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Dear Mr. Hendricks and Ms. Nielsen:

**C-746-U CONTAINED LANDFILL FOURTH QUARTER CALENDAR YEAR 2023  
(OCTOBER–DECEMBER) COMPLIANCE MONITORING REPORT, PADUCAH  
GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0295/V4,  
PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID  
NO. 3059**

The subject report for the fourth quarter calendar year (CY) 2023 has been uploaded to the Kentucky eForms portal via the Kentucky Online Gateway. Other recipients outside the Solid Waste Branch are receiving this document via email distribution (see distribution list). 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, a validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results.

The statistical analyses on the fourth quarter CY 2023 monitoring well data collected from the C-746-U Landfill were performed in accordance with Monitoring Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). This report also serves as the statistical exceedance notification for the fourth quarter CY 2023, in accordance with Monitoring Condition GSTR0001, Standard Requirement 5, of the Permit.

If you have any questions or require additional information, please contact Ryan Callihan at (740) 970-0255.

Sincerely,

**APRIL LADD**

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April Ladd  
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Enclosure:

*C-746-U Contained Landfill Fourth Quarter Calendar Year 2023 (October–December)  
Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky,  
FRNP-RPT-0295/V4*

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**C-746-U Contained Landfill  
Fourth Quarter Calendar Year 2023  
(October–December)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**



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**C-746-U Contained Landfill  
Fourth Quarter Calendar Year 2023  
(October–December)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—February 2024

U.S. DEPARTMENT OF ENERGY  
Office of Environmental Management

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

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## ACRONYMS

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

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# 1. INTRODUCTION

This report, *C-746-U Contained Landfill Fourth Quarter Calendar Year 2023 (October–December) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Permit No. 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 presented in groundwater sample analyses tables and laboratory reports, 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 third quarter, calendar year 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 are provided in Appendix I. Analytical laboratory certification is provided in Appendix J. Laboratory analytical methods used to analyze the included data set are provided in Appendix K. Micro-purging stability parameter results are provided in Appendix L.

## 1.1 BACKGROUND

The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Gaseous Diffusion Plant 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 No. 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, 5, and 6, with Phase 7 approved for receipt of waste as of September 27, 2019. A minor permit modification that included upgrades to the leachate storage capacity for Phases 6 and 7 was approved by the Kentucky Division of Waste Management (KDWM) on May 21, 2021 (FRNP 2021). 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 with the exception of MW359, MW368, MW376, and MW377 (screened in the UCRS), which had insufficient amounts of water to obtain samples; therefore, there are no laboratory analysis results for these locations.

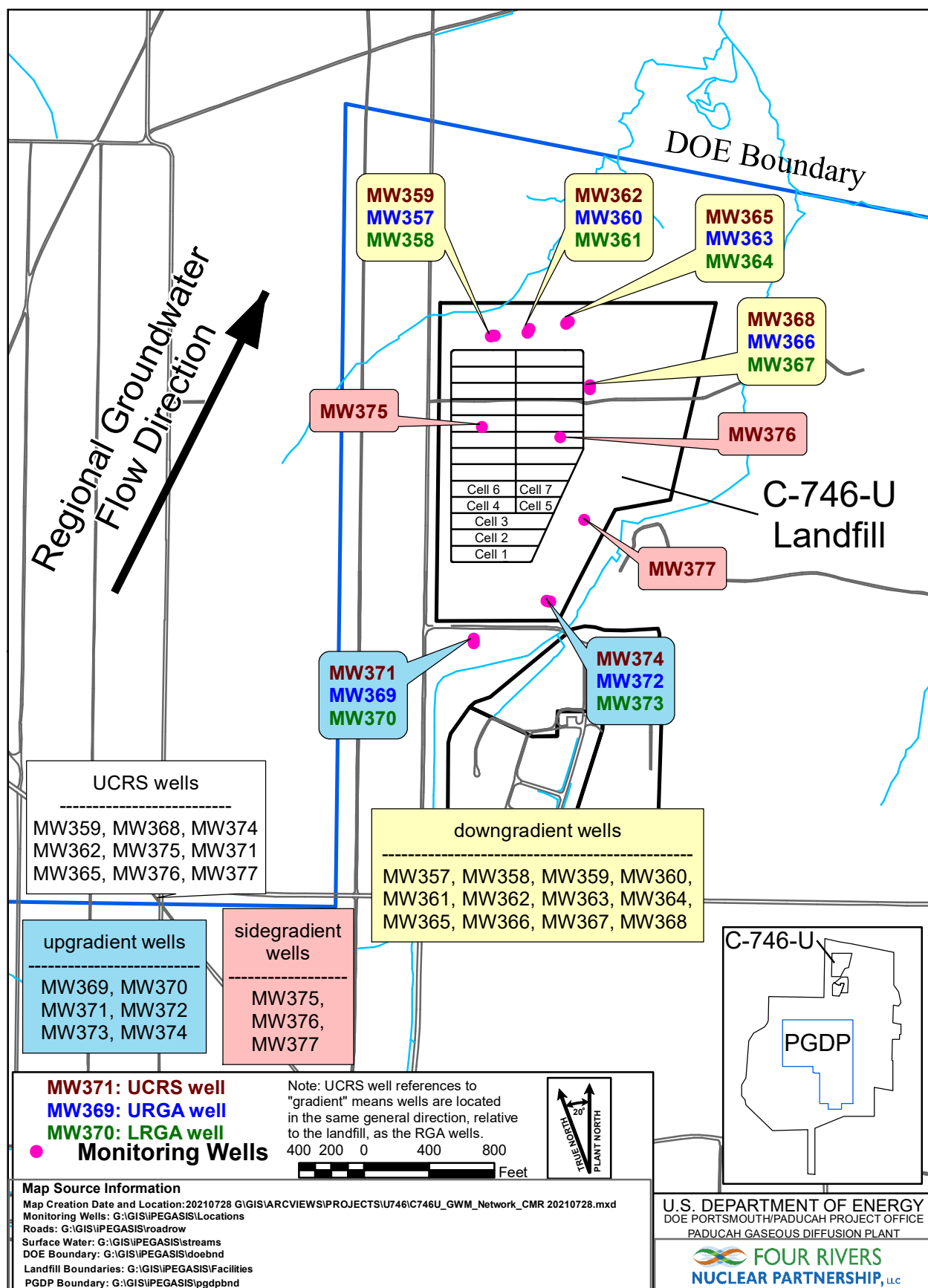


Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

Consistent with the approved *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (Groundwater Monitoring Plan) UCRS wells are included in the monitoring program (LATA Kentucky 2014). Groundwater flow gradients are downward through the UCRS, but flow in the underlying Regional Gravel Aquifer (RGA) is lateral. Groundwater flow in the 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 fourth quarter 2023 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 fourth quarter 2023 was conducted on October 9-11, 2023. 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 October 23, 2023, 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 October, RGA groundwater flow in the area of the landfill was oriented northeast. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in October was  $3.08 \times 10^{-4}$  ft/ft (see Appendix E, Table E.2). The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were  $6.14 \times 10^{-4}$  ft/ft and  $7.08 \times 10^{-4}$  ft/ft, respectively (see Appendix E, Table E.2). Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.04 to 1.78 ft/day for the URGA and 1.20 to 2.05 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. Industrial Hygiene staff monitored for the occurrence of methane in four on-site building locations and four locations along the landfill boundary on November 7, 2023. Appendix H provides a map of the monitoring locations (Appendix H, Figure H.1). Monitoring results identified that all locations were 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 Monitoring Report provided in Appendix H.

### 1.2.3 Surface Water Monitoring

Surface water was monitored, as specified in 401 KAR 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U and C-746-S&T Landfills Permit Number SW07300014, SW07300015, SW07300045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Agency Interest Number 3059* (FRNP 2021), which is Technical Application Attachment 24 of the Solid Waste Permit. Surface water sampling was performed on October 29, 2023, at three locations monitored for the C-746-U Landfill: (1) instream location L154, (2) downstream location L351, and (3) instream location L150 (Figure 2). 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. For the current reporting quarter, there were no parameters that exceeded their respective MCLs. If there had been any MCL exceedances, they would have been 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 fourth quarter 2023, 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**

<b>UCRS</b>	<b>URGA</b>	<b>LRGA</b>
None	None	None

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<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.

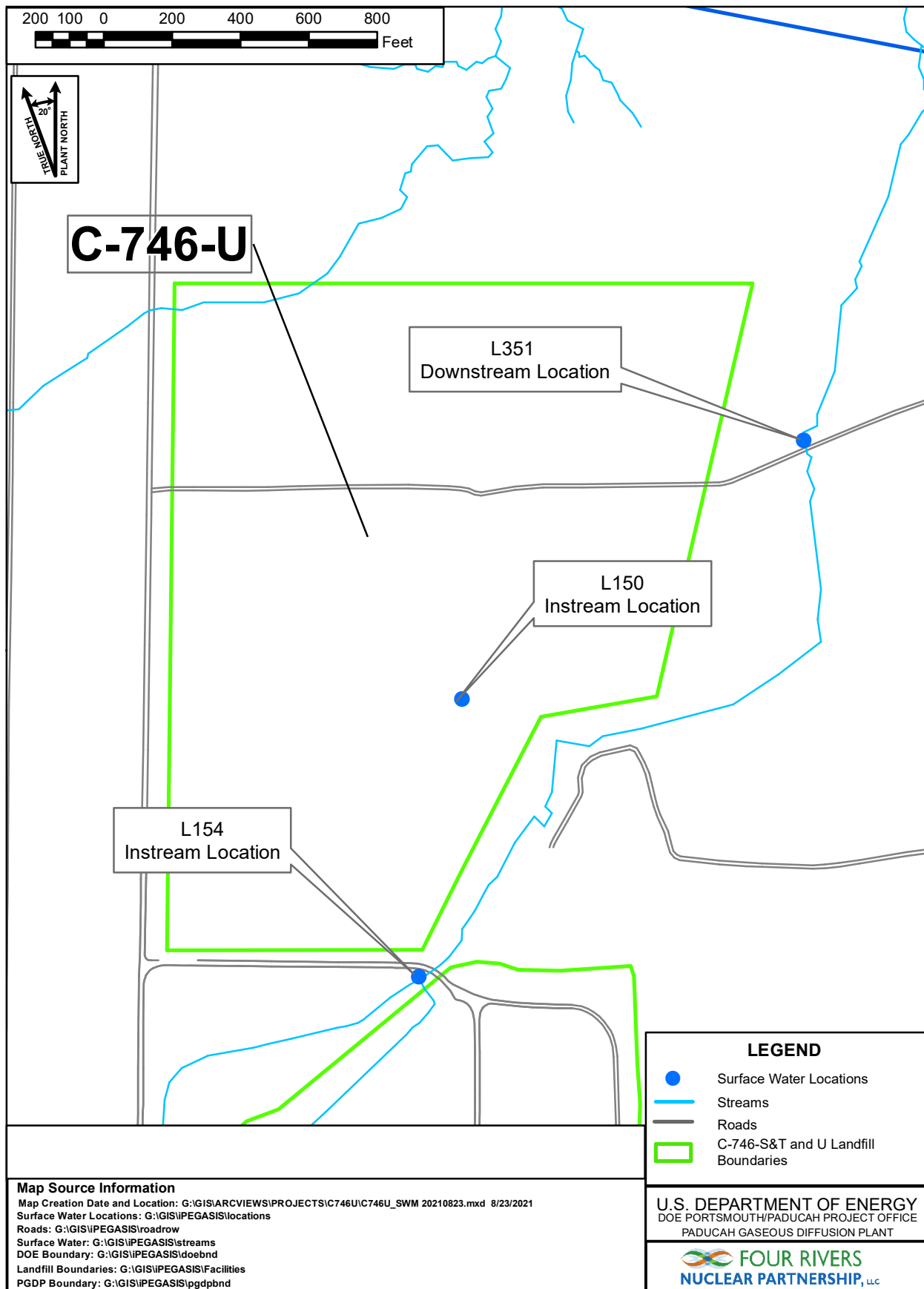


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

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

UCRS <sup>a</sup>	URGA	LRGA
MW362: Dissolved oxygen, oxidation-reduction potential, <sup>b</sup> sulfate	MW357: Oxidation-reduction potential <sup>b</sup>	MW358: Oxidation-reduction potential <sup>b</sup>
MW365: Dissolved oxygen, oxidation-reduction potential, <sup>b</sup> sulfate	MW360: Oxidation-reduction potential <sup>b</sup>	MW361: Oxidation-reduction potential, <sup>b</sup> technetium-99
MW371: Oxidation-reduction potential <sup>b</sup> and sulfate	MW363: Nickel, oxidation-reduction potential <sup>b</sup>	MW364: Oxidation-reduction potential, <sup>b</sup> technetium-99
MW374: Oxidation-reduction potential <sup>b</sup>	MW366: Oxidation-reduction potential <sup>b</sup>	MW367: Oxidation-reduction potential <sup>b</sup>
MW375: Dissolved oxygen, oxidation-reduction potential, <sup>b</sup> sulfate	MW369: Oxidation-reduction potential <sup>b</sup> and technetium-99	MW370: Dissolved oxygen, oxidation-reduction potential <sup>b</sup>
	MW372: Calcium, conductivity, dissolved solids, oxidation-reduction potential, <sup>b</sup> sulfate	MW373: Calcium, oxidation-reduction potential <sup>b</sup>

<sup>a</sup> 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.

<sup>b</sup> Oxidation-reduction potential calibrated as Eh.

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 RGA Wells**

URGA	LRGA
MW363: Nickel	MW361: Technetium-99
	MW364: Technetium-99

A notification of MCL exceedances, or lack of exceedances, was submitted electronically to the KDWM, in accordance with 401 *KAR* 48:300 § 7, prior to the submittal of this report. There were no MCL exceedances in the current reporting quarter.

Any constituent that exceeded the MCL in downgradient wells would be subjected to a comparison against the UTL concentration calculated using historical concentrations from wells identified as background.

This report is the notification of parameters that had statistically significant increased concentrations relative to historical background concentrations, as required by Permit No. 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 Type 1 exceedances—not attributable to the C-746-U Landfill. Except for technetium-99 in MW361 and MW364 and nickel in MW363, all UTL exceedances reported

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

Technetium-99 in downgradient LRGA wells MW361 and MW364, and nickel in downgradient URGA well MW363 exceeded both the historical background UTL and the current background UTL; therefore, these results are preliminarily considered to be Type 2 exceedances. To evaluate the preliminary Type 2 exceedances further, the parameters were subjected to the Mann-Kendall statistical test for trends using the most recent eight quarters of data. The results are summarized in Table 4. No trend was indicated for technetium-99 in MW361 and MW364, or nickel in MW363 and; therefore, they are considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

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

Location	Well ID	Parameter	Sample Size	Alpha <sup>1</sup>	p-Value <sup>2</sup>	S <sup>3</sup>	Decision <sup>4</sup>
C-746-U Landfill	MW361	Technetium-99	8	0.05	-3	0.452	No trend
	MW363	Nickel	8	0.05	6	0.274	No trend
	MW364	Technetium-99	8	0.05	1	0.548	No trend

<sup>1</sup> An alpha of 0.05 represents a 95% confidence interval.

<sup>2</sup> The p-value represents the risk of acceptance the  $H_a$  hypothesis of a trend, in terms of a percentage.

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

<sup>4</sup> The Mann-Kendall decision operates on two hypotheses; the  $H_0$  and  $H_a$ .  $H_0$  assumes there is no trend in the data, whereas  $H_a$  assumes either a positive or negative trend.

Note: Statistics generated using ProUCL.

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

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## 2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the fourth quarter 2023 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).

If parameters that exceed the MCL for Kentucky solid waste facilities found in 401 *KAR* 47:030 § 6 were detected, they were documented and evaluated further. MCL exceedances, if found, 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 Pexceedance—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 in the statistical analyses are listed in Table 5.

**Table 5. Monitoring Wells Included in Statistical Analysis**

UCRS	URGA	LRGA
MW359 <sup>c</sup>	MW357	MW358
MW362	MW360	MW361
MW365	MW363	MW364
MW368 <sup>c</sup>	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 MW 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, 27 parameters, including those with MCLs, required statistical analysis in the UCRS. During the fourth quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. None of the parameters in downgradient UCRS wells exceeded the current background UTLs.

### **2.1.2 Upper Regional Gravel Aquifer**

In this quarter, 25 parameters, including those with MCLs, required statistical analysis in the URGA. During the fourth quarter, calcium, conductivity, dissolved solids, nickel, oxidation-reduction potential, sulfate, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Nickel in downgradient URGA well MW363 exceeded the current background UTL.

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

In this quarter, 23 parameters, including those with MCLs, required statistical analysis in the LRGA. During the fourth quarter, calcium, dissolved oxygen, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Technetium-99 in downgradient LRGA wells MW361 and MW364 exceeded the current background UTL.

## **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.

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

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


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### 3. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** *C-746-U Contained Landfill Fourth Quarter Calendar Year 2023 (October–December) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky (FRNP-RPT-0295/V4)*

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



  
Evan Clark

PG265379

2/21/2024  
Date

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## 4. REFERENCES

- FRNP (Four Rivers Nuclear Partnership, LLC) 2021. *Surface Water Monitoring Plan for C-746-U and C-746-S&T Landfills Permit Number SW07300014, SW07300015, SW07300045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Agency Interest Number 3059*, Solid Waste Landfill Permit No. SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Four Rivers Nuclear Partnership, LLC, Paducah, KY, March.
- KEEC (Kentucky Energy and Environment Cabinet) 2011. Solid Waste Landfill Permit No. 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 No. SW07300014, SW07300015, SW07300045, Technical Application Attachment 25, LATA Environmental Services of Kentucky, LLC, Kevil, KY, June.

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**APPENDIX A**

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

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

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

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

Permit No: SW07300014, Finds/Unit No: \_\_\_\_\_ Quarter & Year 4th Qtr. CY 2023  
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

\_\_\_\_\_  
Date

\_\_\_\_\_  
April Ladd, Paducah Site Lead  
U.S. Department of Energy

\_\_\_\_\_  
Date

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

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## FACILITY INFORMATION SHEET

Sampling Date: Groundwater: October 2023  
Surface water: October 2023  
Methane: November 2023 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, Joel Bradburne, Manager  
Portsmouth/Paducah Project Office Phone No: (859) 219-4000

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: Four Rivers Nuclear Partnership, LLC

Contact Person: Chris Skinner Phone No: (270) 441-5675

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

### LABORATORY RECORD #1

Laboratory GEL Laboratories, LLC Lab ID No: KY90129

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

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

### LABORATORY RECORD #2

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

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

Mailing Address: N/A  
Street City/State Zip

### LABORATORY RECORD #3

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

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

Mailing Address: N/A  
Street City/State Zip

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**APPENDIX C**

**GROUNDWATER SAMPLE ANALYSES  
AND LABORATORY REPORTS**

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**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW357 **DOWN** **RGA Type:** URGAs **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4798 **SAMPLE ID:** MW357UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.361	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	30	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.179	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.1	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		36.7	mg/L	2	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.83	Inches/Hg		10/9/2023				X
Conductivity		404	µmhos/cm		10/9/2023				X
Depth to Water		46.51	ft		10/9/2023				X
Dissolved Oxygen		4.5	mg/L		10/9/2023				X
Eh (approx)		432	mV		10/9/2023				X
pH		6.13	Std Unit		10/9/2023				X
Temperature		64.5	deg F		10/9/2023				X
Turbidity		3.41	NTU		10/9/2023				X
Aluminum	U	0.05	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.0762	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron		0.301	mg/L	0.075	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		24.9	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Copper	J	0.00153	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		9.65	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese	J	0.00286	mg/L	0.005	10/9/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Potassium		1.54	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		35.1	mg/L	0.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	J	0.00448	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.0768	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=

PCB-1221	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
PCB-1232	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
PCB-1242	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
PCB-1248	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
PCB-1254	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
PCB-1260	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0997	ug/L	0.0997	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.605	pCi/L	0.683	10/9/2023	0.599	0.6	AN-1418	=
Radium-228	U	0.703	pCi/L	3.99	10/9/2023	2.17	2.18	EPA-904-M	=
Strontium-90	U	1.95	pCi/L	4.83	10/9/2023	2.8	2.82	EPA-905.0-M	=
Tritium	U	-39.2	pCi/L	222	10/9/2023	121	121	EPA-906.0-M	=
Technetium-99		34	pCi/L	17.9	10/9/2023	11.9	12.5	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.78	pCi/L	2.95	10/9/2023	2.07	2.09	HASL 300, Th-01-RC M	=
Thorium-232	U	0.149	pCi/L	2.12	10/9/2023	1.06	1.06	HASL 300, Th-01-RC M	=
Alpha activity	U	5.97	pCi/L	6.92	10/9/2023	4.92	5.03	SW846-9310	=
Beta activity		22.9	pCi/L	8.78	10/9/2023	7.27	8.19	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0195	ug/L	0.0195	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene		2.41 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		186 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.648 mg/L	2	10/9/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW358 **DOWN** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4799 **SAMPLE ID:** MW358UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.338	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	26.8	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.197	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.582	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		45	mg/L	2	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.83	Inches/Hg		10/9/2023				X
Conductivity		499	µmhos/cm		10/9/2023				X
Depth to Water		46.65	ft		10/9/2023				X
Dissolved Oxygen		0.74	mg/L		10/9/2023				X
Eh (approx)		149	mV		10/9/2023				X
pH		6.37	Std Unit		10/9/2023				X
Temperature		62.8	deg F		10/9/2023				X
Turbidity		3.08	NTU		10/9/2023				X
Aluminum	U	0.05	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.0589	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron		0.351	mg/L	0.075	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		31.8	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt		0.00514	mg/L	0.001	10/9/2023			SW846-6020B	J
Copper	J	0.000907	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron		1.31	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		13.6	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese		0.335	mg/L	0.005	10/9/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel		0.0133	mg/L	0.002	10/9/2023			SW846-6020B	=
Potassium		2.39	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		35.8	mg/L	0.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	J	0.00502	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.0626	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=

PCB-1221	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
PCB-1232	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
PCB-1242	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
PCB-1248	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
PCB-1254	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
PCB-1260	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0969	ug/L	0.0969	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.486	pCi/L	0.747	10/9/2023	0.61	0.61	AN-1418	=
Radium-228	U	1.32	pCi/L	3.94	10/9/2023	2.24	2.27	EPA-904-M	=
Strontium-90	U	4.03	pCi/L	5.64	10/9/2023	3.53	3.59	EPA-905.0-M	=
Tritium	U	15.5	pCi/L	221	10/9/2023	124	124	EPA-906.0-M	=
Technetium-99		38.3	pCi/L	18.4	10/9/2023	12.4	13.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.56	pCi/L	3.39	10/9/2023	2.5	2.54	HASL 300, Th-01-RC M	=
Thorium-232	U	0.164	pCi/L	2.29	10/9/2023	1.15	1.15	HASL 300, Th-01-RC M	=
Alpha activity	U	1.94	pCi/L	7.15	10/9/2023	3.79	3.8	SW846-9310	=
Beta activity		10.6	pCi/L	9.4	10/9/2023	6.31	6.55	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene	J	0.68 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		218 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)		3.88 mg/L	2	10/9/2023	SW846-9060A	=



**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW360 **DOWN** **RGA Type:** URGa **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4800 **SAMPLE ID:** MW360UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	J	0.134	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	5.41	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.235	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.707	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		9.51	mg/L	0.4	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.8	Inches/Hg		10/9/2023				X
Conductivity		385	µmhos/cm		10/9/2023				X
Depth to Water		39.82	ft		10/9/2023				X
Dissolved Oxygen		1.71	mg/L		10/9/2023				X
Eh (approx)		433	mV		10/9/2023				X
pH		6.2	Std Unit		10/9/2023				X
Temperature		57.4	deg F		10/9/2023				X
Turbidity		4.17	NTU		10/9/2023				X
Aluminum	J	0.0378	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.227	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron		0.0235	mg/L	0.015	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		19.6	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt	J	0.000622	mg/L	0.001	10/9/2023			SW846-6020B	J
Copper		0.00312	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron	J	0.0545	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		7.78	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese		0.00689	mg/L	0.005	10/9/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel	J	0.000843	mg/L	0.002	10/9/2023			SW846-6020B	J
Potassium		0.715	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	J	0.00214	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		58.5	mg/L	1.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	J	0.00608	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.23	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=

