - -		Temperature	T	°C	Field	16.39		16.83		16.61		16.11	
7429-90-5		Aluminum	T	mg/L	6020	0.0245	BJ	<0.05		0.0238	BJ	0.125	B
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		0.00254	J
7440-39-3		Barium	T	mg/L	6020	0.112		0.108		0.148		0.0445	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00795	J	0.103		0.0272		0.00691	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	25.8	*	31.4	*	17.4	*	71.2	*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00175		<0.001		0.00836		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00585		0.000616	J	0.000322	J	0.000471	J
7439-89-6		Iron	T	mg/L	6020	<0.1		<0.1		6.59		0.0747	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	12.1	*	12.9	*	9.36	*	16.5	*
7439-96-5		Manganese	T	mg/L	6020	0.00826	*	0.00334	*J	1.48	*	0.00521	*
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

**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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		0.000494	J
7440-02-0		Nickel	T	mg/L	6020	0.00928		0.0104		0.00563		0.00211	
7440-09-7		Potassium	T	mg/L	6020	0.291	J	1.92		3.14		0.465	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	55.8	*	46	*	24.7	*	37.9	*
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	0.000227		<0.0002		<0.0002		0.000432	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		0.00347	J
7440-66-6		Zinc	T	mg/L	6020	0.00816	BJ	0.00536	J	0.0164	BJ	0.0054	BJ
108-05-4		Vinyl acetate	T	mg/L	8260		*	<0.005			*		*
67-64-1		Acetone	T	mg/L	8260		*	<0.005			*		*
107-02-8		Acrolein	T	mg/L	8260		*	<0.005			*		*
107-13-1		Acrylonitrile	T	mg/L	8260		*	<0.005			*		*
71-43-2		Benzene	T	mg/L	8260		*	<0.001			*		*
108-90-7		Chlorobenzene	T	mg/L	8260		*	<0.001			*		*
1330-20-7		Xylenes	T	mg/L	8260		*	<0.003			*		*
100-42-5		Styrene	T	mg/L	8260		*	<0.001			*		*
108-88-3		Toluene	T	mg/L	8260		*	<0.001			*		*
74-97-5		Chlorobromomethane	T	mg/L	8260		*	<0.001			*		*

**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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260		*	<0.001			*		*
75-25-2	Tribromomethane	T	mg/L	8260		*	<0.001			*		*
74-83-9	Methyl bromide	T	mg/L	8260		*	<0.001			*		*
78-93-3	Methyl ethyl ketone	T	mg/L	8260		*	<0.005			*		*
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260		*	<0.005			*		*
75-15-0	Carbon disulfide	T	mg/L	8260		*	<0.005			*		*
75-00-3	Chloroethane	T	mg/L	8260		*	<0.001			*		*
67-66-3	Chloroform	T	mg/L	8260		*	<0.001			*		*
74-87-3	Methyl chloride	T	mg/L	8260		*	<0.001			*		*
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260		*	<0.001			*		*
74-95-3	Methylene bromide	T	mg/L	8260		*	<0.001			*		*
75-34-3	1,1-Dichloroethane	T	mg/L	8260		*	<0.001			*		*
107-06-2	1,2-Dichloroethane	T	mg/L	8260		*	<0.001			*		*
75-35-4	1,1-Dichloroethylene	T	mg/L	8260		*	<0.001			*		*
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260		*	<0.001			*		*
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260		*	<0.001			*		*
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260		*	<0.001			*		*
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260		*	<0.001			*		*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260		*	<0.001			*		*
75-01-4	Vinyl chloride	T	mg/L	8260		*	<0.001			*		*
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260		*	<0.001			*		*
79-01-6	Ethene, Trichloro-	T	mg/L	8260		*	0.00376			*		*

C-18

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260		*	<0.001			*		*
591-78-6		2-Hexanone	T	mg/L	8260		*	<0.005			*		*
74-88-4		Iodomethane	T	mg/L	8260		*	<0.005			*		*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260		*	<0.001			*		*
56-23-5		Carbon Tetrachloride	T	mg/L	8260		*	<0.001			*		*
75-09-2		Dichloromethane	T	mg/L	8260		*	0.00173	J		*		*
108-10-1		Methyl isobutyl ketone	T	mg/L	8260		*	<0.005			*		*
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011		*	<0.0000194			*		*
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260		*	<0.001			*		*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001			*		*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001			*		*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260		*	<0.001			*		*
75-69-4		Trichlorofluoromethane	T	mg/L	8260		*	<0.001			*		*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260		*	<0.001			*		*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260		*	<0.001			*		*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260		*	<0.001			*		*
1336-36-3		PCB, Total	T	ug/L	8082	0.0709	J	<0.1		<0.102		<0.1	
12674-11-2		PCB-1016	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
11104-28-2		PCB-1221	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
11141-16-5		PCB-1232	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
53469-21-9		PCB-1242	T	ug/L	8082	0.0709	J	<0.1		<0.102		<0.1	
12672-29-6		PCB-1248	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
11096-82-5		PCB-1260	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
11100-14-4		PCB-1268	T	ug/L	8082	<0.1		<0.1		<0.102		<0.1	
12587-46-1		Gross Alpha	T	pCi/L	9310	-1.91	*	-1.26	*	4.37	*	4.16	*
12587-47-2		Gross Beta	T	pCi/L	9310	-1.28	*	41.7	*	5.59	*	15.2	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.509	*	0.183	*	0.557	*	0.506	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-1.77	*	-2.41	*	0.0941	*	-0.189	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-1.09	*	50.5	*	-1.99	*	4.65	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.274	*	-0.0306	*	0.642	*	1.02	*
10028-17-8		Tritium	T	pCi/L	906.0	-32.9	*	167	*	-23.4	*	30.2	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		15.5	J	15.4	J	15.4	J
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.649	J	0.825	J	1.6	J	1.41	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0124		0.00664	J	0.00522	J	0.00688	J

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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)					7/20/2020 06:43		7/23/2020 07:26		7/23/2020 08:04		7/23/2020 08:44		
Duplicate ("Y" or "N") <sup>2</sup>					N		N		N		N		
Split ("Y" or "N") <sup>3</sup>					N		N		N		N		
Facility Sample ID Number (if applicable)					MW369UG4-20		MW370UG4-20R		MW371UG4-20R		MW372UG4-20R		
Laboratory Sample ID Number (if applicable)					516422001		516592004		516592006		516592008		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA		7/28/2020		7/28/2020		7/28/2020		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP		UP		UP		UP		
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.345		0.457		<0.2		0.572	
16887-00-6		Chloride(s)	T	mg/L	9056	29.9		35.6		3.75		44.2	
16984-48-8		Fluoride	T	mg/L	9056	0.244		0.18		0.193		0.187	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.76	*	1		0.0587	J	1.12	
14808-79-8		Sulfate	T	mg/L	9056	5.48		20.7		53.6		124	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.99		30.09		20.1		30.1	
S0145- -		Specific Conductance	T	µMH0/cm	Field	373		452		527		770	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis  
of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	328.84		328.53		345.48		328.61	
N238		Dissolved Oxygen	T	mg/L	Field	3.21		2.86		2.5		1.78	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	186	*	241		336		436	
S0296- -		pH	T	Units	Field	6.21		6.07		6.42		6.16	
NS215		Eh	T	mV	Field	366		366		361		365	
S0907 - -		Temperature	T	°C	Field	17.83		17.89		17.61		18.39	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		1.17		<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		0.00257	J	<0.005	
7440-39-3		Barium	T	mg/L	6020	0.371		0.26		0.105		0.0657	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0152		0.15	*	0.0111	J	1.21	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	16.5		30.6		69		62.4	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00419		<0.001		0.000442	J	<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00228		0.000383	J	0.00166	J	<0.002	
7439-89-6		Iron	T	mg/L	6020	0.135		<0.1		0.772		0.0355	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		0.000834	J	<0.002	
7439-95-4		Magnesium	T	mg/L	6020	6.51		13		11.4		21.4	
7439-96-5		Manganese	T	mg/L	6020	0.00886		0.0022	J	0.0326		<0.005	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	



## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.000262	J	0.000393	J	<0.001	
7440-02-0		Nickel	T	mg/L	6020	0.0191		0.00383		0.00595		0.00253	
7440-09-7		Potassium	T	mg/L	6020	0.485		2.8		0.504		2.22	
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		0.00202	J
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	59.6		46.2		28.9		63.8	
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		0.000655		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		0.0064	J	<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00913	J	0.00334	J	0.00632	BJ	0.00373	BJ
108-05-4		Vinyl acetate	T	mg/L	8260		*	<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260		*	<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260		*	<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260		*	<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	

**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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		*	0.00058	J	<0.001		0.00293	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		*	<0.00002		<0.0000197		<0.0000199	
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	<0.095		<0.0941		<0.0942		<0.096	
12674-11-2		PCB-1016	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
11104-28-2		PCB-1221	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
11141-16-5		PCB-1232	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
53469-21-9		PCB-1242	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
12672-29-6		PCB-1248	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
11096-82-5		PCB-1260	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
11100-14-4		PCB-1268	T	ug/L	8082	<0.095		<0.0941		<0.0942		<0.096	
12587-46-1		Gross Alpha	T	pCi/L	9310	-0.906	*	5.19	*	10.2	*	4.75	*
12587-47-2		Gross Beta	T	pCi/L	9310	17.8	*	65.5	*	10	*	76.1	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.227	*	0.199	*	0.475	*	0.00321	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.22	*	-0.928	*	-1.57	*	-1.31	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	20	*	67.3	*	-8.86	*	106	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.273	*	-0.144	*	-0.617	*	0.366	*
10028-17-8		Tritium	T	pCi/L	906.0	-41.2	*	-75.4	*	32.1	*	-72.3	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	10.1	J	22		10.1	J	26.8	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.37	J	1.02	J	2.48		1.09	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0122		0.0092	J	0.00612	J	0.0206	

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 <sup>1</sup> , 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)					7/23/2020 09:24		7/23/2020 10:04		7/23/2020 06:09		NA		
Duplicate ("Y" or "N") <sup>2</sup>					N		N		N		N		
Split ("Y" or "N") <sup>3</sup>					N		N		N		N		
Facility Sample ID Number (if applicable)					MW373UG4-20R		MW374UG4-20R		MW375UG4-20R		NA		
Laboratory Sample ID Number (if applicable)					516592010		516592012		516592001		NA		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/28/2020		7/28/2020		7/29/2020		NA		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP		UP		SIDE		SIDE		
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.552		0.65		<0.2			*
16887-00-6		Chloride(s)	T	mg/L	9056	39.3		54.5		3.64			*
16984-48-8		Fluoride	T	mg/L	9056	0.204		0.25		0.313			*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.814		<0.1		1			*
14808-79-8		Sulfate	T	mg/L	9056	169		9.1		24.3			*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.1		30.11		30.07			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	859		687		341			*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis  
of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	328.61		341.75		334.72			*
N238		Dissolved Oxygen	T	mg/L	Field	1.41		0.7		1.8			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	476		383		197			*
S0296- -		pH	T	Units	Field	6.11		6.53		6.03			*
NS215		Eh	T	mV	Field	377		304		374			*
S0907 - -		Temperature	T	°C	Field	18.33		18.39		17.83			*
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05			*
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003			*
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00247	J	<0.005			*
7440-39-3		Barium	T	mg/L	6020	0.0337		0.135		0.164			*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020	1.97		0.0151	*	0.00852	J		*
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020	72.2		20.5		13.2			*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020	0.000837	J	0.000644	J	<0.001			*
7440-50-8		Copper	T	mg/L	6020	0.000322	J	<0.002		0.000469	J		*
7439-89-6		Iron	T	mg/L	6020	0.037	J	0.878		0.0384	J		*
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020	26.6		5.4		5.25			*
7439-96-5		Manganese	T	mg/L	6020	0.0374		0.313		0.00131	J		*
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002			*

**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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.000203	J	<0.001			*
7440-02-0		Nickel	T	mg/L	6020	0.00399		0.00233		0.00657			*
7440-09-7		Potassium	T	mg/L	6020	2.77		0.407		0.258	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		0.00395	J	0.00266	J		*
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5		Sodium	T	mg/L	6020	64.1		121		53.1			*
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	0.000078	J	0.000295		0.000072	J		*
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02			*
7440-66-6		Zinc	T	mg/L	6020	0.00448	BJ	0.00426	BJ	0.00496	BJ		*
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			*
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005			*
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			*
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*

**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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00382		<0.001		<0.001			*



## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.00002		<0.0000197		<0.0000195			*
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
1336-36-3		PCB, Total	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
12674-11-2		PCB-1016	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
11104-28-2		PCB-1221	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
11141-16-5		PCB-1232	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
53469-21-9		PCB-1242	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
12672-29-6		PCB-1248	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
11096-82-5		PCB-1260	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
11100-14-4		PCB-1268	T	ug/L	8082	<0.0958		<0.0962		<0.0946			*
12587-46-1		Gross Alpha	T	pCi/L	9310	9.82	*	1.44	*	-3.19	*		*
12587-47-2		Gross Beta	T	pCi/L	9310	19.4	*	22.7	*	2.22	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.285	*	0.431	*	0.0674	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	0.391	*	-0.0584	*	-0.485	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	18.4	*	-1.29	*	-7.6	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.6	*	0.363	*	2.26	*		*
10028-17-8		Tritium	T	pCi/L	906.0	-21.3	*	-37.6	*	-43.8	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		<20		<20			*
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2			*
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060	1.1	J	2.37		0.877	J		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.0163		0.0327		0.0048	J		*

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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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	7/21/2020 05:20		7/21/2020 09:06		7/21/2020 05:15			
06:50Duplicate ("Y" or "N") <sup>2</sup>					N	N		N		N			
Split ("Y" or "N") <sup>3</sup>					N	N		N		N			
Facility Sample ID Number (if applicable)					NA	RI1UG4-20		FB1UG4-20		TB2UG4-20			
Laboratory Sample ID Number (if applicable)					NA	516426016		516426015		516426017			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA	7/24/2020		7/24/2020		7/24/2020			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	NA		NA		NA			
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHO D	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

<sup>7</sup>Flags 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		*	<0.004		<0.004			*
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020		*	<0.015		<0.015			*
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020		*	<0.2		<0.2			*
7440-47-3		Chromium	T	mg/L	6020		*	<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020		*	<0.001		<0.001			*
7440-50-8		Copper	T	mg/L	6020		*	0.000828	J	0.000314	J		*
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			*

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*	<0.001		<0.001			*
7440-02-0		Nickel	T	mg/L	6020		*	<0.002		<0.002			*
7440-09-7		Potassium	T	mg/L	6020		*	<0.3		<0.3			*
7440-16-6		Rhodium	T	mg/L	6020		*	<0.005		<0.005			*
7782-49-2		Selenium	T	mg/L	6020		*	<0.005		<0.005			*
7440-22-4		Silver	T	mg/L	6020		*	<0.001		<0.001			*
7440-23-5		Sodium	T	mg/L	6020		*	<0.25		<0.25			*
7440-25-7		Tantalum	T	mg/L	6020		*	<0.005		<0.005			*
7440-28-0		Thallium	T	mg/L	6020		*	<0.002		<0.002			*
7440-61-1		Uranium	T	mg/L	6020		*	<0.0002		<0.0002			*
7440-62-2		Vanadium	T	mg/L	6020		*	<0.02		<0.02			*
7440-66-6		Zinc	T	mg/L	6020		*	0.00491	J	0.00409	J		*
108-05-4		Vinyl acetate	T	mg/L	8260		*	<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260		*	0.014		0.00547		0.0185	
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	

**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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	TD <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	FLAG S	DETECTED VALUE OR PQL <sup>6</sup>	FLAG S	DETECTED VALUE OR PQL <sup>6</sup>	FLAG S	DETECTED VALUE OR PQL <sup>6</sup>	FLAG 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		*	0.00206	J	<0.005		0.00265	J
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	

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		*	<0.0000188		<0.0000194		<0.0000193	
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		*	0.00041	J	<0.001		0.00041	J
1336-36-3		PCB,Total	T	ug/L	8082		*	<0.0958		<0.0954			*
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.0958		<0.0954			*
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.0958		<0.0954			*
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.0958		<0.0954			*
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.0958		<0.0954			*
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.0958		<0.0954			*

C-37

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*	<0.0958		<0.0954			*
11096-82-5		PCB-1260	T	ug/L	8082		*	<0.0958		<0.0954			*
11100-14-4		PCB-1268	T	ug/L	8082		*	<0.0958		<0.0954			*
12587-46-1		Gross Alpha	T	pCi/L	9310		*	0.348	*	0.183	*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*	-3.52	*	7.91	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*	0.512	*	0.26	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*	-0.895	*	3.78	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*	-8.52	*	-3.49	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*	0.666	*	-0.0132	*		*
10028-17-8		Tritium	T	pCi/L	906.0		*	74.4	*	153	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*		*		*
57-12-5		Cyanide	T	mg/L	9012		*		*		*		*
20461-54-5		Iodide	T	mg/L	300.0		*	<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020		*		*		*		*



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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)					7/23/2020 05:30	8/6/2020 05:25	7/21/2020 09:03						
Duplicate ("Y" or "N") <sup>2</sup>					N	N	Y						
Split ("Y" or "N") <sup>3</sup>					N	N	N						
Facility Sample ID Number (if applicable)					TB4UG4-20	TB6UG4-20	MW358DUG4-20						
Laboratory Sample ID Number (if applicable)					516592014	517763009	516426003						
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/28/2020	8/11/2020	7/24/2020						
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					NA	NA	DOWN						
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*	0.453			
16887-00-6		Chloride(s)	T	mg/L	9056		*		*	35.5			
16984-48-8		Fluoride	T	mg/L	9056		*		*	0.187			
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*	0.961			
14808-79-8		Sulfate	T	mg/L	9056		*		*	65.3			
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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

<sup>7</sup>Flags 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		*		*	247	*		
S0296- -		pH	T	Units	Field		*		*		*		
NS215		Eh	T	mV	Field		*		*		*		
S0907 - -		Temperature	T	°C	Field		*		*		*		
7429-90-5		Aluminum	T	mg/L	6020		*		*	<0.05			
7440-36-0		Antimony	T	mg/L	6020		*		*	<0.003			
7440-38-2		Arsenic	T	mg/L	6020		*		*	0.00211	J		
7440-39-3		Barium	T	mg/L	6020		*		*	0.0586			
7440-41-7		Beryllium	T	mg/L	6020		*		*	<0.0005			
7440-42-8		Boron	T	mg/L	6020		*		*	0.401			
7440-43-9		Cadmium	T	mg/L	6020		*		*	<0.001			
7440-70-2		Calcium	T	mg/L	6020		*		*	34.5			
7440-47-3		Chromium	T	mg/L	6020		*		*	<0.01			
7440-48-4		Cobalt	T	mg/L	6020		*		*	0.00543			
7440-50-8		Copper	T	mg/L	6020		*		*	0.000413	J		
7439-89-6		Iron	T	mg/L	6020		*		*	2.62			
7439-92-1		Lead	T	mg/L	6020		*		*	<0.002			
7439-95-4		Magnesium	T	mg/L	6020		*		*	15.2			
7439-96-5		Manganese	T	mg/L	6020		*		*	0.411			
7439-97-6		Mercury	T	mg/L	7470		*		*	<0.0002			

C-40

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*	<0.001			
7440-02-0		Nickel	T	mg/L	6020		*		*	0.0129			
7440-09-7		Potassium	T	mg/L	6020		*		*	2.44			
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		*		*	41.5			
7440-25-7		Tantalum	T	mg/L	6020		*		*	<0.005			
7440-28-0		Thallium	T	mg/L	6020		*		*	<0.002			
7440-61-1		Uranium	T	mg/L	6020		*		*	<0.0002			
7440-62-2		Vanadium	T	mg/L	6020		*		*	<0.02			
7440-66-6		Zinc	T	mg/L	6020		*		*	0.00834	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		0.00489	J	<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			

## 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 <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00052	J		
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		0.00168			

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000197		<0.0000197		<0.0000193			
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	0.00034	J	<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		*		*	<0.0953			
12674-11-2		PCB-1016	T	ug/L	8082		*		*	<0.0953			
11104-28-2		PCB-1221	T	ug/L	8082		*		*	<0.0953			
11141-16-5		PCB-1232	T	ug/L	8082		*		*	<0.0953			
53469-21-9		PCB-1242	T	ug/L	8082		*		*	<0.0953			
12672-29-6		PCB-1248	T	ug/L	8082		*		*	<0.0953			

C-43

## 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 <sup>1</sup> , 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 <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*	<0.0953			
11096-82-5		PCB-1260	T	ug/L	8082		*		*	<0.0953			
11100-14-4		PCB-1268	T	ug/L	8082		*		*	<0.0953			
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*	4.95	*		
12587-47-2		Gross Beta	T	pCi/L	9310		*		*	22.8	*		
10043-66-0		Iodine-131	T	pCi/L			*		*		*		
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*	0.409	*		
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*	-2.73	*		
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*	34.8	*		
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*	0.211	*		
10028-17-8		Tritium	T	pCi/L	906.0		*		*	-34.6	*		
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*	<20			
57-12-5		Cyanide	T	mg/L	9012		*		*	<0.2			
20461-54-5		Iodide	T	mg/L	300.0		*		*	<0.5			
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*	11.1			
S0586- -		Total Organic Halides	T	mg/L	9020		*		*	0.00442	J		

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

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

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

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4796	8004-0984	8004-4793	8004-0983				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					MW363	MW365	MW367	MW368				
Sample Sequence #					3	3	3	3				
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)					8/6/2020 06:20	8/6/2020 07:42	8/6/2020 08:52	8/6/2020 09:15				
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N				
Split ("Y" or "N") <sup>3</sup>					N	N	N	N				
Facility Sample ID Number (if applicable)					MW363UG4-20R2	MW365UG4-20R2	MW367UG4-20R2	MW368UG4-20R2				
Laboratory Sample ID Number (if applicable)					517763001	517763004	517763007	517763008				
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					8/11/2020	8/11/2020	8/11/2020	8/11/2020				
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN				
CAS RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	30.08		30.09		30.1		30.1
S0145- -		Specific Conductance	T	µMH0/cm	Field	430		405		281		544