PCB-1221	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
PCB-1232	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
PCB-1242	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
PCB-1248	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
PCB-1254	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
PCB-1260	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0956	ug/L	0.0956	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.712	pCi/L	0.922	10/9/2023	0.782	0.784	AN-1418	=
Radium-228	U	2.72	pCi/L	3.48	10/9/2023	2.23	2.33	EPA-904-M	=
Strontium-90	U	2.2	pCi/L	5	10/9/2023	2.92	2.94	EPA-905.0-M	=
Tritium	U	67.6	pCi/L	220	10/9/2023	127	128	EPA-906.0-M	=
Technetium-99	U	6.18	pCi/L	17.9	10/9/2023	10.5	10.5	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.12	pCi/L	2	10/9/2023	1.34	1.36	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0969	pCi/L	1.2	10/9/2023	0.469	0.469	HASL 300, Th-01-RC M	=
Alpha activity	U	2.22	pCi/L	6.73	10/9/2023	3.69	3.7	SW846-9310	=
Beta activity	U	3.3	pCi/L	9.31	10/9/2023	5.35	5.38	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		195 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.984 mg/L	2	10/9/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW361 **DOWN** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4795 **SAMPLE ID:** MW361UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.478	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	36.9	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.173	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.11	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		80.1	mg/L	2	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.81	Inches/Hg		10/9/2023				X
Conductivity		504	µmhos/cm		10/9/2023				X
Depth to Water		39.08	ft		10/9/2023				X
Dissolved Oxygen		4.04	mg/L		10/9/2023				X
Eh (approx)		434	mV		10/9/2023				X
pH		6.03	Std Unit		10/9/2023				X
Temperature		57.8	deg F		10/9/2023				X
Turbidity		3.23	NTU		10/9/2023				X
Aluminum	U	0.05	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.061	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron		0.165	mg/L	0.015	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		35.4	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Copper	J	0.00169	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		14.8	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese	J	0.0027	mg/L	0.005	10/9/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Potassium		2.49	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		42.4	mg/L	0.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	J	0.00384	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.0617	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=

PCB-1221	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
PCB-1242	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.1	ug/L	0.1	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.226	pCi/L	1.55	10/9/2023	0.804	0.804	AN-1418	=
Radium-228	U	1.94	pCi/L	3.35	10/9/2023	2.03	2.09	EPA-904-M	=
Strontium-90	UT	-3.94	pCi/L	7.51	10/9/2023	3.51	3.51	EPA-905.0-M	UJ
Tritium	U	78.9	pCi/L	221	10/9/2023	129	130	EPA-906.0-M	=
Technetium-99		50.3	pCi/L	16.7	10/9/2023	12	13.3	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.243	pCi/L	2.54	10/9/2023	1.27	1.27	HASL 300, Th-01-RC M	=
Thorium-232	U	0.123	pCi/L	1.84	10/9/2023	0.918	0.918	HASL 300, Th-01-RC M	=
Alpha activity	U	4.93	pCi/L	6.41	10/9/2023	4.48	4.56	SW846-9310	=
Beta activity		25.3	pCi/L	9.02	10/9/2023	7.57	8.62	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0191	ug/L	0.0191	10/9/2023			SW846-8011	UJ
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene	J	0.37 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		269 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	5.76 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.827 mg/L	2	10/9/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW362 **DOWN** **RGA Type:** UCRS **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-0986 **SAMPLE ID:** MW362UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	2.62	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.394	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.459	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		21.5	mg/L	2	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.83	Inches/Hg		10/9/2023				X
Conductivity		614	µmhos/cm		10/9/2023				X
Depth to Water		28.4	ft		10/9/2023				X
Dissolved Oxygen		3.07	mg/L		10/9/2023				X
Eh (approx)		401	mV		10/9/2023				X
pH		7.02	Std Unit		10/9/2023				X
Temperature		59.1	deg F		10/9/2023				X
Turbidity		6.3	NTU		10/9/2023				X
Aluminum		0.909	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.0991	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron	J	0.0146	mg/L	0.015	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		18.2	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Copper	J	0.00137	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron		0.171	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		7.7	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese	J	0.00198	mg/L	0.005	10/9/2023			SW846-6020B	J
Molybdenum	J	0.00079	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel	J	0.00115	mg/L	0.002	10/9/2023			SW846-6020B	J
Potassium		0.369	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		115	mg/L	1.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium		0.0021	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.0989	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved		0.002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=

PCB-1221	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
PCB-1232	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
PCB-1242	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
PCB-1248	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
PCB-1254	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
PCB-1260	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0986	ug/L	0.0986	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.395	pCi/L	1.03	10/9/2023	0.688	0.689	AN-1418	=
Radium-228	U	0.205	pCi/L	3.6	10/9/2023	1.87	1.87	EPA-904-M	=
Strontium-90	U	4.03	pCi/L	6.44	10/9/2023	3.89	3.95	EPA-905.0-M	=
Tritium	U	-14.5	pCi/L	220	10/9/2023	122	122	EPA-906.0-M	=
Technetium-99	U	-2.83	pCi/L	18.6	10/9/2023	10.4	10.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.3	pCi/L	2.65	10/9/2023	2.09	2.13	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.203	pCi/L	1.94	10/9/2023	0.711	0.712	HASL 300, Th-01-RC M	=
Alpha activity	U	-2.53	pCi/L	9.65	10/9/2023	3.38	3.38	SW846-9310	=
Beta activity	U	6.82	pCi/L	8.91	10/9/2023	5.58	5.69	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0188	ug/L	0.0188	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=



Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		331 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)		11.4 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)		2.05 mg/L	2	10/9/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW363 **DOWN** **RGA Type:** URG **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4796 **SAMPLE ID:** MW363UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/9/2023			SW846-9056A	=
Chloride	J	20.7	mg/L	250	10/9/2023			SW846-9056A	=
Fluoride	J	0.212	mg/L	4	10/9/2023			SW846-9056A	=
Nitrate as Nitrogen	J	3.79	mg/L	10	10/9/2023			SW846-9056A	=
Sulfate		27.1	mg/L	2	10/9/2023			SW846-9056A	=
Barometric Pressure Reading		29.82	Inches/Hg		10/9/2023				X
Conductivity		360	µmhos/cm		10/9/2023				X
Depth to Water		46.54	ft		10/9/2023				X
Dissolved Oxygen		0.77	mg/L		10/9/2023				X
Eh (approx)		301	mV		10/9/2023				X
pH		6.21	Std Unit		10/9/2023				X
Temperature		63.3	deg F		10/9/2023				X
Turbidity		3.44	NTU		10/9/2023				X
Aluminum	U	0.05	mg/L	0.05	10/9/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/9/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Barium		0.124	mg/L	0.004	10/9/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/9/2023			SW846-6020B	=
Boron		0.0214	mg/L	0.015	10/9/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Calcium		23.2	mg/L	0.2	10/9/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Cobalt	J	0.000955	mg/L	0.001	10/9/2023			SW846-6020B	J
Copper	J	0.000684	mg/L	0.002	10/9/2023			SW846-6020B	J
Iron	J	0.0595	mg/L	0.1	10/9/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Magnesium		9.02	mg/L	0.03	10/9/2023			SW846-6020B	=
Manganese		0.136	mg/L	0.005	10/9/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Nickel		0.0813	mg/L	0.002	10/9/2023			SW846-6020B	=
Potassium		2.12	mg/L	0.3	10/9/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/9/2023			SW846-6020B	=
Sodium		35.7	mg/L	0.25	10/9/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/9/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/9/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	10/9/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/9/2023			SW846-7470A	=
Barium, Dissolved		0.121	mg/L	0.004	10/9/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/9/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/9/2023			SW846-6020B	=
PCB-1016	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=

PCB-1221	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
PCB-1232	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
PCB-1242	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
PCB-1248	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
PCB-1254	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
PCB-1260	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	UJ
PCB-1268	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.105	ug/L	0.105	10/9/2023			SW846-8082A	UJ
Radium-226	U	0.701	pCi/L	1.04	10/9/2023	0.817	0.818	AN-1418	=
Radium-228	U	3.1	pCi/L	4.16	10/9/2023	2.61	2.73	EPA-904-M	=
Strontium-90	U	-0.5	pCi/L	5.55	10/9/2023	2.88	2.88	EPA-905.0-M	=
Tritium	U	-4.92	pCi/L	222	10/9/2023	123	123	EPA-906.0-M	=
Technetium-99	U	4.47	pCi/L	17.9	10/9/2023	10.4	10.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.3	pCi/L	2.73	10/9/2023	2.08	2.11	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.106	pCi/L	2.27	10/9/2023	0.947	0.948	HASL 300, Th-01-RC M	=
Alpha activity	U	2.16	pCi/L	7.98	10/9/2023	4.31	4.32	SW846-9310	=
Beta activity	U	7.42	pCi/L	8.56	10/9/2023	5.47	5.6	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/9/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Dissolved Solids		192 mg/L	10	10/9/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/9/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/9/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/9/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	6.02 ug/L	10	10/9/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.18 mg/L	2	10/9/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW364 **DOWN** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4797 **SAMPLE ID:** MW364UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.452	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	36.4	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.221	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.08	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		67.3	mg/L	2	10/10/2023			SW846-9056A	=
Barometric Pressure Reading		29.88	Inches/Hg		10/10/2023				X
Conductivity		487	µmhos/cm		10/10/2023				X
Depth to Water		46.24	ft		10/10/2023				X
Dissolved Oxygen		3.58	mg/L		10/10/2023				X
Eh (approx)		450	mV		10/10/2023				X
pH		6.01	Std Unit		10/10/2023				X
Temperature		58.3	deg F		10/10/2023				X
Turbidity		2.31	NTU		10/10/2023				X
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.0601	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron		0.153	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		33.7	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Copper	J	0.00175	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		14	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese	J	0.00103	mg/L	0.005	10/10/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Potassium		2.01	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		41.2	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.0119	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.0558	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=

PCB-1221	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
PCB-1242	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.1	ug/L	0.1	10/10/2023			SW846-8082A	UJ
Radium-226	U	0.0826	pCi/L	0.859	10/10/2023	0.448	0.448	AN-1418	=
Radium-228	U	3.74	pCi/L	4.45	10/10/2023	2.89	3.04	EPA-904-M	=
Strontium-90	U	3.61	pCi/L	5.23	10/10/2023	3.25	3.3	EPA-905.0-M	=
Tritium	U	-73.8	pCi/L	221	10/10/2023	118	118	EPA-906.0-M	=
Technetium-99		63.9	pCi/L	18.9	10/10/2023	13.8	15.6	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.471	pCi/L	3	10/10/2023	1.59	1.6	HASL 300, Th-01-RC M	=
Thorium-232	U	0.0695	pCi/L	2.51	10/10/2023	1.17	1.17	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.682	pCi/L	9.68	10/10/2023	3.98	3.99	SW846-9310	=
Beta activity		42	pCi/L	12	10/10/2023	10.3	12.5	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/10/2023			SW846-8011	UJ
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/10/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene	J	0.78 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		235 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	3.5 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.762 mg/L	2	10/10/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW365 **DOWN** **RGA Type:** UCRS **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-0984 **SAMPLE ID:** MW365UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	2.27	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.371	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.749	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		52.3	mg/L	2	10/10/2023			SW846-9056A	=
Barometric Pressure Reading		29.9	Inches/Hg		10/10/2023				X
Conductivity		372	µmhos/cm		10/10/2023				X
Depth to Water		41.29	ft		10/10/2023				X
Dissolved Oxygen		6.54	mg/L		10/10/2023				X
Eh (approx)		465	mV		10/10/2023				X
pH		6.31	Std Unit		10/10/2023				X
Temperature		60.8	deg F		10/10/2023				X
Turbidity		2.94	NTU		10/10/2023				X
Aluminum	J	0.0405	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.104	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron	J	0.00527	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		17.9	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt		0.00114	mg/L	0.001	10/10/2023			SW846-6020B	J
Copper		0.00348	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron	J	0.0439	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		8.01	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese		0.0151	mg/L	0.005	10/10/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel		0.00511	mg/L	0.002	10/10/2023			SW846-6020B	J
Potassium	J	0.223	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		43.3	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	J	0.000082	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.00569	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.0998	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	J	0.000088	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=



PCB-1221	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=
PCB-1232	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=
PCB-1242	J	0.0427	ug/L	0.0988	10/10/2023			SW846-8082A	=
PCB-1248	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=
PCB-1254	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=
PCB-1260	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.0988	ug/L	0.0988	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	JY2	0.0427	ug/L	0.0988	10/10/2023			SW846-8082A	J
Radium-226	U	0.914	pCi/L	0.964	10/10/2023	0.883	0.885	AN-1418	=
Radium-228		4.06	pCi/L	3.58	10/10/2023	2.48	2.69	EPA-904-M	=
Strontium-90	U	2.4	pCi/L	6.78	10/10/2023	3.9	3.92	EPA-905.0-M	=
Tritium	U	28.1	pCi/L	221	10/10/2023	125	126	EPA-906.0-M	=
Technetium-99	U	-0.836	pCi/L	17.9	10/10/2023	10.1	10.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	-0.445	pCi/L	2.98	10/10/2023	1.07	1.08	HASL 300, Th-01-RC M	=
Thorium-232	U	0.239	pCi/L	1.9	10/10/2023	1.06	1.06	HASL 300, Th-01-RC M	=
Alpha activity	U	1.36	pCi/L	7.72	10/10/2023	3.81	3.81	SW846-9310	=
Beta activity	U	-7.22	pCi/L	10.6	10/10/2023	4.62	4.62	SW846-9310	UJ
1,2-Dibromo-3-chloropropane	UY2	0.0187	ug/L	0.0187	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/10/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		189 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)		13 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.5 mg/L	2	10/10/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW366 **DOWN** **RGA Type:** URGAs **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-0982 **SAMPLE ID:** MW366UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.483	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	38.3	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.224	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.941	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		47.6	mg/L	4	10/10/2023			SW846-9056A	=
Barometric Pressure Reading		29.91	Inches/Hg		10/10/2023				X
Conductivity		489	µmhos/cm		10/10/2023				X
Depth to Water		46.79	ft		10/10/2023				X
Dissolved Oxygen		3.8	mg/L		10/10/2023				X
Eh (approx)		462	mV		10/10/2023				X
pH		6.1	Std Unit		10/10/2023				X
Temperature		60.8	deg F		10/10/2023				X
Turbidity		2.16	NTU		10/10/2023				X
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.114	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron		0.076	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		33.9	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Copper	J	0.00158	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron	J	0.0573	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		14.1	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese	J	0.00254	mg/L	0.005	10/10/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel	J	0.000838	mg/L	0.002	10/10/2023			SW846-6020B	J
Potassium		2.1	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	J	0.00254	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		47.2	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.00374	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.108	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=

PCB-1221	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
PCB-1232	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
PCB-1242	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
PCB-1248	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
PCB-1254	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
PCB-1260	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.0998	ug/L	0.0998	10/10/2023			SW846-8082A	UJ
Radium-226	U	0.348	pCi/L	0.998	10/10/2023	0.641	0.642	AN-1418	=
Radium-228		4.13	pCi/L	3.76	10/10/2023	2.58	2.79	EPA-904-M	=
Strontium-90	U	-0.704	pCi/L	7.43	10/10/2023	3.52	3.52	EPA-905.0-M	=
Tritium	U	42.2	pCi/L	220	10/10/2023	126	126	EPA-906.0-M	=
Technetium-99		66.3	pCi/L	18.2	10/10/2023	13.5	15.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.136	pCi/L	3.25	10/10/2023	1.54	1.54	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.118	pCi/L	2.71	10/10/2023	1.14	1.14	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.249	pCi/L	6.78	10/10/2023	2.43	2.43	SW846-9310	=
Beta activity		41.5	pCi/L	7.9	10/10/2023	8.8	11.1	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0191	ug/L	0.0191	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/10/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene		1.61 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		233 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	4.08 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.761 mg/L	2	10/10/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW367 **DOWN** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4793 **SAMPLE ID:** MW367DUG1-24 **Sample Type:** FR

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	7.37	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.148	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	U	10	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		19.7	mg/L	0.8	10/10/2023			SW846-9056A	=
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	J	0.00205	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.127	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron		0.0154	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		13.5	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt		0.0061	mg/L	0.001	10/10/2023			SW846-6020B	J
Copper	J	0.000833	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron		6.09	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		7	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese		1.2	mg/L	0.05	10/10/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel		0.00252	mg/L	0.002	10/10/2023			SW846-6020B	J
Potassium		2.81	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		15.4	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.00996	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.118	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1221	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1232	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1242	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1248	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1254	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
PCB-1260	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.099	ug/L	0.099	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.099	ug/L	0.099	10/10/2023			SW846-8082A	UJ

Radium-226	U	0.514	pCi/L	1.14	10/10/2023	0.929	0.93	AN-1418	=
Radium-228	U	2.04	pCi/L	4.49	10/10/2023	2.63	2.68	EPA-904-M	=
Strontium-90	U	1.61	pCi/L	5.98	10/10/2023	3.37	3.38	EPA-905.0-M	=
Tritium	U	-72	pCi/L	219	10/10/2023	117	117	EPA-906.0-M	=
Technetium-99	U	-13	pCi/L	19	10/10/2023	10	10	HASL 300, Tc-02-RC M	UJ
Thorium-230	U	1.08	pCi/L	2.77	10/10/2023	1.71	1.72	HASL 300, Th-01-RC M	=
Thorium-232	U	0.604	pCi/L	1.35	10/10/2023	1.11	1.11	HASL 300, Th-01-RC M	=
Alpha activity	U	-1.89	pCi/L	9.24	10/10/2023	3.5	3.5	SW846-9310	=
Beta activity	U	1.7	pCi/L	7.12	10/10/2023	3.92	3.93	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/10/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=

trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		90 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.537 mg/L	2	10/10/2023	SW846-9060A	=



**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW367 **DOWN** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4793 **SAMPLE ID:** MW367UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	7.03	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.185	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	U	10	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		19.5	mg/L	0.8	10/10/2023			SW846-9056A	=
Barometric Pressure Reading		29.91	Inches/Hg		10/10/2023				X
Conductivity		230	µmhos/cm		10/10/2023				X
Depth to Water		47.17	ft		10/10/2023				X
Dissolved Oxygen		0.78	mg/L		10/10/2023				X
Eh (approx)		281	mV		10/10/2023				X
pH		5.87	Std Unit		10/10/2023				X
Temperature		62.2	deg F		10/10/2023				X
Turbidity		13.07	NTU		10/10/2023				X
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.126	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron	J	0.0145	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		13.6	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt		0.00634	mg/L	0.001	10/10/2023			SW846-6020B	J
Copper	J	0.000891	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron		6.31	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		6.95	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese		1.21	mg/L	0.05	10/10/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel		0.00243	mg/L	0.002	10/10/2023			SW846-6020B	J
Potassium		2.76	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		15.2	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.0105	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.129	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=

PCB-1221	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
PCB-1232	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
PCB-1242	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
PCB-1248	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
PCB-1254	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
PCB-1260	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.0991	ug/L	0.0991	10/10/2023			SW846-8082A	UJ
Radium-226	U	1.38	pCi/L	1.39	10/10/2023	1.31	1.32	AN-1418	=
Radium-228	U	0.509	pCi/L	4.27	10/10/2023	2.29	2.29	EPA-904-M	=
Strontium-90	U	-1.46	pCi/L	6.86	10/10/2023	3.22	3.22	EPA-905.0-M	=
Tritium	U	-108	pCi/L	221	10/10/2023	115	115	EPA-906.0-M	=
Technetium-99	U	-0.151	pCi/L	18.7	10/10/2023	10.6	10.6	HASL 300, Tc-02-RC M	=
Thorium-230	U	-0.146	pCi/L	2.67	10/10/2023	1.13	1.13	HASL 300, Th-01-RC M	=
Thorium-232	U	0.447	pCi/L	1.87	10/10/2023	1.13	1.13	HASL 300, Th-01-RC M	=
Alpha activity	U	5.64	pCi/L	6.57	10/10/2023	4.75	4.83	SW846-9310	=
Beta activity	U	6.5	pCi/L	7.2	10/10/2023	4.76	4.89	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0191	ug/L	0.0191	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/10/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		85 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.534 mg/L	2	10/10/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW369 **UP** **RGA Type:** URGa **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4820 **SAMPLE ID:** MW369UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.331	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	27.5	mg/L	250	10/11/2023			SW846-9056A	=
Fluoride	J	0.292	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.922	mg/L	10	10/11/2023			SW846-9056A	=
Sulfate		8.72	mg/L	0.4	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.85	Inches/Hg		10/11/2023				X
Conductivity		345	µmhos/cm		10/11/2023				X
Depth to Water		40.89	ft		10/11/2023				X
Dissolved Oxygen		3.49	mg/L		10/11/2023				X
Eh (approx)		385	mV		10/11/2023				X
pH		6.02	Std Unit		10/11/2023				X
Temperature		58.7	deg F		10/11/2023				X
Turbidity		6.84	NTU		10/11/2023				X
Aluminum		0.0661	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.379	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron		0.0159	mg/L	0.015	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		16	mg/L	0.2	10/11/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt		0.00636	mg/L	0.001	10/11/2023			SW846-6020B	J
Copper		0.00446	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron		0.323	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		6.42	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese		0.0369	mg/L	0.005	10/11/2023			SW846-6020B	=
Molybdenum	J	0.00025	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel		0.00431	mg/L	0.002	10/11/2023			SW846-6020B	J
Potassium		0.574	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium	J	0.00322	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		46.9	mg/L	0.25	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	J	0.00914	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.392	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ

PCB-1221	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1232	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1242	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1248	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1254	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1260	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ
Radium-226	U	0.405	pCi/L	1.24	10/11/2023	0.842	0.842	AN-1418	=
Radium-228	U	2.82	pCi/L	3.13	10/11/2023	2.08	2.2	EPA-904-M	=
Strontium-90	U	3.63	pCi/L	4.6	10/11/2023	2.85	2.9	EPA-905.0-M	=
Tritium	U	-45.9	pCi/L	229	10/11/2023	125	125	EPA-906.0-M	=
Technetium-99		76.7	pCi/L	18.3	10/11/2023	14	16.5	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.63	pCi/L	2.18	10/11/2023	1.61	1.63	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.166	pCi/L	1.51	10/11/2023	0.546	0.547	HASL 300, Th-01-RC M	=
Alpha activity	U	2.23	pCi/L	9.13	10/11/2023	4.78	4.79	SW846-9310	=
Beta activity		45.5	pCi/L	12.1	10/11/2023	10.5	12.9	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.019	ug/L	0.019	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene		1.72 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		192 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	J	13.2 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	7.88 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.824 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW370 **UP** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4818 **SAMPLE ID:** MW370UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.549	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	39.4	mg/L	250	10/11/2023			SW846-9056A	=
Fluoride	J	0.238	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.971	mg/L	10	10/11/2023			SW846-9056A	=
Sulfate		18.8	mg/L	4	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.87	Inches/Hg		10/11/2023				X
Conductivity		450	µmhos/cm		10/11/2023				X
Depth to Water		41.36	ft		10/11/2023				X
Dissolved Oxygen		4.64	mg/L		10/11/2023				X
Eh (approx)		327	mV		10/11/2023				X
pH		6.1	Std Unit		10/11/2023				X
Temperature		59.7	deg F		10/11/2023				X
Turbidity		4.66	NTU		10/11/2023				X
Aluminum	U	0.05	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.234	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron		0.118	mg/L	0.015	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		29	mg/L	0.2	10/11/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt	J	0.000302	mg/L	0.001	10/11/2023			SW846-6020B	J
Copper		0.00205	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron	J	0.0622	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		12.1	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese		0.00696	mg/L	0.005	10/11/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Potassium		2.55	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		43.3	mg/L	0.25	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	J	0.00963	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.239	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	UJ

PCB-1221	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
PCB-1242	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.1	ug/L	0.1	10/11/2023			SW846-8082A	UJ
Radium-226	U	0.243	pCi/L	1.15	10/11/2023	0.767	0.767	AN-1418	=
Radium-228	U	2.3	pCi/L	4.37	10/11/2023	2.61	2.67	EPA-904-M	=
Strontium-90	U	5.54	pCi/L	6.31	10/11/2023	4.03	4.13	EPA-905.0-M	=
Tritium	U	-14.4	pCi/L	227	10/11/2023	126	126	EPA-906.0-M	=
Technetium-99	U	18.6	pCi/L	18.7	10/11/2023	11.5	11.7	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.5	pCi/L	2.64	10/11/2023	2.08	2.12	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.103	pCi/L	2.18	10/11/2023	0.91	0.911	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.84	pCi/L	11.5	10/11/2023	4.98	4.98	SW846-9310	=
Beta activity	U	8.9	pCi/L	11.4	10/11/2023	7.11	7.26	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0187	ug/L	0.0187	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=



Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene		2.84 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		230 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	J	13.2 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)		10.2 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.846 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW371 **UP** **RGA Type:** UCRS **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4819 **SAMPLE ID:** MW371UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	3.73	mg/L	250	10/11/2023			SW846-9056A	=
Fluoride	J	0.284	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.172	mg/L	10	10/11/2023			SW846-9056A	=
Sulfate		15.8	mg/L	0.4	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.87	Inches/Hg		10/11/2023				X
Conductivity		695	µmhos/cm		10/11/2023				X
Depth to Water		24.76	ft		10/11/2023				X
Dissolved Oxygen		1.33	mg/L		10/11/2023				X
Eh (approx)		376	mV		10/11/2023				X
pH		6.46	Std Unit		10/11/2023				X
Temperature		59.9	deg F		10/11/2023				X
Turbidity		10.84	NTU		10/11/2023				X
Aluminum		0.949	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.138	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron	U	0.015	mg/L	0.015	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		53.9	mg/L	2	10/11/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Copper	J	0.00186	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron		0.517	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		17.3	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese		0.00961	mg/L	0.005	10/11/2023			SW846-6020B	J
Molybdenum	J	0.000524	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel		0.0023	mg/L	0.002	10/11/2023			SW846-6020B	J
Potassium		0.446	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		79.7	mg/L	2.5	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium		0.00167	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	J	0.00508	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	J	0.00575	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.137	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved		0.00157	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ

PCB-1221	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1232	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1242	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1248	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1254	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1260	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ
Radium-226	U	0.431	pCi/L	0.516	10/11/2023	0.46	0.461	AN-1418	=
Radium-228	U	1.17	pCi/L	3.27	10/11/2023	1.86	1.89	EPA-904-M	=
Strontium-90	U	2.88	pCi/L	3.19	10/11/2023	2.04	2.1	EPA-905.0-M	=
Tritium	U	35.7	pCi/L	229	10/11/2023	130	130	EPA-906.0-M	=
Technetium-99	U	-7.46	pCi/L	17.8	10/11/2023	9.66	9.66	HASL 300, Tc-02-RC M	=
Thorium-230	U	-0.0785	pCi/L	2.53	10/11/2023	1.09	1.1	HASL 300, Th-01-RC M	=
Thorium-232	U	0.0459	pCi/L	2	10/11/2023	0.923	0.923	HASL 300, Th-01-RC M	=
Alpha activity	U	3.63	pCi/L	9.93	10/11/2023	5.58	5.61	SW846-9310	=
Beta activity	U	3.66	pCi/L	12.8	10/11/2023	7.3	7.32	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0187	ug/L	0.0187	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		388 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	4.52 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)		2.11 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW372 **UP** **RGA Type:** URGa **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4808 **SAMPLE ID:** MW372UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.497	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	38.4	mg/L	250	10/11/2023			SW846-9056A	=
Fluoride	J	0.263	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.818	mg/L	10	10/11/2023			SW846-9056A	=
Sulfate		143	mg/L	4	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.87	Inches/Hg		10/11/2023				X
Conductivity		747	µmhos/cm		10/11/2023				X
Depth to Water		36.05	ft		10/11/2023				X
Dissolved Oxygen		3.24	mg/L		10/11/2023				X
Eh (approx)		340	mV		10/11/2023				X
pH		6.13	Std Unit		10/11/2023				X
Temperature		60.6	deg F		10/11/2023				X
Turbidity		4	NTU		10/11/2023				X
Aluminum	U	0.05	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.0547	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron		1.19	mg/L	0.3	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		64.6	mg/L	4	10/11/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Copper	J	0.00162	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron		0.125	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		21.6	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese	J	0.00265	mg/L	0.005	10/11/2023			SW846-6020B	J
Molybdenum	J	0.00022	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel	J	0.000761	mg/L	0.002	10/11/2023			SW846-6020B	J
Potassium		2.1	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium	J	0.0016	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		59	mg/L	5	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.0563	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ

PCB-1221	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1232	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1242	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1248	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1254	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
PCB-1260	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.104	ug/L	0.104	10/11/2023			SW846-8082A	UJ
Radium-226	U	0.483	pCi/L	0.686	10/11/2023	0.528	0.529	AN-1418	=
Radium-228	U	0.29	pCi/L	3.38	10/11/2023	1.75	1.76	EPA-904-M	=
Strontium-90	U	2.91	pCi/L	6.15	10/11/2023	3.62	3.65	EPA-905.0-M	=
Tritium	U	9.23	pCi/L	229	10/11/2023	128	128	EPA-906.0-M	=
Technetium-99		22.5	pCi/L	19.2	10/11/2023	12.1	12.3	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.0946	pCi/L	3.11	10/11/2023	1.46	1.46	HASL 300, Th-01-RC M	=
Thorium-232	U	0.674	pCi/L	1.48	10/11/2023	1.23	1.23	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.22	pCi/L	10.1	10/11/2023	4.13	4.13	SW846-9310	=
Beta activity		29.2	pCi/L	12.2	10/11/2023	9.25	10.5	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene		4.31 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		447 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	J	11 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	8.32 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW373 **UP** **RGA Type:** LRGA **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-4792 **SAMPLE ID:** MW373UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.462	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	31.2	mg/L	4	10/11/2023			SW846-9056A	=
Fluoride	J	0.233	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.71	mg/L	10	10/11/2023			SW846-9056A	=
Sulfate		177	mg/L	8	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.85	Inches/Hg		10/11/2023				X
Conductivity		898	µmhos/cm		10/11/2023				X
Depth to Water		36.32	ft		10/11/2023				X
Dissolved Oxygen		2	mg/L		10/11/2023				X
Eh (approx)		357	mV		10/11/2023				X
pH		6.14	Std Unit		10/11/2023				X
Temperature		64.7	deg F		10/11/2023				X
Turbidity		3.68	NTU		10/11/2023				X
Aluminum	U	0.05	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.0339	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron		2.06	mg/L	0.3	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		79	mg/L	4	10/11/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt	J	0.000542	mg/L	0.001	10/11/2023			SW846-6020B	J
Copper	J	0.00162	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron	J	0.0956	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		27.8	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese		0.0709	mg/L	0.005	10/11/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel	J	0.00179	mg/L	0.002	10/11/2023			SW846-6020B	J
Potassium		2.7	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		64.6	mg/L	5	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium	J	0.000072	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	J	0.00486	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.0351	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved	J	0.000069	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ



PCB-1221	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1232	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1242	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1248	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1254	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
PCB-1260	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.101	ug/L	0.101	10/11/2023			SW846-8082A	UJ
Radium-226	U	0.199	pCi/L	0.81	10/11/2023	0.456	0.457	AN-1418	=
Radium-228	U	0.993	pCi/L	3.48	10/11/2023	1.94	1.96	EPA-904-M	=
Strontium-90	U	4.55	pCi/L	5.98	10/11/2023	3.76	3.84	EPA-905.0-M	=
Tritium	U	-33.1	pCi/L	229	10/11/2023	125	125	EPA-906.0-M	=
Technetium-99	U	14.7	pCi/L	18.1	10/11/2023	11	11.2	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.179	pCi/L	2.42	10/11/2023	1.18	1.18	HASL 300, Th-01-RC M	=
Thorium-232	U	0.0402	pCi/L	1.88	10/11/2023	0.866	0.867	HASL 300, Th-01-RC M	=
Alpha activity	U	1.39	pCi/L	8.09	10/11/2023	3.86	3.86	SW846-9310	=
Beta activity	U	6.39	pCi/L	14.5	10/11/2023	8.56	8.62	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.0188	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene		3.5 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		529 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)		13 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.33 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW374 **UP** **RGA Type:** UCRS **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-0990 **SAMPLE ID:** MW374UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.607	mg/L	0.2	10/11/2023			SW846-9056A	=
Chloride	J	48.9	mg/L	250	10/11/2023			SW846-9056A	=
Fluoride	J	0.227	mg/L	4	10/11/2023			SW846-9056A	=
Nitrate as Nitrogen	JW	0.223	mg/L	10	10/11/2023			SW846-9056A	J
Sulfate		14.2	mg/L	0.4	10/11/2023			SW846-9056A	=
Barometric Pressure Reading		29.83	Inches/Hg		10/11/2023				X
Conductivity		882	µmhos/cm		10/11/2023				X
Depth to Water		24.1	ft		10/11/2023				X
Dissolved Oxygen		1.84	mg/L		10/11/2023				X
Eh (approx)		398	mV		10/11/2023				X
pH		6.13	Std Unit		10/11/2023				X
Temperature		66	deg F		10/11/2023				X
Turbidity		3.61	NTU		10/11/2023				X
Aluminum		0.171	mg/L	0.05	10/11/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/11/2023			SW846-6020B	=
Arsenic	J	0.00293	mg/L	0.005	10/11/2023			SW846-6020B	=
Barium		0.175	mg/L	0.004	10/11/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/11/2023			SW846-6020B	=
Boron		0.0181	mg/L	0.015	10/11/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Calcium		24.5	mg/L	0.2	10/11/2023			SW846-6020B	=
Chromium	J	0.00459	mg/L	0.01	10/11/2023			SW846-6020B	=
Cobalt	J	0.000917	mg/L	0.001	10/11/2023			SW846-6020B	J
Copper	J	0.00117	mg/L	0.002	10/11/2023			SW846-6020B	J
Iron		1.37	mg/L	0.1	10/11/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Magnesium		5.9	mg/L	0.03	10/11/2023			SW846-6020B	=
Manganese		0.33	mg/L	0.005	10/11/2023			SW846-6020B	=
Molybdenum	J	0.000304	mg/L	0.001	10/11/2023			SW846-6020B	=
Nickel	J	0.00071	mg/L	0.002	10/11/2023			SW846-6020B	J
Potassium		0.433	mg/L	0.3	10/11/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Selenium		0.00698	mg/L	0.005	10/11/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/11/2023			SW846-6020B	=
Sodium		121	mg/L	2.5	10/11/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/11/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/11/2023			SW846-6020B	=
Uranium		0.000329	mg/L	0.0002	10/11/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	10/11/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/11/2023			SW846-7470A	=
Barium, Dissolved		0.147	mg/L	0.004	10/11/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/11/2023			SW846-6020B	=
Uranium, Dissolved		0.000303	mg/L	0.0002	10/11/2023			SW846-6020B	=
PCB-1016	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	UJ

PCB-1221	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
PCB-1232	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
PCB-1242	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
PCB-1248	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
PCB-1254	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
PCB-1260	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	UJ
PCB-1268	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.106	ug/L	0.106	10/11/2023			SW846-8082A	UJ
Radium-226	U	1.14	pCi/L	1.56	10/11/2023	1.28	1.28	AN-1418	=
Radium-228	U	0.705	pCi/L	3.54	10/11/2023	1.91	1.92	EPA-904-M	=
Strontium-90	U	0.174	pCi/L	6.28	10/11/2023	3.32	3.32	EPA-905.0-M	=
Tritium	U	-87.8	pCi/L	228	10/11/2023	121	121	EPA-906.0-M	=
Technetium-99	U	14.6	pCi/L	19.7	10/11/2023	11.9	12.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.43	pCi/L	2.89	10/11/2023	2.25	2.28	HASL 300, Th-01-RC M	=
Thorium-232	U	0.33	pCi/L	2.42	10/11/2023	1.27	1.27	HASL 300, Th-01-RC M	=
Alpha activity	U	3.69	pCi/L	11.7	10/11/2023	6.42	6.45	SW846-9310	=
Beta activity	U	8.54	pCi/L	14.1	10/11/2023	8.51	8.63	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.019	ug/L	0.019	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/11/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Dissolved Solids		384 mg/L	10	10/11/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/11/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	J	11 mg/L	20	10/11/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/11/2023	SW846-9012B	=
Total Organic Halides (TOX)		16.5 ug/L	10	10/11/2023	SW846-9020B	=
Total Organic Carbon (TOC)		2.28 mg/L	2	10/11/2023	SW846-9060A	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** MW375 **SIDE:** **RGa Type:** UCRS **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** 8004-0985 **SAMPLE ID:** MW375UG1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	10/10/2023			SW846-9056A	=
Chloride	J	3.13	mg/L	250	10/10/2023			SW846-9056A	=
Fluoride	J	0.403	mg/L	4	10/10/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.889	mg/L	10	10/10/2023			SW846-9056A	=
Sulfate		22.3	mg/L	0.8	10/10/2023			SW846-9056A	=
Barometric Pressure Reading		29.93	Inches/Hg		10/10/2023				X
Conductivity		330	µmhos/cm		10/10/2023				X
Depth to Water		40.58	ft		10/10/2023				X
Dissolved Oxygen		3.09	mg/L		10/10/2023				X
Eh (approx)		445	mV		10/10/2023				X
pH		6.39	Std Unit		10/10/2023				X
Temperature		64.6	deg F		10/10/2023				X
Turbidity		5.11	NTU		10/10/2023				X
Aluminum		0.0678	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium		0.182	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron	J	0.00667	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium		13.8	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt	J	0.000308	mg/L	0.001	10/10/2023			SW846-6020B	J
Copper	J	0.00181	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron		0.117	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium		5.46	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese	J	0.00446	mg/L	0.005	10/10/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel	J	0.00123	mg/L	0.002	10/10/2023			SW846-6020B	J
Potassium	J	0.293	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	J	0.00257	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	J	0.000351	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium		52.9	mg/L	2.5	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.00524	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
Barium, Dissolved		0.171	mg/L	0.004	10/10/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
PCB-1016	UY2	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=

PCB-1221	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
PCB-1232	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
PCB-1242	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
PCB-1248	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
PCB-1254	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
PCB-1260	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.102	ug/L	0.102	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.102	ug/L	0.102	10/10/2023			SW846-8082A	UJ
Radium-226	U	0.813	pCi/L	0.858	10/10/2023	0.786	0.788	AN-1418	=
Radium-228	U	-0.0658	pCi/L	3.88	10/10/2023	1.97	1.97	EPA-904-M	=
Strontium-90	U	3.12	pCi/L	5.66	10/10/2023	3.41	3.44	EPA-905.0-M	=
Tritium	U	-13.9	pCi/L	220	10/10/2023	122	122	EPA-906.0-M	=
Technetium-99	U	4.2	pCi/L	19.6	10/10/2023	11.3	11.3	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.2	pCi/L	2.72	10/10/2023	1.71	1.73	HASL 300, Th-01-RC M	=
Thorium-232	U	0.115	pCi/L	1.76	10/10/2023	0.875	0.876	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.55	pCi/L	9.13	10/10/2023	3.88	3.88	SW846-9310	=
Beta activity	U	-2.11	pCi/L	7.84	10/10/2023	3.62	3.62	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Ethylbenzene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	10/10/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Dissolved Solids		168 mg/L	10	10/10/2023	EPA-160.1	=
Iodide	U	0.5 mg/L	0.5	10/10/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20 mg/L	20	10/10/2023	EPA-410.4	=
Cyanide	U	0.2 mg/L	0.2	10/10/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	6.56 ug/L	10	10/10/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.918 mg/L	2	10/10/2023	SW846-9060A	=



**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** N/A **SAMPLE ID:** FB1UG1-24 **Sample Typ** FB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium	U	0.004	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron	U	0.015	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium	U	0.2	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Copper	J	0.00121	mg/L	0.002	10/10/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium	U	0.03	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Potassium	U	0.3	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium	U	0.25	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	J	0.00929	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
PCB-1016	UY2	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1221	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1232	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1242	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1248	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1254	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1260	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.104	ug/L	0.104	10/10/2023			SW846-8082A	UJ
Radium-226	U	0.826	pCi/L	1.05	10/10/2023	0.857	0.859	AN-1418	=
Radium-228		4.56	pCi/L	4.23	10/10/2023	2.83	3.06	EPA-904-M	=
Strontium-90	U	-1.62	pCi/L	6.83	10/10/2023	3.4	3.4	EPA-905.0-M	=
Tritium	U	45.6	pCi/L	222	10/10/2023	127	127	EPA-906.0-M	=
Technetium-99	U	-0.0639	pCi/L	17.9	10/10/2023	10.2	10.2	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.26	pCi/L	2.33	10/10/2023	1.57	1.59	HASL 300, Th-01-RC M	=
Thorium-232	U	0.384	pCi/L	1.64	10/10/2023	0.979	0.98	HASL 300, Th-01-RC M	=
Alpha activity	U	-2.49	pCi/L	8.44	10/10/2023	2.71	2.71	SW846-9310	=

Beta activity	U	2.7	pCi/L	8.36	10/10/2023	4.75	4.77	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.0191	ug/L	0.0191	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone		5.02	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/10/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodide	U	0.5	mg/L	0.5	10/10/2023			EPA-300.0	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** N/A **SAMPLE ID:** RI1UG1-24 **Sample Typ** RI

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Aluminum	U	0.05	mg/L	0.05	10/10/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	10/10/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Barium	U	0.004	mg/L	0.004	10/10/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	10/10/2023			SW846-6020B	=
Boron	U	0.015	mg/L	0.015	10/10/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Calcium	U	0.2	mg/L	0.2	10/10/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	10/10/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Copper	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Iron	U	0.1	mg/L	0.1	10/10/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Magnesium	U	0.03	mg/L	0.03	10/10/2023			SW846-6020B	=
Manganese	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Potassium	U	0.3	mg/L	0.3	10/10/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	10/10/2023			SW846-6020B	=
Sodium	U	0.25	mg/L	0.25	10/10/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	10/10/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	10/10/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	10/10/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	10/10/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	10/10/2023			SW846-7470A	=
PCB-1016	UY2	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1221	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1232	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1242	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1248	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1254	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
PCB-1260	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	UJ
PCB-1268	U	0.104	ug/L	0.104	10/10/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.104	ug/L	0.104	10/10/2023			SW846-8082A	UJ
Radium-226	U	0.0643	pCi/L	0.916	10/10/2023	0.455	0.455	AN-1418	=
Radium-228	U	1.72	pCi/L	3.86	10/10/2023	2.26	2.3	EPA-904-M	=
Strontium-90	U	4.65	pCi/L	5.96	10/10/2023	3.79	3.86	EPA-905.0-M	=
Tritium	U	100	pCi/L	221	10/10/2023	130	132	EPA-906.0-M	=
Technetium-99	U	-2.22	pCi/L	18	10/10/2023	10.1	10.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.554	pCi/L	2.46	10/10/2023	1.36	1.36	HASL 300, Th-01-RC M	=
Thorium-232	U	0.511	pCi/L	1.19	10/10/2023	0.948	0.95	HASL 300, Th-01-RC M	=
Alpha activity	U	1.39	pCi/L	6.61	10/10/2023	3.38	3.39	SW846-9310	=

Beta activity	U	-3.58	pCi/L	13.9	10/10/2023	7.24	7.24	SW846-9310	=
1,2-Dibromo-3-chloropropane	UY2	0.019	ug/L	0.019	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/10/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodide	U	0.5	mg/L	0.5	10/10/2023			EPA-300.0	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** N/A **SAMPLE ID:** TB1UG1-24 **Sample Typ** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	UY2	0.0189	ug/L	0.0189	10/9/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/9/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	10/9/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	10/9/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	10/9/2023			SW846-8260D	=

Trichlorofluoromethane	U	1 ug/L	1	10/9/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/9/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/9/2023	SW846-8260D	=

**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** N/A **SAMPLE ID:** TB2UG1-24 **Sample Typ** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	UY2	0.0191	ug/L	0.0191	10/10/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acetone	J	2.05	ug/L	5	10/10/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/10/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	10/10/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	10/10/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	10/10/2023			SW846-8260D	=

Trichlorofluoromethane	U	1 ug/L	1	10/10/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/10/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/10/2023	SW846-8260D	=



**Paducah OREIS**  
**GROUNDWATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**AKGWA Well Tag #:** N/A **SAMPLE ID:** TB3UG1-24 **Sample Typ** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	10/11/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	10/11/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	10/11/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	10/11/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	10/11/2023			SW846-8260D	=

Trichlorofluoromethane	U	1 ug/L	1	10/11/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	10/11/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	10/11/2023	SW846-8260D	=

Qualifier Code Definitions	
B	Analyte found in the associated blank
H	Analysis performed outside holding time requirement
J	Estimated value
L	LCS or LCSD recovery outside of control limits
L1	LCS/LCSD RPD outside acceptance criteria
N	Sample spike (MS/MSD) recovery not within control limits
N1	MS/MSD RPD outside acceptance criteria
P	Difference between results from two GC columns outside control limits
S	Sample surrogate recovery outside acceptance criteria
T	Tracer recovery outside control limits of 30-110%
U	Analyte analyzed for but not detected at or below the lowest concentration reported.
W	Post-digestion spike recovery out of control limits
W1	Post-digestion spike and post-digestion spike duplicate RPD out of control limits
X	Other specific flags and footnotes may be required to properly define the results.
Y1	MS/MSD recovery outside acceptance criteria
Y2	MS/MSD RPD outside acceptance criteria

RGA Type Code Definitions	
LRGA	Lower Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
NA	

Sample Type Code Definitions	
REG	Regular
FR	Field Replicate (code used for Field Duplicate)
RI	Equipment Rinsate Blank
FB	Field Blank
TB	Trip Blank

Validation Code Definitions	
=	Validated result, no additional qualifier necessary
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	Analyte not detected above the reported detection limit, and the reported detection limit is approximated due to quality deficiency.
X	Not validated

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**ATTACHMENT C1**

**GEL LABORATORIES CERTIFICATE OF ANALYSIS**

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# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001  
Matrix: WG  
Collect Date: 09-OCT-23  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*AN-1418 AlphaSpec Ra226, Liquid "As Received"*

Radium-226	U	0.605	+/-0.599	0.683	+/-0.600	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
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*Th-01-RC M, Th Isotopes, Liquid "As Received"*

Thorium-230	U	1.78	+/-2.07	2.95	+/-2.09	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
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Thorium-232	U	0.149	+/-1.06	2.12	+/-1.06		pCi/L							
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### Rad Gas Flow Proportional Counting

*904.0Mod, Ra228, Liquid "As Received"*

Radium-228	U	0.703	+/-2.17	3.99	+/-2.18	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
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*905.0Mod, Sr90, liquid "As Received"*

Strontium-90	U	1.95	+/-2.80	4.83	+/-2.82	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
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*9310, Alpha/Beta Activity, liquid "As Received"*

Alpha	U	5.97	+/-4.92	6.92	+/-5.03	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
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Beta		22.9	+/-7.27	8.78	+/-8.19	50.0	pCi/L							
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### Rad Liquid Scintillation Analysis

*906.0M, Tritium Dist, Liquid "As Received"*

Tritium	U	-39.2	+/-121	222	+/-121	300	pCi/L			GS3	10/28/23	1552	2509431	6
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*Tc-02-RC-MOD, Tc99, Liquid "As Received"*

Technetium-99		34.0	+/-11.9	17.9	+/-12.5	25.0	pCi/L			AG2	11/05/23	1645	2506694	7
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### The following Analytical Methods were performed

Method	Description
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1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	93.3	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	72.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	85.1	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	77.3	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	97.5	(30%-110%)