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

# RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

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 <sup>1</sup> , Facility Well/Spring Number					8004-4796		8004-0984		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					363		365		367		368		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	325.98		329.62		326.17		332.4	
N238		Dissolved Oxygen	T	mg/L	Field	0.9		1.53		0.82		2.72	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	5.77		6.23		5.99		6.53	
NS215		Eh	T	mV	Field	412		396		263		250	
S0907 - -		Temperature	T	°C	Field	15.56		16.44		17.22		16.78	
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		*		*		*		*



**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 <sup>1</sup> , Facility Well/Spring Number						8004-4796		8004-0984		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						363		365		367		368	
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*		*		*
7440-02-0		Nickel	T	mg/L	6020		*		*		*		*
7440-09-7		Potassium	T	mg/L	6020		*		*		*		*
7440-16-6		Rhodium	T	mg/L	6020		*		*		*		*
7782-49-2		Selenium	T	mg/L	6020		*		*		*		*
7440-22-4		Silver	T	mg/L	6020		*		*		*		*
7440-23-5		Sodium	T	mg/L	6020		*		*		*		*
7440-25-7		Tantalum	T	mg/L	6020		*		*		*		*
7440-28-0		Thallium	T	mg/L	6020		*		*		*		*
7440-61-1		Uranium	T	mg/L	6020		*		*		*		*
7440-62-2		Vanadium	T	mg/L	6020		*		*		*		*
7440-66-6		Zinc	T	mg/L	6020		*		*		*		*
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	0.00182	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	

C-47

## 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 <sup>1</sup> , Facility Well/Spring Number					8004-4796		8004-0984		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					363		365		367		368	
CAS RN <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00047	J	<0.001		0.00123		<0.001	

C-48

## 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 <sup>1</sup> , Facility Well/Spring Number						8004-4796		8004-0984		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						363		365		367		368	
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.0018	J	0.00179	J	0.00167	J	<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		<0.0000194		<0.0000194		<0.0000197	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

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 <sup>1</sup> , Facility Well/Spring Number	8004-4820			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	MW369			
Sample Sequence #	3			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA			
Sample Date and Time (Month/Day/Year hour: minutes)	7/23/2020 07:03			
Duplicate ("Y" or "N") <sup>2</sup>	N			
Split ("Y" or "N") <sup>3</sup>	N			
Facility Sample ID Number (if applicable)	MW369UG4-20R			
Laboratory Sample ID Number (if applicable)	516592003			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	778/2020			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP			

CAS RN <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	30.09							
S0145- -	Specific Conductance	T	µMH0/cm	Field	372							

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

<sup>7</sup>Flags 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 <sup>1</sup> , Facility Well/Spring Number					8004-4820								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					369								
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	328.55							
N238		Dissolved Oxygen	T	mg/L	Field	2.66							
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*						
S0296- -		pH	T	Units	Field	6.2							
NS215		Eh	T	mV	Field	353							
S0907 - -		Temperature	T	°C	Field	17.44							
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		*						

## 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 <sup>1</sup> , Facility Well/Spring Number						8004-4820							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369							
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*						
7440-02-0		Nickel	T	mg/L	6020		*						
7440-09-7		Potassium	T	mg/L	6020		*						
7440-16-6		Rhodium	T	mg/L	6020		*						
7782-49-2		Selenium	T	mg/L	6020		*						
7440-22-4		Silver	T	mg/L	6020		*						
7440-23-5		Sodium	T	mg/L	6020		*						
7440-25-7		Tantalum	T	mg/L	6020		*						
7440-28-0		Thallium	T	mg/L	6020		*						
7440-61-1		Uranium	T	mg/L	6020		*						
7440-62-2		Vanadium	T	mg/L	6020		*						
7440-66-6		Zinc	T	mg/L	6020		*						
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005							
67-64-1		Acetone	T	mg/L	8260	<0.005							
107-02-8		Acrolein	T	mg/L	8260	<0.005							
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005							
71-43-2		Benzene	T	mg/L	8260	<0.001							
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001							
1330-20-7		Xylenes	T	mg/L	8260	<0.003							
100-42-5		Styrene	T	mg/L	8260	<0.001							
108-88-3		Toluene	T	mg/L	8260	<0.001							
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001							

C-52

## 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 <sup>1</sup> , Facility Well/Spring Number					8004-4820							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369							
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001							
75-25-2	Tribromomethane	T	mg/L	8260	<0.001							
74-83-9	Methyl bromide	T	mg/L	8260	<0.001							
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005							
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005							
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005							
75-00-3	Chloroethane	T	mg/L	8260	<0.001							
67-66-3	Chloroform	T	mg/L	8260	<0.001							
74-87-3	Methyl chloride	T	mg/L	8260	<0.001							
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001							
74-95-3	Methylene bromide	T	mg/L	8260	<0.001							
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001							
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001							
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001							
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001							
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001							
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001							
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001							
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001							
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001							
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001							
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00065	J						

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



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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG4-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.15. Rad error is 6.15.
		Gross beta		TPU is 9.89. Rad error is 9.32.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.553. Rad error is 0.553.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.32. Rad error is 3.3.
		Technetium-99		TPU is 12.1. Rad error is 11.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.818. Rad error is 0.815.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 147. Rad error is 147.
8004-4799 MW358	MW358UG4-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.26. Rad error is 8.16.
		Gross beta		TPU is 9.33. Rad error is 8.52.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.681. Rad error is 0.681.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.74. Rad error is 3.74.
		Technetium-99		TPU is 13.1. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.979. Rad error is 0.974.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 125.
8004-0981 MW359	MW359UG4-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.5. Rad error is 3.5.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5. Rad error is 5.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.722. Rad error is 0.721.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.65. Rad error is 3.62.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10. Rad error is 10.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.757. Rad error is 0.754.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 140. Rad error is 140.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4800 MW360	MW360UG4-20	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.86. Rad error is 6.82.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.21. Rad error is 5.1.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.553. Rad error is 0.552.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.76.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.7. Rad error is 10.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.16. Rad error is 1.16.
8004-4795 MW361	MW361UG4-20	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.73. Rad error is 4.73.
		Gross beta		TPU is 12.7. Rad error is 10.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.587. Rad error is 0.587.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.56. Rad error is 3.53.
		Technetium-99		TPU is 13.2. Rad error is 12.1.
8004-0986 MW362	MW362UG4-20	Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.99. Rad error is 0.981.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 146. Rad error is 145.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.97. Rad error is 6.96.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.36. Rad error is 8.36.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.54. Rad error is 0.54.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.56. Rad error is 3.56.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.7. Rad error is 10.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.644. Rad error is 0.644.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-20R	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		Vinyl acetate		Sample received out of temperature at lab, resample result reported.
		Acetone		Sample received out of temperature at lab, resample result reported.
		Acrolein		Sample received out of temperature at lab, resample result reported.
		Acrylonitrile		Sample received out of temperature at lab, resample result reported.
		Benzene		Sample received out of temperature at lab, resample result reported.
		Chlorobenzene		Sample received out of temperature at lab, resample result reported.
		Xylenes		Sample received out of temperature at lab, resample result reported.
		Styrene		Sample received out of temperature at lab, resample result reported.
		Toluene		Sample received out of temperature at lab, resample result reported.
		Chlorobromomethane		Sample received out of temperature at lab, resample result reported.
		Bromodichloromethane		Sample received out of temperature at lab, resample result reported.
		Tribromomethane		Sample received out of temperature at lab, resample result reported.
		Methyl bromide		Sample received out of temperature at lab, resample result reported.
		Methyl Ethyl Ketone		Sample received out of temperature at lab, resample result reported.
		trans-1,4-Dichloro-2-butene		Sample received out of temperature at lab, resample result reported.
		Carbon disulfide		Sample received out of temperature at lab, resample result reported.
		Chloroethane		Sample received out of temperature at lab, resample result reported.
		Chloroform		Sample received out of temperature at lab, resample result reported.
		Methyl chloride		Sample received out of temperature at lab, resample result reported.
		cis-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Methylene bromide		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethylene		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromoethane		Sample received out of temperature at lab, resample result reported.
		1,1,2,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,2-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		Vinyl chloride		Sample received out of temperature at lab, resample result reported.
		Tetrachloroethene		Sample received out of temperature at lab, resample result reported.
		Trichloroethene		Sample received out of temperature at lab, resample result reported.
		Ethylbenzene		Sample received out of temperature at lab, resample result reported.
		2-Hexanone		Sample received out of temperature at lab, resample result reported.
		Iodomethane		Sample received out of temperature at lab, resample result reported.
		Dibromochloromethane		Sample received out of temperature at lab, resample result reported.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-20R	Carbon tetrachloride		Sample received out of temperature at lab, resample result reported.
		Dichloromethane		Sample received out of temperature at lab, resample result reported.
		Methyl Isobutyl Ketone		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromo-3-chloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloropropane		Sample received out of temperature at lab, resample result reported.
		trans-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		cis-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		trans-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Trichlorofluoromethane		Sample received out of temperature at lab, resample result reported.
		1,2,3-Trichloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		1,4-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.51. Rad error is 3.51.
		Gross beta		TPU is 7.4. Rad error is 7.16.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.411. Rad error is 0.41.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.05. Rad error is 2.05.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.22. Rad error is 9.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.04. Rad error is 1.03.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 135.
8004-4797 MW364	MW364UG4-20R2	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	N	Sample spike (MS/MSD) recovery not within control limits
		Sodium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.59. Rad error is 4.58.
		Gross beta		TPU is 12.7. Rad error is 10.8.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.408. Rad error is 0.408.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.41. Rad error is 3.41.
		Technetium-99		TPU is 11.5. Rad error is 10.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.875. Rad error is 0.872.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 159. Rad error is 159.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG4-20R	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		Vinyl acetate		Sample received out of temperature at lab, resample result reported.
		Acetone		Sample received out of temperature at lab, resample result reported.
		Acrolein		Sample received out of temperature at lab, resample result reported.
		Acrylonitrile		Sample received out of temperature at lab, resample result reported.
		Benzene		Sample received out of temperature at lab, resample result reported.
		Chlorobenzene		Sample received out of temperature at lab, resample result reported.
		Xylenes		Sample received out of temperature at lab, resample result reported.
		Styrene		Sample received out of temperature at lab, resample result reported.
		Toluene		Sample received out of temperature at lab, resample result reported.
		Chlorobromomethane		Sample received out of temperature at lab, resample result reported.
		Bromodichloromethane		Sample received out of temperature at lab, resample result reported.
		Tribromomethane		Sample received out of temperature at lab, resample result reported.
		Methyl bromide		Sample received out of temperature at lab, resample result reported.
		Methyl Ethyl Ketone		Sample received out of temperature at lab, resample result reported.
		trans-1,4-Dichloro-2-butene		Sample received out of temperature at lab, resample result reported.
		Carbon disulfide		Sample received out of temperature at lab, resample result reported.
		Chloroethane		Sample received out of temperature at lab, resample result reported.
		Chloroform		Sample received out of temperature at lab, resample result reported.
		Methyl chloride		Sample received out of temperature at lab, resample result reported.
		cis-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Methylene bromide		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethylene		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromoethane		Sample received out of temperature at lab, resample result reported.
		1,1,2,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,2-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		Vinyl chloride		Sample received out of temperature at lab, resample result reported.
		Tetrachloroethene		Sample received out of temperature at lab, resample result reported.
		Trichloroethene		Sample received out of temperature at lab, resample result reported.
		Ethylbenzene		Sample received out of temperature at lab, resample result reported.
		2-Hexanone		Sample received out of temperature at lab, resample result reported.
		Iodomethane		Sample received out of temperature at lab, resample result reported.
		Dibromochloromethane		Sample received out of temperature at lab, resample result reported.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG4-20R	Carbon tetrachloride		Sample received out of temperature at lab, resample result reported.
		Dichloromethane		Sample received out of temperature at lab, resample result reported.
		Methyl Isobutyl Ketone		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromo-3-chloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloropropane		Sample received out of temperature at lab, resample result reported.
		trans-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		cis-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		trans-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Trichlorofluoromethane		Sample received out of temperature at lab, resample result reported.
		1,2,3-Trichloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		1,4-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.87. Rad error is 6.87.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.25. Rad error is 4.25.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.508. Rad error is 0.507.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.42. Rad error is 3.42.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.28. Rad error is 8.28.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.808. Rad error is 0.805.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
8004-0982 MW366	MW366UG4-20R2	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	N	Sample spike (MS/MSD) recovery not within control limits
		Sodium	E	Result estimated due to matrix interferences.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.95. Rad error is 1.95.
		Gross beta		TPU is 13.1. Rad error is 11.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.421. Rad error is 0.42.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.47. Rad error is 3.47.
		Technetium-99		TPU is 11.7. Rad error is 10.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.647. Rad error is 0.646.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 168. Rad error is 165.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG4-20R	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		Vinyl acetate		Sample received out of temperature at lab, resample result reported.
		Acetone		Sample received out of temperature at lab, resample result reported.
		Acrolein		Sample received out of temperature at lab, resample result reported.
		Acrylonitrile		Sample received out of temperature at lab, resample result reported.
		Benzene		Sample received out of temperature at lab, resample result reported.
		Chlorobenzene		Sample received out of temperature at lab, resample result reported.
		Xylenes		Sample received out of temperature at lab, resample result reported.
		Styrene		Sample received out of temperature at lab, resample result reported.
		Toluene		Sample received out of temperature at lab, resample result reported.
		Chlorobromomethane		Sample received out of temperature at lab, resample result reported.
		Bromodichloromethane		Sample received out of temperature at lab, resample result reported.
		Tribromomethane		Sample received out of temperature at lab, resample result reported.
		Methyl bromide		Sample received out of temperature at lab, resample result reported.
		Methyl Ethyl Ketone		Sample received out of temperature at lab, resample result reported.
		trans-1,4-Dichloro-2-butene		Sample received out of temperature at lab, resample result reported.
		Carbon disulfide		Sample received out of temperature at lab, resample result reported.
		Chloroethane		Sample received out of temperature at lab, resample result reported.
		Chloroform		Sample received out of temperature at lab, resample result reported.
		Methyl chloride		Sample received out of temperature at lab, resample result reported.
		cis-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Methylene bromide		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethylene		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromoethane		Sample received out of temperature at lab, resample result reported.
		1,1,2,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,2-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		Vinyl chloride		Sample received out of temperature at lab, resample result reported.
		Tetrachloroethene		Sample received out of temperature at lab, resample result reported.
		Trichloroethene		Sample received out of temperature at lab, resample result reported.
		Ethylbenzene		Sample received out of temperature at lab, resample result reported.
		2-Hexanone		Sample received out of temperature at lab, resample result reported.
		Iodomethane		Sample received out of temperature at lab, resample result reported.
		Dibromochloromethane		Sample received out of temperature at lab, resample result reported.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG4-20R	Carbon tetrachloride		Sample received out of temperature at lab, resample result reported.
		Dichloromethane		Sample received out of temperature at lab, resample result reported.
		Methyl Isobutyl Ketone		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromo-3-chloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloropropane		Sample received out of temperature at lab, resample result reported.
		trans-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		cis-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		trans-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Trichlorofluoromethane		Sample received out of temperature at lab, resample result reported.
		1,2,3-Trichloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		1,4-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.15. Rad error is 5.1.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.51. Rad error is 5.43.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.492. Rad error is 0.491.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.99. Rad error is 3.99.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.53. Rad error is 8.53.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1. Rad error is 0.994.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 130. Rad error is 130.



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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0983 MW368	MW368UG4-20R	Calcium	E	Result estimated due to matrix interferences.
		Magnesium	E	Result estimated due to matrix interferences.
		Manganese	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		Vinyl acetate		Sample received out of temperature at lab, resample result reported.
		Acetone		Sample received out of temperature at lab, resample result reported.
		Acrolein		Sample received out of temperature at lab, resample result reported.
		Acrylonitrile		Sample received out of temperature at lab, resample result reported.
		Benzene		Sample received out of temperature at lab, resample result reported.
		Chlorobenzene		Sample received out of temperature at lab, resample result reported.
		Xylenes		Sample received out of temperature at lab, resample result reported.
		Styrene		Sample received out of temperature at lab, resample result reported.
		Toluene		Sample received out of temperature at lab, resample result reported.
		Chlorobromomethane		Sample received out of temperature at lab, resample result reported.
		Bromodichloromethane		Sample received out of temperature at lab, resample result reported.
		Tribromomethane		Sample received out of temperature at lab, resample result reported.
		Methyl bromide		Sample received out of temperature at lab, resample result reported.
		Methyl Ethyl Ketone		Sample received out of temperature at lab, resample result reported.
		trans-1,4-Dichloro-2-butene		Sample received out of temperature at lab, resample result reported.
		Carbon disulfide		Sample received out of temperature at lab, resample result reported.
		Chloroethane		Sample received out of temperature at lab, resample result reported.
		Chloroform		Sample received out of temperature at lab, resample result reported.
		Methyl chloride		Sample received out of temperature at lab, resample result reported.
		cis-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Methylene bromide		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethylene		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromoethane		Sample received out of temperature at lab, resample result reported.
		1,1,2,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,2-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		Vinyl chloride		Sample received out of temperature at lab, resample result reported.
		Tetrachloroethene		Sample received out of temperature at lab, resample result reported.
		Trichloroethene		Sample received out of temperature at lab, resample result reported.
		Ethylbenzene		Sample received out of temperature at lab, resample result reported.
		2-Hexanone		Sample received out of temperature at lab, resample result reported.
		Iodomethane		Sample received out of temperature at lab, resample result reported.
		Dibromochloromethane		Sample received out of temperature at lab, resample result reported.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0983 MW368	MW368UG4-20R	Carbon tetrachloride		Sample received out of temperature at lab, resample result reported.
		Dichloromethane		Sample received out of temperature at lab, resample result reported.
		Methyl Isobutyl Ketone		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromo-3-chloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloropropane		Sample received out of temperature at lab, resample result reported.
		trans-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		cis-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		trans-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Trichlorofluoromethane		Sample received out of temperature at lab, resample result reported.
		1,2,3-Trichloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		1,4-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.25. Rad error is 6.21.
		Gross beta		TPU is 9.3. Rad error is 8.95.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.474. Rad error is 0.473.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.07. Rad error is 2.07.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.66. Rad error is 8.65.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.31. Rad error is 1.3.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 144. Rad error is 144.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4820 MW369	MW369UG4-20	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Vinyl acetate		Sample received out of temperature at lab, resample result reported.
		Acetone		Sample received out of temperature at lab, resample result reported.
		Acrolein		Sample received out of temperature at lab, resample result reported.
		Acrylonitrile		Sample received out of temperature at lab, resample result reported.
		Benzene		Sample received out of temperature at lab, resample result reported.
		Chlorobenzene		Sample received out of temperature at lab, resample result reported.
		Xylenes		Sample received out of temperature at lab, resample result reported.
		Styrene		Sample received out of temperature at lab, resample result reported.
		Toluene		Sample received out of temperature at lab, resample result reported.
		Chlorobromomethane		Sample received out of temperature at lab, resample result reported.
		Bromodichloromethane		Sample received out of temperature at lab, resample result reported.
		Tribromomethane		Sample received out of temperature at lab, resample result reported.
		Methyl bromide		Sample received out of temperature at lab, resample result reported.
		Methyl Ethyl Ketone		Sample received out of temperature at lab, resample result reported.
		trans-1,4-Dichloro-2-butene		Sample received out of temperature at lab, resample result reported.
		Carbon disulfide		Sample received out of temperature at lab, resample result reported.
		Chloroethane		Sample received out of temperature at lab, resample result reported.
		Chloroform		Sample received out of temperature at lab, resample result reported.
		Methyl chloride		Sample received out of temperature at lab, resample result reported.
		cis-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Methylene bromide		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1-Dichloroethylene		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromoethane		Sample received out of temperature at lab, resample result reported.
		1,1,2,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,2-Trichloroethane		Sample received out of temperature at lab, resample result reported.
		1,1,1,2-Tetrachloroethane		Sample received out of temperature at lab, resample result reported.
		Vinyl chloride		Sample received out of temperature at lab, resample result reported.
		Tetrachloroethene		Sample received out of temperature at lab, resample result reported.
		Trichloroethene		Sample received out of temperature at lab, resample result reported.
		Ethylbenzene		Sample received out of temperature at lab, resample result reported.
		2-Hexanone		Sample received out of temperature at lab, resample result reported.
		Iodomethane		Sample received out of temperature at lab, resample result reported.
		Dibromochloromethane		Sample received out of temperature at lab, resample result reported.
		Carbon tetrachloride		Sample received out of temperature at lab, resample result reported.
		Dichloromethane		Sample received out of temperature at lab, resample result reported.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4820 MW369	MW369UG4-20	Methyl Isobutyl Ketone		Sample received out of temperature at lab, resample result reported.
		1,2-Dibromo-3-chloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichloropropane		Sample received out of temperature at lab, resample result reported.
		trans-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		cis-1,3-Dichloropropene		Sample received out of temperature at lab, resample result reported.
		trans-1,2-Dichloroethene		Sample received out of temperature at lab, resample result reported.
		Trichlorofluoromethane		Sample received out of temperature at lab, resample result reported.
		1,2,3-Trichloropropane		Sample received out of temperature at lab, resample result reported.
		1,2-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		1,4-Dichlorobenzene		Sample received out of temperature at lab, resample result reported.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.5. Rad error is 5.5.
		Gross beta		TPU is 9.58. Rad error is 9.12.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.557. Rad error is 0.557.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.21. Rad error is 3.19.
		Technetium-99		TPU is 11.3. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.44. Rad error is 0.44.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 135.
8004-4818 MW370	MW370UG4-20R	Boron	N	Sample spike (MS/MSD) recovery not within control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.83. Rad error is 5.76.
		Gross beta		TPU is 15.2. Rad error is 10.9.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.44. Rad error is 0.44.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.96. Rad error is 2.96.
		Technetium-99		TPU is 16.8. Rad error is 15.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.662. Rad error is 0.661.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4819 MW371	MW371UG4-20R	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.93. Rad error is 7.73.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.64. Rad error is 7.46.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.48. Rad error is 0.479.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.38. Rad error is 3.38.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13. Rad error is 13.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.641. Rad error is 0.641.
8004-4808 MW372	MW372UG4-20R	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 130. Rad error is 130.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.18. Rad error is 6.12.
		Gross beta		TPU is 17. Rad error is 11.7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.238. Rad error is 0.238.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.87. Rad error is 3.87.
		Technetium-99		TPU is 19.4. Rad error is 15.5.
8004-4792 MW373	MW373UG4-20R	Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.11. Rad error is 1.1.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 120. Rad error is 120.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.57. Rad error is 9.42.
		Gross beta		TPU is 8.68. Rad error is 8.03.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.592. Rad error is 0.592.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.97. Rad error is 3.97.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13.9. Rad error is 13.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.943. Rad error is 0.935.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0990 MW374	MW374UG4-20R	Boron	N	Sample spike (MS/MSD) recovery not within control limits
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.93. Rad error is 4.92.
		Gross beta		TPU is 8.86. Rad error is 8.06.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.469. Rad error is 0.468.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.93. Rad error is 2.93.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13.1. Rad error is 13.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.797. Rad error is 0.793.
8004-0985 MW375	MW375UG4-20R	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 138. Rad error is 138.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.53. Rad error is 3.53.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.5. Rad error is 6.48.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.336. Rad error is 0.336.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.8. Rad error is 2.8.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13.2. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.99. Rad error is 1.94.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 129.

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

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

## GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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



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

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

## GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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

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

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

## GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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

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

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

## GROUNDWATER WRITTEN COMMENTS

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

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG4-20	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.72. Rad error is 3.71.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.72. Rad error is 6.72.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.727. Rad error is 0.727.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.01. Rad error is 3.01.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.889. Rad error is 0.881.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 146. Rad error is 145.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG4-20	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.27. Rad error is 5.26.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.23. Rad error is 9.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.577. Rad error is 0.577.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.57. Rad error is 4.53.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.3. Rad error is 10.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.726. Rad error is 0.725.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 170. Rad error is 168.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.



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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-20	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-20	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4UG4-20	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4UG4-20	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB6UG4-20	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB6UG4-20	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4799 MW358	MW358DUG4-20	Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.1. Rad error is 8.06.
		Gross beta		TPU is 8.27. Rad error is 7.38.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.713. Rad error is 0.712.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.77. Rad error is 2.77.
		Technetium-99		TPU is 12.2. Rad error is 11.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.736. Rad error is 0.733.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 131.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-20R2	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.
		Total Dissolved Solids		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.
		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.



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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG4-20R2	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.
		Total Dissolved Solids		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.
		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.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG4-20R2	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.
		Total Dissolved Solids		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.
		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.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0983 MW368	MW368UG4-20R2	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.
		Total Dissolved Solids		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.
		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.

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

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4820 MW369	MW369UG4-20R	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.
		Total Dissolved Solids		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.
		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.

**APPENDIX D**

**STATISTICAL ANALYSES AND  
QUALIFICATION STATEMENT**

**THIS PAGE INTENTIONALLY LEFT BLANK**

# GROUNDWATER STATISTICAL COMMENTS

---

## Introduction

The statistical analyses conducted on the third quarter 2020 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 2020 data used to conduct the statistical analyses were collected in July and August 2020. The statistical analyses for this report first used data from the first eight quarters that had been sampled for each parameter to develop the historical background value, beginning with the first two baseline sampling events in 2002, when available. Then a second set of statistical analyses, using the last eight quarters, was run on analytes that had at least one downgradient well that had exceeded the historical background. The sampling dates associated with both the historical and the current background data are listed next to the result in the statistical analysis sheets of this appendix.

## Statistical Analysis Process

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

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

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

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

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

<sup>a</sup> 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.

<sup>b</sup> Well was dry this quarter, and a groundwater sample could not be collected.

**BG:** upgradient or background wells

**TW:** downgradient or test wells

**SG:** sidegradient wells

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

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



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

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 URGAs, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, second quarter 2020. The observations are representative of the current quarter data. 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 or data assessment, this result is not used, and the next available data point is used for the background or current quarter data.

---

<sup>1</sup> 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**

<b>Parameters</b>
Acetone
Aluminum
Beta Activity
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
<i>cis</i> -1,2-Dichloroethene
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Methylene Chloride
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**

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

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

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

**Bold** denotes parameters with at least one uncensored observation.

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
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
<b>Acetone</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
<b>Aluminum</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Antimony	6	6	0	No
Beryllium	6	6	0	No
<b>Beta activity</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Carbon disulfide	6	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
<i>cis</i> -1,2-Dichloroethene	6	6	0	No
<i>cis</i> -1,3-Dichloropropene	6	6	0	No
<b>Cobalt</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Copper</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
<b>Iron</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Manganese</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<b>Methylene chloride</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>

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

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

**Bold** denotes parameters with at least one uncensored observation.

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

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

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

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

**Bold** denotes parameters with at least one uncensored observation.



## **Discussion of Results from Historical Background Comparison**

For the UCRS, URGAs, 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, URGAs, and LRGA, the test was applied to 28, 30, and 29 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, oxidation-reduction potential, and sulfate.

### **URGA**

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

### **LRGA**

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

## **Statistical Summary**

Summaries of the results of the statistical tests conducted on data obtained from wells in the UCRS, the URGAs, 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**

<b>UCRS</b>	<b>URGA</b>	<b>LRGA</b>
<b>MW359:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW357:</b> Oxidation-Reduction Potential	<b>MW358:</b> Technetium-99
<b>MW362:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW360:</b> Oxidation-Reduction Potential	<b>MW361:</b> Oxidation-Reduction Potential, Technetium-99
<b>MW365:</b> Oxidation-Reduction Potential, Sulfate	<b>MW363:</b> Oxidation-Reduction Potential	<b>MW364:</b> Oxidation-Reduction Potential, Technetium-99
<b>MW368:</b> Calcium, Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW366:</b> Oxidation-Reduction Potential	<b>MW367:</b> Oxidation-Reduction Potential
<b>MW371:</b> Calcium, Oxidation-Reduction Potential, Sulfate	<b>MW369:</b> Oxidation-Reduction Potential	<b>MW370:</b> Beta activity, Oxidation-Reduction Potential, Technetium-99
<b>MW374:</b> Oxidation-Reduction Potential	<b>MW372:</b> Beta Activity, Calcium, Conductivity, Dissolved Solids, Oxidation-Reduction Potential, Technetium-99	<b>MW373:</b> Oxidation-Reduction Potential
<b>MW375:</b> Oxidation-Reduction Potential, Sulfate		

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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 and MW371.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.97	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.31	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.45	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	1.27	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, and MW368.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.
Methylene Chloride	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.49	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, and MW375.
Total Organic Carbon (TOC)	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	1.32	No exceedance of statistically derived historical background concentration.
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.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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.
Beta Activity	Tolerance Interval	0.74	Current results exceed statistically derived historical background concentration in MW372.
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.29	Current results exceed statistically derived historical background concentration in MW372.
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	Current results exceed statistically derived historical background concentration in MW372.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW372.
Iron	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Methylene Chloride	Tolerance Interval	0.36	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
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	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.75	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	0.87	Current results exceed statistically derived historical background concentration in MW372.
Total Organic Carbon (TOC)	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
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.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	2.78	No exceedance of statistically derived historical background concentration.
Beta activity <sup>1</sup>	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.
<i>Cis</i> -1,2-Dichloroethene	Tolerance Interval	0.80	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.
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.
Methylene Chloride	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
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 MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration.
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 MW358, MW361, MW364, and MW370.
Total Organic Carbon (TOC)	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Trichloroethene <sup>1</sup>	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.

<sup>1</sup> A tolerance interval was calculated based on an MCL exceedance.



## **Discussion of Results from Current Background Comparison**

For concentrations in wells in the UCRS, URGAs, 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, URGAs, and LRGA, the test was applied to 4, 6, and 3 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

### **UCRS**

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

### **URGA**

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

### **LRGA**

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

## **Statistical Summary**

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGAs, and the LRGA are presented in Exhibit D.10, Exhibit D.11, and Exhibit D.12, respectively.

**Exhibit D.10. Test Summaries for Qualified Parameters for Current Background—UCRS**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Calcium	Tolerance Interval	0.53	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Dissolved Oxygen	Tolerance Interval	0.78	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.
Oxidation-Reduction Potential	Tolerance Interval	0.19	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	0.95	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.11. Test Summaries for Qualified Parameters for Current Background—URGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Beta Activity	Tolerance Interval	0.83	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Calcium	Tolerance Interval	0.53	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.
Conductivity	Tolerance Interval	0.27	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Dissolved Solids	Tolerance Interval	0.39	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.
Oxidation-Reduction Potential	Tolerance Interval	0.11	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	0.74	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.12. Test Summaries for Qualified Parameters for Current Background—LRGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Beta activity	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.
Oxidation-Reduction Potential	Tolerance Interval	0.11	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	0.77	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**

**THIS PAGE INTENTIONALLY LEFT BLANK**

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Aluminum**

**UNITS: mg/L**

**UCRS**

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

## Dry/Partially Dry Wells

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.05	N/A	-2.996	N/A
MW362	Downgradient	Yes	0.022	N/A	-3.817	NO
MW365	Downgradient	No	0.0245	N/A	-3.709	N/A
MW368	Downgradient	Yes	0.125	N/A	-2.079	NO
MW371	Upgradient	Yes	1.17	N/A	0.157	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	No	0.05	N/A	-2.996	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Boron****UNITS: mg/L****UCRS**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	0.00521	N/A	-5.257	NO
MW362	Downgradient	Yes	0.0195	N/A	-3.937	NO
MW365	Downgradient	Yes	0.00795	N/A	-4.835	NO
MW368	Downgradient	Yes	0.00691	N/A	-4.975	NO
MW371	Upgradient	Yes	0.0111	N/A	-4.501	NO
MW374	Upgradient	Yes	0.0151	N/A	-4.193	NO
MW375	Sidegradient	Yes	0.00852	N/A	-4.765	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



C-746-U Third Quarter 2020 Statistical Analysis		Historical Background Comparison
Bromide	UNITS: mg/L	UCRS

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

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

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

### 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	0.0936	NO	-2.369	N/A
MW365	Downgradient	No	0.2	N/A	-1.609	N/A
MW368	Downgradient	No	0.2	N/A	-1.609	N/A
MW371	Upgradient	No	0.2	N/A	-1.609	N/A
MW374	Upgradient	Yes	0.65	NO	-0.431	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,  $S = \sqrt{\text{Sum}([(background\ result - X)^2] / [\text{count of background results} - 1])}^{0.5}$

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Calcium****UNITS: mg/L****UCRS**

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

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

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

**Historical Background Data from Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	5.77	NO	1.753	N/A
MW362	Downgradient	Yes	21.8	NO	3.082	N/A
MW365	Downgradient	Yes	25.8	NO	3.250	N/A
MW368	Downgradient	Yes	71.2	YES	4.265	N/A
MW371	Upgradient	Yes	69	YES	4.234	N/A
MW374	Upgradient	Yes	20.5	NO	3.020	N/A
MW375	Sidegradient	Yes	13.2	NO	2.580	N/A

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

**Conclusion of Statistical Analysis on Historical Data**

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

**Wells with Exceedances**

MW368  
MW371

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

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

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

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

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

**Statistics-Background Data**      X= 72.938    S= 70.749    CV(1)=0.970      K factor\*\*= 2.523    TL(1)= 251.437    LL(1)=N/A

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

### Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	260	5.561
1/7/2003	214	5.366
4/2/2003	147	4.990
7/9/2003	72	4.277
10/7/2003	56	4.025
1/6/2004	68	4.220
4/7/2004	35	3.555
7/14/2004	35	3.555

### Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	20	N/A	2.996	N/A
MW362	Downgradient	No	20	N/A	2.996	N/A
MW365	Downgradient	No	20	N/A	2.996	N/A
MW368	Downgradient	Yes	15.4	NO	2.734	N/A
MW371	Upgradient	Yes	10.1	NO	2.313	N/A
MW374	Upgradient	No	20	N/A	2.996	N/A
MW375	Sidegradient	No	20	N/A	2.996	N/A

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

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Chloride      UNITS: mg/L      UCRS

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

**Statistics-Background Data**      X= 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	1.45	NO	0.372	N/A
MW362	Downgradient	Yes	3.89	NO	1.358	N/A
MW365	Downgradient	Yes	2.82	NO	1.037	N/A
MW368	Downgradient	Yes	2.75	NO	1.012	N/A
MW371	Upgradient	Yes	3.75	NO	1.322	N/A
MW374	Upgradient	Yes	54.5	NO	3.998	N/A
MW375	Sidegradient	Yes	3.64	NO	1.292	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Cobalt****UNITS: mg/L****UCRS**

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

**Statistics-Background Data**      **X**= 0.007    **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	0.00175	N/A	-6.348	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	No	0.000442	N/A	-7.724	N/A
MW374	Upgradient	No	0.000644	N/A	-7.348	N/A
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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Conductivity      UNITS: umho/cm      UCRS

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

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

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

### Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	541	6.293
4/22/2002	643	6.466
7/15/2002	632	6.449
10/8/2002	631	6.447
1/8/2003	680	6.522
4/3/2003	749	6.619
7/9/2003	734	6.599
10/6/2003	753	6.624
Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	1007	6.915
10/8/2002	1680	7.427
1/7/2003	1715.9	7.448
4/2/2003	172	5.147
7/9/2003	1231	7.116
10/7/2003	1214	7.102
1/6/2004	1172	7.066
4/7/2004	1145	7.043

### Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result > TL(1)?	LN(Result)	LN(Result) > TL(2)
MW359	Downgradient	Yes	221	NO	5.398	N/A
MW362	Downgradient	Yes	697	NO	6.547	N/A
MW365	Downgradient	Yes	405	NO	6.004	N/A
MW368	Downgradient	Yes	544	NO	6.299	N/A
MW371	Upgradient	Yes	527	NO	6.267	N/A
MW374	Upgradient	Yes	687	NO	6.532	N/A
MW375	Sidegradient	Yes	341	NO	5.832	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Copper      UNITS: mg/L      UCRS

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

**Statistics-Background Data**      X= 0.056    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	0.000962	N/A	-6.946	NO
MW362	Downgradient	Yes	0.00102	N/A	-6.888	NO
MW365	Downgradient	Yes	0.00585	N/A	-5.141	NO
MW368	Downgradient	Yes	0.000471	N/A	-7.661	NO
MW371	Upgradient	Yes	0.00166	N/A	-6.401	NO
MW374	Upgradient	No	0.002	N/A	-6.215	N/A
MW375	Sidegradient	Yes	0.000469	N/A	-7.665	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Dissolved Oxygen****UNITS: mg/L****UCRS**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.59	YES	1.278	N/A
MW362	Downgradient	Yes	3.03	YES	1.109	N/A
MW365	Downgradient	Yes	1.53	NO	0.425	N/A
MW368	Downgradient	Yes	2.72	YES	1.001	N/A
MW371	Upgradient	Yes	2.5	NO	0.916	N/A
MW374	Upgradient	Yes	0.7	NO	-0.357	N/A
MW375	Sidegradient	Yes	1.8	NO	0.588	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  
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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Dissolved Solids****UNITS: mg/L****UCRS**

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

**Statistics-Background Data**      **X= 590.000 S= 248.068 CV(1)=0.420      K factor\*\*= 2.523      TL(1)= 1215.876 LL(1)=N/A**
**Statistics-Transformed Background Data**      **X= 6.308 S= 0.383 CV(2)=0.061      K factor\*\*= 2.523      TL(2)= 7.274      LL(2)=N/A**
**Historical Background Data from  
Upgradient Wells with Transformed Result**
**Dry/Partially Dry Wells**

**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)
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

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	Yes	146	NO	4.984	N/A
MW362	Downgradient	Yes	377	NO	5.932	N/A
MW365	Downgradient	Yes	270	NO	5.598	N/A
MW368	Downgradient	Yes	330	NO	5.799	N/A
MW371	Upgradient	Yes	336	NO	5.817	N/A
MW374	Upgradient	Yes	383	NO	5.948	N/A
MW375	Sidegradient	Yes	197	NO	5.283	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Iron**

**UNITS: mg/L**

**UCRS**

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

**Statistics-Background Data**      X= 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	0.0364	NO	-3.313	N/A
MW362	Downgradient	Yes	0.044	NO	-3.124	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.0747	NO	-2.594	N/A
MW371	Upgradient	Yes	0.772	NO	-0.259	N/A
MW374	Upgradient	Yes	0.878	NO	-0.130	N/A
MW375	Sidegradient	Yes	0.0384	NO	-3.260	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Magnesium****UNITS: mg/L****UCRS**

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

**Statistics-Background Data**      **X**= 11.347    **S**= 3.019    **CV(1)**=0.266    **K factor\*\***= 2.523    **TL(1)**= 18.963    **LL(1)**=N/A

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.12	NO	1.138	N/A
MW362	Downgradient	Yes	9.32	NO	2.232	N/A
MW365	Downgradient	Yes	12.1	NO	2.493	N/A
MW368	Downgradient	Yes	16.5	NO	2.803	N/A
MW371	Upgradient	Yes	11.4	NO	2.434	N/A
MW374	Upgradient	Yes	5.4	NO	1.686	N/A
MW375	Sidegradient	Yes	5.25	NO	1.658	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Manganese**

**UNITS: mg/L**

**UCRS**

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

**Statistics-Background Data**      X= 0.248    S= 0.222    CV(1)=0.894    K factor\*\*= 2.523    TL(1)= 0.809    LL(1)=N/A

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

## Historical Background Data from Upgradient Wells with Transformed Result

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

## Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.00114	N/A	-6.777	N/A
MW362	Downgradient	No	0.005	N/A	-5.298	N/A
MW365	Downgradient	Yes	0.00826	NO	-4.796	N/A
MW368	Downgradient	Yes	0.00521	NO	-5.257	N/A
MW371	Upgradient	Yes	0.0326	NO	-3.423	N/A
MW374	Upgradient	Yes	0.313	NO	-1.162	N/A
MW375	Sidegradient	No	0.00131	N/A	-6.638	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Methylene chloride**

**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= 5.125    S= 1.500    CV(1)=0.293    K factor\*\*= 2.523    TL(1)= 8.910    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.595    S= 0.296    CV(2)=0.186    K factor\*\*= 2.523    TL(2)= 2.343    LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

## Dry/Partially Dry Wells

**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)
3/18/2002	2	0.693
4/22/2002	5	1.609
7/15/2002	10	2.303
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	1.609
10/7/2003	5	1.609
1/6/2004	5	1.609
4/7/2004	5	1.609
7/14/2004	5	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	5	N/A	1.609	N/A
MW362	Downgradient	No	5	N/A	1.609	N/A
MW365	Downgradient	Yes	1.79	NO	0.582	N/A
MW368	Downgradient	No	5	N/A	1.609	N/A
MW371	Upgradient	No	5	N/A	1.609	N/A
MW374	Upgradient	No	5	N/A	1.609	N/A
MW375	Sidegradient	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.

## 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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Molybdenum**

**UNITS: mg/L**

**UCRS**

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

**Statistics-Background Data**      X= 0.006    S= 0.010    CV(1)= 1.650    K factor\*\*= 2.523    TL(1)= 0.030    LL(1)=N/A

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.00121	-6.717
4/3/2003	0.001	-6.908
7/9/2003	0.00111	-6.803
10/6/2003	0.001	-6.908
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.00222	-6.110
1/7/2003	0.00201	-6.210
4/2/2003	0.00159	-6.444
7/9/2003	0.00242	-6.024
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

## Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	Yes	0.000458	N/A	-7.689	NO
MW365	Downgradient	No	0.001	N/A	-6.908	N/A
MW368	Downgradient	Yes	0.000494	N/A	-7.613	NO
MW371	Upgradient	Yes	0.000393	N/A	-7.842	NO
MW374	Upgradient	Yes	0.000203	N/A	-8.502	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 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	0.00324	NO	-5.732	N/A
MW362	Downgradient	Yes	0.00272	NO	-5.907	N/A
MW365	Downgradient	Yes	0.00928	NO	-4.680	N/A
MW368	Downgradient	Yes	0.00211	NO	-6.161	N/A
MW371	Upgradient	Yes	0.00595	NO	-5.124	N/A
MW374	Upgradient	Yes	0.00233	NO	-6.062	N/A
MW375	Sidegradient	Yes	0.00657	NO	-5.025	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Oxidation-Reduction Potential      UNITS: mV      UCRS

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

**Statistics-Background Data**      X= 22.281    S= 78.889    CV(1)= 3.541    K factor\*\*= 2.523    TL(1)= 221.319    LL(1)=N/A

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

### Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

### Dry/Partially Dry Wells

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**#Because the natural log was not 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)
MW359	Downgradient	Yes	171	N/A	5.142	YES
MW362	Downgradient	Yes	340	N/A	5.829	YES
MW365	Downgradient	Yes	396	N/A	5.981	YES
MW368	Downgradient	Yes	250	N/A	5.521	YES
MW371	Upgradient	Yes	361	N/A	5.889	YES
MW374	Upgradient	Yes	304	N/A	5.717	YES
MW375	Sidegradient	Yes	374	N/A	5.924	YES

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

### Conclusion of Statistical Analysis on Historical Data

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

### Wells with Exceedances

MW359  
MW362  
MW365  
MW368  
MW371  
MW374  
MW375

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

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

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

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****PCB, Total****UNITS: UG/L****UCRS**

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

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

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

**Historical Background Data from Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.0997	N/A	-2.306	N/A
MW362	Downgradient	No	0.0951	N/A	-2.353	N/A
MW365	Downgradient	Yes	0.0709	NO	-2.646	N/A
MW368	Downgradient	No	0.1	N/A	-2.303	N/A
MW371	Upgradient	No	0.0942	N/A	-2.362	N/A
MW374	Upgradient	No	0.0962	N/A	-2.341	N/A
MW375	Sidegradient	No	0.0946	N/A	-2.358	N/A

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

**Conclusion of Statistical Analysis on Historical Data**

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

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

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

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

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.