# GEL LABORATORIES LLC

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24

Sample ID: 640537001

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty



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## Certificate of Analysis

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24

Project: FRNP00507

Sample ID: 640537003

Client ID: FRNP005

Matrix: WG

Collect Date: 09-OCT-23

Receive Date: 10-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.486	+/-0.610	0.747	+/-0.610	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	2.56	+/-2.50	3.39	+/-2.54	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
Thorium-232	U	0.164	+/-1.15	2.29	+/-1.15		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	1.32	+/-2.24	3.94	+/-2.27	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	4.03	+/-3.53	5.64	+/-3.59	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	1.94	+/-3.79	7.15	+/-3.80	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
Beta		10.6	+/-6.31	9.40	+/-6.55	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	15.5	+/-124	221	+/-124	300	pCi/L			GS3	10/28/23	1629	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99		38.3	+/-12.4	18.4	+/-13.1	25.0	pCi/L			AG2	11/05/23	1702	2506694	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	87.2	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	68.5	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	84	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	56.8	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	94.8	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24

Project: FRNP00507

Sample ID: 640537003

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24

Project: FRNP00507

Sample ID: 640537005

Client ID: FRNP005

Matrix: WG

Collect Date: 09-OCT-23

Receive Date: 10-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.712	+/-0.782	0.922	+/-0.784	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	1.12	+/-1.34	2.00	+/-1.36	50.0	pCi/L			CM4	11/01/23	1050	2510227	2
Thorium-232	U	-0.0969	+/-0.469	1.20	+/-0.469		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	2.72	+/-2.23	3.48	+/-2.33	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	2.20	+/-2.92	5.00	+/-2.94	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	2.22	+/-3.69	6.73	+/-3.70	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
Beta	U	3.30	+/-5.35	9.31	+/-5.38	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	67.6	+/-127	220	+/-128	300	pCi/L			GS3	10/28/23	1706	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	6.18	+/-10.5	17.9	+/-10.5	25.0	pCi/L			AG2	11/05/23	1719	2506694	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	89.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	97.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	89	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	59.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	96.6	(30%-110%)

# GEL LABORATORIES LLC

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24

Project: FRNP00507

Sample ID: 640537005

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24

Project: FRNP00507

Sample ID: 640537007

Client ID: FRNP005

Matrix: WG

Collect Date: 09-OCT-23

Receive Date: 10-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.226	+/-0.804	1.55	+/-0.804	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	0.243	+/-1.27	2.54	+/-1.27	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
Thorium-232	U	0.123	+/-0.918	1.84	+/-0.918		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	1.94	+/-2.03	3.35	+/-2.09	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	TU	-3.94	+/-3.51	7.51	+/-3.51	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	4.93	+/-4.48	6.41	+/-4.56	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
Beta		25.3	+/-7.57	9.02	+/-8.62	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	78.9	+/-129	221	+/-130	300	pCi/L			GS3	10/28/23	1743	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99		50.3	+/-12.0	16.7	+/-13.3	25.0	pCi/L			AG2	11/05/23	1735	2506694	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	89.1	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	91.9	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	88.2	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	29.5 *	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	98.9	(30%-110%)

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24

Project: FRNP00507

Sample ID: 640537007

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24

Project: FRNP00507

Sample ID: 640537009

Client ID: FRNP005

Matrix: WG

Collect Date: 09-OCT-23

Receive Date: 10-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.395	+/-0.688	1.03	+/-0.689	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	2.30	+/-2.09	2.65	+/-2.13	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
Thorium-232	U	-0.203	+/-0.711	1.94	+/-0.712		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	0.205	+/-1.87	3.60	+/-1.87	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	4.03	+/-3.89	6.44	+/-3.95	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-2.53	+/-3.38	9.65	+/-3.38	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
Beta	U	6.82	+/-5.58	8.91	+/-5.69	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-14.5	+/-122	220	+/-122	300	pCi/L			GS3	10/28/23	1819	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-2.83	+/-10.4	18.6	+/-10.4	25.0	pCi/L			AG2	11/05/23	1752	2506694	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	86.5	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	78.7	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	88.3	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	84.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	95.6	(30%-110%)

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24

Project: FRNP00507

Sample ID: 640537009

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration



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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24

Project: FRNP00507

Sample ID: 640537011

Client ID: FRNP005

Matrix: WG

Collect Date: 09-OCT-23

Receive Date: 10-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.701	+/-0.817	1.04	+/-0.818	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	2.30	+/-2.08	2.73	+/-2.11	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
Thorium-232	U	-0.106	+/-0.947	2.27	+/-0.948		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	3.10	+/-2.61	4.16	+/-2.73	4.99	pCi/L			JE1	10/27/23	1147	2512653	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	-0.500	+/-2.88	5.55	+/-2.88	8.00	pCi/L			ST2	10/31/23	1506	2511643	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	2.16	+/-4.31	7.98	+/-4.32	15.0	pCi/L			KP1	10/26/23	0912	2510794	5
Beta	U	7.42	+/-5.47	8.56	+/-5.60	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-4.92	+/-123	222	+/-123	300	pCi/L			GS3	10/28/23	1856	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	4.47	+/-10.4	17.9	+/-10.4	25.0	pCi/L			AG2	11/05/23	1809	2506694	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	87.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	91.6	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2512653	83.7	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2511643	75	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2506694	98.2	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24

Sample ID: 640537011

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001  
Matrix: WG  
Collect Date: 09-OCT-23 12:00  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0195	0.00879	0.0195	ug/L	0.976	1	LOF	10/13/23	1508	2507788	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.648	0.330	2.00	mg/L		1	RM3	11/02/23	1941	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	0956	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RMJ	10/13/23	0135	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	1857	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	30.0	0.335	250	mg/L		5	JLD1	10/10/23	2342	2506215	7
Sulfate		36.7	0.665	2.00	mg/L		5					
Bromide		0.361	0.0670	0.200	mg/L		1	JLD1	10/10/23	1544	2506215	8
Fluoride	J	0.179	0.0330	4.00	mg/L		1					
Nitrate-N	J	1.10	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1058	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0021	2506552	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Boron		0.301	0.0260	0.0750	mg/L	1.00	5	PRB	11/03/23	0742	2506552	11
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2216	2506552	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0762	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		24.9	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00153	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		9.65	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00286	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium		1.54	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		35.1	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00448	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0997	0.0332	0.0997	ug/L	0.000997	1	NS2	10/27/23	1205	2514783	13
Aroclor-1221	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1232	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1242	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1248	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1254	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1260	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1268	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-Total	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		186	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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## Certificate of Analysis

Report Date: January 31, 2024

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1740	2506372	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1300	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		2.41	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.18 ug/L	6.97	103	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.133 ug/L	0.199	67	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.118 ug/L	0.199	59	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	50.7 ug/L	50.0	101	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.3 ug/L	50.0	101	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.8 ug/L	50.0	100	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW357UG1-24  
Sample ID: 640537002  
Matrix: WG  
Collect Date: 09-OCT-23 12:00  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0768	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2220	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24  
Sample ID: 640537003  
Matrix: WG  
Collect Date: 09-OCT-23 12:50  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00856	0.0190	ug/L	0.952	1	LOF	10/13/23	1533	2507788	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		3.88	0.330	2.00	mg/L		1	RM3	11/02/23	2020	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	0957	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RMJ	10/13/23	0237	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	1910	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	26.8	0.335	250	mg/L		5	JLD1	10/11/23	0014	2506215	7
Sulfate		45.0	0.665	2.00	mg/L		5					
Bromide		0.338	0.0670	0.200	mg/L		1	JLD1	10/10/23	1616	2506215	8
Fluoride	J	0.197	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.582	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1059	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.351	0.0260	0.0750	mg/L	1.00	5	PRB	11/03/23	0745	2506552	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0022	2506552	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2223	2506552	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0589	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24  
Sample ID: 640537003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		31.8	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00514	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000907	0.000300	0.00200	mg/L	1.00	1					
Iron		1.31	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		13.6	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.335	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.0133	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.39	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		35.8	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00502	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0969	0.0323	0.0969	ug/L	0.000969	1	NS2	10/27/23	1220	2514783	13
Aroclor-1221	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1232	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1242	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1248	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1254	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1260	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1268	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-Total	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		218	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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## Certificate of Analysis

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Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24  
Sample ID: 640537003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1740	2506372	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1328	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24  
Sample ID: 640537003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.680	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW358UG1-24  
Sample ID: 640537003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.63 ug/L	6.80	98	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.178 ug/L	0.194	92	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.126 ug/L	0.194	65	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	50.0 ug/L	50.0	100	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.6 ug/L	50.0	101	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID:	MW358UG1-24	Project:	FRNP00507
Sample ID:	640537004	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	09-OCT-23 12:50		
Receive Date:	10-OCT-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0626	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2227	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24 Project: FRNP00507  
Sample ID: 640537005 Client ID: FRNP005  
Matrix: WG  
Collect Date: 09-OCT-23 07:31  
Receive Date: 10-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00854	0.0190	ug/L	0.949	1	LOF	10/13/23	1558	2507788	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.984	0.330	2.00	mg/L		1	RM3	11/02/23	2059	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	0958	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RMJ	10/13/23	0316	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	1923	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide	J	0.134	0.0670	0.200	mg/L		1	JLD1	10/10/23	1648	2506215	7
Chloride	J	5.41	0.0670	250	mg/L		1					
Fluoride	J	0.235	0.0330	4.00	mg/L		1					
Sulfate		9.51	0.133	0.400	mg/L		1					
Nitrate-N	J	0.707	0.165	10.0	mg/L		5	JLD1	10/11/23	0046	2506215	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1101	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	J	0.0378	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2231	2506552	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.227	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0235	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		19.6	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24  
Sample ID: 640537005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt	J	0.000622	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00312	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0545	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		7.78	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.00689	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000843	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.715	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00214	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00608	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0024	2506552	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Sodium		58.5	0.400	1.25	mg/L	1.00	5	PRB	11/03/23	0749	2506552	12
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0956	0.0318	0.0956	ug/L	0.000956	1	NS2	10/27/23	1235	2514783	13
Aroclor-1221	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1232	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1242	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1248	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1254	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1260	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-1268	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Aroclor-Total	U	0.0956	0.0318	0.0956	ug/L	0.000956	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		195	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24  
Sample ID: 640537005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1741	2506372	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1355	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24  
Sample ID: 640537005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24  
Sample ID: 640537005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	5.89 ug/L	6.78	87	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.192 ug/L	0.191	101	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.115 ug/L	0.191	60	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.4 ug/L	50.0	95	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW360UG1-24  
Sample ID: 640537006  
Matrix: WG  
Collect Date: 09-OCT-23 07:31  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.230	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2234	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537007  
Matrix: WG  
Collect Date: 09-OCT-23 08:19  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0191	0.00862	0.0191	ug/L	0.957	1	LOF	10/13/23	1623	2507788	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.827	0.330	2.00	mg/L		1	RM3	11/02/23	2138	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	0959	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	5.76	3.33	10.0	ug/L		1	RMJ	10/12/23	2349	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	1936	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	36.9	0.335	250	mg/L		5	JLD1	10/11/23	0118	2506215	7
Sulfate		80.1	0.665	2.00	mg/L		5					
Bromide		0.478	0.0670	0.200	mg/L		1	JLD1	10/10/23	1719	2506215	8
Fluoride	J	0.173	0.0330	4.00	mg/L		1					
Nitrate-N	J	1.11	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1102	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2245	2506552	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0610	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.165	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		35.4	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00169	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		14.8	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00270	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.49	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		42.4	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00384	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0030	2506552	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.100	0.0333	0.100	ug/L	0.00100	1	NS2	10/27/23	1250	2514783	12
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		269	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1741	2506372	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1423	2507144	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.370	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551



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C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.86 ug/L	6.84	100	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.182 ug/L	0.200	91	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.142 ug/L	0.200	71	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.7 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW361UG1-24  
Sample ID: 640537008  
Matrix: WG  
Collect Date: 09-OCT-23 08:19  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0617	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2303	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24  
Sample ID: 640537009  
Matrix: WG  
Collect Date: 09-OCT-23 09:21  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0188	0.00845	0.0188	ug/L	0.938	1	LOF	10/13/23	1737	2507788	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.05	0.330	2.00	mg/L		1	RM3	11/02/23	2336	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1008	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		11.4	3.33	10.0	ug/L		1	RMJ	10/13/23	0419	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2014	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/10/23	1751	2506215	7
Chloride	J	2.62	0.0670	250	mg/L		1					
Fluoride	J	0.394	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.459	0.0330	10.0	mg/L		1					
Sulfate		21.5	0.665	2.00	mg/L		5	JLD1	10/11/23	0253	2506215	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1114	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Sodium		115	0.400	1.25	mg/L	1.00	5	PRB	11/03/23	0752	2506552	10
Aluminum		0.909	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2328	2506552	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0991	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	J	0.0146	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		18.2	0.0800	0.200	mg/L	1.00	1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24  
Sample ID: 640537009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00137	0.000300	0.00200	mg/L	1.00	1					
Iron		0.171	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		7.70	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00198	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000790	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00115	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.369	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium		0.00210	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0040	2506552	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0986	0.0328	0.0986	ug/L	0.000986	1	NS2	10/27/23	1336	2514783	13
Aroclor-1221	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1232	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1242	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1248	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1254	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1260	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-1268	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Aroclor-Total	U	0.0986	0.0328	0.0986	ug/L	0.000986	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		331	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24  
Sample ID: 640537009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1742	2506372	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1451	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24  
Sample ID: 640537009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24  
Sample ID: 640537009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.90 ug/L	6.70	103	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.191 ug/L	0.197	97	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.126 ug/L	0.197	64	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.6 ug/L	50.0	93	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.4 ug/L	50.0	97	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW362UG1-24 Project: FRNP00507  
Sample ID: 640537010 Client ID: FRNP005  
Matrix: WG  
Collect Date: 09-OCT-23 09:21  
Receive Date: 10-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0989	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2332	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.00200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor      Lc/LC: Critical Level  
DL: Detection Limit      PF: Prep Factor  
MDA: Minimum Detectable Activity      RL: Reporting Limit  
MDC: Minimum Detectable Concentration      SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24 Project: FRNP00507  
Sample ID: 640537011 Client ID: FRNP005  
Matrix: WG  
Collect Date: 09-OCT-23 13:39  
Receive Date: 10-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00855	0.0190	ug/L	0.950	1	LOF	10/13/23	1802	2507788	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.18	0.330	2.00	mg/L		1	RM3	11/03/23	0015	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1009	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	6.02	3.33	10.0	ug/L		1	RMJ	10/13/23	0459	2507411	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2027	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	20.7	0.335	250	mg/L		5	JLD1	10/11/23	0429	2506215	7
Sulfate		27.1	0.665	2.00	mg/L		5					
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/10/23	1823	2506215	8
Fluoride	J	0.212	0.0330	4.00	mg/L		1					
Nitrate-N	J	3.79	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1116	2506550	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	0042	2506552	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/02/23	2336	2506552	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.124	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0214	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24  
Sample ID: 640537011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		23.2	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	J	0.000955	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000684	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0595	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		9.02	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.136	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.0813	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.12	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		35.7	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.105	0.0350	0.105	ug/L	0.00105	1	NS2	10/27/23	1415	2514783	12
Aroclor-1221	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1232	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1242	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1248	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1254	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1260	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-1268	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Aroclor-Total	U	0.105	0.0350	0.105	ug/L	0.00105	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		192	2.38	10.0	mg/L			CH6	10/11/23	1536	2506738	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24  
Sample ID: 640537011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/10/23	1743	2506372	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1518	2507144	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24  
Sample ID: 640537011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1155	2506548
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	LW1	10/27/23	0540	2514780
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24  
Sample ID: 640537011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.78 ug/L	6.78	100	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.198 ug/L	0.210	94	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.154 ug/L	0.210	73	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.8 ug/L	50.0	100	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.6 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.7 ug/L	50.0	99	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW363UG1-24  
Sample ID: 640537012  
Matrix: WG  
Collect Date: 09-OCT-23 13:39  
Receive Date: 10-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.121	0.000670	0.00400	mg/L	1.00	1	PRB	11/02/23	2339	2506552	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/10/23	1508	2506330
SW846 3005A	ICP-MS 3005A PREP	SD	10/18/23	1545	2506551

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB1UG1-24 Project: FRNP00507  
Sample ID: 640537013 Client ID: FRNP005  
Matrix: WATER  
Collect Date: 09-OCT-23 06:40  
Receive Date: 10-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0189	0.00853	0.0189	ug/L	0.947	1	LOF	10/13/23	1916	2507788	2
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1546	2507144	3
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB1UG1-24  
Sample ID: 640537013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	10/13/23	1153	2507787

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	
3	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.24 ug/L	6.77	107	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.5 ug/L	50.0	97	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.3 ug/L	50.0	99	(77%-121%)

Notes:



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## *Certificate of Analysis*

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB1UG1-24  
Sample ID: 640537013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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*Column headers are defined as follows:*

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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**ATTACHMENT C2**

**GEL LABORATORIES CERTIFICATE OF ANALYSIS**

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# GEL LABORATORIES LLC

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683001  
Matrix: WG  
Collect Date: 10-OCT-23  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*AN-1418 AlphaSpec Ra226, Liquid "As Received"*

Radium-226	U	0.0826	+/-0.448	0.859	+/-0.448	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
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*Th-01-RC M, Th Isotopes, Liquid "As Received"*

Thorium-230	U	0.471	+/-1.59	3.00	+/-1.60	50.0	pCi/L			CM4	11/03/23	0857	2510227	2
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Thorium-232	U	0.0695	+/-1.17	2.51	+/-1.17		pCi/L							
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### Rad Gas Flow Proportional Counting

*904.0Mod, Ra228, Liquid "As Received"*

Radium-228	U	3.74	+/-2.89	4.45	+/-3.04	4.99	pCi/L			JE1	10/18/23	1030	2507346	3
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*905.0Mod, Sr90, liquid "As Received"*

Strontium-90	U	3.61	+/-3.25	5.23	+/-3.30	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
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*9310, Alpha/Beta Activity, liquid "As Received"*

Alpha	U	-0.682	+/-3.98	9.68	+/-3.99	15.0	pCi/L			KP1	10/26/23	1427	2510802	5
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Beta		42.0	+/-10.3	12.0	+/-12.5	50.0	pCi/L							
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### Rad Liquid Scintillation Analysis

*906.0M, Tritium Dist, Liquid "As Received"*

Tritium	U	-73.8	+/-118	221	+/-118	300	pCi/L			GS3	10/28/23	1933	2509431	6
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*Tc-02-RC-MOD, Tc99, Liquid "As Received"*

Technetium-99		63.9	+/-13.8	18.9	+/-15.6	25.0	pCi/L			AG2	11/05/23	2359	2508220	7
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### The following Analytical Methods were performed

Method	Description
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1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	89.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	74.7	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	85	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	75	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	96.4	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24

Sample ID: 640683001

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24

Project: FRNP00507

Sample ID: 640683003

Client ID: FRNP005

Matrix: WG

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.914	+/-0.883	0.964	+/-0.885	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	-0.445	+/-1.07	2.98	+/-1.08	50.0	pCi/L			CM4	11/01/23	1100	2510227	2
Thorium-232	U	0.239	+/-1.06	1.90	+/-1.06		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228		4.06	+/-2.48	3.58	+/-2.69	4.99	pCi/L			JE1	10/18/23	0902	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	2.40	+/-3.90	6.78	+/-3.92	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	1.36	+/-3.81	7.72	+/-3.81	15.0	pCi/L			KP1	10/26/23	1427	2510802	5
Beta	U	-7.22	+/-4.62	10.6	+/-4.62	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	28.1	+/-125	221	+/-126	300	pCi/L			GS3	10/28/23	2010	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-0.836	+/-10.1	17.9	+/-10.1	25.0	pCi/L			AG2	11/06/23	0016	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	84.4	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	93.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	80.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	75	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	97.5	(30%-110%)

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## *Certificate of Analysis*

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24

Project: FRNP00507

Sample ID: 640683003

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration



# GEL LABORATORIES LLC

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## Certificate of Analysis

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24

Project: FRNP00507

Sample ID: 640683005

Client ID: FRNP005

Matrix: WG

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.348	+/-0.641	0.998	+/-0.642	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	0.136	+/-1.54	3.25	+/-1.54	50.0	pCi/L			CM4	11/01/23	1100	2510227	2
Thorium-232	U	-0.118	+/-1.14	2.71	+/-1.14		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228		4.13	+/-2.58	3.76	+/-2.79	4.99	pCi/L			JE1	10/18/23	0901	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	-0.704	+/-3.52	7.43	+/-3.52	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-0.249	+/-2.43	6.78	+/-2.43	15.0	pCi/L			KP1	11/01/23	1203	2510802	5
Beta		41.5	+/-8.80	7.90	+/-11.1	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	42.2	+/-126	220	+/-126	300	pCi/L			GS3	10/28/23	2047	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99		66.3	+/-13.5	18.2	+/-15.4	25.0	pCi/L			AG2	11/06/23	0033	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	89.5	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	94.4	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	84.7	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	47.7	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	97.4	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24

Project: FRNP00507

Sample ID: 640683005

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24

Project: FRNP00507

Sample ID: 640683007

Client ID: FRNP005

Matrix: WG

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.514	+/-0.929	1.14	+/-0.930	5.00	pCi/L			CM4	11/03/23	0901	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	1.08	+/-1.71	2.77	+/-1.72	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.604	+/-1.11	1.35	+/-1.11		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	2.04	+/-2.63	4.49	+/-2.68	4.99	pCi/L			JE1	10/18/23	1030	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	1.61	+/-3.37	5.98	+/-3.38	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-1.89	+/-3.50	9.24	+/-3.50	15.0	pCi/L			KP1	10/26/23	1427	2510802	5
Beta	U	1.70	+/-3.92	7.12	+/-3.93	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-72.0	+/-117	219	+/-117	300	pCi/L			GS3	10/28/23	2124	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-13.0	+/-10.0	19.0	+/-10.0	25.0	pCi/L			AG2	11/06/23	0049	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	88.7	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	87.2	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	88.1	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	81.8	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	94.9	(30%-110%)

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24

Sample ID: 640683007

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24

Project: FRNP00507

Sample ID: 640683009

Client ID: FRNP005

Matrix: WG

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	1.38	+/-1.31	1.39	+/-1.32	5.00	pCi/L			CM4	11/03/23	0901	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	-0.146	+/-1.13	2.67	+/-1.13	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.447	+/-1.13	1.87	+/-1.13		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	0.509	+/-2.29	4.27	+/-2.29	4.99	pCi/L			JE1	10/20/23	0957	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	-1.46	+/-3.22	6.86	+/-3.22	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	5.64	+/-4.75	6.57	+/-4.83	15.0	pCi/L			KP1	10/26/23	1427	2510802	5
Beta	U	6.50	+/-4.76	7.20	+/-4.89	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-108	+/-115	221	+/-115	300	pCi/L			GS3	10/28/23	2201	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-0.151	+/-10.6	18.7	+/-10.6	25.0	pCi/L			AG2	11/06/23	0106	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	90.5	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	83.7	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	81.3	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	59.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	96.1	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24

Project: FRNP00507

Sample ID: 640683009

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24

Project: FRNP00507

Sample ID: 640683011

Client ID: FRNP005

Matrix: WG

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.813	+/-0.786	0.858	+/-0.788	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	1.20	+/-1.71	2.72	+/-1.73	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.115	+/-0.875	1.76	+/-0.876		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	-0.0658	+/-1.97	3.88	+/-1.97	4.99	pCi/L			JE1	10/18/23	0901	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	3.12	+/-3.41	5.66	+/-3.44	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-0.550	+/-3.88	9.13	+/-3.88	15.0	pCi/L			KP1	10/26/23	1430	2510802	5
Beta	U	-2.11	+/-3.62	7.84	+/-3.62	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-13.9	+/-122	220	+/-122	300	pCi/L			GS3	10/28/23	2238	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	4.20	+/-11.3	19.6	+/-11.3	25.0	pCi/L			AG2	11/06/23	0123	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	93.4	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	89.4	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	84.8	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	65.9	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	92.7	(30%-110%)

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24

Sample ID: 640683011

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty



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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24

Sample ID: 640683013

Matrix: WATER

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.826	+/-0.857	1.05	+/-0.859	5.00	pCi/L			CM4	11/02/23	0818	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	1.26	+/-1.57	2.33	+/-1.59	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.384	+/-0.979	1.64	+/-0.980		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228		4.56	+/-2.83	4.23	+/-3.06	4.99	pCi/L			JE1	10/18/23	0902	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	-1.62	+/-3.40	6.83	+/-3.40	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-2.49	+/-2.71	8.44	+/-2.71	15.0	pCi/L			KP1	10/26/23	1430	2510802	5
Beta	U	2.70	+/-4.75	8.36	+/-4.77	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	45.6	+/-127	222	+/-127	300	pCi/L			GS3	10/28/23	2315	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-0.0639	+/-10.2	17.9	+/-10.2	25.0	pCi/L			AG2	11/06/23	0139	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	88.3	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	105	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	86.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	77.3	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	96.6	(30%-110%)

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24

Sample ID: 640683013

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RI1UG1-24

Project: FRNP00507

Sample ID: 640683014

Client ID: FRNP005

Matrix: WATER

Collect Date: 10-OCT-23

Receive Date: 11-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.0643	+/-0.455	0.916	+/-0.455	5.00	pCi/L			CM4	11/02/23	0845	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	0.554	+/-1.36	2.46	+/-1.36	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.511	+/-0.948	1.19	+/-0.950		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	1.72	+/-2.26	3.86	+/-2.30	4.99	pCi/L			JE1	10/18/23	0902	2507346	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	4.65	+/-3.79	5.96	+/-3.86	8.00	pCi/L			ST2	10/31/23	1710	2512676	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	1.39	+/-3.38	6.61	+/-3.39	15.0	pCi/L			KP1	10/26/23	1430	2510802	5
Beta	U	-3.58	+/-7.24	13.9	+/-7.24	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	100	+/-130	221	+/-132	300	pCi/L			GS3	10/28/23	2352	2509431	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-2.22	+/-10.1	18.0	+/-10.1	25.0	pCi/L			AG2	11/06/23	0156	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	90.7	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	96.3	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2507346	79.8	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2512676	68.2	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	98.3	(30%-110%)

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RI1UG1-24

Sample ID: 640683014

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24 Project: FRNP00507  
Sample ID: 640683001 Client ID: FRNP005  
Matrix: WG  
Collect Date: 10-OCT-23 07:43  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00856	0.0190	ug/L	0.951	1	LOF	10/16/23	1535	2507792	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.762	0.330	2.00	mg/L		1	RM3	11/03/23	0116	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1024	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	3.50	3.33	10.0	ug/L		1	RMJ	10/13/23	2241	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2106	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.452	0.0670	0.200	mg/L		1	JLD1	10/11/23	1212	2506982	7
Fluoride	J	0.221	0.0330	4.00	mg/L		1					
Nitrate-N	J	1.08	0.0330	10.0	mg/L		1					
Chloride	J	36.4	0.335	250	mg/L		5	JLD1	10/11/23	2001	2506982	8
Sulfate		67.3	0.665	2.00	mg/L		5					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1150	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2327	2507018	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1958	2507018	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0601	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.153	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		33.7	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00175	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		14.0	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00103	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.01	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		41.2	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0119	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.100	0.0333	0.100	ug/L	0.00100	1	YS1	10/30/23	1215	2515516	12
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	UY2	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		235	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1614	2507144	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.780	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016



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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.91 ug/L	6.79	102	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.150 ug/L	0.200	75	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.0547 ug/L	0.200	27	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.1 ug/L	50.0	100	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW364UG1-24  
Sample ID: 640683002  
Matrix: WG  
Collect Date: 10-OCT-23 07:43  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0558	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2024	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24 Project: FRNP00507  
Sample ID: 640683003 Client ID: FRNP005  
Matrix: WG  
Collect Date: 10-OCT-23 08:42  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0187	0.00841	0.0187	ug/L	0.935	1	LOF	10/16/23	1649	2507792	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.50	0.330	2.00	mg/L		1	RM3	11/03/23	0313	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1027	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		13.0	3.33	10.0	ug/L		1	RMJ	10/17/23	0249	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2144	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/11/23	1242	2506982	7
Chloride	J	2.27	0.0670	250	mg/L		1					
Fluoride	J	0.371	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.749	0.0330	10.0	mg/L		1					
Sulfate		52.3	0.665	2.00	mg/L		5	JLD1	10/11/23	2136	2506982	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1158	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2341	2507018	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	J	0.0405	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2027	2507018	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.104	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	J	0.00527	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24  
Sample ID: 640683003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		17.9	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00114	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00348	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0439	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		8.01	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0151	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00511	0.000600	0.00200	mg/L	1.00	1					
Potassium	J	0.223	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		43.3	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	J	0.0000820	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00569	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.0988	0.0329	0.0988	ug/L	0.000988	1	YS1	10/30/23	1254	2515516	12
Aroclor-1221	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1232	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1242	J	0.0427	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1248	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1254	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1260	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1268	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-Total	JY2	0.0427	0.0329	0.0988	ug/L	0.000988	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		189	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24  
Sample ID: 640683003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1641	2507144	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24  
Sample ID: 640683003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24  
Sample ID: 640683003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	5.72 ug/L	6.68	86	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.180 ug/L	0.198	91	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.0840 ug/L	0.198	43	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW365UG1-24  
Sample ID: 640683004  
Matrix: WG  
Collect Date: 10-OCT-23 08:42  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0998	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2031	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	J	0.0000880	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683005  
Matrix: WG  
Collect Date: 10-OCT-23 09:29  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0191	0.00858	0.0191	ug/L	0.953	1	LOF	10/16/23	1713	2507792	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.761	0.330	2.00	mg/L		1	RM3	11/03/23	0352	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1028	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	4.08	3.33	10.0	ug/L		1	RMJ	10/14/23	0115	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2157	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.483	0.0670	0.200	mg/L		1	JLD1	10/11/23	1314	2506982	7
Fluoride	J	0.224	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.941	0.0330	10.0	mg/L		1					
Chloride	J	38.3	0.670	250	mg/L		10	JLD1	10/11/23	2207	2506982	8
Sulfate		47.6	1.33	4.00	mg/L		10					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1200	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2343	2507018	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2035	2507018	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.114	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0760	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		33.9	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00158	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0573	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		14.1	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00254	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000838	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.10	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00254	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		47.2	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00374	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.0998	0.0332	0.0998	ug/L	0.000998	1	YS1	10/30/23	1307	2515516	12
Aroclor-1221	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1232	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1242	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1248	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1254	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1260	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-1268	U	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Aroclor-Total	UY2	0.0998	0.0332	0.0998	ug/L	0.000998	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		233	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1709	2507144	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		1.61	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.25 ug/L	6.81	92	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.161 ug/L	0.200	81	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.0923 ug/L	0.200	46	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.5 ug/L	50.0	95	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.7 ug/L	50.0	97	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW366UG1-24  
Sample ID: 640683006  
Matrix: WG  
Collect Date: 10-OCT-23 09:29  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.108	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2038	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683007  
Matrix: WG  
Collect Date: 10-OCT-23 12:54  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00855	0.0190	ug/L	0.950	1	LOF	10/16/23	1738	2507792	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.537	0.330	2.00	mg/L		1	RM3	11/03/23	0431	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1029	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RMJ	10/14/23	0156	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2210	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/11/23	1345	2506982	7
Chloride	J	7.37	0.0670	250	mg/L		1					
Fluoride	J	0.148	0.0330	4.00	mg/L		1					
Nitrate-N	U	10.0	0.0330	10.0	mg/L		1					
Sulfate		19.7	0.266	0.800	mg/L		2	JLD1	10/11/23	2238	2506982	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1201	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Manganese		1.20	0.0100	0.0500	mg/L	1.00	10	PRB	11/04/23	0903	2507018	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2345	2507018	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2042	2507018	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	J	0.00205	0.00200	0.00500	mg/L	1.00	1					
Barium		0.127	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0154	0.00520	0.0150	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		13.5	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00610	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000833	0.000300	0.00200	mg/L	1.00	1					
Iron		6.09	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		7.00	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00252	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.81	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		15.4	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00996	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.0990	0.0330	0.0990	ug/L	0.000990	1	YS1	10/30/23	1320	2515516	13
Aroclor-1221	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1232	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1242	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1248	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1254	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1260	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-1268	U	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Aroclor-Total	UY2	0.0990	0.0330	0.0990	ug/L	0.000990	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		90.0	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1736	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098

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Report Date: January 31, 2024

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.84 ug/L	6.78	101	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.163 ug/L	0.198	82	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.0782 ug/L	0.198	40	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	50.5 ug/L	50.0	101	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.9 ug/L	50.0	102	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.1 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367DUG1-24  
Sample ID: 640683008  
Matrix: WG  
Collect Date: 10-OCT-23 12:54  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.118	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2045	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24 Project: FRNP00507  
Sample ID: 640683009 Client ID: FRNP005  
Matrix: WG  
Collect Date: 10-OCT-23 12:54  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0191	0.00859	0.0191	ug/L	0.955	1	LOF	10/16/23	1802	2507792	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.534	0.330	2.00	mg/L		1	RM3	11/03/23	0510	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1030	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RMJ	10/17/23	0117	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2223	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Sulfate		19.5	0.266	0.800	mg/L		2	JLD1	10/11/23	2310	2506982	7
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/11/23	1417	2506982	8
Chloride	J	7.03	0.0670	250	mg/L		1					
Fluoride	J	0.185	0.0330	4.00	mg/L		1					
Nitrate-N	U	10.0	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1206	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Manganese		1.21	0.0100	0.0500	mg/L	1.00	10	PRB	11/04/23	0904	2507018	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2347	2507018	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2056	2507018	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.126	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	J	0.0145	0.00520	0.0150	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24  
Sample ID: 640683009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		13.6	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00634	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000891	0.000300	0.00200	mg/L	1.00	1					
Iron		6.31	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		6.95	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00243	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.76	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		15.2	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0105	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.0991	0.0330	0.0991	ug/L	0.000991	1	YS1	10/30/23	1332	2515516	13
Aroclor-1221	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1232	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1242	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1248	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1254	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1260	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-1268	U	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Aroclor-Total	UY2	0.0991	0.0330	0.0991	ug/L	0.000991	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		85.0	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24  
Sample ID: 640683009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1804	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Report Date: January 31, 2024

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24  
Sample ID: 640683009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098



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C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24  
Sample ID: 640683009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.88 ug/L	6.82	101	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.173 ug/L	0.198	87	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.118 ug/L	0.198	60	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.2 ug/L	50.0	96	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.9 ug/L	50.0	100	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.1 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW367UG1-24  
Sample ID: 640683010  
Matrix: WG  
Collect Date: 10-OCT-23 12:54  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.129	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2100	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683011  
Matrix: WG  
Collect Date: 10-OCT-23 12:02  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00856	0.0190	ug/L	0.951	1	LOF	10/16/23	1827	2507792	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.918	0.330	2.00	mg/L		1	RM3	11/03/23	0548	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/17/23	1031	2506667	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	6.56	3.33	10.0	ug/L		1	RMJ	10/17/23	0215	2508753	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/19/23	2236	2506653	6
SW846 9056A Anions (5 elements) "As Received"												
Sulfate		22.3	0.266	0.800	mg/L		2	JLD1	10/12/23	0044	2506982	7
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/11/23	1448	2506982	8
Chloride	J	3.13	0.0670	250	mg/L		1					
Fluoride	J	0.403	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.889	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1208	2507100	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Sodium		52.9	0.800	2.50	mg/L	1.00	10	PRB	11/04/23	0906	2507018	10
Aluminum		0.0678	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2104	2507018	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.182	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	J	0.00667	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		13.8	0.0800	0.200	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	J	0.000308	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00181	0.000300	0.00200	mg/L	1.00	1					
Iron		0.117	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		5.46	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00446	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00123	0.000600	0.00200	mg/L	1.00	1					
Potassium	J	0.293	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00257	0.00150	0.00500	mg/L	1.00	1					
Silver	J	0.000351	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00524	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2348	2507018	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.102	0.0341	0.102	ug/L	0.00102	1	YS1	10/30/23	1345	2515516	13
Aroclor-1221	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1232	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1242	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1248	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1254	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1260	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1268	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-Total	UY2	0.102	0.0341	0.102	ug/L	0.00102	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		168	2.38	10.0	mg/L			CH6	10/12/23	1423	2507357	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	10/12/23	0922	2507119	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1831	2507144	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/13/23	1131	2506666
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.52 ug/L	6.80	96	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.214 ug/L	0.205	105	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.142 ug/L	0.205	69	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.6 ug/L	50.0	97	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.2 ug/L	50.0	100	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.0 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW375UG1-24  
Sample ID: 640683012  
Matrix: WG  
Collect Date: 10-OCT-23 12:02  
Receive Date: 11-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.171	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	2107	2507018	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
EPA 160	Laboratory Filtration	RXB5	10/11/23	1136	2506979

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24 Project: FRNP00507  
Sample ID: 640683013 Client ID: FRNP005  
Matrix: WATER  
Collect Date: 10-OCT-23 12:58  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0191	0.00859	0.0191	ug/L	0.955	1	LOF	10/16/23	1940	2507792	1
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1705	2512145	3
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1210	2507100	4
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2111	2507018	5
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium	U	0.00400	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	U	0.0150	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium	U	0.200	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00121	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium	U	0.0300	0.0100	0.0300	mg/L	1.00	1					
Manganese	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium	U	0.300	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium	U	0.250	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00929	0.00330	0.0200	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24  
Sample ID: 640683013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2350	2507018	6
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.104	0.0347	0.104	ug/L	0.00104	1	YS1	10/30/23	1420	2515516	7
Aroclor-1221	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1232	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1242	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1248	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1254	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1260	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1268	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-Total	UY2	0.104	0.0347	0.104	ug/L	0.00104	1					
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1859	2507144	8
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone		5.02	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24  
Sample ID: 640683013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098

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## Certificate of Analysis

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Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: FB1UG1-24  
Sample ID: 640683013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	EPA 300.0		
4	SW846 7470A		
5	SW846 3005A/6020B		
6	SW846 3005A/6020B		
7	SW846 3535A/8082A		
8	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.58 ug/L	6.82	96	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.192 ug/L	0.209	92	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.140 ug/L	0.209	67	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	50.2 ug/L	50.0	100	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.4 ug/L	50.0	101	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.3 ug/L	50.0	99	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RIIUG1-24 Project: FRNP00507  
Sample ID: 640683014 Client ID: FRNP005  
Matrix: WATER  
Collect Date: 10-OCT-23 06:45  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0190	0.00855	0.0190	ug/L	0.950	1	LOF	10/16/23	2004	2507792	1
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1718	2512145	3
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	10/12/23	1211	2507100	4
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	2114	2507018	5
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium	U	0.00400	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	U	0.0150	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium	U	0.200	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	U	0.00200	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium	U	0.0300	0.0100	0.0300	mg/L	1.00	1					
Manganese	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium	U	0.300	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium	U	0.250	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RIIUG1-24  
Sample ID: 640683014

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2352	2507018	6
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	UY2	0.104	0.0346	0.104	ug/L	0.00104	1	YS1	10/30/23	1433	2515516	7
Aroclor-1221	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1232	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1242	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1248	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1254	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1260	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-1268	U	0.104	0.0346	0.104	ug/L	0.00104	1					
Aroclor-Total	UY2	0.104	0.0346	0.104	ug/L	0.00104	1					
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1926	2507144	8
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RI1UG1-24  
Sample ID: 640683014

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	DXF4	10/30/23	0530	2515515
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/11/23	1405	2507098
SW846 3005A	ICP-MS 3005A PREP	JM13	10/13/23	1430	2507016
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: RIIUG1-24  
Sample ID: 640683014

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	
3	EPA 300.0	
4	SW846 7470A	
5	SW846 3005A/6020B	
6	SW846 3005A/6020B	
7	SW846 3535A/8082A	
8	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.83 ug/L	6.78	101	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.211 ug/L	0.208	101	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.134 ug/L	0.208	65	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.3 ug/L	50.0	93	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB2UG1-24 Project: FRNP00507  
Sample ID: 640683015 Client ID: FRNP005  
Matrix: WATER  
Collect Date: 10-OCT-23 06:40  
Receive Date: 11-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	UY2	0.0191	0.00858	0.0191	ug/L	0.953	1	LOF	10/16/23	2028	2507792	2
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	10/12/23	1954	2507144	3
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	2.05	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB2UG1-24  
Sample ID: 640683015

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	10/16/23	1316	2507791

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	
3	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.87 ug/L	6.81	101	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.5 ug/L	50.0	93	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.7 ug/L	50.0	97	(77%-121%)

Notes:

# GEL LABORATORIES LLC

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## *Certificate of Analysis*

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB2UG1-24  
Sample ID: 640683015

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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*Column headers are defined as follows:*

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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**ATTACHMENT C3**

**GEL LABORATORIES CERTIFICATE OF ANALYSIS**

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# GEL LABORATORIES LLC

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884001  
Matrix: WG  
Collect Date: 11-OCT-23  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*AN-1418 AlphaSpec Ra226, Liquid "As Received"*

Radium-226	U	0.405	+/-0.842	1.24	+/-0.842	5.00	pCi/L			CM4	11/03/23	0901	2510223	1
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*Th-01-RC M, Th Isotopes, Liquid "As Received"*

Thorium-230	U	1.63	+/-1.61	2.18	+/-1.63	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
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Thorium-232	U	-0.166	+/-0.546	1.51	+/-0.547		pCi/L							
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### Rad Gas Flow Proportional Counting

*904.0Mod, Ra228, Liquid "As Received"*

Radium-228	U	2.82	+/-2.08	3.13	+/-2.20	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
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*905.0Mod, Sr90, liquid "As Received"*

Strontium-90	U	3.63	+/-2.85	4.60	+/-2.90	8.00	pCi/L			ST2	11/07/23	1303	2513903	4
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*9310, Alpha/Beta Activity, liquid "As Received"*

Alpha	U	2.23	+/-4.78	9.13	+/-4.79	15.0	pCi/L			KP1	10/30/23	1232	2510825	5
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Beta		45.5	+/-10.5	12.1	+/-12.9	50.0	pCi/L							
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### Rad Liquid Scintillation Analysis

*906.0M, Tritium Dist, Liquid "As Received"*

Tritium	U	-45.9	+/-125	229	+/-125	300	pCi/L			GS3	11/01/23	1611	2512932	6
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*Tc-02-RC-MOD, Tc99, Liquid "As Received"*

Technetium-99		76.7	+/-14.0	18.3	+/-16.5	25.0	pCi/L			AG2	11/06/23	0213	2508220	7
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### The following Analytical Methods were performed

Method	Description
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1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	90.2	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	101	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	90.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	77.3	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	93.8	(30%-110%)

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## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24

Sample ID: 640884001

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24

Project: FRNP00507

Sample ID: 640884003

Client ID: FRNP005

Matrix: WG

Collect Date: 11-OCT-23

Receive Date: 12-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.243	+/-0.767	1.15	+/-0.767	5.00	pCi/L			CM4	11/03/23	0901	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	2.50	+/-2.08	2.64	+/-2.12	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	-0.103	+/-0.910	2.18	+/-0.911		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	2.30	+/-2.61	4.37	+/-2.67	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	5.54	+/-4.03	6.31	+/-4.13	8.00	pCi/L			ST2	11/01/23	1658	2513903	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-0.840	+/-4.98	11.5	+/-4.98	15.0	pCi/L			KP1	10/30/23	1232	2510825	5
Beta	U	8.90	+/-7.11	11.4	+/-7.26	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-14.4	+/-126	227	+/-126	300	pCi/L			GS3	11/01/23	1648	2512932	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	18.6	+/-11.5	18.7	+/-11.7	25.0	pCi/L			AG2	11/07/23	1306	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	82.1	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	94.7	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	93.3	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	79.5	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	92.9	(30%-110%)

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## *Certificate of Analysis*

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24

Project: FRNP00507

Sample ID: 640884003

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24

Project: FRNP00507

Sample ID: 640884005

Client ID: FRNP005

Matrix: WG

Collect Date: 11-OCT-23

Receive Date: 12-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.431	+/-0.460	0.516	+/-0.461	5.00	pCi/L			CM4	11/02/23	0842	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	-0.0785	+/-1.09	2.53	+/-1.10	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.0459	+/-0.923	2.00	+/-0.923		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	1.17	+/-1.86	3.27	+/-1.89	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	2.88	+/-2.04	3.19	+/-2.10	8.00	pCi/L			ST2	11/07/23	1030	2513903	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	3.63	+/-5.58	9.93	+/-5.61	15.0	pCi/L			KP1	10/30/23	1232	2510825	5
Beta	U	3.66	+/-7.30	12.8	+/-7.32	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	35.7	+/-130	229	+/-130	300	pCi/L			GS3	11/01/23	1725	2512932	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	-7.46	+/-9.66	17.8	+/-9.66	25.0	pCi/L			AG2	11/06/23	0246	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	90.4	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	94.2	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	90.5	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	79.5	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	95.6	(30%-110%)

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24

Project: FRNP00507

Sample ID: 640884005

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24

Project: FRNP00507

Sample ID: 640884007

Client ID: FRNP005

Matrix: WG

Collect Date: 11-OCT-23

Receive Date: 12-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.483	+/-0.528	0.686	+/-0.529	5.00	pCi/L			CM4	11/02/23	0842	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	0.0946	+/-1.46	3.11	+/-1.46	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.674	+/-1.23	1.48	+/-1.23		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	0.290	+/-1.75	3.38	+/-1.76	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	2.91	+/-3.62	6.15	+/-3.65	8.00	pCi/L			ST2	11/01/23	1658	2513903	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	-0.220	+/-4.13	10.1	+/-4.13	15.0	pCi/L			KP1	10/30/23	1232	2510825	5
Beta		29.2	+/-9.25	12.2	+/-10.5	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	9.23	+/-128	229	+/-128	300	pCi/L			GS3	11/01/23	1801	2512932	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99		22.5	+/-12.1	19.2	+/-12.3	25.0	pCi/L			AG2	11/06/23	0303	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	87	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	81.4	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	89.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	63.6	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	94.6	(30%-110%)

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24

Sample ID: 640884007

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24

Project: FRNP00507

Sample ID: 640884009

Client ID: FRNP005

Matrix: WG

Collect Date: 11-OCT-23

Receive Date: 12-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	0.199	+/-0.456	0.810	+/-0.457	5.00	pCi/L			CM4	11/02/23	0842	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	0.179	+/-1.18	2.42	+/-1.18	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.0402	+/-0.866	1.88	+/-0.867		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	0.993	+/-1.94	3.48	+/-1.96	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	4.55	+/-3.76	5.98	+/-3.84	8.00	pCi/L			ST2	11/01/23	1658	2513903	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	1.39	+/-3.86	8.09	+/-3.86	15.0	pCi/L			KP1	10/30/23	1235	2510825	5
Beta	U	6.39	+/-8.56	14.5	+/-8.62	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-33.1	+/-125	229	+/-125	300	pCi/L			GS3	11/01/23	1838	2512932	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	14.7	+/-11.0	18.1	+/-11.2	25.0	pCi/L			AG2	11/06/23	0319	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	87.3	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	89.7	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	88.1	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	77.3	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	96.5	(30%-110%)

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24

Project: FRNP00507

Sample ID: 640884009

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration



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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24