<b>C-746-U Third Quarter 2020 Statistical Analysis</b> <b>PCB-1242</b>	<b>Historical Background Comparison</b> <b>UNITS: UG/L</b> <b>UCRS</b>
---	---

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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

<b>Historical Background Data from Upgradient Wells with Transformed Result</b>
---

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

<b>Dry/Partially Dry Wells</b>
--------------------------------

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.**

<b>Current Quarter Data</b>
-----------------------------

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.0997	N/A	-2.306	N/A
MW362	Downgradient	No	0.0951	N/A	-2.353	N/A
MW365	Downgradient	Yes	0.0709	N/A	-2.646	NO
MW368	Downgradient	No	0.1	N/A	-2.303	N/A
MW371	Upgradient	No	0.0942	N/A	-2.362	N/A
MW374	Upgradient	No	0.0962	N/A	-2.341	N/A
MW375	Sidegradient	No	0.0946	N/A	-2.358	N/A

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

<b>Conclusion of Statistical Analysis on Historical Data</b>
--

**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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

pH

UNITS: Std Unit

UCRS

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

## Dry/Partially Dry Wells

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW359	Downgradient	Yes	6.23	NO	1.829	N/A
MW362	Downgradient	Yes	6.93	NO	1.936	N/A
MW365	Downgradient	Yes	6.23	NO	1.829	N/A
MW368	Downgradient	Yes	6.53	NO	1.876	N/A
MW371	Upgradient	Yes	6.42	NO	1.859	N/A
MW374	Upgradient	Yes	6.53	NO	1.876	N/A
MW375	Sidegradient	Yes	6.03	NO	1.797	N/A

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

## Conclusion of Statistical Analysis on Historical Data

**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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Potassium**

**UNITS: mg/L**

**UCRS**

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

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

Well Number: MW374

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

## Dry/Partially Dry Wells

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.3	N/A	-1.204	N/A
MW362	Downgradient	Yes	0.29	NO	-1.238	N/A
MW365	Downgradient	Yes	0.291	NO	-1.234	N/A
MW368	Downgradient	Yes	0.465	NO	-0.766	N/A
MW371	Upgradient	Yes	0.504	NO	-0.685	N/A
MW374	Upgradient	Yes	0.407	NO	-0.899	N/A
MW375	Sidegradient	Yes	0.258	NO	-1.355	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Sodium****UNITS: mg/L****UCRS**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	34.9	NO	3.552	N/A
MW362	Downgradient	Yes	137	NO	4.920	N/A
MW365	Downgradient	Yes	55.8	NO	4.022	N/A
MW368	Downgradient	Yes	37.9	NO	3.635	N/A
MW371	Upgradient	Yes	28.9	NO	3.364	N/A
MW374	Upgradient	Yes	121	NO	4.796	N/A
MW375	Sidegradient	Yes	53.1	NO	3.972	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Sulfate****UNITS: mg/L****UCRS**

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

**Statistics-Background Data**      **X**= 6.469    **S**= 3.153    **CV(1)**=0.487    **K factor\*\***= 2.523    **TL(1)**= 14.423    **LL(1)**=N/A

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

**Historical Background Data from Upgradient Wells with Transformed Result**

Well Number: MW371

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

Well Number: MW374

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

**Dry/Partially Dry Wells**

Well No. Gradient

MW376	Sidegradient
MW377	Sidegradient

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	45.4	YES	3.816	N/A
MW362	Downgradient	Yes	32.3	YES	3.475	N/A
MW365	Downgradient	Yes	57.3	YES	4.048	N/A
MW368	Downgradient	Yes	81	YES	4.394	N/A
MW371	Upgradient	Yes	53.6	YES	3.982	N/A
MW374	Upgradient	Yes	9.1	NO	2.208	N/A
MW375	Sidegradient	Yes	24.3	YES	3.190	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Total Organic Carbon (TOC)**

**UNITS: mg/L**

**UCRS**

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	11.1	2.407
4/22/2002	7	1.946
7/15/2002	4.1	1.411
10/8/2002	6	1.792
1/8/2003	5.3	1.668
4/3/2003	5.3	1.668
7/9/2003	2.9	1.065
10/6/2003	3.2	1.163
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	90	4.500
1/7/2003	64	4.159
4/2/2003	25	3.219
7/9/2003	16	2.773
10/7/2003	13	2.565
1/6/2004	10	2.303
4/7/2004	7.2	1.974
7/14/2004	12	2.485

## Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	1.12	N/A	0.113	NO
MW362	Downgradient	Yes	2.27	N/A	0.820	NO
MW365	Downgradient	Yes	0.649	N/A	-0.432	NO
MW368	Downgradient	Yes	1.41	N/A	0.344	NO
MW371	Upgradient	Yes	2.48	N/A	0.908	NO
MW374	Upgradient	Yes	2.37	N/A	0.863	NO
MW375	Sidegradient	Yes	0.877	N/A	-0.131	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Total Organic Halides (TOX)****UNITS: ug/L****UCRS**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**
**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	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

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	10	N/A	2.303	N/A
MW362	Downgradient	Yes	14	N/A	2.639	NO
MW365	Downgradient	Yes	12.4	N/A	2.518	NO
MW368	Downgradient	Yes	6.88	N/A	1.929	NO
MW371	Upgradient	Yes	6.12	N/A	1.812	NO
MW374	Upgradient	Yes	32.7	N/A	3.487	NO
MW375	Sidegradient	Yes	4.8	N/A	1.569	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Vanadium**

**UNITS: mg/L**

**UCRS**

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

## Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	No	0.02	N/A	-3.912	N/A
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	No	0.02	N/A	-3.912	N/A
MW368	Downgradient	Yes	0.00347	N/A	-5.664	NO
MW371	Upgradient	Yes	0.0064	N/A	-5.051	NO
MW374	Upgradient	No	0.02	N/A	-3.912	N/A
MW375	Sidegradient	No	0.02	N/A	-3.912	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**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	0.00581	N/A	-5.148	NO
MW362	Downgradient	Yes	0.00479	N/A	-5.341	NO
MW365	Downgradient	No	0.00816	N/A	-4.809	N/A
MW368	Downgradient	No	0.0054	N/A	-5.221	N/A
MW371	Upgradient	No	0.00632	N/A	-5.064	N/A
MW374	Upgradient	No	0.00426	N/A	-5.458	N/A
MW375	Sidegradient	No	0.00496	N/A	-5.306	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	5	N/A	1.609	N/A
MW360	Downgradient	No	5	N/A	1.609	N/A
MW363	Downgradient	Yes	1.82	N/A	0.599	NO
MW366	Downgradient	No	5	N/A	1.609	N/A
MW369	Upgradient	No	5	N/A	1.609	N/A
MW372	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.

**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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

Aluminum

UNITS: mg/L

URGA

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

**Statistics-Background Data**      X= 0.625    S= 0.774    CV(1)= 1.239    K factor\*\*= 2.523    TL(1)= 2.578    LL(1)=N/A

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

## Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Well Number: MW372

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.05	N/A	-2.996	N/A
MW360	Downgradient	Yes	0.19	N/A	-1.661	NO
MW363	Downgradient	No	0.0251	N/A	-3.685	N/A
MW366	Downgradient	No	0.05	N/A	-2.996	N/A
MW369	Upgradient	No	0.05	N/A	-2.996	N/A
MW372	Upgradient	No	0.05	N/A	-2.996	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Beta activity****UNITS: pCi/L****URGA**

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

**Statistics-Background Data**      **X**= 15.996    **S**= 11.899    **CV(1)**=0.744      **K factor\*\***= 2.523    **TL(1)**= 46.017    **LL(1)**=N/A

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

**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	32.5	3.481
4/22/2002	35.4	3.567
7/15/2002	12.9	2.557
10/8/2002	7.59	2.027
1/8/2003	9.58	2.260
4/3/2003	6.69	1.901
7/8/2003	9.1	2.208
10/6/2003	7.31	1.989

Well Number: MW372

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	20.1	N/A	3.001	N/A
MW360	Downgradient	No	6.42	N/A	1.859	N/A
MW363	Downgradient	Yes	11.1	N/A	2.407	N/A
MW366	Downgradient	Yes	41.7	N/A	3.731	N/A
MW369	Upgradient	Yes	17.8	N/A	2.879	N/A
MW372	Upgradient	Yes	76.1	YES	4.332	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Boron****UNITS: mg/L****URGA**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

**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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.338	NO	-1.085	N/A
MW360	Downgradient	Yes	0.0366	NO	-3.308	N/A
MW363	Downgradient	Yes	0.0234	NO	-3.755	N/A
MW366	Downgradient	Yes	0.103	NO	-2.273	N/A
MW369	Upgradient	Yes	0.0152	NO	-4.186	N/A
MW372	Upgradient	Yes	1.21	NO	0.191	N/A

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

**Conclusion of Statistical Analysis on Historical Data**

**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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Bromide      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= 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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.37	NO	-0.994	N/A
MW360	Downgradient	Yes	0.151	NO	-1.890	N/A
MW363	Downgradient	Yes	0.0944	NO	-2.360	N/A
MW366	Downgradient	Yes	0.441	NO	-0.819	N/A
MW369	Upgradient	Yes	0.345	NO	-1.064	N/A
MW372	Upgradient	Yes	0.572	NO	-0.559	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Calcium**

**UNITS: mg/L**

**URGA**

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

**Statistics-Background Data**      X= 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	25	NO	3.219	N/A
MW360	Downgradient	Yes	21.2	NO	3.054	N/A
MW363	Downgradient	Yes	30	NO	3.401	N/A
MW366	Downgradient	Yes	31.4	NO	3.447	N/A
MW369	Upgradient	Yes	16.5	NO	2.803	N/A
MW372	Upgradient	Yes	62.4	YES	4.134	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## 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

Well Number: MW369

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

Well Number: MW372

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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	20	N/A	2.996	N/A
MW360	Downgradient	No	20	N/A	2.996	N/A
MW363	Downgradient	Yes	31.4	NO	3.447	N/A
MW366	Downgradient	Yes	15.5	NO	2.741	N/A
MW369	Upgradient	Yes	10.1	NO	2.313	N/A
MW372	Upgradient	Yes	26.8	NO	3.288	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

<b>C-746-U Third Quarter 2020 Statistical Analysis</b>	<b>Historical Background Comparison</b>
<b>Chloride</b>	<b>UNITS: mg/L</b>
	<b>URGA</b>

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

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

<b>Statistics-Transformed Background Data</b>	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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	32.1	NO	3.469	N/A
MW360	Downgradient	Yes	9.64	NO	2.266	N/A
MW363	Downgradient	Yes	27.5	NO	3.314	N/A
MW366	Downgradient	Yes	38.9	NO	3.661	N/A
MW369	Upgradient	Yes	29.9	NO	3.398	N/A
MW372	Upgradient	Yes	44.2	NO	3.789	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Cobalt****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      **X**= 0.025    **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	0.00433	NO	-5.442	N/A
MW363	Downgradient	Yes	0.00102	NO	-6.888	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00419	NO	-5.475	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Conductivity      UNITS: umho/cm      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= 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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	417	NO	6.033	N/A
MW360	Downgradient	Yes	427	NO	6.057	N/A
MW363	Downgradient	Yes	430	NO	6.064	N/A
MW366	Downgradient	Yes	462	NO	6.136	N/A
MW369	Upgradient	Yes	372	NO	5.919	N/A
MW372	Upgradient	Yes	770	YES	6.646	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Copper      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= 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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000343	NO	-7.978	N/A
MW360	Downgradient	Yes	0.00121	NO	-6.717	N/A
MW363	Downgradient	Yes	0.000629	NO	-7.371	N/A
MW366	Downgradient	Yes	0.000616	NO	-7.392	N/A
MW369	Upgradient	Yes	0.00228	NO	-6.084	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.

### 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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Dissolved Oxygen****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.49	NO	1.250	N/A
MW360	Downgradient	Yes	1.03	NO	0.030	N/A
MW363	Downgradient	Yes	0.9	NO	-0.105	N/A
MW366	Downgradient	Yes	3.8	NO	1.335	N/A
MW369	Upgradient	Yes	2.66	NO	0.978	N/A
MW372	Upgradient	Yes	1.78	NO	0.577	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Dissolved Solids

UNITS: mg/L

URGA

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

**Statistics-Background Data**      X= 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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	237	NO	5.468	N/A
MW360	Downgradient	Yes	219	NO	5.389	N/A
MW363	Downgradient	Yes	251	NO	5.525	N/A
MW366	Downgradient	Yes	244	NO	5.497	N/A
MW369	Upgradient	Yes	186	NO	5.226	N/A
MW372	Upgradient	Yes	436	YES	6.078	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Iron**

**UNITS: mg/L**

**URGA**

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

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

Well Number: MW372

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.1	N/A	-2.303	N/A
MW360	Downgradient	Yes	0.57	NO	-0.562	N/A
MW363	Downgradient	Yes	0.0546	NO	-2.908	N/A
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	Yes	0.135	NO	-2.002	N/A
MW372	Upgradient	Yes	0.0355	NO	-3.338	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.

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

## 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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Magnesium****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      X= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	10.3	NO	2.332	N/A
MW360	Downgradient	Yes	7.71	NO	2.043	N/A
MW363	Downgradient	Yes	12.5	NO	2.526	N/A
MW366	Downgradient	Yes	12.9	NO	2.557	N/A
MW369	Upgradient	Yes	6.51	NO	1.873	N/A
MW372	Upgradient	Yes	21.4	NO	3.063	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Manganese**

**UNITS: mg/L**

**URGA**

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

**Statistics-Background Data**      X= 0.413    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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00517	NO	-5.265	N/A
MW360	Downgradient	Yes	0.0784	NO	-2.546	N/A
MW363	Downgradient	Yes	0.166	NO	-1.796	N/A
MW366	Downgradient	Yes	0.00334	NO	-5.702	N/A
MW369	Upgradient	Yes	0.00886	NO	-4.726	N/A
MW372	Upgradient	No	0.005	N/A	-5.298	N/A

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

## Conclusion of Statistical Analysis on Historical Data

**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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Methylene chloride**

**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= 5.438    S= 1.931    CV(1)=0.355    K factor\*\*= 2.523    TL(1)= 10.310    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.639    S= 0.345    CV(2)=0.211    K factor\*\*= 2.523    TL(2)= 2.510    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	5	1.609
7/15/2002	10	2.303
10/8/2002	5	1.609
1/8/2003	5	1.609
4/3/2003	5	1.609
7/8/2003	5	1.609
10/6/2003	5	1.609

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5	1.609
4/23/2002	5	1.609
7/16/2002	10	2.303
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5	1.609
10/7/2003	5	1.609

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	5	N/A	1.609	N/A
MW360	Downgradient	No	5	N/A	1.609	N/A
MW363	Downgradient	Yes	1.8	NO	0.588	N/A
MW366	Downgradient	Yes	1.73	NO	0.548	N/A
MW369	Upgradient	No	5	N/A	1.609	N/A
MW372	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.

## 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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Molybdenum**

**UNITS: mg/L**

**URGA**

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

**Statistics-Background Data**      X= 0.010    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

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

## 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	0.000217	N/A	-8.436	NO
MW363	Downgradient	No	0.001	N/A	-6.908	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	No	0.001	N/A	-6.908	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Nickel****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      **X**= 0.024    **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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00303	NO	-5.799	N/A
MW360	Downgradient	Yes	0.00461	NO	-5.380	N/A
MW363	Downgradient	Yes	0.0158	NO	-4.148	N/A
MW366	Downgradient	Yes	0.0104	NO	-4.566	N/A
MW369	Upgradient	Yes	0.0191	NO	-3.958	N/A
MW372	Upgradient	Yes	0.00253	NO	-5.980	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Oxidation-Reduction Potential      UNITS: mV      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= 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	362	N/A	5.892	YES
MW360	Downgradient	Yes	382	N/A	5.945	YES
MW363	Downgradient	Yes	412	N/A	6.021	YES
MW366	Downgradient	Yes	398	N/A	5.986	YES
MW369	Upgradient	Yes	353	N/A	5.866	YES
MW372	Upgradient	Yes	365	N/A	5.900	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.0939	N/A	-2.366	N/A
MW360	Downgradient	No	0.0937	N/A	-2.368	N/A
MW363	Downgradient	Yes	0.0382	NO	-3.265	N/A
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	No	0.095	N/A	-2.354	N/A
MW372	Upgradient	No	0.096	N/A	-2.343	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

<b>C-746-U Third Quarter 2020 Statistical Analysis</b>	<b>Historical Background Comparison</b>
<b>PCB-1242</b>	<b>UNITS: UG/L</b>
	<b>URGA</b>

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

<b>Statistics-Background Data</b>	X= 0.281	S= 0.383	CV(1)= 1.361	K factor**= 2.523	TL(1)= 1.247	LL(1)=N/A
-----------------------------------	----------	----------	--------------	-------------------	--------------	-----------

<b>Statistics-Transformed Background Data</b>	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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.0939	N/A	-2.366	N/A
MW360	Downgradient	No	0.0937	N/A	-2.368	N/A
MW363	Downgradient	Yes	0.0382	N/A	-3.265	NO
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	No	0.095	N/A	-2.354	N/A
MW372	Upgradient	No	0.096	N/A	-2.343	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

pH

UNITS: Std Unit

URGA

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

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

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

## Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW369

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

Well Number: MW372

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW357	Downgradient	Yes	6.17	NO	1.820	N/A
MW360	Downgradient	Yes	6.28	NO	1.837	N/A
MW363	Downgradient	Yes	5.77	NO	1.753	N/A
MW366	Downgradient	Yes	6.18	NO	1.821	N/A
MW369	Upgradient	Yes	6.2	NO	1.825	N/A
MW372	Upgradient	Yes	6.16	NO	1.818	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Potassium**

**UNITS: mg/L**

**URGA**

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

**Statistics-Background Data**      X= 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.6	NO	0.470	N/A
MW360	Downgradient	Yes	0.668	NO	-0.403	N/A
MW363	Downgradient	Yes	2.06	NO	0.723	N/A
MW366	Downgradient	Yes	1.92	NO	0.652	N/A
MW369	Upgradient	Yes	0.485	NO	-0.724	N/A
MW372	Upgradient	Yes	2.22	NO	0.798	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Sodium****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	43.9	NO	3.782	N/A
MW360	Downgradient	Yes	71	NO	4.263	N/A
MW363	Downgradient	Yes	45.2	NO	3.811	N/A
MW366	Downgradient	Yes	46	NO	3.829	N/A
MW369	Upgradient	Yes	59.6	NO	4.088	N/A
MW372	Upgradient	Yes	63.8	NO	4.156	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Sulfate****UNITS: mg/L****URGA**

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

**Statistics-Background Data**      X= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	41.1	NO	3.716	N/A
MW360	Downgradient	Yes	12	NO	2.485	N/A
MW363	Downgradient	Yes	27.3	NO	3.307	N/A
MW366	Downgradient	Yes	42.3	NO	3.745	N/A
MW369	Upgradient	Yes	5.48	NO	1.701	N/A
MW372	Upgradient	Yes	124	NO	4.820	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Technetium-99****UNITS: pCi/L****URGA**

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

**Statistics-Background Data**      X= 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	34.3	NO	3.535	N/A
MW360	Downgradient	No	4.16	N/A	1.426	N/A
MW363	Downgradient	No	13.6	N/A	2.610	N/A
MW366	Downgradient	Yes	50.5	NO	3.922	N/A
MW369	Upgradient	Yes	20	NO	2.996	N/A
MW372	Upgradient	Yes	106	YES	4.663	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Total Organic Carbon (TOC)****UNITS: mg/L****URGA**

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

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

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

**Historical Background Data from  
Upgradient Wells with Transformed Result**

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

Well Number: MW369

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

Well Number: MW372

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.753	N/A	-0.284	NO
MW360	Downgradient	Yes	1.28	N/A	0.247	NO
MW363	Downgradient	Yes	1.06	N/A	0.058	NO
MW366	Downgradient	Yes	0.825	N/A	-0.192	NO
MW369	Upgradient	Yes	1.37	N/A	0.315	NO
MW372	Upgradient	Yes	1.09	N/A	0.086	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Total Organic Halides (TOX)****UNITS: ug/L****URGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	10	N/A	2.303	N/A
MW360	Downgradient	Yes	5.26	NO	1.660	N/A
MW363	Downgradient	Yes	7.74	NO	2.046	N/A
MW366	Downgradient	Yes	6.64	NO	1.893	N/A
MW369	Upgradient	Yes	12.2	NO	2.501	N/A
MW372	Upgradient	Yes	20.6	NO	3.025	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Zinc**

**UNITS: mg/L**

**URGA**

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

**Statistics-Background Data**      X= 0.116    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

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

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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00639	N/A	-5.053	NO
MW360	Downgradient	Yes	0.00578	N/A	-5.153	NO
MW363	Downgradient	No	0.00561	N/A	-5.183	N/A
MW366	Downgradient	Yes	0.00536	N/A	-5.229	NO
MW369	Upgradient	Yes	0.00913	N/A	-4.696	NO
MW372	Upgradient	No	0.00373	N/A	-5.591	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Aluminum**

**UNITS: mg/L**

**LRGA**

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

**Statistics-Background Data**      X= 2.026    S= 5.626    CV(1)= 2.777    K factor\*\*= 2.523    TL(1)= 16.219    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -0.803    S= 1.380    CV(2)= -1.718    K factor\*\*= 2.523    TL(2)= 2.678    LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

**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	4.66	1.539
4/23/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	22.7	3.122
4/23/2002	1.46	0.378
7/16/2002	0.253	-1.374
10/8/2002	0.482	-0.730
1/7/2003	0.608	-0.498
4/2/2003	0.446	-0.807
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0277	N/A	-3.586	NO
MW361	Downgradient	No	0.05	N/A	-2.996	N/A
MW364	Downgradient	No	0.05	N/A	-2.996	N/A
MW367	Downgradient	No	0.0238	N/A	-3.738	N/A
MW370	Upgradient	No	0.05	N/A	-2.996	N/A
MW373	Upgradient	No	0.05	N/A	-2.996	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Beta activity****UNITS: pCi/L****LRGA**

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

**Statistics-Background Data**      X= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	23.3	N/A	3.148	N/A
MW361	Downgradient	Yes	46.1	N/A	3.831	N/A
MW364	Downgradient	Yes	40.7	N/A	3.706	N/A
MW367	Downgradient	No	5.59	N/A	1.721	N/A
MW370	Upgradient	Yes	65.5	YES	4.182	N/A
MW373	Upgradient	Yes	19.4	N/A	2.965	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Boron**

**UNITS: mg/L**

**LRGA**

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

**Statistics-Background Data**      X= 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.401	NO	-0.914	N/A
MW361	Downgradient	Yes	0.0945	NO	-2.359	N/A
MW364	Downgradient	Yes	0.0338	NO	-3.387	N/A
MW367	Downgradient	Yes	0.0272	NO	-3.605	N/A
MW370	Upgradient	Yes	0.15	NO	-1.897	N/A
MW373	Upgradient	Yes	1.97	NO	0.678	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

C-746-U Third Quarter 2020 Statistical Analysis		Historical Background Comparison
Bromide	UNITS: mg/L	LRGA

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

**Statistics-Background Data**      **X= 1.000**    **S= 0.000**    **CV(1)=0.000**    **K factor\*\*= 2.523**    **TL(1)= 1.000**    **LL(1)=N/A**

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

### Historical Background Data from Upgradient Wells with Transformed Result

**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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.453	NO	-0.792	N/A
MW361	Downgradient	Yes	0.475	NO	-0.744	N/A
MW364	Downgradient	Yes	0.428	NO	-0.849	N/A
MW367	Downgradient	Yes	0.173	NO	-1.754	N/A
MW370	Upgradient	Yes	0.457	NO	-0.783	N/A
MW373	Upgradient	Yes	0.552	NO	-0.594	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.