Project: FRNP00507

Sample ID: 640884011

Client ID: FRNP005

Matrix: WG

Collect Date: 11-OCT-23

Receive Date: 12-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>AN-1418 AlphaSpec Ra226, Liquid "As Received"</i>														
Radium-226	U	1.14	+/-1.28	1.56	+/-1.28	5.00	pCi/L			CM4	11/03/23	0901	2510223	1
<i>Th-01-RC M, Th Isotopes, Liquid "As Received"</i>														
Thorium-230	U	2.43	+/-2.25	2.89	+/-2.28	50.0	pCi/L			CM4	11/01/23	1412	2510227	2
Thorium-232	U	0.330	+/-1.27	2.42	+/-1.27		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>														
<i>904.0Mod, Ra228, Liquid "As Received"</i>														
Radium-228	U	0.705	+/-1.91	3.54	+/-1.92	4.99	pCi/L			JE1	10/20/23	1122	2509216	3
<i>905.0Mod, Sr90, liquid "As Received"</i>														
Strontium-90	U	0.174	+/-3.32	6.28	+/-3.32	8.00	pCi/L			ST2	11/01/23	1658	2513903	4
<i>9310, Alpha/Beta Activity, liquid "As Received"</i>														
Alpha	U	3.69	+/-6.42	11.7	+/-6.45	15.0	pCi/L			KP1	10/30/23	1235	2510825	5
Beta	U	8.54	+/-8.51	14.1	+/-8.63	50.0	pCi/L							
<b>Rad Liquid Scintillation Analysis</b>														
<i>906.0M, Tritium Dist, Liquid "As Received"</i>														
Tritium	U	-87.8	+/-121	228	+/-121	300	pCi/L			GS3	11/01/23	1915	2512932	6
<i>Tc-02-RC-MOD, Tc99, Liquid "As Received"</i>														
Technetium-99	U	14.6	+/-11.9	19.7	+/-12.1	25.0	pCi/L			AG2	11/06/23	0336	2508220	7

### The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2510223	91.1	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2510227	83.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2509216	90.8	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2513903	81.8	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2508220	91.9	(30%-110%)

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## *Certificate of Analysis*

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Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24

Sample ID: 640884011

Project: FRNP00507

Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24 Project: FRNP00507  
Sample ID: 640884001 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 07:41  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0190	0.00853	0.0190	ug/L	0.948	1	LOF	10/17/23	1635	2507796	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.824	0.330	2.00	mg/L		1	RM3	11/03/23	0627	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0713	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	7.88	3.33	10.0	ug/L		1	RMJ	10/21/23	0127	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1731	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.331	0.0670	0.200	mg/L		1	JLD1	10/12/23	1329	2507664	7
Fluoride	J	0.292	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.922	0.0330	10.0	mg/L		1					
Sulfate		8.72	0.133	0.400	mg/L		1					
Chloride	J	27.5	0.335	250	mg/L		5	JLD1	10/12/23	2357	2507664	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1231	2514927	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum		0.0661	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1645	2508582	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.379	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0159	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		16.0	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt		0.00636	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00446	0.000300	0.00200	mg/L	1.00	1					
Iron		0.323	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		6.42	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0369	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000250	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00431	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.574	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00322	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		46.9	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00914	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2257	2508582	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.104	0.0345	0.104	ug/L	0.00104	1	NS2	11/01/23	1345	2517137	12
Aroclor-1221	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1232	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1242	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1248	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1254	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1260	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-1268	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Aroclor-Total	U	0.104	0.0345	0.104	ug/L	0.00104	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		192	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	J	13.2	8.95	20.0	mg/L		1	JW2	10/13/23	1432	2508146	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	0945	2508300	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		1.72	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884001

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.42 ug/L	6.77	109	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.187 ug/L	0.207	90	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.130 ug/L	0.207	63	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.9 ug/L	50.0	96	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.1 ug/L	50.0	100	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.1 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW369UG1-24  
Sample ID: 640884002  
Matrix: WG  
Collect Date: 11-OCT-23 07:41  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.392	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1649	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24  
Sample ID: 640884003  
Matrix: WG  
Collect Date: 11-OCT-23 08:28  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0187	0.00841	0.0187	ug/L	0.934	1	LOF	10/17/23	1659	2507796	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.846	0.330	2.00	mg/L		1	RM3	11/03/23	0807	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0714	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		10.2	3.33	10.0	ug/L		1	RMJ	10/20/23	2334	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1744	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.549	0.0670	0.200	mg/L		1	JLD1	10/12/23	1401	2507664	7
Fluoride	J	0.238	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.971	0.0330	10.0	mg/L		1					
Chloride	J	39.4	0.670	250	mg/L		10	JLD1	10/13/23	0028	2507664	8
Sulfate		18.8	1.33	4.00	mg/L		10					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1232	2514927	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1652	2508582	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.234	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.118	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		29.0	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24  
Sample ID: 640884003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt	J	0.000302	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00205	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0622	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		12.1	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.00696	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.55	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		43.3	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00963	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2259	2508582	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.100	0.0333	0.100	ug/L	0.00100	1	NS2	11/01/23	1400	2517137	12
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		230	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24  
Sample ID: 640884003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	J	13.2	8.95	20.0	mg/L		1	JW2	10/13/23	1433	2508146	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1012	2508300	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24  
Sample ID: 640884003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		2.84	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24  
Sample ID: 640884003

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3535A/8082A		
13	EPA 160.1		
14	EPA 410.4		
15	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	4.96 ug/L	6.67	74	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.160 ug/L	0.200	80	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.114 ug/L	0.200	57	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.3 ug/L	50.0	101	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.9 ug/L	50.0	102	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW370UG1-24 Project: FRNP00507  
Sample ID: 640884004 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 08:28  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.239	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1718	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor      Lc/LC: Critical Level  
DL: Detection Limit      PF: Prep Factor  
MDA: Minimum Detectable Activity      RL: Reporting Limit  
MDC: Minimum Detectable Concentration      SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24 Project: FRNP00507  
Sample ID: 640884005 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 09:30  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0187	0.00844	0.0187	ug/L	0.937	1	LOF	10/17/23	1812	2507796	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.11	0.330	2.00	mg/L		1	RM3	11/03/23	0706	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0717	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	4.52	3.33	10.0	ug/L		1	RMJ	10/21/23	0230	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1822	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Nitrate-N	J	0.172	0.0660	10.0	mg/L		2	JLD1	10/13/23	0202	2507664	7
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	10/12/23	1432	2507664	8
Chloride	J	3.73	0.0670	250	mg/L		1					
Fluoride	J	0.284	0.0330	4.00	mg/L		1					
Sulfate		15.8	0.133	0.400	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1244	2514927	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum		0.949	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1743	2508582	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.138	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	U	0.0150	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24  
Sample ID: 640884005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Copper	J	0.00186	0.000300	0.00200	mg/L	1.00	1					
Iron		0.517	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		17.3	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.00961	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000524	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00230	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.446	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium		0.00167	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	J	0.00508	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00575	0.00330	0.0200	mg/L	1.00	1					
Calcium		53.9	0.800	2.00	mg/L	1.00	10	PRB	11/03/23	1841	2508582	11
Sodium		79.7	0.800	2.50	mg/L	1.00	10					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2312	2508582	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.101	0.0337	0.101	ug/L	0.00101	1	NS2	11/01/23	1445	2517137	13
Aroclor-1221	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1232	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1242	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1248	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1254	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1260	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-1268	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Aroclor-Total	U	0.101	0.0337	0.101	ug/L	0.00101	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		388	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												



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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24  
Sample ID: 640884005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/13/23	1434	2508146	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1039	2508300	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24  
Sample ID: 640884005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24  
Sample ID: 640884005

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.14 ug/L	6.70	92	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.168 ug/L	0.203	83	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.127 ug/L	0.203	63	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.4 ug/L	50.0	97	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	51.4 ug/L	50.0	103	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.9 ug/L	50.0	100	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW371UG1-24  
Sample ID: 640884006  
Matrix: WG  
Collect Date: 11-OCT-23 09:30  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.137	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1747	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.00157	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24 Project: FRNP00507  
Sample ID: 640884007 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 10:17  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00853	0.0189	ug/L	0.947	1	LOF	10/17/23	1837	2507796	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.00	0.330	2.00	mg/L		1	RM3	11/03/23	1004	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0718	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	8.32	3.33	10.0	ug/L		1	RMJ	10/21/23	0310	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1835	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	38.4	0.670	250	mg/L		10	JLD1	10/13/23	0234	2507664	7
Sulfate		143	1.33	4.00	mg/L		10					
Bromide		0.497	0.0670	0.200	mg/L		1	JLD1	10/12/23	1503	2507664	8
Fluoride	J	0.263	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.818	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1245	2514927	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2314	2508582	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1750	2508582	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0547	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24  
Sample ID: 640884007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00162	0.000300	0.00200	mg/L	1.00	1					
Iron		0.125	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		21.6	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00265	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000220	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000761	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.10	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00160	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Boron		1.19	0.104	0.300	mg/L	1.00	20	PRB	11/03/23	1845	2508582	12
Calcium		64.6	1.60	4.00	mg/L	1.00	20					
Sodium		59.0	1.60	5.00	mg/L	1.00	20					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.104	0.0347	0.104	ug/L	0.00104	1	NS2	11/01/23	1500	2517137	13
Aroclor-1221	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1232	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1242	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1248	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1254	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1260	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-1268	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Aroclor-Total	U	0.104	0.0347	0.104	ug/L	0.00104	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		447	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24  
Sample ID: 640884007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	J	11.0	8.95	20.0	mg/L		1	JW2	10/13/23	1434	2508146	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1107	2508300	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24  
Sample ID: 640884007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		4.31	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920



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Report Date: January 31, 2024

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24  
Sample ID: 640884007

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.15 ug/L	6.77	91	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.217 ug/L	0.208	104	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.155 ug/L	0.208	75	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	51.2 ug/L	50.0	102	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	51.1 ug/L	50.0	102	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW372UG1-24 Project: FRNP00507  
Sample ID: 640884008 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 10:17  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0563	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1754	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor      Lc/LC: Critical Level  
DL: Detection Limit      PF: Prep Factor  
MDA: Minimum Detectable Activity      RL: Reporting Limit  
MDC: Minimum Detectable Concentration      SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24  
Sample ID: 640884009  
Matrix: WG  
Collect Date: 11-OCT-23 12:35  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0188	0.00848	0.0188	ug/L	0.942	1	LOF	10/17/23	1901	2507796	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.33	0.330	2.00	mg/L		1	RM3	11/03/23	1043	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0719	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		13.0	3.33	10.0	ug/L		1	RMJ	10/21/23	0411	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1914	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	31.2	1.34	250	mg/L		20	JLD1	10/13/23	0336	2507664	7
Sulfate		177	2.66	8.00	mg/L		20					
Nitrate-N	J	0.710	0.165	10.0	mg/L		5	JLD1	10/13/23	0305	2507664	8
Bromide		0.462	0.0670	0.200	mg/L		1	JLD1	10/12/23	1535	2507664	9
Fluoride	J	0.233	0.0330	4.00	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1247	2514927	10
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		2.06	0.104	0.300	mg/L	1.00	20	PRB	11/03/23	1848	2508582	11
Calcium		79.0	1.60	4.00	mg/L	1.00	20					
Sodium		64.6	1.60	5.00	mg/L	1.00	20					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2316	2508582	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1757	2508582	13
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0339	0.000670	0.00400	mg/L	1.00	1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24  
Sample ID: 640884009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	J	0.000542	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00162	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0956	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		27.8	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0709	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00179	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.70	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	J	0.0000720	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00486	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.101	0.0336	0.101	ug/L	0.00101	1	NS2	11/01/23	1516	2517137	14
Aroclor-1221	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1232	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1242	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1248	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1254	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1260	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-1268	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Aroclor-Total	U	0.101	0.0336	0.101	ug/L	0.00101	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		529	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24  
Sample ID: 640884009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	10/13/23	1435	2508146	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1135	2508300	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24  
Sample ID: 640884009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		3.50	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24  
Sample ID: 640884009

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 9056A		
10	SW846 7470A		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3005A/6020B		
14	SW846 3535A/8082A		
15	EPA 160.1		
16	EPA 410.4		
17	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.51 ug/L	6.73	97	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.189 ug/L	0.202	93	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.132 ug/L	0.202	65	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.0 ug/L	50.0	96	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	51.1 ug/L	50.0	102	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW373UG1-24 Project: FRNP00507  
Sample ID: 640884010 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 12:35  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0351	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1801	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	J	0.0000690	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level  
DL: Detection Limit PF: Prep Factor  
MDA: Minimum Detectable Activity RL: Reporting Limit  
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit



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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24  
Sample ID: 640884011  
Matrix: WG  
Collect Date: 11-OCT-23 13:19  
Receive Date: 12-OCT-23  
Collector: Client

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0190	0.00856	0.0190	ug/L	0.952	1	LOF	10/17/23	1926	2507796	2
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.28	0.330	2.00	mg/L		1	RM3	11/03/23	1122	2517902	3
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	10/23/23	0720	2508852	4
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		16.5	3.33	10.0	ug/L		1	RMJ	10/21/23	0447	2509519	5
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	HXC1	10/20/23	1936	2512145	6
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.607	0.0670	0.200	mg/L		1	JLD1	10/13/23	1225	2508401	7
Fluoride	J	0.227	0.0330	4.00	mg/L		1					
Nitrate-N	JW	0.223	0.0330	10.0	mg/L		1					
Sulfate		14.2	0.133	0.400	mg/L		1					
Chloride	J	48.9	0.670	250	mg/L		10	JLD1	10/14/23	0005	2508401	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	AXS5	10/30/23	1249	2514927	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum		0.171	0.0193	0.0500	mg/L	1.00	1	PRB	11/03/23	1805	2508582	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	J	0.00293	0.00200	0.00500	mg/L	1.00	1					
Barium		0.175	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0181	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		24.5	0.0800	0.200	mg/L	1.00	1					
Chromium	J	0.00459	0.00300	0.0100	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24  
Sample ID: 640884011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt	J	0.000917	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00117	0.000300	0.00200	mg/L	1.00	1					
Iron		1.37	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		5.90	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.330	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000304	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000710	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.433	0.0800	0.300	mg/L	1.00	1					
Selenium		0.00698	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium		0.000329	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Sodium		121	0.800	2.50	mg/L	1.00	10	PRB	11/03/23	1852	2508582	11
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	11/03/23	2318	2508582	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.106	0.0354	0.106	ug/L	0.00106	1	NS2	11/01/23	1531	2517137	13
Aroclor-1221	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1232	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1242	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1248	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1254	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1260	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-1268	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Aroclor-Total	U	0.106	0.0354	0.106	ug/L	0.00106	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		384	2.38	10.0	mg/L			CH6	10/13/23	1601	2508295	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24  
Sample ID: 640884011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	J	11.0	8.95	20.0	mg/L		1	JW2	10/13/23	1709	2508487	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1202	2508300	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

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Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24  
Sample ID: 640884011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/18/23	0901	2508851
SW846 3535A	SW3535A PCB SPE Extraction	LW1	11/01/23	0543	2517128
SW846 9010C Distillation	SW846 9010C Prep	ES2	10/20/23	1051	2508851
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	10/27/23	1210	2514920
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24  
Sample ID: 640884011

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW846 8011		
2	SW846 8011		
3	SW846 9060A		
4	SW846 9012B		
5	SW846 9020B		
6	EPA 300.0		
7	SW846 9056A		
8	SW846 9056A		
9	SW846 7470A		
10	SW846 3005A/6020B		
11	SW846 3005A/6020B		
12	SW846 3005A/6020B		
13	SW846 3535A/8082A		
14	EPA 160.1		
15	EPA 410.4		
16	SW846 8260D		

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.66 ug/L	6.80	98	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.219 ug/L	0.212	103	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.142 ug/L	0.212	67	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.9 ug/L	50.0	96	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.8 ug/L	50.0	102	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.3 ug/L	50.0	101	(77%-121%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: MW374UG1-24 Project: FRNP00507  
Sample ID: 640884012 Client ID: FRNP005  
Matrix: WG  
Collect Date: 11-OCT-23 13:19  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.147	0.000670	0.00400	mg/L	1.00	1	PRB	11/03/23	1808	2508582	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.000303	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	10/13/23	1438	2508416
SW846 3005A	ICP-MS 3005A PREP	JM13	10/17/23	1535	2508581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor      Lc/LC: Critical Level  
DL: Detection Limit      PF: Prep Factor  
MDA: Minimum Detectable Activity      RL: Reporting Limit  
MDC: Minimum Detectable Concentration      SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB3UG1-24 Project: FRNP00507  
Sample ID: 640884013 Client ID: FRNP005  
Matrix: WATER  
Collect Date: 11-OCT-23 06:45  
Receive Date: 12-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00861	0.0191	ug/L	0.957	1	LOF	10/17/23	1950	2507796	1
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	10/13/23	1230	2508300	3
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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## Certificate of Analysis

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Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB3UG1-24  
Sample ID: 640884013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	10/17/23	1322	2507795

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	
3	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.33 ug/L	6.83	93	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.1 ug/L	50.0	96	(74%-123%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.5 ug/L	50.0	101	(76%-127%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.7 ug/L	50.0	99	(77%-121%)

Notes:



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## *Certificate of Analysis*

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Quarterly(UG24-01)

Client Sample ID: TB3UG1-24  
Sample ID: 640884013

Project: FRNP00507  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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*Column headers are defined as follows:*

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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**APPENDIX D**

**STATISTICAL ANALYSES AND  
QUALIFICATION STATEMENT**

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RESIDENTIAL/CONTAINED—QUARTERLY, 4th CY 2023  
Facility: U.S. DOE—Paducah Gaseous Diffusion Plant  
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-980-008-982/1  
LAB ID: None

## GROUNDWATER STATISTICAL COMMENTS

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### Introduction

The statistical analyses conducted on the fourth quarter 2023 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). A statistician qualification statement has been provided for this analysis.

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 fourth quarter 2023 data used to conduct the statistical analyses were collected in October 2023. 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. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted. 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.

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,b</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,b</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 LRGAs, 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, fourth quarter 2023. 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>
Aluminum
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential <sup>a</sup>
Polychlorinated Biphenyl (PCB), Total
PCB-1242
pH <sup>b</sup>
Potassium
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Vanadium
Zinc

<sup>a</sup> Oxidation-Reduction Potential calibrated as Eh.

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

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>6</b>	<b>3</b>	<b>3</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>3</b>	<b>3</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>2</b>	<b>4</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>0</b>	<b>6</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 27, 25, and 23 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents 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 dissolved oxygen, oxidation-reduction potential, and sulfate.

### **URGA**

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

### **LRGA**

This quarter's results identified historical background exceedances for calcium, dissolved oxygen, 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>MW362:</b> Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	<b>MW357:</b> Oxidation-Reduction Potential*	<b>MW358:</b> Oxidation-Reduction Potential*
<b>MW365:</b> Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	<b>MW360:</b> Oxidation-Reduction Potential*	<b>MW361:</b> Oxidation-Reduction Potential* and Technetium-99
<b>MW371:</b> Oxidation-Reduction Potential* and Sulfate	<b>MW363:</b> Nickel and Oxidation-Reduction Potential*	<b>MW364:</b> Oxidation-Reduction Potential* and Technetium-99
<b>MW374:</b> Oxidation-Reduction Potential*	<b>MW366:</b> Oxidation-Reduction Potential*	<b>MW367:</b> Oxidation-Reduction Potential*
<b>MW375:</b> Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	<b>MW369:</b> Oxidation-Reduction Potential* and Technetium-99	<b>MW370:</b> Dissolved Oxygen and Oxidation-Reduction Potential*
	<b>MW372:</b> Calcium, Conductivity, Dissolved Solids, Oxidation-Reduction Potential,* and Sulfate	<b>MW373:</b> Calcium and Oxidation-Reduction Potential*

\*Oxidation-Reduction Potential calibrated as Eh.



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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test<sup>a</sup></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	No exceedance of statistically derived historical background concentration.
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 MW362, MW365, and MW375.
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.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential <sup>b</sup>	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW362, MW365, 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 MW362, MW365, MW371, and MW375.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test<sup>a</sup></b>	<b>Results of Tolerance Interval Test Conducted</b>
TOC	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
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

<sup>a</sup> If CV > 1.0, used log-transformed data.

<sup>b</sup> Oxidation-Reduction Potential calibrated as Eh.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test<sup>a</sup></b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.29	Current results exceed statistically derived historical background concentration in MW372.
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.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	Current results exceed statistically derived historical background concentration in MW363.
Oxidation-Reduction Potential <sup>b</sup>	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW360, MW363, MW366, MW369, and MW372.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test<sup>a</sup></b>	<b>Results of Tolerance Interval Test Conducted</b>
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	Current results exceed statistically derived historical background concentration in MW372.
Technetium-99	Tolerance Interval	0.87	Current results exceed statistically derived historical background concentration in MW369.
TOC	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
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

<sup>a</sup> If CV > 1.0, used log-transformed data.

<sup>b</sup> Oxidation-Reduction Potential calibrated as Eh.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test<sup>a</sup></b>	<b>Results of Tolerance Interval Test Conducted</b>
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	Current results exceed statistically derived historical background concentration in MW373.
COD	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.16	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.83	Current results exceed statistically derived historical background concentration in MW370.
Dissolved Solids	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential <sup>b</sup>	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW358, MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	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 MW361 and MW364.
TOC	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
TOX	Tolerance Interval	0.98	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

<sup>a</sup> If CV > 1.0, used log-transformed data.

<sup>b</sup> Oxidation-Reduction Potential calibrated as Eh.

## Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGAs, and LRGAs 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 LRGAs, the test was applied to 3, 7, and 4 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

### UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted; however, that none of the UCRS wells exceeded the current TL this quarter.

### URGA

This quarter's results showed a statistically significant exceedance of current background TL for nickel in downgradient URGAs well MW363.

### LRGA

This quarter's results showed statistically significant exceedances of current background TL for technetium-99 in downgradient LRGA wells MW361 and MW364.

## 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**

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Dissolved Oxygen	Tolerance Interval	0.72	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	0.24	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	0.82	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

\*Oxidation-Reduction Potential calibrated as Eh.

**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>
Calcium	Tolerance Interval	0.62	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	0.37	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	0.41	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.
Nickel	Tolerance Interval	0.53	MW363 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential*	Tolerance Interval	0.08	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	0.92	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	0.29	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

\*Oxidation-Reduction Potential calibrated as Eh.

**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>
Calcium	Tolerance Interval	0.41	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	0.34	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	0.08	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	0.55	MW361 and MW364 exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

\*Oxidation-Reduction Potential calibrated as Eh.