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

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

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.

# C-746-U Third Quarter 2020 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	34.5	NO	3.541	N/A
MW361	Downgradient	Yes	33.2	NO	3.503	N/A
MW364	Downgradient	Yes	34.2	NO	3.532	N/A
MW367	Downgradient	Yes	17.4	NO	2.856	N/A
MW370	Upgradient	Yes	30.6	NO	3.421	N/A
MW373	Upgradient	Yes	72.2	NO	4.279	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 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

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	10.1	NO	2.313	N/A
MW361	Downgradient	No	20	N/A	2.996	N/A
MW364	Downgradient	Yes	29.4	NO	3.381	N/A
MW367	Downgradient	Yes	15.4	NO	2.734	N/A
MW370	Upgradient	Yes	22	NO	3.091	N/A
MW373	Upgradient	No	20	N/A	2.996	N/A

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

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.



<b>C-746-U Third Quarter 2020 Statistical Analysis</b>	<b>Historical Background Comparison</b>
<b>Chloride</b>	<b>UNITS: mg/L</b>
	<b>LRGA</b>

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

<b>Statistics-Background Data</b>	X= 45.919	S= 7.524	CV(1)=0.164	K factor**= 2.523	TL(1)= 64.901	LL(1)=N/A
-----------------------------------	-----------	----------	-------------	-------------------	---------------	-----------

<b>Statistics-Transformed Background Data</b>	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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	35.5	NO	3.570	N/A
MW361	Downgradient	Yes	36.3	NO	3.592	N/A
MW364	Downgradient	Yes	34.8	NO	3.550	N/A
MW367	Downgradient	Yes	15.2	NO	2.721	N/A
MW370	Upgradient	Yes	35.6	NO	3.572	N/A
MW373	Upgradient	Yes	39.3	NO	3.671	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.

**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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## cis-1,2-Dichloroethene      UNITS: ug/L      LRGA

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

**Statistics-Background Data**      X= 6.250      S= 5.000      CV(1)=0.800      K factor\*\*= 2.523      TL(1)= 18.865      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.710      S= 0.402      CV(2)=0.235      K factor\*\*= 2.523      TL(2)= 2.725      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	5	1.609
4/23/2002	5	1.609
7/15/2002	5	1.609
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: MW373

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/23/2002	25	3.219
7/16/2002	5	1.609
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5	1.609
10/7/2003	5	1.609

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.53	NO	-0.635	N/A
MW361	Downgradient	No	1	N/A	0.000	N/A
MW364	Downgradient	No	1	N/A	0.000	N/A
MW367	Downgradient	No	1	N/A	0.000	N/A
MW370	Upgradient	No	1	N/A	0.000	N/A
MW373	Upgradient	No	1	N/A	0.000	N/A

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

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Cobalt****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 0.027    **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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00657	N/A	-5.025	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	No	0.001	N/A	-6.908	N/A
MW367	Downgradient	Yes	0.00836	N/A	-4.784	NO
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	No	0.000837	N/A	-7.086	N/A

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

**Conclusion of Statistical Analysis on Historical Data**

**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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Conductivity****UNITS: umho/cm****LRGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	537	NO	6.286	N/A
MW361	Downgradient	Yes	510	NO	6.234	N/A
MW364	Downgradient	Yes	478	NO	6.170	N/A
MW367	Downgradient	Yes	281	NO	5.638	N/A
MW370	Upgradient	Yes	452	NO	6.114	N/A
MW373	Upgradient	Yes	859	NO	6.756	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Copper****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 0.025    **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	0.000413	NO	-7.792	N/A
MW361	Downgradient	Yes	0.000612	NO	-7.399	N/A
MW364	Downgradient	Yes	0.000878	NO	-7.038	N/A
MW367	Downgradient	Yes	0.000322	NO	-8.041	N/A
MW370	Upgradient	Yes	0.000383	NO	-7.867	N/A
MW373	Upgradient	Yes	0.000322	NO	-8.041	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Dissolved Oxygen****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.75	NO	-0.288	N/A
MW361	Downgradient	Yes	2.63	NO	0.967	N/A
MW364	Downgradient	Yes	3.39	NO	1.221	N/A
MW367	Downgradient	Yes	0.82	NO	-0.198	N/A
MW370	Upgradient	Yes	2.86	NO	1.051	N/A
MW373	Upgradient	Yes	1.41	NO	0.344	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Dissolved Solids****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	274	NO	5.613	N/A
MW361	Downgradient	Yes	211	NO	5.352	N/A
MW364	Downgradient	Yes	256	NO	5.545	N/A
MW367	Downgradient	Yes	163	NO	5.094	N/A
MW370	Upgradient	Yes	241	NO	5.485	N/A
MW373	Upgradient	Yes	476	NO	6.165	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Iron****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      X= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.39	NO	1.221	N/A
MW361	Downgradient	Yes	0.0393	NO	-3.237	N/A
MW364	Downgradient	No	0.1	N/A	-2.303	N/A
MW367	Downgradient	Yes	6.59	NO	1.886	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	Yes	0.037	NO	-3.297	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Magnesium****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      X= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	15.2	NO	2.721	N/A
MW361	Downgradient	Yes	14.3	NO	2.660	N/A
MW364	Downgradient	Yes	14.3	NO	2.660	N/A
MW367	Downgradient	Yes	9.36	NO	2.236	N/A
MW370	Upgradient	Yes	13	NO	2.565	N/A
MW373	Upgradient	Yes	26.6	NO	3.281	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Manganese**

**UNITS: mg/L**

**LRGA**

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

**Statistics-Background Data**      X= 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.495	NO	-0.703	N/A
MW361	Downgradient	Yes	0.0186	NO	-3.985	N/A
MW364	Downgradient	Yes	0.00257	NO	-5.964	N/A
MW367	Downgradient	Yes	1.48	NO	0.392	N/A
MW370	Upgradient	No	0.0022	N/A	-6.119	N/A
MW373	Upgradient	Yes	0.0374	NO	-3.286	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Methylene chloride**

**UNITS: ug/L**

**LRGA**

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

**Statistics-Background Data**      X= 5.375    S= 2.156    CV(1)=0.401    K factor\*\*= 2.523    TL(1)= 10.816    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.603    S= 0.428    CV(2)=0.267    K factor\*\*= 2.523    TL(2)= 2.683    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	5	1.609
7/15/2002	10	2.303
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: MW373

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/23/2002	7	1.946
7/16/2002	10	2.303
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5	1.609
10/7/2003	5	1.609

## 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	No	5	N/A	1.609	N/A
MW364	Downgradient	Yes	1.75	NO	0.560	N/A
MW367	Downgradient	Yes	1.67	NO	0.513	N/A
MW370	Upgradient	No	5	N/A	1.609	N/A
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.

## 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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	0.001	N/A	-6.908	N/A
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	Yes	0.000233	N/A	-8.364	NO
MW367	Downgradient	No	0.001	N/A	-6.908	N/A
MW370	Upgradient	No	0.000262	N/A	-8.247	N/A
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.

**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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Nickel****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 0.024    **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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0142	NO	-4.255	N/A
MW361	Downgradient	Yes	0.00276	NO	-5.893	N/A
MW364	Downgradient	Yes	0.0111	NO	-4.501	N/A
MW367	Downgradient	Yes	0.00563	NO	-5.180	N/A
MW370	Upgradient	Yes	0.00383	NO	-5.565	N/A
MW373	Upgradient	Yes	0.00399	NO	-5.524	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Oxidation-Reduction Potential      UNITS: mV      LRGA

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

**Statistics-Background Data**      X= 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	104	N/A	4.644	NO
MW361	Downgradient	Yes	353	N/A	5.866	YES
MW364	Downgradient	Yes	405	N/A	6.004	YES
MW367	Downgradient	Yes	263	N/A	5.572	YES
MW370	Upgradient	Yes	366	N/A	5.903	YES
MW373	Upgradient	Yes	377	N/A	5.932	YES

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

### Conclusion of Statistical Analysis on Historical Data

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

### Wells with Exceedances

MW361  
MW364  
MW367  
MW370  
MW373

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

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

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

pH

UNITS: Std Unit

LRGA

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

**Statistics-Background Data**      X= 6.283    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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	6.25	NO	1.833	N/A
MW361	Downgradient	Yes	6.08	NO	1.805	N/A
MW364	Downgradient	Yes	6.03	NO	1.797	N/A
MW367	Downgradient	Yes	5.99	NO	1.790	N/A
MW370	Upgradient	Yes	6.07	NO	1.803	N/A
MW373	Upgradient	Yes	6.11	NO	1.810	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Potassium****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.44	NO	0.892	N/A
MW361	Downgradient	Yes	2.37	NO	0.863	N/A
MW364	Downgradient	Yes	2.12	NO	0.751	N/A
MW367	Downgradient	Yes	3.14	NO	1.144	N/A
MW370	Upgradient	Yes	2.8	NO	1.030	N/A
MW373	Upgradient	Yes	2.77	NO	1.019	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Sodium****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	41.7	NO	3.731	N/A
MW361	Downgradient	Yes	46.5	NO	3.839	N/A
MW364	Downgradient	Yes	44.8	NO	3.802	N/A
MW367	Downgradient	Yes	24.7	NO	3.207	N/A
MW370	Upgradient	Yes	46.2	NO	3.833	N/A
MW373	Upgradient	Yes	64.1	NO	4.160	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Sulfate**

**UNITS: mg/L**

**LRGA**

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

**Statistics-Background Data**      **X**= 122.381   **S**= 195.095   **CV(1)**= 1.594      **K factor\*\***= 2.523      **TL(1)**= 614.606      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 3.985      **S**= 1.323      **CV(2)**= 0.332      **K factor\*\***= 2.523      **TL(2)**= 7.322      **LL(2)**=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	17.4	2.856
4/23/2002	37.9	3.635
7/15/2002	15.7	2.754
10/8/2002	13.4	2.595
1/8/2003	14.4	2.667
4/3/2003	18.1	2.896
7/9/2003	9.6	2.262
10/6/2003	16.5	2.803

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	163.3	5.096
4/23/2002	809.6	6.697
7/16/2002	109.4	4.695
10/8/2002	110.6	4.706
1/7/2003	113.7	4.734
4/2/2003	133	4.890
7/9/2003	182.1	5.205
10/7/2003	193.4	5.265

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	65.3	N/A	4.179	NO
MW361	Downgradient	Yes	84.1	N/A	4.432	NO
MW364	Downgradient	Yes	71.5	N/A	4.270	NO
MW367	Downgradient	Yes	28.6	N/A	3.353	NO
MW370	Upgradient	Yes	20.7	N/A	3.030	NO
MW373	Upgradient	Yes	169	N/A	5.130	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.



# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

## Technetium-99      UNITS: pCi/L      LRGA

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

**Statistics-Background Data**      X= 7.655    S= 13.274    CV(1)= 1.734    K factor\*\*= 2.523    TL(1)= 41.146    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.946    S= 0.939    CV(2)=0.483    K factor\*\*= 2.523    TL(2)= 3.833    LL(2)=N/A

### Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.8	2.380
4/23/2002	8.53	2.144
7/15/2002	5.09	1.627
10/8/2002	4.78	1.564
1/8/2003	-5.12	#Func!
4/3/2003	5.11	1.631
7/9/2003	4.25	1.447
10/6/2003	6.54	1.878

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	16.5	2.803
4/23/2002	3.49	1.250
7/16/2002	1.42	0.351
10/8/2002	-6.06	#Func!
1/7/2003	-8.41	#Func!
4/2/2003	26.3	3.270
7/9/2003	3.06	1.118
10/7/2003	46.2	3.833

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

**#Because the natural log was not 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	49.9	N/A	3.910	YES
MW361	Downgradient	Yes	48.7	N/A	3.886	YES
MW364	Downgradient	Yes	47.7	N/A	3.865	YES
MW367	Downgradient	No	-1.99	N/A	#Error	N/A
MW370	Upgradient	Yes	67.3	N/A	4.209	YES
MW373	Upgradient	No	18.4	N/A	2.912	N/A

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

### Conclusion of Statistical Analysis on Historical Data

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

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Total Organic Carbon (TOC)****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      X= 6.169    S= 12.072    CV(1)= 1.957    K factor\*\*= 2.523    TL(1)= 36.626    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.069    S= 1.014    CV(2)=0.948    K factor\*\*= 2.523    TL(2)= 3.626    LL(2)=N/A

**Historical Background Data from  
Upgradient Wells with Transformed Result**

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.2	0.182
4/23/2002	4.3	1.459
7/15/2002	2.6	0.956
10/8/2002	2.3	0.833
1/8/2003	3	1.099
4/3/2003	1.2	0.182
7/9/2003	2.6	0.956
10/6/2003	1.7	0.531

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.1	0.095
4/23/2002	17.5	2.862
7/16/2002	49	3.892
10/8/2002	2.9	1.065
1/7/2003	3.9	1.361
4/2/2003	2.5	0.916
7/9/2003	1.7	0.531
10/7/2003	1.2	0.182

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	11.1	N/A	2.407	NO
MW361	Downgradient	Yes	0.785	N/A	-0.242	NO
MW364	Downgradient	Yes	0.727	N/A	-0.319	NO
MW367	Downgradient	Yes	1.6	N/A	0.470	NO
MW370	Upgradient	Yes	1.02	N/A	0.020	NO
MW373	Upgradient	Yes	1.1	N/A	0.095	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Total Organic Halides (TOX)****UNITS: ug/L****LRGA**

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

**Statistics-Background Data**      **X**= 79.819    **S**= 78.470    **CV(1)**=0.983    **K factor\*\***= 2.523    **TL(1)**= 277.798    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 3.971    **S**= 0.950    **CV(2)**=0.239    **K factor\*\***= 2.523    **TL(2)**= 6.368    **LL(2)**=N/A

**Historical Background Data from  
Upgradient Wells with Transformed Result**

**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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.42	NO	1.486	N/A
MW361	Downgradient	No	10	N/A	2.303	N/A
MW364	Downgradient	Yes	4.98	NO	1.605	N/A
MW367	Downgradient	Yes	5.22	NO	1.652	N/A
MW370	Upgradient	Yes	9.2	NO	2.219	N/A
MW373	Upgradient	Yes	16.3	NO	2.791	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison

**Trichloroethene**

**UNITS: ug/L**

**LRGA**

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

**Statistics-Background Data**      X= 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

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.81	N/A	0.593	N/A
MW361	Downgradient	Yes	6.9	NO	1.932	N/A
MW364	Downgradient	Yes	6.98	NO	1.943	N/A
MW367	Downgradient	Yes	1.23	N/A	0.207	N/A
MW370	Upgradient	Yes	0.58	N/A	-0.545	N/A
MW373	Upgradient	Yes	3.82	N/A	1.340	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**C-746-U Third Quarter 2020 Statistical Analysis      Historical Background Comparison****Zinc****UNITS: mg/L****LRGA**

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

**Statistics-Background Data**      **X**= 0.055    **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

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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00834	NO	-4.787	N/A
MW361	Downgradient	Yes	0.00483	NO	-5.333	N/A
MW364	Downgradient	Yes	0.0131	NO	-4.335	N/A
MW367	Downgradient	No	0.0164	N/A	-4.110	N/A
MW370	Upgradient	Yes	0.00334	NO	-5.702	N/A
MW373	Upgradient	No	0.00448	N/A	-5.408	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

**THIS PAGE INTENTIONALLY LEFT BLANK**

**ATTACHMENT D2**

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

**THIS PAGE INTENTIONALLY LEFT BLANK**



# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Calcium

UNITS: mg/L

UCRS

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

**Statistics-Background Data**      **X**= 39.606    **S**= 21.096    **CV(1)**=0.533    **K factor\*\***= 2.523    **TL(1)**= 92.832    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 3.545    **S**= 0.534    **CV(2)**=0.151    **K factor\*\***= 2.523    **TL(2)**= 4.892    **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)
7/18/2018	58.4	4.067
10/10/2018	48	3.871
1/16/2019	40	3.689
4/15/2019	43.3	3.768
7/15/2019	70.4	4.254
10/16/2019	58.4	4.067
1/21/2020	74.8	4.315
4/6/2020	70.9	4.261

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW368	Downgradient	Yes	71.2	NO	4.265	N/A
MW371	Upgradient	Yes	69	NO	4.234	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2018	19.9	2.991
10/10/2018	20.4	3.016
1/17/2019	21.8	3.082
4/11/2019	21.5	3.068
7/11/2019	20.7	3.030
10/16/2019	21.8	3.082
1/22/2020	21	3.045
4/6/2020	22.4	3.109

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Dissolved Oxygen

UNITS: mg/L

UCRS

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

Statistics-Background Data      X= 2.858    S= 2.234    CV(1)=0.782    K factor\*\*= 2.523    TL(1)= 8.495    LL(1)=N/A

Statistics-Transformed Background Data      X= 0.726    S= 0.867    CV(2)=1.194    K factor\*\*= 2.523    TL(2)= 2.914    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)
7/18/2018	4.89	1.587
10/10/2018	0.96	-0.041
1/16/2019	8.02	2.082
5/28/2019	5.2	1.649
7/15/2019	4.6	1.526
10/16/2019	1.27	0.239
3/17/2020	5.56	1.716
4/6/2020	3.39	1.221

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2018	0.52	-0.654
10/10/2018	0.88	-0.128
1/17/2019	0.67	-0.400
5/28/2019	1.49	0.399
7/11/2019	2.23	0.802
10/16/2019	1.88	0.631
3/17/2020	3.36	1.212
4/6/2020	0.8	-0.223

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	3.59	NO	1.278	N/A
MW362	Downgradient	Yes	3.03	NO	1.109	N/A
MW368	Downgradient	Yes	2.72	NO	1.001	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,  $S = [\text{Sum}([(background\ result-X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

<b>C-746-U Third Quarter 2020 Statistical Analysis</b> <b>Oxidation-Reduction Potential</b>	<b>Current Background Comparison</b> <b>UNITS: mV</b>
	<b>UCRS</b>

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

<b>Statistics-Background Data</b>	X= 334.813	S= 62.762	CV(1)=0.187	K factor**= 2.523	TL(1)= 493.162	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	X= 5.795	S= 0.202	CV(2)=0.035	K factor**= 2.523	TL(2)= 6.305	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)
7/18/2018	342	5.835
10/10/2018	328	5.793
1/16/2019	396	5.981
5/28/2019	363	5.894
7/15/2019	423	6.047
10/16/2019	321	5.771
3/17/2020	335	5.814
4/6/2020	423	6.047

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	171	NO	5.142	N/A
MW362	Downgradient	Yes	340	NO	5.829	N/A
MW365	Downgradient	Yes	396	NO	5.981	N/A
MW368	Downgradient	Yes	250	NO	5.521	N/A
MW371	Upgradient	Yes	361	NO	5.889	N/A
MW374	Upgradient	Yes	304	NO	5.717	N/A
MW375	Sidegradient	Yes	374	NO	5.924	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2018	269	5.595
10/10/2018	218	5.384
1/17/2019	254	5.537
5/28/2019	355	5.872
7/11/2019	354	5.869
10/16/2019	233	5.451
3/17/2020	358	5.881
4/6/2020	385	5.953

**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,  $S = \sqrt{\frac{\sum [(background\ result - X)^2]}{count\ of\ background\ results - 1}}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

Sulfate

UNITS: mg/L

UCRS

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

Statistics-Background Data X= 24.158 S= 22.855 CV(1)=0.946 K factor\*\*= 2.523 TL(1)= 81.820 LL(1)=N/A