**ATTACHMENT D1**

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

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# C-746-U Fourth Quarter 2023 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)= 2.06E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.371 S= 1.678 CV(2)=-4.521 K factor\*\*= 2.523 TL(2)= 3.86E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.24E+00	8.06E-01
4/22/2002	2.00E-01	-1.61E+00
7/15/2002	2.00E-01	-1.61E+00
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.13E+01	3.06E+00
1/7/2003	2.00E+01	3.00E+00
4/2/2003	4.11E+00	1.41E+00
7/9/2003	1.41E+00	3.44E-01
10/7/2003	1.09E+00	8.62E-02
1/6/2004	8.54E-01	-1.58E-01
4/7/2004	2.00E-01	-1.61E+00
7/14/2004	2.00E-01	-1.61E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	9.09E-01	N/A	-9.54E-02	NO
MW365	Downgradient	Yes	4.05E-02	N/A	-3.21E+00	NO
MW371	Upgradient	Yes	9.49E-01	N/A	-5.23E-02	NO
MW374	Upgradient	Yes	1.71E-01	N/A	-1.77E+00	NO
MW375	Sidegradient	Yes	6.78E-02	N/A	-2.69E+00	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 Fourth Quarter 2023 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)**= 2.68E+00      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= -1.034      **S**= 1.030      **CV(2)**=-0.996      **K factor\*\***= 2.523      **TL(2)**= 1.56E+00      **LL(2)**=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	2.00E+00	6.93E-01
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00
1/6/2004	2.00E-01	-1.61E+00
4/7/2004	2.00E-01	-1.61E+00
7/14/2004	2.00E-01	-1.61E+00

## Dry/Partially Dry Wells

Well No. Gradient

MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.46E-02	N/A	-4.23E+00	NO
MW365	Downgradient	Yes	5.27E-03	N/A	-5.25E+00	NO
MW371	Upgradient	No	1.50E-02	N/A	-4.20E+00	N/A
MW374	Upgradient	Yes	1.81E-02	N/A	-4.01E+00	NO
MW375	Sidegradient	Yes	6.67E-03	N/A	-5.01E+00	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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

Bromide

UNITS: mg/L

UCRS

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

**Statistics-Background Data** X= 1.394 S= 0.474 CV(1)=0.340 K factor\*\*= 2.523 TL(1)= 2.59E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= 0.279 S= 0.332 CV(2)=1.190 K factor\*\*= 2.523 TL(2)= 1.12E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	2.10E+00	7.42E-01
1/7/2003	2.10E+00	7.42E-01
4/2/2003	1.90E+00	6.42E-01
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.90E+00	6.42E-01
1/6/2004	1.90E+00	6.42E-01
4/7/2004	1.80E+00	5.88E-01
7/14/2004	1.60E+00	4.70E-01

## Dry/Partially Dry Wells

Well No. Gradient

MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW365	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW371	Upgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW374	Upgradient	Yes	6.07E-01	NO	-4.99E-01	N/A
MW375	Sidegradient	No	2.00E-01	N/A	-1.61E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 6.85E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.466 S= 0.356 CV(2)=0.103 K factor\*\*= 2.523 TL(2)= 4.36E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.72E+01	2.84E+00
4/22/2002	2.24E+01	3.11E+00
7/15/2002	2.55E+01	3.24E+00
10/8/2002	2.64E+01	3.27E+00
1/8/2003	2.72E+01	3.30E+00
4/3/2003	3.03E+01	3.41E+00
7/9/2003	2.59E+01	3.25E+00
10/6/2003	2.70E+01	3.30E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	6.73E+01	4.21E+00
1/7/2003	6.06E+01	4.10E+00
4/2/2003	4.72E+01	3.85E+00
7/9/2003	3.47E+01	3.55E+00
10/7/2003	3.71E+01	3.61E+00
1/6/2004	3.77E+01	3.63E+00
4/7/2004	3.22E+01	3.47E+00
7/14/2004	2.69E+01	3.29E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.82E+01	NO	2.90E+00	N/A
MW365	Downgradient	Yes	1.79E+01	NO	2.88E+00	N/A
MW371	Upgradient	Yes	5.39E+01	NO	3.99E+00	N/A
MW374	Upgradient	Yes	2.45E+01	NO	3.20E+00	N/A
MW375	Sidegradient	Yes	1.38E+01	NO	2.62E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.51E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 4.000 S= 0.702 CV(2)=0.175 K factor\*\*= 2.523 TL(2)= 5.77E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	3.50E+01	3.56E+00
4/22/2002	3.50E+01	3.56E+00
7/15/2002	3.50E+01	3.56E+00
10/8/2002	3.50E+01	3.56E+00
1/8/2003	3.50E+01	3.56E+00
4/3/2003	3.50E+01	3.56E+00
7/9/2003	3.50E+01	3.56E+00
10/6/2003	3.50E+01	3.56E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.60E+02	5.56E+00
1/7/2003	2.14E+02	5.37E+00
4/2/2003	1.47E+02	4.99E+00
7/9/2003	7.20E+01	4.28E+00
10/7/2003	5.60E+01	4.03E+00
1/6/2004	6.80E+01	4.22E+00
4/7/2004	3.50E+01	3.56E+00
7/14/2004	3.50E+01	3.56E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW365	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW371	Upgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW374	Upgradient	Yes	1.10E+01	NO	2.40E+00	N/A
MW375	Sidegradient	No	2.00E+01	N/A	3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.11E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.620 S= 1.590 CV(2)=0.439 K factor\*\*= 2.523 TL(2)= 7.63E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/15/2002	8.30E+00	2.12E+00
10/8/2002	7.60E+00	2.03E+00
1/8/2003	7.70E+00	2.04E+00
4/3/2003	8.80E+00	2.17E+00
7/9/2003	8.10E+00	2.09E+00
10/6/2003	8.60E+00	2.15E+00
1/7/2004	7.60E+00	2.03E+00
4/6/2004	7.60E+00	2.03E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	1.99E+02	5.29E+00
1/7/2003	2.00E+02	5.30E+00
4/2/2003	1.72E+02	5.15E+00
7/9/2003	1.79E+02	5.19E+00
10/7/2003	1.76E+02	5.17E+00
1/6/2004	1.70E+02	5.14E+00
4/7/2004	1.56E+02	5.05E+00
7/14/2004	1.45E+02	4.97E+00

## Dry/Partially Dry Wells

Well No. Gradient

MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	2.62E+00	NO	9.63E-01	N/A
MW365	Downgradient	Yes	2.27E+00	NO	8.20E-01	N/A
MW371	Upgradient	Yes	3.73E+00	NO	1.32E+00	N/A
MW374	Upgradient	Yes	4.89E+01	NO	3.89E+00	N/A
MW375	Sidegradient	Yes	3.13E+00	NO	1.14E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.12E-02 LL(1)=N/A

**Statistics-Transformed Background Data** X= -5.843 S= 1.392 CV(2)=-0.238 K factor\*\*= 2.523 TL(2)= -2.33E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.00E-03	-6.91E+00
4/3/2003	1.00E-03	-6.91E+00
7/9/2003	1.00E-03	-6.91E+00
10/6/2003	1.00E-03	-6.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1.00E-02	-4.61E+00
1/7/2003	1.00E-02	-4.61E+00
4/2/2003	1.00E-02	-4.61E+00
7/9/2003	1.61E-03	-6.43E+00
10/7/2003	1.00E-03	-6.91E+00
1/6/2004	1.00E-03	-6.91E+00
4/7/2004	1.00E-03	-6.91E+00
7/14/2004	1.00E-03	-6.91E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW365	Downgradient	Yes	1.14E-03	N/A	-6.78E+00	NO
MW371	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW374	Upgradient	Yes	9.17E-04	N/A	-6.99E+00	NO
MW375	Sidegradient	Yes	3.08E-04	N/A	-8.09E+00	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 Fourth Quarter 2023 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)= 1.97E+03 LL(1)=N/A

**Statistics-Transformed Background Data** X= 6.705 S= 0.550 CV(2)=0.082 K factor\*\*= 2.523 TL(2)= 8.09E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	5.41E+02	6.29E+00
4/22/2002	6.43E+02	6.47E+00
7/15/2002	6.32E+02	6.45E+00
10/8/2002	6.31E+02	6.45E+00
1/8/2003	6.80E+02	6.52E+00
4/3/2003	7.49E+02	6.62E+00
7/9/2003	7.34E+02	6.60E+00
10/6/2003	7.53E+02	6.62E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	1.01E+03	6.91E+00
10/8/2002	1.68E+03	7.43E+00
1/7/2003	1.72E+03	7.45E+00
4/2/2003	1.72E+02	5.15E+00
7/9/2003	1.23E+03	7.12E+00
10/7/2003	1.21E+03	7.10E+00
1/6/2004	1.17E+03	7.07E+00
4/7/2004	1.15E+03	7.04E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	6.14E+02	NO	6.42E+00	N/A
MW365	Downgradient	Yes	3.72E+02	NO	5.92E+00	N/A
MW371	Upgradient	Yes	6.95E+02	NO	6.54E+00	N/A
MW374	Upgradient	Yes	8.82E+02	NO	6.78E+00	N/A
MW375	Sidegradient	Yes	3.30E+02	NO	5.80E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.37E-01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -3.395 S= 0.915 CV(2)=-0.270 K factor\*\*= 2.523 TL(2)= -1.09E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E-01	-1.61E+00
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.37E-03	N/A	-6.59E+00	NO
MW365	Downgradient	Yes	3.48E-03	N/A	-5.66E+00	NO
MW371	Upgradient	Yes	1.86E-03	N/A	-6.29E+00	NO
MW374	Upgradient	Yes	1.17E-03	N/A	-6.75E+00	NO
MW375	Sidegradient	Yes	1.81E-03	N/A	-6.31E+00	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 Fourth Quarter 2023 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)= 2.70E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.013 S= 0.577 CV(2)= -43.069 K factor\*\*= 2.523 TL(2)= 1.44E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.26E+00	8.15E-01
4/22/2002	1.15E+00	1.40E-01
7/15/2002	9.40E-01	-6.19E-02
10/8/2002	7.40E-01	-3.01E-01
1/8/2003	2.62E+00	9.63E-01
4/3/2003	1.50E+00	4.05E-01
7/9/2003	1.66E+00	5.07E-01
10/6/2003	1.28E+00	2.47E-01
Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	6.00E-01	-5.11E-01
10/8/2002	6.70E-01	-4.00E-01
1/7/2003	2.30E-01	-1.47E+00
4/2/2003	6.50E-01	-4.31E-01
7/9/2003	9.20E-01	-8.34E-02
10/7/2003	9.90E-01	-1.01E-02
1/6/2004	1.11E+00	1.04E-01
4/7/2004	8.80E-01	-1.28E-01

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	3.07E+00	YES	1.12E+00	N/A
MW365	Downgradient	Yes	6.54E+00	YES	1.88E+00	N/A
MW371	Upgradient	Yes	1.33E+00	NO	2.85E-01	N/A
MW374	Upgradient	Yes	1.84E+00	NO	6.10E-01	N/A
MW375	Sidegradient	Yes	3.09E+00	YES	1.13E+00	N/A

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

MW362  
MW365  
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 Fourth Quarter 2023 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)= 1.22E+03 LL(1)=N/A

**Statistics-Transformed Background Data** X= 6.308 S= 0.383 CV(2)=0.061 K factor\*\*= 2.523 TL(2)= 7.27E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.74E+02	5.61E+00
4/22/2002	4.09E+02	6.01E+00
7/15/2002	4.18E+02	6.04E+00
10/8/2002	4.24E+02	6.05E+00
1/8/2003	4.31E+02	6.07E+00
4/3/2003	4.44E+02	6.10E+00
7/9/2003	4.45E+02	6.10E+00
10/6/2003	4.38E+02	6.08E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1.14E+03	7.04E+00
1/7/2003	1.10E+03	7.00E+00
4/2/2003	8.63E+02	6.76E+00
7/9/2003	6.82E+02	6.53E+00
10/7/2003	5.89E+02	6.38E+00
1/6/2004	6.03E+02	6.40E+00
4/7/2004	6.01E+02	6.40E+00
7/14/2004	5.82E+02	6.37E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	3.31E+02	NO	5.80E+00	N/A
MW365	Downgradient	Yes	1.89E+02	NO	5.24E+00	N/A
MW371	Upgradient	Yes	3.88E+02	NO	5.96E+00	N/A
MW374	Upgradient	Yes	3.84E+02	NO	5.95E+00	N/A
MW375	Sidegradient	Yes	1.68E+02	NO	5.12E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.30E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 1.363 S= 1.147 CV(2)=0.841 K factor\*\*= 2.523 TL(2)= 4.26E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.31E+00	2.70E-01
4/22/2002	9.13E-01	-9.10E-02
7/15/2002	8.81E-01	-1.27E-01
10/8/2002	3.86E+00	1.35E+00
1/8/2003	1.88E+00	6.31E-01
4/3/2003	3.18E+00	1.16E+00
7/9/2003	4.84E-01	-7.26E-01
10/6/2003	2.72E+00	1.00E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.30E+01	3.14E+00
1/7/2003	1.39E+01	2.63E+00
4/2/2003	1.40E+01	2.64E+00
7/9/2003	1.42E+01	2.65E+00
10/7/2003	7.92E+00	2.07E+00
1/6/2004	7.86E+00	2.06E+00
4/7/2004	4.82E+00	1.57E+00
7/14/2004	4.87E+00	1.58E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.71E-01	NO	-1.77E+00	N/A
MW365	Downgradient	Yes	4.39E-02	NO	-3.13E+00	N/A
MW371	Upgradient	Yes	5.17E-01	NO	-6.60E-01	N/A
MW374	Upgradient	Yes	1.37E+00	NO	3.15E-01	N/A
MW375	Sidegradient	Yes	1.17E-01	NO	-2.15E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 1.90E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 2.401 S= 0.237 CV(2)=0.099 K factor\*\*= 2.523 TL(2)= 3.00E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	7.10E+00	1.96E+00
4/22/2002	9.77E+00	2.28E+00
7/15/2002	1.04E+01	2.34E+00
10/8/2002	1.02E+01	2.32E+00
1/8/2003	1.07E+01	2.37E+00
4/3/2003	1.19E+01	2.48E+00
7/9/2003	1.08E+01	2.38E+00
10/6/2003	1.09E+01	2.39E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E+01	3.00E+00
1/7/2003	1.61E+01	2.78E+00
4/2/2003	1.31E+01	2.57E+00
7/9/2003	1.03E+01	2.33E+00
10/7/2003	1.11E+01	2.41E+00
1/6/2004	1.10E+01	2.40E+00
4/7/2004	9.69E+00	2.27E+00
7/14/2004	8.49E+00	2.14E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	7.70E+00	NO	2.04E+00	N/A
MW365	Downgradient	Yes	8.01E+00	NO	2.08E+00	N/A
MW371	Upgradient	Yes	1.73E+01	NO	2.85E+00	N/A
MW374	Upgradient	Yes	5.90E+00	NO	1.77E+00	N/A
MW375	Sidegradient	Yes	5.46E+00	NO	1.70E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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,  $S = \sqrt{[\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])}$

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 Fourth Quarter 2023 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)= 8.09E-01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -1.873 S= 1.068 CV(2)=-0.570 K factor\*\*= 2.523 TL(2)= 8.21E-01 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	6.30E-02	-2.76E+00
4/22/2002	6.70E-02	-2.70E+00
7/15/2002	7.40E-02	-2.60E+00
10/8/2002	5.21E-02	-2.95E+00
1/8/2003	3.85E-02	-3.26E+00
4/3/2003	5.51E-02	-2.90E+00
7/9/2003	5.46E-02	-2.91E+00
10/6/2003	5.43E-02	-2.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.96E-01	-5.18E-01
1/7/2003	5.65E-01	-5.71E-01
4/2/2003	6.75E-01	-3.93E-01
7/9/2003	3.97E-01	-9.24E-01
10/7/2003	3.12E-01	-1.16E+00
1/6/2004	2.99E-01	-1.21E+00
4/7/2004	3.29E-01	-1.11E+00
7/14/2004	3.42E-01	-1.07E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.98E-03	NO	-6.22E+00	N/A
MW365	Downgradient	Yes	1.51E-02	NO	-4.19E+00	N/A
MW371	Upgradient	Yes	9.61E-03	NO	-4.64E+00	N/A
MW374	Upgradient	Yes	3.30E-01	NO	-1.11E+00	N/A
MW375	Sidegradient	Yes	4.46E-03	NO	-5.41E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)**= 2.99E-02      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= -6.108      **S**= 1.239      **CV(2)**=-0.203      **K factor\*\***= 2.523      **TL(2)**= -2.98E+00      **LL(2)**=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.21E-03	-6.72E+00
4/3/2003	1.00E-03	-6.91E+00
7/9/2003	1.11E-03	-6.80E+00
10/6/2003	1.00E-03	-6.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.22E-03	-6.11E+00
1/7/2003	2.01E-03	-6.21E+00
4/2/2003	1.59E-03	-6.44E+00
7/9/2003	2.42E-03	-6.02E+00
10/7/2003	1.00E-03	-6.91E+00
1/6/2004	1.00E-03	-6.91E+00
4/7/2004	1.00E-03	-6.91E+00
7/14/2004	1.00E-03	-6.91E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	7.90E-04	N/A	-7.14E+00	NO
MW365	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW371	Upgradient	Yes	5.24E-04	N/A	-7.55E+00	NO
MW374	Upgradient	Yes	3.04E-04	N/A	-8.10E+00	NO
MW375	Sidegradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.82E-02 LL(1)=N/A

**Statistics-Transformed Background Data** X= -4.349 S= 1.109 CV(2)=-0.255 K factor\*\*= 2.523 TL(2)= -1.55E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/22/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	1.24E-02	-4.39E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/9/2003	5.00E-03	-5.30E+00
10/6/2003	5.00E-03	-5.30E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.00E-02	-3.00E+00
1/7/2003	5.00E-02	-3.00E+00
4/2/2003	5.00E-02	-3.00E+00
7/9/2003	7.94E-03	-4.84E+00
10/7/2003	5.00E-03	-5.30E+00
1/6/2004	5.00E-03	-5.30E+00
4/7/2004	5.00E-03	-5.30E+00
7/14/2004	5.00E-03	-5.30E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.15E-03	NO	-6.77E+00	N/A
MW365	Downgradient	Yes	5.11E-03	NO	-5.28E+00	N/A
MW371	Upgradient	Yes	2.30E-03	NO	-6.07E+00	N/A
MW374	Upgradient	Yes	7.10E-04	NO	-7.25E+00	N/A
MW375	Sidegradient	Yes	1.23E-03	NO	-6.70E+00	N/A

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

# UCRS

**C-746-U Fourth Quarter 2023 Statistical Analysis Historical Background Comparison****PCB, Total****UNITS: µg/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)**= 7.46E-01      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= -1.647      **S**= 0.440      **CV(2)**=-0.267      **K factor\*\***= 2.523      **TL(2)**= -5.37E-01      **LL(2)**=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.70E-01	-1.77E+00
7/15/2002	1.70E-01	-1.77E+00
7/9/2003	1.70E-01	-1.77E+00
10/6/2003	1.70E-01	-1.77E+00
7/13/2004	1.80E-01	-1.71E+00
7/25/2005	1.70E-01	-1.77E+00
4/5/2006	1.80E-01	-1.71E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
7/9/2003	1.70E-01	-1.77E+00
10/7/2003	1.70E-01	-1.77E+00
7/14/2004	1.80E-01	-1.71E+00
7/26/2005	1.70E-01	-1.77E+00
4/6/2006	1.80E-01	-1.71E+00
7/10/2006	1.70E-01	-1.77E+00
10/12/2006	1.70E-01	-1.77E+00
1/8/2007	1.70E-01	-1.77E+00

**Dry/Partially Dry Wells**

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	9.86E-02	N/A	-2.32E+00	N/A
MW365	Downgradient	Yes	4.27E-02	NO	-3.15E+00	N/A
MW371	Upgradient	No	1.01E-01	N/A	-2.29E+00	N/A
MW374	Upgradient	No	1.06E-01	N/A	-2.24E+00	N/A
MW375	Sidegradient	No	1.02E-01	N/A	-2.28E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison****PCB-1242****UNITS: µg/L****UCRS**

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

**Statistics-Background Data**      **X**= 0.159      **S**= 0.224      **CV(1)**=1.409      **K factor\*\***= 2.523      **TL(1)**= 7.26E-01      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= -2.134      **S**= 0.579      **CV(2)**=-0.272      **K factor\*\***= 2.523      **TL(2)**= -6.72E-01      **LL(2)**=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.10E-01	-2.21E+00
7/15/2002	1.10E-01	-2.21E+00
7/9/2003	1.30E-01	-2.04E+00
10/6/2003	9.00E-02	-2.41E+00
7/13/2004	1.00E-01	-2.30E+00
7/25/2005	9.00E-02	-2.41E+00
4/5/2006	1.00E-01	-2.30E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
7/9/2003	1.30E-01	-2.04E+00
10/7/2003	9.00E-02	-2.41E+00
7/14/2004	1.00E-01	-2.30E+00
7/26/2005	1.00E-01	-2.30E+00
4/6/2006	1.00E-01	-2.30E+00
7/10/2006	1.00E-01	-2.30E+00
10/12/2006	1.00E-01	-2.30E+00
1/8/2007	1.00E-01	-2.30E+00

**Dry/Partially Dry Wells**

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	9.86E-02	N/A	-2.32E+00	N/A
MW365	Downgradient	Yes	4.27E-02	N/A	-3.15E+00	NO
MW371	Upgradient	No	1.01E-01	N/A	-2.29E+00	N/A
MW374	Upgradient	No	1.06E-01	N/A	-2.24E+00	N/A
MW375	Sidegradient	No	1.02E-01	N/A	-2.28E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.48E+00 LL(1)=5.76E+00

**Statistics-Transformed Background Data** X= 1.889 S= 0.046 CV(2)=0.024 K factor\*\*= 2.904 TL(2)= 2.02E+00 LL(2)=1.75E+00

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	6.30E+00	1.84E+00
4/22/2002	6.50E+00	1.87E+00
7/15/2002	6.50E+00	1.87E+00
10/8/2002	6.60E+00	1.89E+00
1/8/2003	6.60E+00	1.89E+00
4/3/2003	6.90E+00	1.93E+00
7/9/2003	6.70E+00	1.90E+00
10/6/2003	7.00E+00	1.95E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	5.75E+00	1.75E+00
10/8/2002	6.60E+00	1.89E+00
1/7/2003	6.82E+00	1.92E+00
4/2/2003	6.86E+00	1.93E+00
7/9/2003	6.70E+00	1.90E+00
10/7/2003	6.60E+00	1.89E+00
1/6/2004	6.90E+00	1.93E+00
4/7/2004	6.58E+00	1.88E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)?
MW362	Downgradient	Yes	7.02E+00	NO	1.95E+00	N/A
MW365	Downgradient	Yes	6.31E+00	NO	1.84E+00	N/A
MW371	Upgradient	Yes	6.46E+00	NO	1.87E+00	N/A
MW374	Upgradient	Yes	6.13E+00	NO	1.81E+00	N/A
MW375	Sidegradient	Yes	6.39E+00	NO	1.85E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.55E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.023 S= 0.752 CV(2)=-32.218 K factor\*\*= 2.523 TL(2)= 1.87E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	4.08E-01	-8.96E-01
1/8/2003	3.84E-01	-9.57E-01
4/3/2003	3.68E-01	-1.00E+00
7/9/2003	5.87E-01	-5.33E-01
10/6/2003	3.82E-01	-9.62E-01
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	3.04E+00	1.11E+00
1/7/2003	2.83E+00	1.04E+00
4/2/2003	2.00E+00	6.93E-01
7/9/2003	1.09E+00	8.62E-02
10/7/2003	8.02E-01	-2.21E-01
1/6/2004	8.97E-01	-1.09E-01
4/7/2004	6.89E-01	-3.73E-01
7/14/2004	7.16E-01	-3.34E-01

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	3.69E-01	NO	-9.97E-01	N/A
MW365	Downgradient	Yes	2.23E-01	NO	-1.50E+00	N/A
MW371	Upgradient	Yes	4.46E-01	NO	-8.07E-01	N/A
MW374	Upgradient	Yes	4.33E-01	NO	-8.37E-01	N/A
MW375	Sidegradient	Yes	2.93E-01	NO	-1.23E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)=** 3.68E+02    **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** 5.146    **S=** 0.356    **CV(2)=**0.069    **K factor\*\*=** 2.523    **TL(2)=** 6.04E+00    **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.29E+02	4.86E+00
4/22/2002	1.31E+02	4.88E+00
7/15/2002	1.27E+02	4.84E+00
10/8/2002	1.23E+02	4.81E+00
1/8/2003	1.28E+02	4.85E+00
4/3/2003	1.44E+02	4.97E+00
7/9/2003	1.26E+02	4.84E+00
10/6/2003	1.20E+02	4.79E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	3.36E+02	5.82E+00
1/7/2003	3.29E+02	5.80E+00
4/2/2003	2.87E+02	5.66E+00
7/9/2003	1.81E+02	5.20E+00
10/7/2003	1.82E+02	5.20E+00
1/6/2004	2.06E+02	5.33E+00
4/7/2004	1.82E+02	5.20E+00
7/14/2004	1.98E+02	5.29E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.15E+02	NO	4.74E+00	N/A
MW365	Downgradient	Yes	4.33E+01	NO	3.77E+00	N/A
MW371	Upgradient	Yes	7.97E+01	NO	4.38E+00	N/A
MW374	Upgradient	Yes	1.21E+02	NO	4.80E+00	N/A
MW375	Sidegradient	Yes	5.29E+01	NO	3.97E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 1.44E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 1.794 S= 0.357 CV(2)=0.199 K factor\*\*= 2.523 TL(2)= 2.69E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.63E+01	2.79E+00
4/22/2002	8.60E+00	2.15E+00
7/15/2002	6.70E+00	1.90E+00
10/8/2002	5.00E+00	1.61E+00
1/8/2003	5.00E+00	1.61E+00
4/3/2003	5.00E+00	1.61E+00
7/9/2003	5.00E+00	1.61E+00
10/6/2003	5.00E+00	1.61E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.00E+00	1.61E+00
1/7/2003	5.00E+00	1.61E+00
4/2/2003	5.00E+00	1.61E+00
7/9/2003	5.60E+00	1.72E+00
10/7/2003	5.00E+00	1.61E+00
1/6/2004	5.00E+00	1.61E+00
4/7/2004	1.13E+01	2.42E+00
7/14/2004	5.00E+00	1.61E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	2.15E+01	YES	3.07E+00	N/A
MW365	Downgradient	Yes	5.23E+01	YES	3.96E+00	N/A
MW371	Upgradient	Yes	1.58E+01	YES	2.76E+00	N/A
MW374	Upgradient	Yes	1.42E+01	NO	2.65E+00	N/A
MW375	Sidegradient	Yes	2.23E+01	YES	3.10E+00	N/A