Statistics-Transformed Background Data X= 2.779 S= 0.915 CV(2)=0.329 K factor\*\*= 2.523 TL(2)= 5.086 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)
7/18/2018	47.7	3.865
10/10/2018	21.9	3.086
1/16/2019	10.1	2.313
4/15/2019	59.1	4.079
7/15/2019	55.4	4.015
10/16/2019	30	3.401
1/21/2020	27	3.296
4/6/2020	75.3	4.321

Well Number: MW374

Date Collected	Result	LN(Result)
7/18/2018	7.69	2.040
10/10/2018	6.6	1.887
1/17/2019	6.8	1.917
4/11/2019	8.28	2.114
7/11/2019	8.06	2.087
10/16/2019	6.43	1.861
1/22/2020	7.75	2.048
4/6/2020	8.41	2.129

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	45.4	NO	3.816	N/A
MW362	Downgradient	Yes	32.3	NO	3.475	N/A
MW365	Downgradient	Yes	57.3	NO	4.048	N/A
MW368	Downgradient	Yes	81	NO	4.394	N/A
MW371	Upgradient	Yes	53.6	NO	3.982	N/A
MW375	Sidegradient	Yes	24.3	NO	3.190	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

Beta activity

UNITS: pCi/L

URGA

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

Statistics-Background Data X= 53.650 S= 44.743 CV(1)=0.834 K factor\*\*= 2.523 TL(1)= 166.536 LL(1)=N/A

Statistics-Transformed Background Data X= 3.667 S= 0.809 CV(2)=0.221 K factor\*\*= 2.523 TL(2)= 5.708 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)
7/18/2018	14.9	2.701
10/9/2018	23.2	3.144
1/16/2019	22.5	3.114
4/15/2019	83.7	4.427
7/15/2019	120	4.787
10/16/2019	14.8	2.695
1/21/2020	16.8	2.821
4/6/2020	27.8	3.325

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	76.1	NO	4.332	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	27.7	3.321
10/10/2018	123	4.812
1/17/2019	25.4	3.235
4/11/2019	41	3.714
7/11/2019	141	4.949
10/16/2019	105	4.654
1/22/2020	50.7	3.926
4/6/2020	20.9	3.040

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Calcium

UNITS: mg/L

URGA

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

Statistics-Background Data	X= 34.644	S= 18.421	CV(1)=0.532	K factor**= 2.523	TL(1)= 81.120	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.399	S= 0.569	CV(2)=0.167	K factor**= 2.523	TL(2)= 4.833	LL(2)=N/A

### Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/18/2018	15.6	2.747
10/9/2018	16.3	2.791
1/16/2019	16.3	2.791
4/15/2019	20	2.996
7/15/2019	17.7	2.874
10/16/2019	15.5	2.741
1/21/2020	19.1	2.950
4/6/2020	20.4	3.016

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	62.4	NO	4.134	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	38.4	3.648
10/10/2018	49.7	3.906
1/17/2019	46.8	3.846
4/11/2019	49.7	3.906
7/11/2019	49.7	3.906
10/16/2019	59.4	4.084
1/22/2020	57	4.043
4/6/2020	62.7	4.138

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

### 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,  $S = \sqrt{\frac{\sum [(background\ result - X)^2]}{[count\ of\ background\ results - 1]}}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Conductivity

UNITS: umho/cm

URGA

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

Statistics-Background Data X= 519.750 S= 140.621 CV(1)=0.271 K factor\*\*= 2.523 TL(1)= 874.537 LL(1)=N/A

Statistics-Transformed Background Data X= 6.218 S= 0.274 CV(2)=0.044 K factor\*\*= 2.523 TL(2)= 6.911 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)
7/18/2018	372	5.919
10/9/2018	374	5.924
1/16/2019	386	5.956
5/28/2019	387	5.958
7/15/2019	373	5.922
10/16/2019	367	5.905
3/17/2020	440	6.087
4/6/2020	407	6.009

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	770	NO	6.646	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	597	6.392
10/10/2018	618	6.426
1/17/2019	613	6.418
5/28/2019	628	6.443
7/11/2019	640	6.461
10/16/2019	697	6.547
1/22/2020	730	6.593
4/6/2020	687	6.532

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

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.



# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Dissolved Solids

UNITS: mg/L

URGA

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

Statistics-Background Data X= 312.688 S= 120.821 CV(1)=0.386 K factor\*\*= 2.523 TL(1)= 617.520 LL(1)=N/A

Statistics-Transformed Background Data X= 5.682 S= 0.358 CV(2)=0.063 K factor\*\*= 2.523 TL(2)= 6.587 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)
7/18/2018	197	5.283
10/9/2018	196	5.278
1/16/2019	224	5.412
4/15/2019	261	5.565
7/15/2019	194	5.268
10/16/2019	227	5.425
1/21/2020	224	5.412
4/6/2020	214	5.366

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	436	NO	6.078	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	323	5.778
10/10/2018	336	5.817
1/17/2019	394	5.976
4/11/2019	309	5.733
7/11/2019	616	6.423
10/16/2019	466	6.144
1/22/2020	423	6.047
4/6/2020	399	5.989

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

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.



<b>C-746-U Third Quarter 2020 Statistical Analysis</b> <b>Oxidation-Reduction Potential</b>	<b>Current Background Comparison</b> <b>UNITS: mV</b>
	<b>URGA</b>

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

<b>Statistics-Background Data</b>	<b>X=</b> 363.375	<b>S=</b> 41.315	<b>CV(1)=</b> 0.114	<b>K factor**=</b> 2.523	<b>TL(1)=</b> 467.612	<b>LL(1)=</b> N/A
<b>Statistics-Transformed Background Data</b>	<b>X=</b> 5.889	<b>S=</b> 0.116	<b>CV(2)=</b> 0.020	<b>K factor**=</b> 2.523	<b>TL(2)=</b> 6.182	<b>LL(2)=</b> 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)
7/18/2018	338	5.823
10/9/2018	341	5.832
1/16/2019	432	6.068
5/28/2019	309	5.733
7/15/2019	410	6.016
10/16/2019	347	5.849
3/17/2020	327	5.790
4/6/2020	390	5.966

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	362	NO	5.892	N/A
MW360	Downgradient	Yes	382	NO	5.945	N/A
MW363	Downgradient	Yes	412	NO	6.021	N/A
MW366	Downgradient	Yes	398	NO	5.986	N/A
MW369	Upgradient	Yes	353	NO	5.866	N/A
MW372	Upgradient	Yes	365	NO	5.900	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	371	5.916
10/10/2018	295	5.687
1/17/2019	393	5.974
5/28/2019	400	5.991
7/11/2019	390	5.966
10/16/2019	303	5.714
1/22/2020	375	5.927
4/6/2020	393	5.974

**Conclusion of Statistical Analysis on Current Data**

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

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

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

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

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

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

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

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Technetium-99

UNITS: pCi/L

URGA

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

**Statistics-Background Data**      **X**= 74.231    **S**= 55.245    **CV(1)**=0.744    **K factor\*\***= 2.523    **TL(1)**= 213.614    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 4.095    **S**= 0.642    **CV(2)**=0.157    **K factor\*\***= 2.523    **TL(2)**= 5.715    **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)
7/18/2018	31.4	3.447
10/9/2018	55	4.007
1/16/2019	39.1	3.666
4/15/2019	70.8	4.260
7/15/2019	55.8	4.022
10/16/2019	30.1	3.405
1/21/2020	31.7	3.456
4/6/2020	29.8	3.395

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	106	NO	4.663	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
7/18/2018	70.9	4.261
10/10/2018	158	5.063
1/17/2019	35	3.555
4/11/2019	59.4	4.084
7/11/2019	183	5.209
10/16/2019	194	5.268
1/22/2020	97.2	4.577
4/6/2020	46.5	3.839

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

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

Beta activity

UNITS: pCi/L

LRGA

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

Statistics-Background Data X= 44.628 S= 30.407 CV(1)=0.681 K factor\*\*= 2.523 TL(1)= 121.343 LL(1)=N/A

Statistics-Transformed Background Data X= 3.506 S= 0.870 CV(2)=0.248 K factor\*\*= 2.523 TL(2)= 5.701 LL(2)=N/A

## Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/18/2018	102	4.625
10/9/2018	81.7	4.403
1/16/2019	75.8	4.328
4/15/2019	61	4.111
7/15/2019	52.7	3.965
10/16/2019	70.1	4.250
1/21/2020	75.9	4.329
4/6/2020	53	3.970

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2018	30.6	3.421
10/10/2018	22.8	3.127
1/17/2019	17.4	2.856
4/11/2019	13.7	2.617
7/11/2019	21.9	3.086
10/16/2019	17.3	2.851
1/22/2020	13.4	2.595
4/6/2020	4.74	1.556

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	65.5	NO	4.182	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Oxidation-Reduction Potential

UNITS: mV

LRGA

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

Statistics-Background Data X= 390.188 S= 41.594 CV(1)=0.107 K factor\*\*= 2.523 TL(1)= 495.128 LL(1)=N/A

Statistics-Transformed Background Data X= 5.961 S= 0.109 CV(2)=0.018 K factor\*\*= 2.523 TL(2)= 6.235 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)
7/18/2018	369	5.911
10/9/2018	346	5.846
1/16/2019	440	6.087
5/28/2019	400	5.991
7/15/2019	421	6.043
10/16/2019	405	6.004
1/21/2020	425	6.052
4/6/2020	448	6.105

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2018	318	5.762
10/10/2018	438	6.082
1/17/2019	336	5.817
5/28/2019	374	5.924
7/11/2019	417	6.033
10/16/2019	347	5.849
1/22/2020	350	5.858
4/6/2020	409	6.014

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	353	NO	5.866	N/A
MW364	Downgradient	Yes	405	NO	6.004	N/A
MW367	Downgradient	Yes	263	NO	5.572	N/A
MW370	Upgradient	Yes	366	NO	5.903	N/A
MW373	Upgradient	Yes	377	NO	5.932	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,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

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.

# C-746-U Third Quarter 2020 Statistical Analysis

# Current Background Comparison

## Techneium-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**= 58.613    **S**= 45.133    **CV(1)**=0.770    **K factor\*\***= 2.523    **TL(1)**= 172.482    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 3.879    **S**= 0.823    **CV(2)**=0.212    **K factor\*\***= 2.523    **TL(2)**= 4.828    **LL(2)**=N/A

### Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
7/18/2018	96.2	4.566
10/9/2018	114	4.736
1/16/2019	94.3	4.546
4/15/2019	111	4.710
7/15/2019	107	4.673
10/16/2019	125	4.828
1/21/2020	82.8	4.416
4/6/2020	60.4	4.101

Well Number: MW373

Date Collected	Result	LN(Result)
7/18/2018	-15.9	#Func!
10/10/2018	20.3	3.011
1/17/2019	28.4	3.346
4/11/2019	22.7	3.122
7/11/2019	28.3	3.343
10/16/2019	36.5	3.597
1/22/2020	13	2.565
4/6/2020	13.8	2.625

**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)
MW358	Downgradient	Yes	49.9	NO	3.910	N/A
MW361	Downgradient	Yes	48.7	NO	3.886	N/A
MW364	Downgradient	Yes	47.7	NO	3.865	N/A
MW370	Upgradient	Yes	67.3	NO	4.209	N/A

### Conclusion of Statistical Analysis on Current Data

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

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

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

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

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.

**THIS PAGE INTENTIONALLY LEFT BLANK**

**ATTACHMENT D3**

**STATISTICIAN QUALIFICATION STATEMENT**

**THIS PAGE INTENTIONALLY LEFT BLANK**



October 20, 2020

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

Dear Mr. Greene:

As an Environmental Scientist, with a bachelor's degree in Earth Sciences/Geology, I have over 30 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was reviewed by a qualified independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the third quarter 2020 monitoring well data collected from the C-746-S&T and C-746-U Landfills were performed in accordance with guidance provided in the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Sincerely,



Bryan Smith

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX E**

**GROUNDWATER FLOW RATE AND DIRECTION**

**THIS PAGE INTENTIONALLY LEFT BLANK**

## GROUNDWATER FLOW RATE AND DIRECTION

---

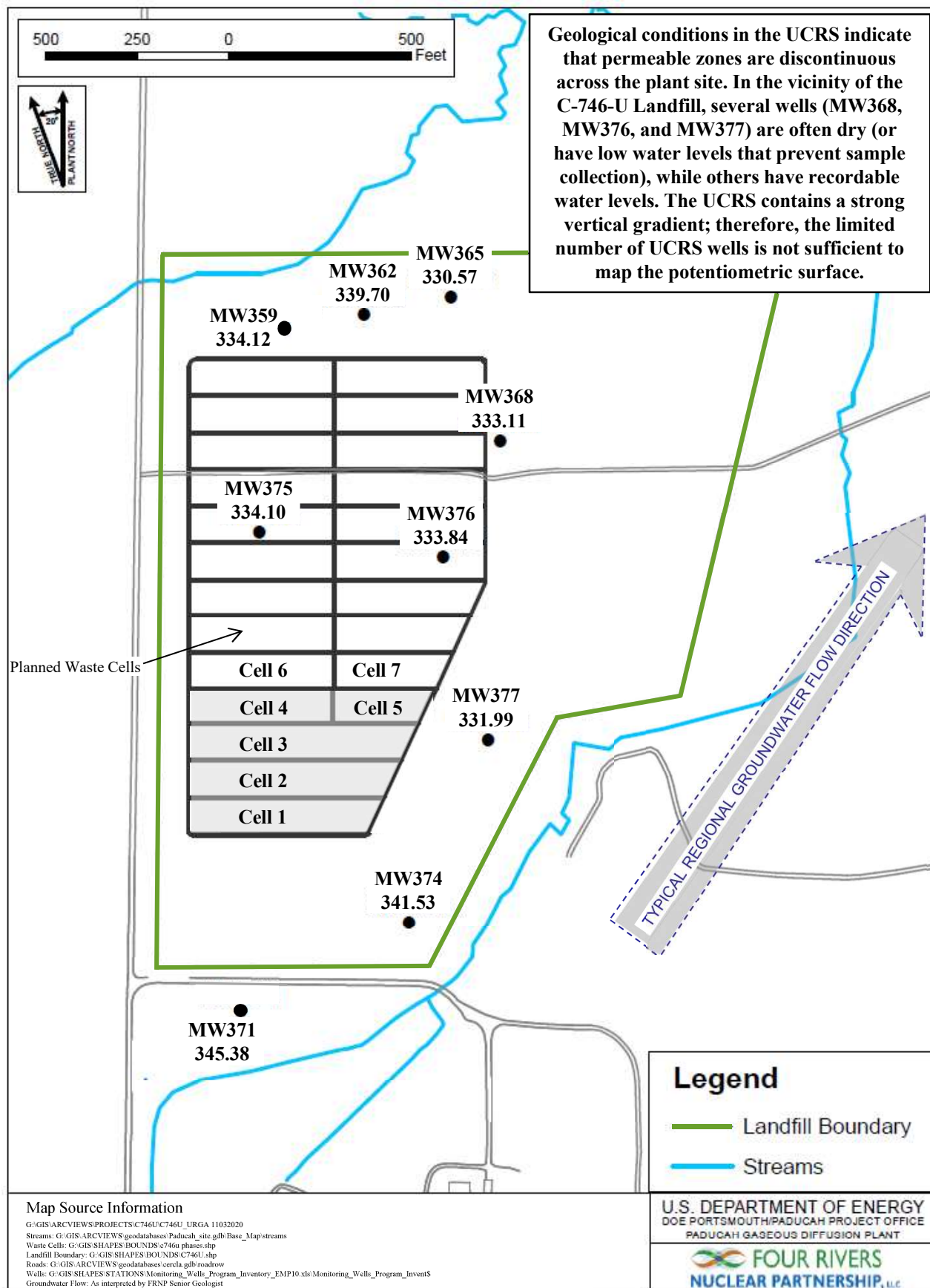
Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently 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 2020 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on July 27, 2020. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling for laboratory analysis.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradients for the URGA and LRGA at the C-746-U Landfill, as measured along the defined groundwater flow directions, were  $1.16 \times 10^{-3}$  ft/ft and  $1.15 \times 10^{-3}$  ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was  $6.07 \times 10^{-4}$  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.

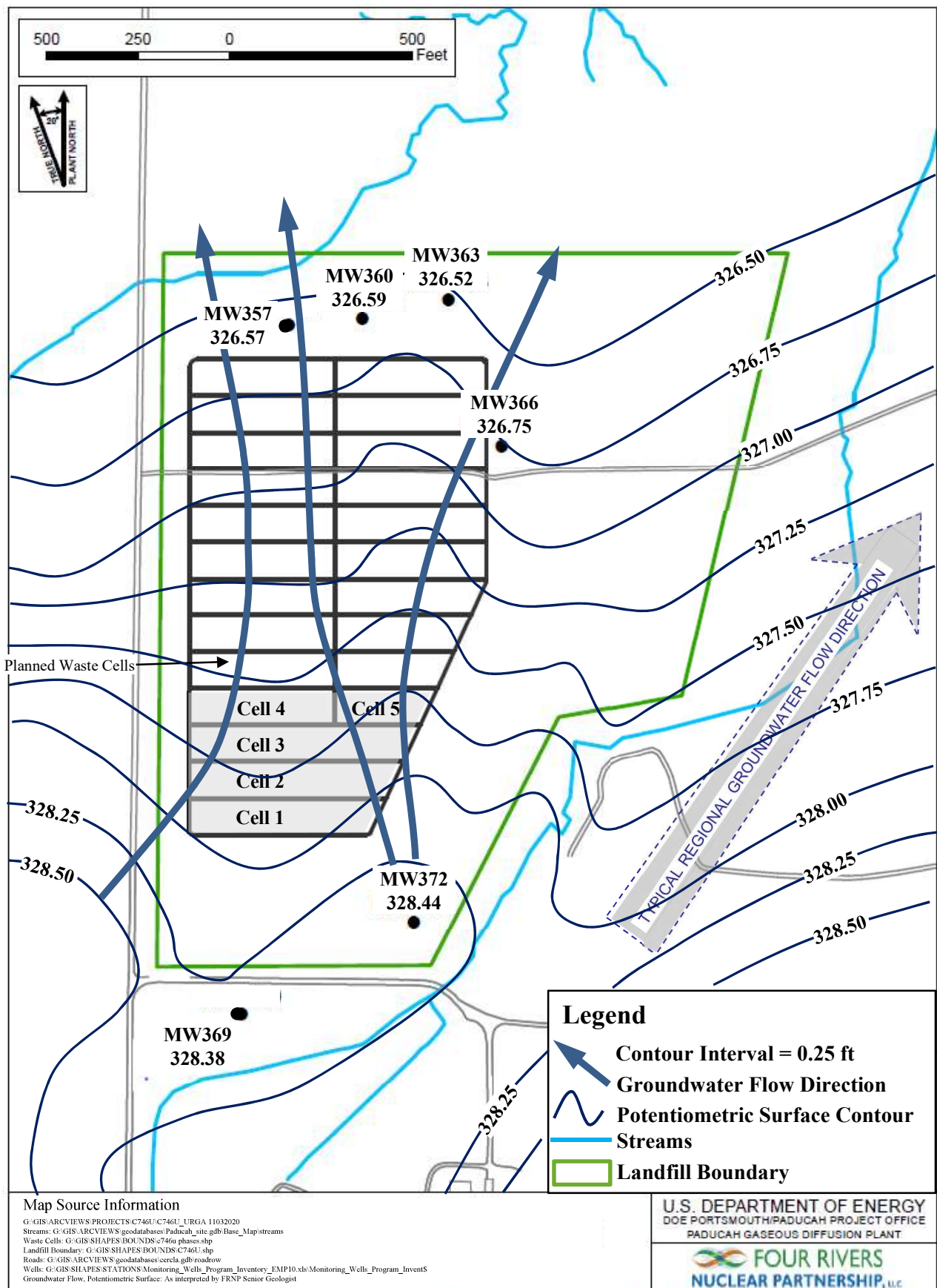
Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for July 2020, the groundwater flow direction in the immediate area of the landfill was to the northeast.



**Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-U Landfill July 27, 2020**

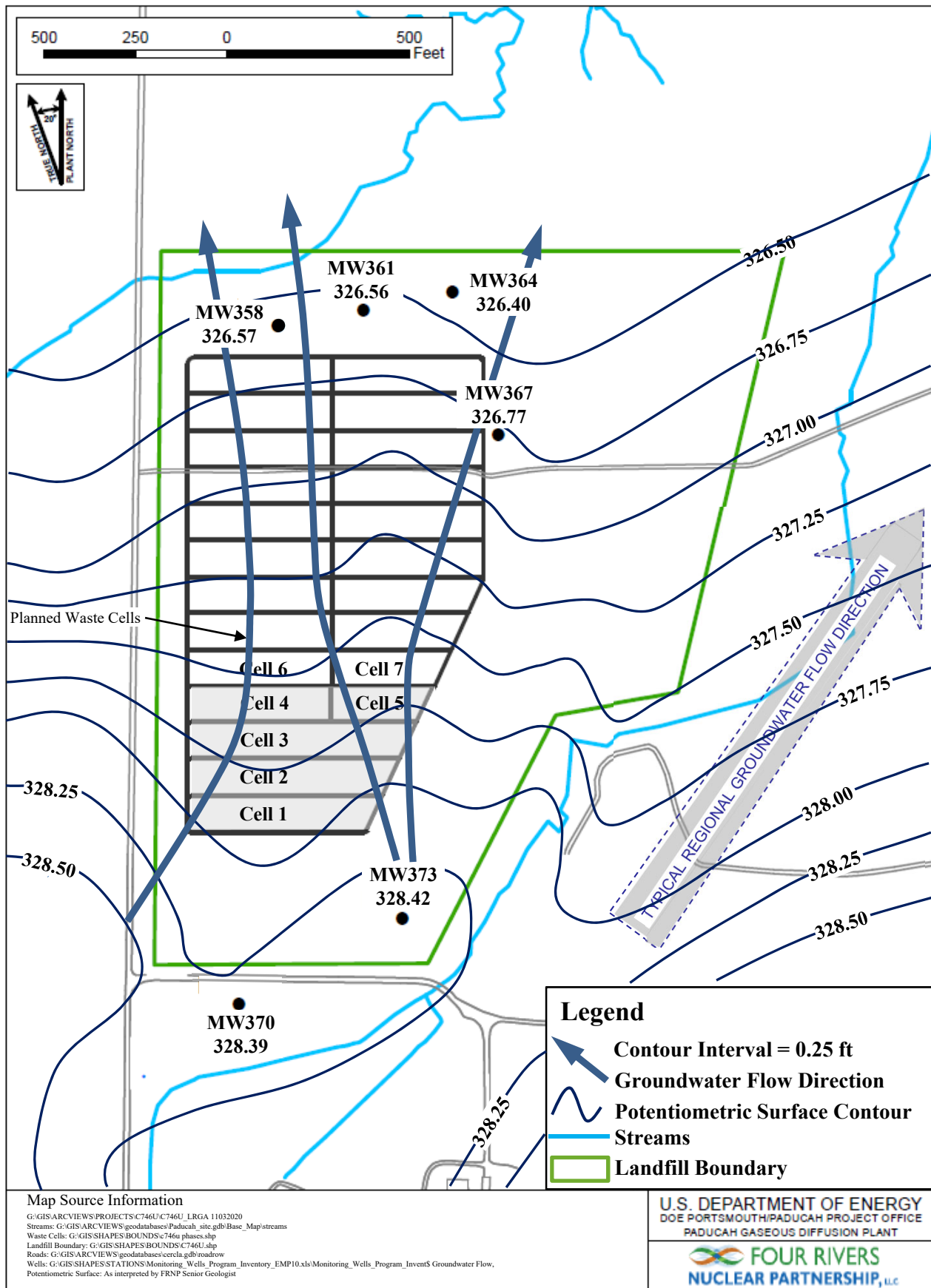
**Table E.1. C-746-U Landfill Third Quarter 2020 (July) Water Levels**

C-746-U Landfill (July 2020) 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)
7/27/2020	7:07	MW357	URGA	368.82	30.06	0.00	42.25	326.57	42.25	326.57
7/27/2020	7:09	MW358	LRGA	368.97	30.06	0.00	42.40	326.57	42.40	326.57
7/27/2020	7:08	MW359	UCRS	368.96	30.06	0.00	34.84	334.12	34.84	334.12
7/27/2020	7:04	MW360	URGA	362.12	30.06	0.00	35.53	326.59	35.53	326.59
7/27/2020	7:05	MW361	LRGA	361.37	30.06	0.00	34.81	326.56	34.81	326.56
7/27/2020	7:06	MW362	UCRS	361.90	30.06	0.00	22.20	339.70	22.20	339.70
7/27/2020	7:12	MW363	URGA	368.61	30.06	0.00	42.09	326.52	42.09	326.52
7/27/2020	7:13	MW364	LRGA	368.22	30.06	0.00	41.82	326.40	41.82	326.40
7/27/2020	7:14	MW365	UCRS	368.19	30.06	0.00	37.62	330.57	37.62	330.57
7/27/2020	7:15	MW366	URGA	369.00	30.06	0.00	42.25	326.75	42.25	326.75
7/27/2020	7:16	MW367	LRGA	369.42	30.06	0.00	42.65	326.77	42.65	326.77
7/27/2020	7:17	MW368	UCRS	369.03	30.06	0.00	35.92	333.11	35.92	333.11
7/27/2020	7:42	MW369	URGA	364.28	30.06	0.00	35.90	328.38	35.90	328.38
7/27/2020	7:43	MW370	LRGA	365.17	30.06	0.00	36.78	328.39	36.78	328.39
7/27/2020	7:44	MW371	UCRS	364.69	30.06	0.00	19.31	345.38	19.31	345.38
7/27/2020	7:38	MW372	URGA	359.47	30.06	0.00	31.03	328.44	31.03	328.44
7/27/2020	7:39	MW373	LRGA	359.78	30.06	0.00	31.36	328.42	31.36	328.42
7/27/2020	7:40	MW374	UCRS	359.49	30.06	0.00	17.96	341.53	17.96	341.53
7/27/2020	7:32	MW375	UCRS	370.41	30.06	0.00	36.31	334.10	36.31	334.10
7/27/2020	7:34	MW376	UCRS	370.44	30.06	0.00	36.60	333.84	36.60	333.84
7/27/2020	7:36	MW377	UCRS	365.79	30.06	0.00	33.80	331.99	33.80	331.99
Reference Barometric Pressure				30.06						
Elev = elevation										
amsl = above mean sea level										
BP = barometric pressure										
DTW = depth to water in feet below datum										
URGA = Upper Regional Gravel Aquifer										
LRGA = Lower Regional Gravel Aquifer										
UCRS = Upper Continental Recharge System										
*Assumes a barometric efficiency of 1.0										

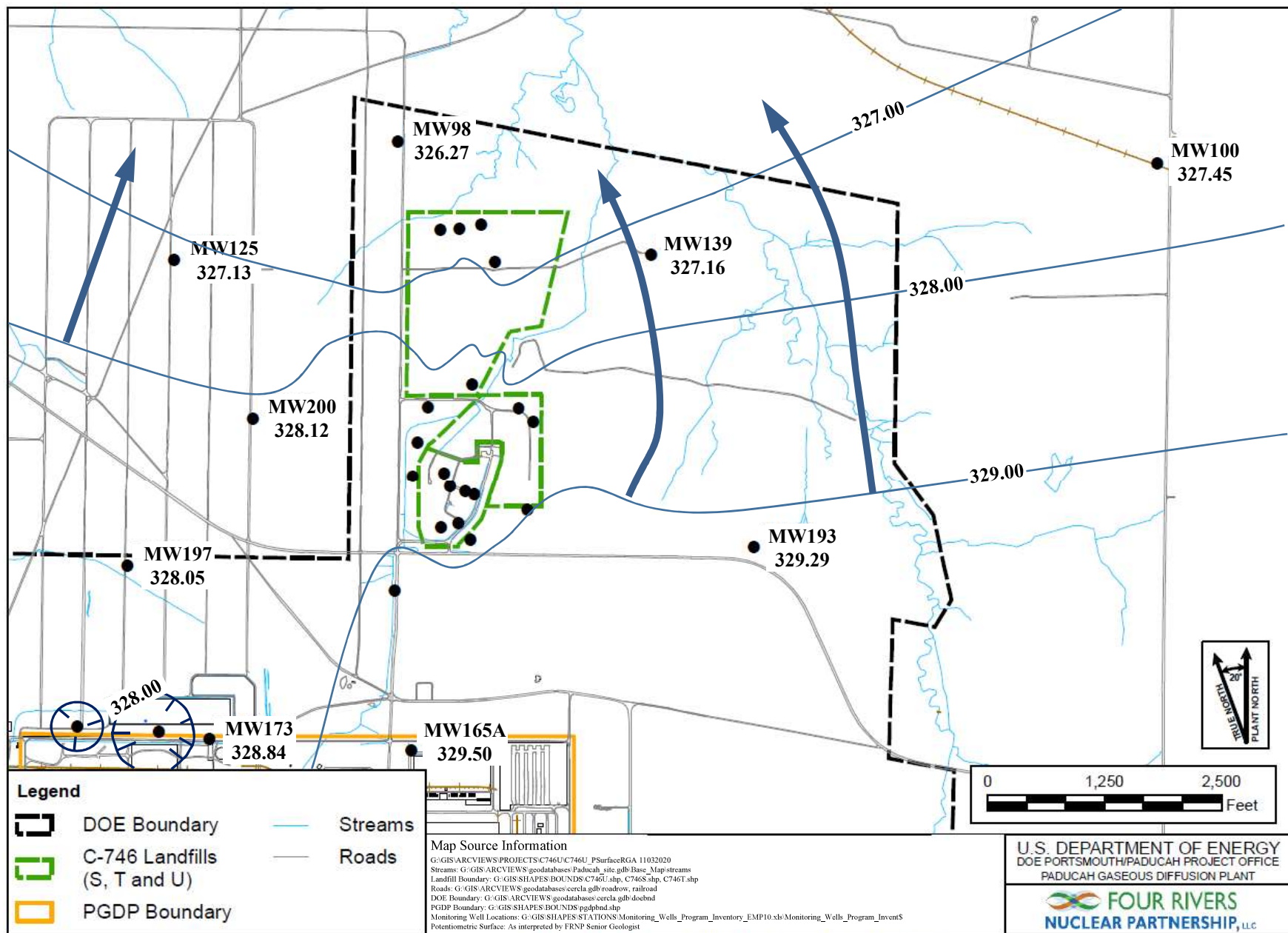


**Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer  
at the C-746-U Landfill July 27, 2020**





**Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer  
at the C-746-U Landfill, July 27, 2020**



**Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer  
July 27, 2020**

**Table E.2. C-746-U Landfill Hydraulic Gradients**

	ft/ft
Beneath Landfill—Upper RGA	$1.16 \times 10^{-3}$
Beneath Landfill—Lower RGA	$1.15 \times 10^{-3}$
Vicinity	$6.07 \times 10^{-4}$

**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
<b>Upper RGA</b>					
725	0.256	0.841	$2.97 \times 10^{-4}$	3.37	$1.19 \times 10^{-3}$
425	0.150	0.493	$1.74 \times 10^{-4}$	1.97	$6.96 \times 10^{-4}$
<b>Lower RGA</b>					
725	0.256	0.833	$2.94 \times 10^{-4}$	3.33	$1.18 \times 10^{-3}$
425	0.150	0.488	$1.72 \times 10^{-4}$	1.95	$6.90 \times 10^{-4}$

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX F**  
**NOTIFICATIONS**

**THIS PAGE INTENTIONALLY LEFT BLANK**

## 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 2020 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>
<b>Upper Continental Recharge System</b>	None	
<b>Upper Regional Gravel Aquifer</b>	Technetium-99	MW372
<b>Lower Regional Gravel Aquifer</b>	Technetium-99	MW358, MW361, MW364, MW370

NOTE: Although technetium-99 is not cited in 40 CFR § 302.4, Appendix A, this radionuclide is being reported along with the parameters of this regulation.

8/18/2020

**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**

<b>AKGWA</b>	<b>Station</b>	<b>Analysis</b>	<b>Method</b>	<b>Results</b>	<b>Units</b>	<b>MCL</b>
8004-4795	MW361	Trichloroethene	8260B	6.9	ug/L	5
8004-4797	MW364	Trichloroethene	8260B	6.98	ug/L	5
8004-4818	MW370	Beta activity	9310	65.5	pCi/L	50
8004-4808	MW372	Beta activity	9310	76.1	pCi/L	50

NOTE 1: MCLs are defined in 401 KAR 47:030.

NOTE 2: MW369, MW370, MW372, and MW373 are down-gradient wells for the C-746-S and C-746-T Landfills and upgradient for the C-746-U Landfill. These wells are sampled with the C-746-U Landfill monitoring well network. These wells are reported on the exceedance reports for C-746-S, C-746-T, and C-746-U.



**APPENDIX G**  
**CHART OF MCL AND UTL EXCEEDANCES**

**THIS PAGE INTENTIONALLY LEFT BLANK**

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>ACETONE</b>																						
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							*															
<b>ALPHA ACTIVITY</b>																						
Quarter 1, 2004																						■
Quarter 2, 2004							■															
Quarter 3, 2009							■															
<b>ALUMINUM</b>																						
Quarter 3, 2003												*										
<b>BETA ACTIVITY</b>																						
Quarter 1, 2004																	■					
Quarter 2, 2004																	■					■
Quarter 3, 2004																	■					
Quarter 4, 2004																	■					
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 4, 2011											■						■					
Quarter 1, 2012											■						■					
Quarter 2, 2012											■						■		■			
Quarter 3, 2012											■						■					
Quarter 4, 2012											■						■					■
Quarter 1, 2013											■						■					■
Quarter 3, 2013											■						■					■
Quarter 4, 2013											■						■					
Quarter 1, 2014											■						■					
Quarter 4, 2014											■						■					
Quarter 1, 2015											■						■					
Quarter 2, 2015											■						■					
Quarter 4, 2015											■						■			■		
Quarter 3, 2016											■						■				■	
Quarter 4, 2016											■						■					
Quarter 2, 2017											■						■					■
Quarter 3, 2017											■						■					■
Quarter 4, 2017											■						■					■
Quarter 1, 2018											■						■			■		■
Quarter 2, 2018											■						■					
Quarter 3, 2018											■						■					■
Quarter 4, 2018											■						■					■
Quarter 1, 2019											■						■					■
Quarter 2, 2019											■						■					■
Quarter 3, 2019											■						■					■
Quarter 4, 2019											■						■					■
Quarter 1, 2020									■		■						■					■
Quarter 2, 2020											■						■					■
Quarter 3, 2020											■						■					■
<b>BROMIDE</b>																						
Quarter 2, 2004													*									

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>CALCIUM</b>																						
Quarter 3, 2003											*											
Quarter 2, 2005																						*
Quarter 3, 2006																*						
Quarter 2, 2008																*						
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 3, 2014																*						*
Quarter 4, 2014																*						*
Quarter 2, 2015																*						*
Quarter 3, 2015																*						*
Quarter 4, 2015																*						*
Quarter 1, 2016																*						*
Quarter 2, 2016																*						*
Quarter 2, 2017	*																					
Quarter 1, 2018	*																					
Quarter 3, 2018	*																					
Quarter 3, 2019	*							*														
Quarter 4, 2019																*						
Quarter 1, 2020								*								*						
Quarter 2, 2020								*								*						
Quarter 3, 2020	*							*								*						
<b>CARBON DISULFIDE</b>																						
Quarter 3, 2003											*											
Quarter 2, 2005								*														
Quarter 3, 2005						*																
Quarter 4, 2005						*																
Quarter 1, 2006						*																
Quarter 2, 2006						*																
Quarter 3, 2010		*									*											
Quarter 4, 2010														*								
Quarter 1, 2011																*						
<b>CHEMICAL OXYGEN DEMAND</b>																						
Quarter 3, 2002											*	*	*	*	*	*						
Quarter 4, 2002											*	*		*	*	*						
Quarter 1, 2003											*	*										
Quarter 2, 2003											*	*	*									
Quarter 3, 2003	*										*	*					*					
Quarter 4, 2003						*					*	*										
Quarter 3, 2004											*											
Quarter 3, 2005						*					*					*	*		*			
Quarter 4, 2005						*												*	*			
Quarter 1, 2006																			*			
Quarter 4, 2016																		*				
Quarter 1, 2017											*											
Quarter 2, 2019												*				*						
Quarter 3, 2019													*			*						*
Quarter 4, 2019																*						
<b>CHLORIDE</b>																						
Quarter 1, 2006																						*
Quarter 2, 2014																*						
<b>COBALT</b>																						
Quarter 3, 2003	*						*				*	*		*	*	*	*	*	*	*	*	*
Quarter 1, 2004																*						
Quarter 2, 2016																*						
<b>CONDUCTIVITY</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*	*										
Quarter 4, 2003											*											
Quarter 1, 2004											*											
Quarter 2, 2004											*											

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>CONDUCTIVITY</b>																						
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															*	*						
Quarter 2, 2015															*	*						
Quarter 3, 2015															*	*						
Quarter 4, 2015															*	*						
Quarter 1, 2016															*	*						
Quarter 2, 2016															*	*						
Quarter 3, 2016															*	*						
Quarter 2, 2019															*	*						
Quarter 3, 2019															*	*						
Quarter 4, 2019															*	*						
Quarter 1, 2020															*	*						
Quarter 2, 2020															*	*						
Quarter 3, 2020															*	*						
<b>DISSOLVED OXYGEN</b>																						
Quarter 1, 2003					*	*					*											
Quarter 3, 2003					*						*											
Quarter 4, 2003					*																	
Quarter 1, 2004					*																	
Quarter 2, 2004								*								*						
Quarter 1, 2005					*																	
Quarter 2, 2005								*														
Quarter 1, 2006					*																	
Quarter 2, 2006					*			*														
Quarter 3, 2006					*			*														
Quarter 4, 2006					*				*													
Quarter 2, 2007					*			*														
Quarter 3, 2007					*			*	*													
Quarter 1, 2008					*														*			
Quarter 2, 2008								*	*													
Quarter 3, 2008								*														
Quarter 1, 2009							*															
Quarter 2, 2009					*			*	*													
Quarter 3, 2009						*		*	*													
Quarter 1, 2010					*		*															
Quarter 2, 2010					*	*		*	*											*	*	
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	D	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
<b>DISSOLVED OXYGEN</b>																						
Quarter 4, 2010							*						*								*	
Quarter 1, 2011						*																
Quarter 2, 2011					*	*	*	*	*						*							
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	*				*	*	*	*	*													
Quarter 4, 2018						*																
Quarter 1, 2019					*	*	*	*	*													
Quarter 2, 2019					*	*	*	*	*													
Quarter 3, 2019	*				*	*	*	*	*													
Quarter 4, 2019					*	*	*	*	*													
Quarter 1, 2020						*	*	*	*													
Quarter 2, 2020					*	*	*	*	*													
Quarter 3, 2020	*				*	*																
<b>DISSOLVED SOLIDS</b>																						
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															*	*						
Quarter 3, 2019															*	*						
Quarter 4, 2019															*	*						
Quarter 1, 2020															*	*						
Quarter 2, 2020															*	*						
Quarter 3, 2020															*	*						

**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	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
<b>IODIDE</b>																						
Quarter 2, 2003																	*					
Quarter 3, 2003	*										*											
Quarter 4, 2003							*															
Quarter 3, 2010						*		*					*					*				
<b>IODINE-131</b>																						
Quarter 3, 2010																						
<b>IODOMETHANE</b>																						
Quarter 4, 2003						*																
<b>IRON</b>																						
Quarter 4, 2002						*																
Quarter 3, 2003																	*					
Quarter 4, 2003											*						*					
Quarter 1, 2004											*						*					
Quarter 2, 2004											*											
Quarter 3, 2004											*											
Quarter 3, 2005																	*					
<b>MAGNESIUM</b>																						
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	*																					
Quarter 3, 2019	*																					
Quarter 4, 2019																*						
Quarter 2, 2020																*						
<b>MANGANESE</b>																						
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											*	*	*	*			*	*	*			

**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	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
<b>MANGANESE</b>																						
Quarter 2, 2007							*				*											
Quarter 3, 2007							*															
Quarter 3, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 3, 2011							*															
Quarter 2, 2016															*							
Quarter 3, 2016									*													
<b>NICKEL</b>																						
Quarter 3, 2003											*											
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
Quarter 4, 2002																		*		*		
Quarter 1, 2003																		*		*		
Quarter 2, 2003																				*		
Quarter 3, 2003	*																					
Quarter 4, 2003					*																	
Quarter 2, 2004														*				*				*
Quarter 3, 2004					*			*					*	*	*			*			*	*
Quarter 4, 2004												*									*	*
Quarter 1, 2005																		*			*	*
Quarter 2, 2005							*		*				*		*			*		*	*	*
Quarter 3, 2005					*	*		*			*	*	*		*			*		*	*	*
Quarter 4, 2005		*						*					*		*			*		*		*
Quarter 1, 2006					*		*	*	*									*		*		*
Quarter 2, 2006					*		*	*	*				*		*			*		*		*
Quarter 3, 2006					*		*	*	*				*		*			*		*		*
Quarter 4, 2006					*		*	*	*		*	*	*		*			*		*		*
Quarter 1, 2007		*			*		*	*	*				*		*			*		*		*
Quarter 2, 2007					*		*	*	*				*		*			*		*		*
Quarter 3, 2007					*		*	*	*									*		*		*
Quarter 4, 2007					*		*	*	*									*		*		*
Quarter 1, 2008					*		*	*	*		*	*	*		*			*		*		*
Quarter 2, 2008					*		*	*	*		*	*	*		*			*		*		*
Quarter 3, 2008					*		*	*	*		*	*	*		*			*		*		*
Quarter 4, 2008					*		*	*	*		*	*	*		*			*		*		*
Quarter 1, 2009					*		*	*	*		*	*	*		*			*		*		*
Quarter 2, 2009					*		*	*	*		*	*	*		*			*		*		*
Quarter 3, 2009		*			*	*	*	*	*		*	*	*		*			*	*	*	*	*
Quarter 4, 2009		*			*	*	*	*	*		*	*	*		*			*	*	*	*	*
Quarter 1, 2010		*			*	*	*	*	*		*	*	*		*			*	*	*	*	*
Quarter 2, 2010		*			*	*	*	*	*		*	*	*		*			*	*	*	*	*
Quarter 3, 2010		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2010		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2011		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2011		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2011		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2011		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2012		*			*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2012	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2012	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2012	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2013	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2013	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2013	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2013	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2014	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2014	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2014	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2014	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2015	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2015	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2015	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2015	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2016	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2016	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2016	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2016	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2017	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2017	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2017	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2017	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2018	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 2, 2018	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 3, 2018	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 4, 2018	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*
Quarter 1, 2019	*	*		*	*	*	*	*	*		*	*	*		*	*		*	*	*	*	*



**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
OXIDATION-REDUCTION POTENTIAL																						
Quarter 2, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
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 2, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 1, 2010							*															
Quarter 2, 2010							*															
Quarter 4, 2010							*															
PCB-1016																						
Quarter 3, 2004												*										
Quarter 2, 2006							*					*										
Quarter 1, 2007							*															
Quarter 2, 2007							*															
Quarter 3, 2007							*															
Quarter 2, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 1, 2010							*															
Quarter 2, 2010							*															
Quarter 4, 2010							*															
PCB-1242																						
Quarter 3, 2006							*					*										
Quarter 4, 2006										*												
Quarter 1, 2008							*															
Quarter 2, 2012							*															
PCB-1248																						
Quarter 2, 2008							*															
PCB-1260																						
Quarter 2, 2006							*															
pH																						
Quarter 3, 2002										*												
Quarter 4, 2002										*												
Quarter 1, 2003										*												
Quarter 2, 2003										*												
Quarter 3, 2003	*						*			*												
Quarter 4, 2003							*									*						
Quarter 1, 2004							*									*						
Quarter 3, 2005						*												*	*			
Quarter 4, 2005						*													*			
Quarter 3, 2006																*						
Quarter 2, 2011														*								
Quarter 3, 2011														*								
Quarter 4, 2011														*								
Quarter 1, 2012																*	*					
Quarter 2, 2012											*	*				*	*					
Quarter 1, 2013										*		*				*						
Quarter 3, 2015																	*					
Quarter 2, 2016																				*	*	
Quarter 3, 2016																				*		
Quarter 2, 2017																	*	*	*	*		
Quarter 3, 2018					*					*	*						*	*	*	*		
Quarter 4, 2018																*		*				
Quarter 3, 2019																*						
POTASSIUM																						
Quarter 1, 2014																*						
RADIUM-228																						
Quarter 2, 2005																						
Quarter 4, 2005						■						■						■				
SELENIUM																						
Quarter 4, 2003									■													

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>SODIUM</b>																						
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												*										
<b>STRONTIUM-90</b>																						
Quarter 4, 2008																						
<b>SULFATE</b>																						
Quarter 1, 2003							*															
Quarter 2, 2003							*	*														
Quarter 3, 2003	*						*	*														
Quarter 4, 2003						*	*	*														
Quarter 1, 2004						*	*	*														
Quarter 2, 2004						*	*	*														
Quarter 3, 2004						*	*	*														
Quarter 1, 2005						*	*	*	*													
Quarter 2, 2005						*	*	*	*							*						
Quarter 3, 2005						*	*	*	*													
Quarter 4, 2005						*	*	*	*							*						
Quarter 1, 2006						*	*	*	*													
Quarter 2, 2006						*	*	*	*							*						
Quarter 3, 2006							*	*	*													
Quarter 1, 2007							*	*	*													
Quarter 2, 2007							*	*	*													
Quarter 3, 2007							*	*	*													
Quarter 4, 2007		*																				
Quarter 1, 2008		*				*	*	*	*													
Quarter 2, 2008		*				*	*	*	*													
Quarter 3, 2008		*				*	*	*	*													
Quarter 4, 2008		*				*	*	*	*													
Quarter 1, 2009		*				*	*	*	*													
Quarter 2, 2009		*				*	*	*	*													
Quarter 3, 2009		*				*	*	*	*							*						
Quarter 4, 2009		*				*	*	*	*							*						
Quarter 1, 2010		*				*	*	*	*							*						
Quarter 2, 2010		*				*	*	*	*							*						
Quarter 3, 2010		*				*	*	*	*							*						
Quarter 4, 2010		*				*	*	*	*							*						
Quarter 1, 2011		*				*	*	*	*							*						
Quarter 2, 2011		*				*	*	*	*							*						
Quarter 3, 2011		*				*	*	*	*							*						
Quarter 4, 2011		*				*	*	*	*							*						
Quarter 1, 2012		*				*	*	*	*							*						
Quarter 2, 2012	*	*		*	*	*	*	*	*							*						
Quarter 3, 2012		*				*	*	*	*							*						
Quarter 4, 2012		*				*	*	*	*							*						
Quarter 1, 2013		*				*	*	*	*							*						
Quarter 2, 2013		*				*	*	*	*							*						
Quarter 3, 2013	*	*		*	*	*	*	*	*							*						
Quarter 4, 2013		*				*	*	*	*							*						
Quarter 1, 2014		*				*	*	*	*							*						
Quarter 2, 2014	*	*			*	*	*	*	*							*						
Quarter 3, 2014	*	*			*	*	*	*	*							*						
Quarter 4, 2014		*			*	*	*	*	*							*						
Quarter 1, 2015		*				*	*	*	*							*						

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>SULFATE</b>																						
Quarter 2, 2015	*	*			*		*									*						
Quarter 3, 2015		*			*	*	*	*								*						
Quarter 4, 2015	*	*				*	*	*	*													
Quarter 1, 2016	*	*			*	*	*	*														
Quarter 2, 2016	*	*			*	*	*	*														
Quarter 3, 2016	*	*			*	*	*	*	*													
Quarter 4, 2016	*	*				*	*	*	*													
Quarter 1, 2017	*	*				*	*	*	*													
Quarter 2, 2017	*	*			*	*	*	*														
Quarter 3, 2017	*	*			*	*	*	*														
Quarter 4, 2017	*	*				*	*	*	*													
Quarter 1, 2018	*	*			*	*	*	*	*													
Quarter 2, 2018	*	*			*	*	*	*	*													
Quarter 3, 2018	*	*			*	*	*	*	*													
Quarter 4, 2018	*	*				*	*	*	*													
Quarter 1, 2019	*	*			*	*	*	*	*													
Quarter 2, 2019	*	*			*	*	*	*	*													
Quarter 3, 2019	*	*			*	*	*	*	*													
Quarter 4, 2019	*	*			*	*	*	*	*													
Quarter 1, 2020	*	*			*	*	*	*	*													
Quarter 2, 2020	*	*			*	*	*	*	*													
Quarter 3, 2020	*	*			*	*	*	*	*													
<b>TECHNETIUM-99</b>																						
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															*	*	*	*	*	*	*	*

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U		D	D	D	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
<b>TECHNETIUM-99</b>																						
Quarter 2, 2018															*		*				*	
Quarter 3, 2018																*			*	*	*	
Quarter 4, 2018																*		*	*	*	*	
Quarter 1, 2019																	*				*	
Quarter 2, 2019															*						*	
Quarter 3, 2019																*			*		*	
Quarter 4, 2019																*		*	*	*	*	
Quarter 1, 2020																*		*	*	*	*	
Quarter 2, 2020																	*		*	*	*	
Quarter 3, 2020																*		*	*	*	*	
<b>THORIUM-230</b>																						
Quarter 4, 2015																	*					
Quarter 2, 2016											*											
Quarter 4, 2016	*												*				*			*		
Quarter 4, 2017														*								
Quarter 2, 2018											*			*								
<b>TOLUENE</b>																						
Quarter 2, 2014											*				*							
<b>TOTAL ORGANIC CARBON</b>																						
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																				*	*	
<b>TOTAL ORGANIC HALIDES</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*											
Quarter 1, 2004																	*					
<b>TRICHLOROETHENE</b>																						
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													■	■	■		■		■	■	■	■

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
TRICHLOROETHENE																						
Quarter 3, 2013													■		■						■	
Quarter 4, 2013												■			■				■		■	
Quarter 1, 2014													■		■				■		■	
Quarter 2, 2014															■		■					
Quarter 3, 2014													■		■				■		■	
Quarter 4, 2014													■		■				■		■	
Quarter 1, 2015													■		■						■	
Quarter 2, 2015					■										■				■		■	
Quarter 3, 2015													■		■		■				■	
Quarter 4, 2015													■		■						■	
Quarter 1, 2016														■	■		■	■			■	
Quarter 2, 2016												■		■	■			■	■		■	
Quarter 3, 2016													■		■			■	■		■	
Quarter 4, 2016													■		■			■	■		■	
Quarter 1, 2017													■		■			■	■		■	
Quarter 2, 2017															■			■	■		■	
Quarter 3, 2017															■			■	■		■	
Quarter 4, 2017										■			■	■				■	■		■	
Quarter 1, 2018															■			■	■		■	
Quarter 2, 2018													■		■		■	■	■		■	
Quarter 3, 2018										■					■			■	■		■	
Quarter 4, 2018										■			■		■			■	■		■	
Quarter 1, 2019										■					■		■	■	■			
Quarter 2, 2019										■							■	■	■		■	
Quarter 3, 2019																		■	■			
Quarter 4, 2019																		■	■			
Quarter 1, 2020															■			■	■			
Quarter 2, 2020																	■		■			
Quarter 3, 2020																		■	■			
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																						

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX H**  
**METHANE MONITORING DATA**

**THIS PAGE INTENTIONALLY LEFT BLANK**

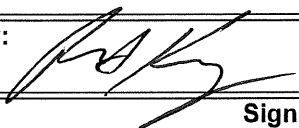


# CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

Date:	09/09/20	Time:	0800	Monitor:	Robert Kirby
Weather Conditions: Sunny, Cool, Slight Wind and 71 Degrees					
Monitoring Equipment: RAE Systems, Multi-RAE Serial # 7971					
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				NA
Remarks: NA					
<div> <div>Performed by: </div> <div>11/02/20</div> </div>					
Signature					Date

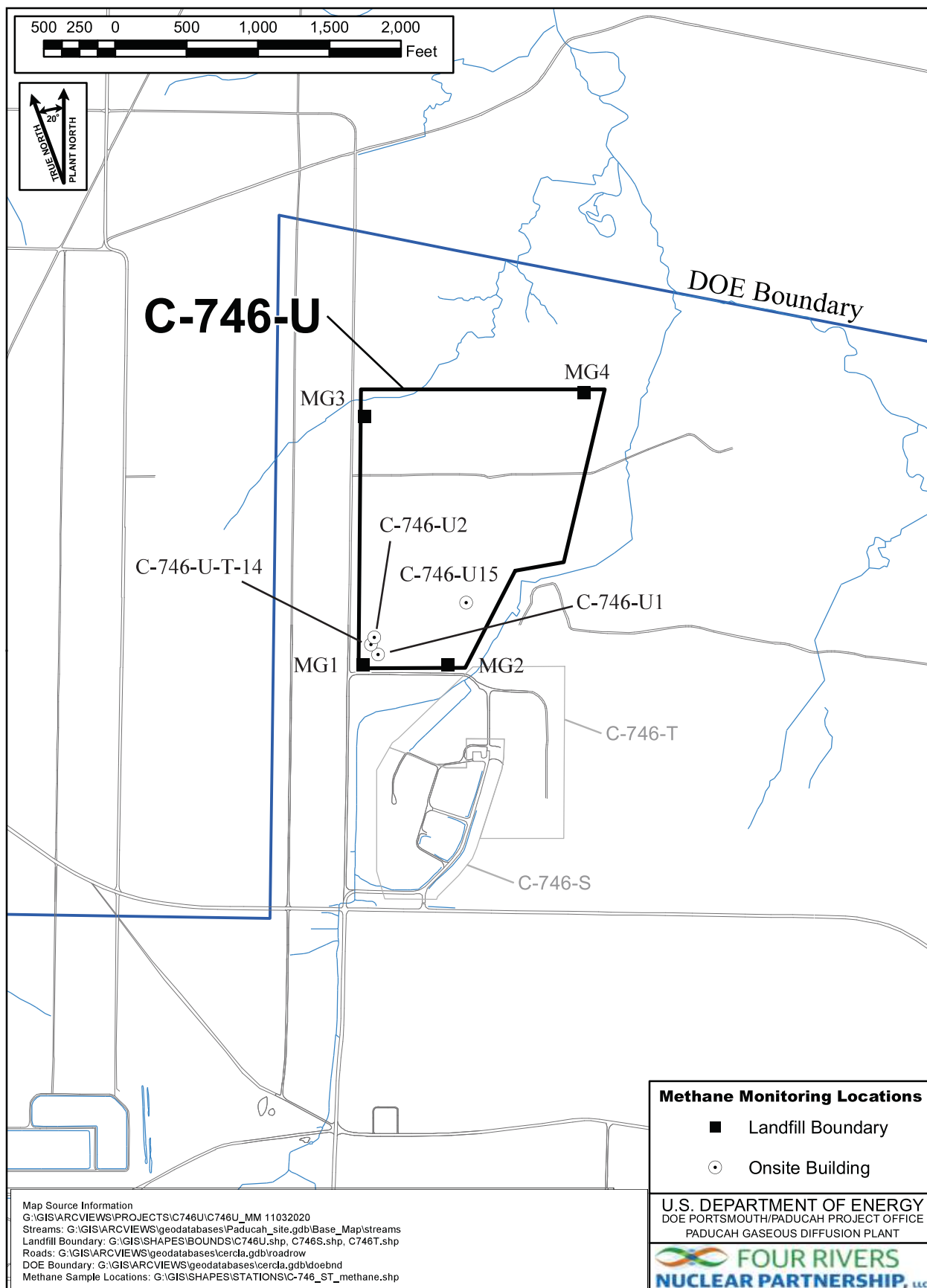


Figure H.1. C-746-U Methane Monitoring Locations

## **APPENDIX I**

### **SURFACE WATER ANALYSES AND WRITTEN COMMENTS**

**THIS PAGE INTENTIONALLY LEFT BLANK**

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

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

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

## SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")						L150 AT SITE		L154 UPSTREAM		L351 DOWNSTREAM			
Sample Sequence #						1		1		1			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment						NA		NA		NA			
Sample Date and Time (Month/Day/Year hour: minutes)						9/2/2020 06:57		9/2/2020 07:13		9/2/2020 06:36			
Duplicate ("Y" or "N") <sup>1</sup>						N		N		N			
Split ('Y' or "N") <sup>2</sup>						N		N		N			
Facility Sample ID Number (if applicable)						L150US4-20R		L154US4-20R		L351US4-20R			
Laboratory Sample ID Number (if applicable)						520388001		520388002		520388003			
Date of Analysis (Month/Day/Year)						9/21/2020		9/21/2020		9/21/2020			
CAS RN <sup>3</sup>		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>
A200-00-0	0	Flow	T	MGD	Field		*		*		*		
16887-00-6	2	Chloride(s)	T	mg/L	300.0	2.39		3.85		4.92			
14808-79-8	0	Sulfate	T	mg/L	300.0	48.1		7.54		14.9			
7439-89-6	0	Iron	T	mg/L	200.8	0.221		0.827		0.925			
7440-23-5	0	Sodium	T	mg/L	200.8	4.38		4.35		7.39			
S0268- -	0	Organic Carbon <sup>6</sup>	T	mg/L	9060	6.68		14.4		23.3			
S0097- -	0	BOD <sup>6</sup>	T	mg/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	10.5	J	36.3		81.4			

3-1

<sup>1</sup>Respond "Y" if the sample was a duplicate of another sample in this report

<sup>2</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>3</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>4</sup>"T" = Total; "D" = Dissolved

<sup>5</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit

<sup>6</sup>Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

<sup>7</sup>Flags are as designated, do not use any other type. Use "\*", " then describe on "Written Comments" page.

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of  
a secondary dilution factor

I-4

**RESIDENTIAL/CONTAINED – QUARTERLY****Facility: US DOE - Paducah Gaseous Diffusion Plant****Permit Number: SW07300014, SW07300015, SW07300045****Finds/Unit: KY8-890-008-982 / 1****LAB ID: None****For Official Use Only**

## SURFACE WATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US4-20R	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.48. Rad error is 3.48.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.57. Rad error is 6.4.
L154	L154US4-20R	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.21. Rad error is 6.15.
		Beta activity		TPU is 12. Rad error is 10.8.
L351	L351US4-20R	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.65. Rad error is 6.56.
		Beta activity		TPU is 10.3. Rad error is 9.52.

**THIS PAGE INTENTIONALLY LEFT BLANK**



## **APPENDIX J**

### **ANALYTICAL LABORATORY CERTIFICATION**

**THIS PAGE INTENTIONALLY LEFT BLANK**



# Accredited Laboratory

A2LA has accredited

**GEL LABORATORIES, LLC**

*Charleston, SC*

for technical competence in the field of

**Environmental Testing**

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 TNI Environmental Testing Laboratory Standard, the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP), and the requirements of the Department of Energy Consolidated Audit Program (DOECAP) as detailed in Version 5.3 of the DoD/DOE Quality System Manual for Environmental Laboratories (QSM), accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 15<sup>th</sup> day of July 2019.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2567.01  
Valid to June 30, 2021

*For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.*

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX K**

**LABORATORY ANALYTICAL METHODS**

**THIS PAGE INTENTIONALLY LEFT BLANK**

# LABORATORY ANALYTICAL METHODS

Analytical Method	Preparation Method	Product
SW846 8260B		Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer
SW846 8011	SW846 8011 PREP	Analysis of 1,2-Dibromoethane (EDB), 1,2-Dibromo-3-Chloropropane (DBCP) and 1,2,3-Trichloropropane in Water by GC/ECD Using Methods 504.1 or 8011
SW846 3535A/8082	SW846 3535A	Analysis of The Analysis of Polychlorinated Biphenyls by GC/ECD by ECD
SW846 6020	SW846 3005A	Determination of Metals by ICP-MS
SW846 7470A	SW846 7470A Prep	Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer
SW846 9060A		Carbon, Total Organic
SW846 9012B	SW846 9010C Distillation	Cyanide, Total
EPA 300.0		Ion Chromatography Iodide
SW846 9056		Ion Chromatography
EPA 160.1		Solids, Total Dissolved
EPA 410.4		COD
Eichrom Industries, AN-1418		AlphaSpec Ra226, Liquid
DOE EML HASL-300, Th-01-RC Modified		Th-01-RC M, Th Isotopes, Liquid
EPA 904.0/SW846 9320 Modified		904.0Mod, Ra228, Liquid
EPA 900.0/SW846 9310		9310, Alpha/Beta Activity, liquid
EPA 905.0 Modified/DOE RP501 Rev. 1 Modified		905.0Mod, Sr90, liquid
DOE EML HASL-300, Tc-02-RC Modified		Tc-02-RC-MOD, Tc99, Liquid
EPA 906.0 Modified		906.0M, Tritium Dist, Liquid

**THIS PAGE INTENTIONALLY LEFT BLANK**



## **APPENDIX L**

### **MICRO-PURGING STABILITY PARAMETERS**

**THIS PAGE INTENTIONALLY LEFT BLANK**

**Micro-Purge Stability Parameters  
for the C-746-U Contained Landfill**

	Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)		Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
<b>MW357</b>						<b>MW358</b>					
Date Collected: 7/21/2020						Date Collected: 7/21/2020					
0759	62.8	442	6.58	3.31	0.0	0856	60.8	537	6.36	1.10	0.5
0802	63.8	414	6.18	3.51	0.0	0859	62.0	531	6.27	0.83	0.0
0805	64.0	417	6.17	3.49	0.0	0902	62.6	537	6.25	0.75	0.0
<b>MW359</b>						<b>MW360</b>					
Date Collected: 7/21/2020						Date Collected: 7/21/2020					
0958	61.5	240	6.54	3.75	2.8	0556	60.9	433	6.25	1.33	27.2
1001	62.6	227	6.26	3.62	0.0	0559	61.9	430	6.28	1.04	17.0
1004	62.8	221	6.23	3.59	0.0	0602	62.1	427	6.28	1.03	16.2
<b>MW361</b>						<b>MW362</b>					
Date Collected: 7/21/2020						Date Collected: 7/21/2020					
0638	60.5	494	6.28	2.92	1.2	0717	60.7	692	6.68	3.63	2.0
0641	61.5	509	6.09	2.66	0.0	0720	61.3	701	6.91	3.07	0.8
0644	61.5	510	6.08	2.63	0.0	0723	61.4	697	6.93	3.03	0.2
<b>MW363</b>						<b>MW364</b>					
Date Collected: 7/30/2020						Date Collected: 8/6/2020					
0621	62.8	432	5.93	2.85	12.1	0638	59.7	470	5.96	4.79	0.0
0624	63.6	429	5.95	2.01	5.3	0641	60.0	474	6.02	3.44	0.0
0627	64.1	429	5.97	2.00	3.6	0644	60.0	478	6.03	3.39	0.0
<b>MW365</b>						<b>MW366</b>					
Date Collected: 7/30/2020						Date Collected: 8/6/2020					
0748	61.9	448	6.23	2.71	0.0	0800	62.1	455	6.24	4.26	0.0
0751	61.7	442	6.25	2.42	0.0	0803	62.2	463	6.17	3.89	0.0
0754	61.5	442	6.25	2.40	0.0	0806	62.3	462	6.18	3.80	0.0
<b>MW367</b>						<b>MW368</b>					
Date Collected: 7/30/2020						Date Collected: 7/30/2020					
0909	62.1	296	5.93	3.69	3.4	0946	61.9	570	6.36	1.73	0.0
0912	62.0	292	5.95	2.43	0.0	0949	61.3	570	6.40	1.96	0.0
0915	61.9	292	5.93	2.39	0.0	0952	61.0	571	6.42	2.00	0.0
<b>MW369</b>						<b>MW370</b>					
Date Collected: 7/20/2020						Date Collected: 7/23/2020					
0636	62.9	383	6.28	4.35	8.5	0719	62.5	450	6.19	2.85	0.8
0639	64.0	374	6.21	3.25	0.0	0722	63.5	447	6.08	2.83	2.0
0642	64.1	373	6.21	3.21	0.0	0725	64.2	452	6.07	2.86	2.2
<b>MW371</b>						<b>MW372</b>					
Date Collected: 7/23/2020						Date Collected: 7/23/2020					
0757	62.8	490	6.24	2.11	2000	0837	62.6	764	6.40	2.43	9.2
0800	63.9	524	6.40	2.48	577	0840	64.7	772	6.17	1.76	3.2
0803	63.7	527	6.42	2.50	580	0843	65.1	770	6.16	1.78	3.7
<b>MW373</b>						<b>MW374</b>					
Date Collected: 7/23/2020						Date Collected: 7/23/2020					
0917	63.6	849	6.22	1.75	8.3	0956	63.3	689	6.39	1.01	22.3
0920	64.7	858	6.12	1.40	1.8	0959	64.4	688	6.49	0.79	10.2
0923	65.0	859	6.11	1.41	1.9	1002	65.1	687	6.53	0.70	10.3
<b>MW375</b>											
Date Collected: 7/23/2020											
0602	63.3	337	5.99	2.34	13.9						
0605	64.0	340	6.02	1.82	3.7						
0608	64.1	341	6.03	1.80	3.0						

**THIS PAGE INTENTIONALLY LEFT BLANK**