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

MW362  
MW365  
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 Fourth Quarter 2023 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)**= 7.90E+01    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 2.318    **S**= 0.979    **CV(2)**=0.422    **K factor\*\***= 2.523    **TL(2)**= 4.79E+00    **LL(2)**=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.11E+01	2.41E+00
4/22/2002	7.00E+00	1.95E+00
7/15/2002	4.10E+00	1.41E+00
10/8/2002	6.00E+00	1.79E+00
1/8/2003	5.30E+00	1.67E+00
4/3/2003	5.30E+00	1.67E+00
7/9/2003	2.90E+00	1.06E+00
10/6/2003	3.20E+00	1.16E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	9.00E+01	4.50E+00
1/7/2003	6.40E+01	4.16E+00
4/2/2003	2.50E+01	3.22E+00
7/9/2003	1.60E+01	2.77E+00
10/7/2003	1.30E+01	2.56E+00
1/6/2004	1.00E+01	2.30E+00
4/7/2004	7.20E+00	1.97E+00
7/14/2004	1.20E+01	2.48E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	2.05E+00	N/A	7.18E-01	NO
MW365	Downgradient	Yes	1.50E+00	N/A	4.05E-01	NO
MW371	Upgradient	Yes	2.11E+00	N/A	7.47E-01	NO
MW374	Upgradient	Yes	2.28E+00	N/A	8.24E-01	NO
MW375	Sidegradient	Yes	9.18E-01	N/A	-8.56E-02	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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

**Total Organic Halides (TOX)**

**UNITS: µg/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)= 7.97E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 4.867 S= 1.065 CV(2)=0.219 K factor\*\*= 2.523 TL(2)= 7.55E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/22/2002	1.05E+02	4.65E+00
7/15/2002	7.00E+01	4.25E+00
10/8/2002	5.20E+01	3.95E+00
1/8/2003	2.02E+01	3.01E+00
4/3/2003	1.04E+02	4.64E+00
7/9/2003	3.42E+01	3.53E+00
10/6/2003	4.61E+01	3.83E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	9.03E+02	6.81E+00
1/7/2003	5.39E+02	6.29E+00
4/2/2003	2.95E+02	5.69E+00
7/9/2003	2.72E+02	5.61E+00
10/7/2003	1.97E+02	5.28E+00
1/6/2004	3.30E+02	5.80E+00
4/7/2004	1.83E+02	5.21E+00
7/14/2004	2.25E+02	5.42E+00

## Dry/Partially Dry Wells

Well No. Gradient

MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	Yes	1.14E+01	N/A	2.43E+00	NO
MW365	Downgradient	Yes	1.30E+01	N/A	2.56E+00	NO
MW371	Upgradient	Yes	4.52E+00	N/A	1.51E+00	NO
MW374	Upgradient	Yes	1.65E+01	N/A	2.80E+00	NO
MW375	Sidegradient	Yes	6.56E+00	N/A	1.88E+00	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 Fourth Quarter 2023 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)= 2.37E-01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -3.438 S= 0.912 CV(2)=-0.265 K factor\*\*= 2.523 TL(2)= -1.14E+00 LL(2)=N/A

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

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E-01	-1.61E+00
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

### Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW365	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW371	Upgradient	Yes	5.08E-03	N/A	-5.28E+00	NO
MW374	Upgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW375	Sidegradient	No	2.00E-02	N/A	-3.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.70E-01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -3.259 S= 0.840 CV(2)=-0.258 K factor\*\*= 2.523 TL(2)= -1.14E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/22/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/9/2003	3.76E-02	-3.28E+00
10/6/2003	2.00E-02	-3.91E+00
Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-01	-1.05E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

## Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
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)
MW362	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW365	Downgradient	Yes	5.69E-03	N/A	-5.17E+00	NO
MW371	Upgradient	Yes	5.75E-03	N/A	-5.16E+00	NO
MW374	Upgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW375	Sidegradient	Yes	5.24E-03	N/A	-5.25E+00	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 Fourth Quarter 2023 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)= 2.58E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.973 S= 0.935 CV(2)=-0.961 K factor\*\*= 2.523 TL(2)= 1.39E+00 LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.55E-01	-1.37E+00
4/22/2002	2.00E-01	-1.61E+00
7/15/2002	3.22E-01	-1.13E+00
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/8/2003	2.00E-01	-1.61E+00
10/6/2003	6.89E-01	-3.73E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.61E+00	9.59E-01
4/23/2002	2.00E-01	-1.61E+00
7/16/2002	1.14E+00	1.31E-01
10/8/2002	8.62E-01	-1.49E-01
1/7/2003	2.32E+00	8.42E-01
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW360	Downgradient	Yes	3.78E-02	N/A	-3.28E+00	NO
MW363	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW366	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW369	Upgradient	Yes	6.61E-02	N/A	-2.72E+00	NO
MW372	Upgradient	No	5.00E-02	N/A	-3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.07E+00      LL(1)=N/A

**Statistics-Transformed Background Data**      X= -0.430      S= 0.990      CV(2)=-2.302      K factor\*\*= 2.523      TL(2)= 2.07E+00      LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/8/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	4.92E-01	-7.09E-01
1/7/2003	4.92E-01	-7.09E-01
4/2/2003	6.00E-01	-5.11E-01
7/9/2003	5.70E-01	-5.62E-01
10/7/2003	6.04E-01	-5.04E-01

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.01E-01	NO	-1.20E+00	N/A
MW360	Downgradient	Yes	2.35E-02	NO	-3.75E+00	N/A
MW363	Downgradient	Yes	2.14E-02	NO	-3.84E+00	N/A
MW366	Downgradient	Yes	7.60E-02	NO	-2.58E+00	N/A
MW369	Upgradient	Yes	1.59E-02	NO	-4.14E+00	N/A
MW372	Upgradient	Yes	1.19E+00	NO	1.74E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

Bromide

UNITS: mg/L

URGA

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

Statistics-Background Data X= 1.000 S= 0.000 CV(1)=0.000 K factor\*\*= 2.523 TL(1)= 1.00E+00 LL(1)=N/A

Statistics-Transformed Background Data X= 0.000 S= 0.000 CV(2)=#Num! K factor\*\*= 2.523 TL(2)= 0.00E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/8/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.00E+00	0.00E+00
4/2/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.00E+00	0.00E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.61E-01	NO	-1.02E+00	N/A
MW360	Downgradient	Yes	1.34E-01	NO	-2.01E+00	N/A
MW363	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW366	Downgradient	Yes	4.83E-01	NO	-7.28E-01	N/A
MW369	Upgradient	Yes	3.31E-01	NO	-1.11E+00	N/A
MW372	Upgradient	Yes	4.97E-01	NO	-6.99E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 5.65E+01 LL(1)=N/A

Statistics-Transformed Background Data X= 3.449 S= 0.299 CV(2)=0.087 K factor\*\*= 2.523 TL(2)= 4.20E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.95E+01	3.38E+00
4/22/2002	2.98E+01	3.39E+00
7/15/2002	2.53E+01	3.23E+00
10/8/2002	2.19E+01	3.09E+00
1/8/2003	2.09E+01	3.04E+00
4/3/2003	2.22E+01	3.10E+00
7/8/2003	2.29E+01	3.13E+00
10/6/2003	2.17E+01	3.08E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	4.15E+01	3.73E+00
4/23/2002	4.36E+01	3.78E+00
7/16/2002	4.04E+01	3.70E+00
10/8/2002	3.88E+01	3.66E+00
1/7/2003	4.11E+01	3.72E+00
4/2/2003	4.29E+01	3.76E+00
7/9/2003	3.51E+01	3.56E+00
10/7/2003	4.66E+01	3.84E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	2.49E+01	NO	3.21E+00	N/A
MW360	Downgradient	Yes	1.96E+01	NO	2.98E+00	N/A
MW363	Downgradient	Yes	2.32E+01	NO	3.14E+00	N/A
MW366	Downgradient	Yes	3.39E+01	NO	3.52E+00	N/A
MW369	Upgradient	Yes	1.60E+01	NO	2.77E+00	N/A
MW372	Upgradient	Yes	6.46E+01	YES	4.17E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

## Chemical Oxygen Demand (COD)

UNITS: mg/L

URGA

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

**Statistics-Background Data**      X= 35.938    S= 3.750    CV(1)=0.104    K factor\*\*= 2.523    TL(1)= 4.54E+01    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.578    S= 0.089    CV(2)=0.025    K factor\*\*= 2.523    TL(2)= 3.80E+00    LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	3.50E+01	3.56E+00
4/22/2002	3.50E+01	3.56E+00
7/15/2002	3.50E+01	3.56E+00
10/8/2002	5.00E+01	3.91E+00
1/8/2003	3.50E+01	3.56E+00
4/3/2003	3.50E+01	3.56E+00
7/8/2003	3.50E+01	3.56E+00
10/6/2003	3.50E+01	3.56E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.50E+01	3.56E+00
4/23/2002	3.50E+01	3.56E+00
7/16/2002	3.50E+01	3.56E+00
10/8/2002	3.50E+01	3.56E+00
1/7/2003	3.50E+01	3.56E+00
4/2/2003	3.50E+01	3.56E+00
7/9/2003	3.50E+01	3.56E+00
10/7/2003	3.50E+01	3.56E+00

**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	2.00E+01	N/A	3.00E+00	N/A
MW360	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW363	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW366	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW369	Upgradient	Yes	1.32E+01	NO	2.58E+00	N/A
MW372	Upgradient	Yes	1.10E+01	NO	2.40E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

Chloride

UNITS: mg/L

URGA

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

**Statistics-Background Data** X= 44.119 S= 4.554 CV(1)=0.103 K factor\*\*= 2.523 TL(1)= 5.56E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.782 S= 0.099 CV(2)=0.026 K factor\*\*= 2.523 TL(2)= 4.03E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
7/15/2002	4.83E+01	3.88E+00
10/8/2002	4.77E+01	3.86E+00
1/8/2003	4.57E+01	3.82E+00
4/3/2003	4.74E+01	3.86E+00
7/8/2003	5.59E+01	4.02E+00
10/6/2003	4.74E+01	3.86E+00
1/7/2004	4.55E+01	3.82E+00
4/7/2004	4.34E+01	3.77E+00

Well Number: MW372

Date Collected	Result	LN(Result)
7/16/2002	3.98E+01	3.68E+00
10/8/2002	4.10E+01	3.71E+00
1/7/2003	3.94E+01	3.67E+00
4/2/2003	3.92E+01	3.67E+00
7/9/2003	3.98E+01	3.68E+00
10/7/2003	4.00E+01	3.69E+00
1/5/2004	4.34E+01	3.77E+00
4/5/2004	4.20E+01	3.74E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.00E+01	NO	3.40E+00	N/A
MW360	Downgradient	Yes	5.41E+00	NO	1.69E+00	N/A
MW363	Downgradient	Yes	2.07E+01	NO	3.03E+00	N/A
MW366	Downgradient	Yes	3.83E+01	NO	3.65E+00	N/A
MW369	Upgradient	Yes	2.75E+01	NO	3.31E+00	N/A
MW372	Upgradient	Yes	3.84E+01	NO	3.65E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.73E-02 LL(1)=N/A

Statistics-Transformed Background Data X= -4.090 S= 1.006 CV(2)=-0.246 K factor\*\*= 2.523 TL(2)= -1.55E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	9.38E-03	-4.67E+00
1/8/2003	5.48E-03	-5.21E+00
4/3/2003	5.87E-03	-5.14E+00
7/8/2003	5.41E-02	-2.92E+00
10/6/2003	6.89E-02	-2.68E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	1.58E-03	-6.45E+00
1/7/2003	1.47E-02	-4.22E+00
4/2/2003	1.16E-02	-4.46E+00
7/9/2003	6.53E-02	-2.73E+00
10/7/2003	7.88E-03	-4.84E+00

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	1.00E-03	N/A	-6.91E+00	N/A
MW360	Downgradient	Yes	6.22E-04	NO	-7.38E+00	N/A
MW363	Downgradient	Yes	9.55E-04	NO	-6.95E+00	N/A
MW366	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW369	Upgradient	Yes	6.36E-03	NO	-5.06E+00	N/A
MW372	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

## Conductivity

UNITS: umho/cm

URGA

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

**Statistics-Background Data** X= 482.856 S= 57.603 CV(1)=0.119 K factor\*\*= 2.523 TL(1)= 6.28E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 6.173 S= 0.123 CV(2)=0.020 K factor\*\*= 2.523 TL(2)= 6.48E+00 LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	3.88E+02	5.96E+00
4/22/2002	4.04E+02	6.00E+00
7/15/2002	3.94E+02	5.98E+00
10/8/2002	4.03E+02	6.00E+00
1/8/2003	5.20E+02	6.25E+00
4/3/2003	4.87E+02	6.19E+00
7/8/2003	4.78E+02	6.17E+00
10/6/2003	4.76E+02	6.17E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.08E+02	6.23E+00
4/23/2002	5.01E+02	6.22E+00
7/16/2002	5.07E+02	6.23E+00
10/8/2002	4.95E+02	6.20E+00
1/7/2003	5.09E+02	6.23E+00
4/2/2003	5.15E+02	6.24E+00
7/9/2003	5.76E+02	6.36E+00
10/7/2003	5.65E+02	6.34E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.04E+02	NO	6.00E+00	N/A
MW360	Downgradient	Yes	3.85E+02	NO	5.95E+00	N/A
MW363	Downgradient	Yes	3.60E+02	NO	5.89E+00	N/A
MW366	Downgradient	Yes	4.89E+02	NO	6.19E+00	N/A
MW369	Upgradient	Yes	3.45E+02	NO	5.84E+00	N/A
MW372	Upgradient	Yes	7.47E+02	YES	6.62E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

## Copper

UNITS: mg/L

URGA

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

**Statistics-Background Data**      X= 0.025      S= 0.010      CV(1)=0.400      K factor\*\*= 2.523      TL(1)= 5.02E-02      LL(1)=N/A

**Statistics-Transformed Background Data**      X= -3.742      S= 0.307      CV(2)=-0.082      K factor\*\*= 2.523      TL(2)= -2.97E+00      LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/8/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/7/2003	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.53E-03	NO	-6.48E+00	N/A
MW360	Downgradient	Yes	3.12E-03	NO	-5.77E+00	N/A
MW363	Downgradient	Yes	6.84E-04	NO	-7.29E+00	N/A
MW366	Downgradient	Yes	1.58E-03	NO	-6.45E+00	N/A
MW369	Upgradient	Yes	4.46E-03	NO	-5.41E+00	N/A
MW372	Upgradient	Yes	1.62E-03	NO	-6.43E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 5.19E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= 0.228 S= 1.065 CV(2)=4.665 K factor\*\*= 2.523 TL(2)= 2.92E+00 LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5.41E+00	1.69E+00
4/22/2002	1.57E+00	4.51E-01
7/15/2002	8.00E-01	-2.23E-01
10/8/2002	1.09E+00	8.62E-02
1/8/2003	2.69E+00	9.90E-01
4/3/2003	2.04E+00	7.13E-01
7/8/2003	1.19E+00	1.74E-01
10/6/2003	1.78E+00	5.77E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.89E+00	1.36E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	1.33E+00	2.85E-01
10/8/2002	2.66E+00	9.78E-01
1/7/2003	4.00E-01	-9.16E-01
4/2/2003	9.10E-01	-9.43E-02
7/9/2003	1.42E+00	3.51E-01
10/7/2003	1.26E+00	2.31E-01

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.50E+00	NO	1.50E+00	N/A
MW360	Downgradient	Yes	1.71E+00	NO	5.36E-01	N/A
MW363	Downgradient	Yes	7.70E-01	NO	-2.61E-01	N/A
MW366	Downgradient	Yes	3.80E+00	NO	1.34E+00	N/A
MW369	Upgradient	Yes	3.49E+00	NO	1.25E+00	N/A
MW372	Upgradient	Yes	3.24E+00	NO	1.18E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.98E+02   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.640   S= 0.175   CV(2)=0.031   K factor\*\*= 2.523   TL(2)= 6.08E+00   LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.73E+02	5.15E+00
4/22/2002	2.46E+02	5.51E+00
7/15/2002	2.32E+02	5.45E+00
10/8/2002	2.75E+02	5.62E+00
1/8/2003	2.69E+02	5.59E+00
4/3/2003	2.50E+02	5.52E+00
7/8/2003	2.95E+02	5.69E+00
10/6/2003	2.76E+02	5.62E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.95E+02	5.69E+00
4/23/2002	3.22E+02	5.77E+00
7/16/2002	3.29E+02	5.80E+00
10/8/2002	2.90E+02	5.67E+00
1/7/2003	3.16E+02	5.76E+00
4/2/2003	3.11E+02	5.74E+00
7/9/2003	3.47E+02	5.85E+00
10/7/2003	3.37E+02	5.82E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.86E+02	NO	5.23E+00	N/A
MW360	Downgradient	Yes	1.95E+02	NO	5.27E+00	N/A
MW363	Downgradient	Yes	1.92E+02	NO	5.26E+00	N/A
MW366	Downgradient	Yes	2.33E+02	NO	5.45E+00	N/A
MW369	Upgradient	Yes	1.92E+02	NO	5.26E+00	N/A
MW372	Upgradient	Yes	4.47E+02	YES	6.10E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.50E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 1.358 S= 1.323 CV(2)=0.974 K factor\*\*= 2.523 TL(2)= 4.70E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	6.56E-01	-4.22E-01
4/22/2002	6.95E-01	-3.64E-01
7/15/2002	7.10E+00	1.96E+00
10/8/2002	2.15E+01	3.07E+00
1/8/2003	1.85E+01	2.92E+00
4/3/2003	1.49E+01	2.70E+00
7/8/2003	1.13E+01	2.42E+00
10/6/2003	1.49E+01	2.70E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.95E+00	1.78E+00
4/23/2002	7.92E-01	-2.33E-01
7/16/2002	1.78E+00	5.77E-01
10/8/2002	7.76E-01	-2.54E-01
1/7/2003	3.55E+00	1.27E+00
4/2/2003	5.02E+00	1.61E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	7.33E-01	-3.11E-01

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	1.00E-01	N/A	-2.30E+00	N/A
MW360	Downgradient	Yes	5.45E-02	NO	-2.91E+00	N/A
MW363	Downgradient	Yes	5.95E-02	NO	-2.82E+00	N/A
MW366	Downgradient	Yes	5.73E-02	NO	-2.86E+00	N/A
MW369	Upgradient	Yes	3.23E-01	NO	-1.13E+00	N/A
MW372	Upgradient	Yes	1.25E-01	NO	-2.08E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.17E+01    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 2.517    S= 0.290    CV(2)=0.115    K factor\*\*= 2.523    TL(2)= 3.25E+00    LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.14E+01	2.43E+00
4/22/2002	1.20E+01	2.48E+00
7/15/2002	1.00E+01	2.30E+00
10/8/2002	8.62E+00	2.15E+00
1/8/2003	7.89E+00	2.07E+00
4/3/2003	7.97E+00	2.08E+00
7/8/2003	1.03E+01	2.33E+00
10/6/2003	9.14E+00	2.21E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.57E+01	2.75E+00
4/23/2002	1.66E+01	2.81E+00
7/16/2002	1.54E+01	2.73E+00
10/8/2002	1.58E+01	2.76E+00
1/7/2003	1.58E+01	2.76E+00
4/2/2003	1.64E+01	2.80E+00
7/9/2003	1.52E+01	2.72E+00
10/7/2003	1.76E+01	2.87E+00

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	9.65E+00	NO	2.27E+00	N/A
MW360	Downgradient	Yes	7.78E+00	NO	2.05E+00	N/A
MW363	Downgradient	Yes	9.02E+00	NO	2.20E+00	N/A
MW366	Downgradient	Yes	1.41E+01	NO	2.65E+00	N/A
MW369	Upgradient	Yes	6.42E+00	NO	1.86E+00	N/A
MW372	Upgradient	Yes	2.16E+01	NO	3.07E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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 Fourth Quarter 2023 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)**= 1.11E+00      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= -1.226      **S**= 1.008      **CV(2)**=-0.822      **K factor\*\***= 2.523      **TL(2)**= 1.32E+00      **LL(2)**=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	3.40E-02	-3.38E+00
4/22/2002	6.20E-02	-2.78E+00
7/15/2002	4.36E-01	-8.30E-01
10/8/2002	8.67E-01	-1.43E-01
1/8/2003	8.28E-01	-1.89E-01
4/3/2003	6.72E-01	-3.97E-01
7/8/2003	3.21E-01	-1.14E+00
10/6/2003	7.14E-01	-3.37E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.05E-01	-1.58E+00
4/23/2002	3.45E-01	-1.06E+00
7/16/2002	2.10E-01	-1.56E+00
10/8/2002	5.39E-02	-2.92E+00
1/7/2003	5.37E-01	-6.22E-01
4/2/2003	4.15E-01	-8.79E-01
7/9/2003	6.54E-01	-4.25E-01
10/7/2003	2.54E-01	-1.37E+00

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	2.86E-03	NO	-5.86E+00	N/A
MW360	Downgradient	Yes	6.89E-03	NO	-4.98E+00	N/A
MW363	Downgradient	Yes	1.36E-01	NO	-2.00E+00	N/A
MW366	Downgradient	Yes	2.54E-03	NO	-5.98E+00	N/A
MW369	Upgradient	Yes	3.69E-02	NO	-3.30E+00	N/A
MW372	Upgradient	Yes	2.65E-03	NO	-5.93E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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 Fourth Quarter 2023 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)=** 4.03E-02      **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** -5.698      **S=** 1.607      **CV(2)=** -0.282      **K factor\*\*=** 2.523      **TL(2)=** -1.64E+00      **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.00E-03	-6.91E+00
4/3/2003	1.00E-03	-6.91E+00
7/8/2003	1.00E-03	-6.91E+00
10/6/2003	1.00E-03	-6.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/7/2003	1.00E-03	-6.91E+00
4/2/2003	1.00E-03	-6.91E+00
7/9/2003	1.05E-03	-6.86E+00
10/7/2003	1.00E-03	-6.91E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW360	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW363	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW366	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW369	Upgradient	Yes	2.50E-04	N/A	-8.29E+00	NO
MW372	Upgradient	Yes	2.20E-04	N/A	-8.42E+00	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 Fourth Quarter 2023 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)= 7.77E-02 LL(1)=N/A

Statistics-Transformed Background Data X= -4.246 S= 1.075 CV(2)=-0.253 K factor\*\*= 2.523 TL(2)= -1.53E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/22/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/8/2003	1.30E-02	-4.34E+00
10/6/2003	1.04E-02	-4.57E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/7/2003	5.00E-03	-5.30E+00
4/2/2003	5.00E-03	-5.30E+00
7/9/2003	1.90E-02	-3.96E+00
10/7/2003	5.00E-03	-5.30E+00

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	2.00E-03	N/A	-6.21E+00	N/A
MW360	Downgradient	Yes	8.43E-04	NO	-7.08E+00	N/A
MW363	Downgradient	Yes	8.13E-02	YES	-2.51E+00	N/A
MW366	Downgradient	Yes	8.38E-04	NO	-7.08E+00	N/A
MW369	Upgradient	Yes	4.31E-03	NO	-5.45E+00	N/A
MW372	Upgradient	Yes	7.61E-04	NO	-7.18E+00	N/A

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

MW363

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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 Fourth Quarter 2023 Statistical Analysis    Historical Background Comparison

## Oxidation-Reduction Potential

UNITS: mV

URGA

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

**Statistics-Background Data**      X= 74.563    S= 94.243    CV(1)=1.264    K factor\*\*= 2.523    TL(1)= 3.12E+02    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 4.554    S= 0.784    CV(2)=0.172    K factor\*\*= 2.523    TL(2)= 5.37E+00    LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.15E+02	5.37E+00
4/22/2002	1.10E+02	4.70E+00
7/15/2002	2.00E+01	3.00E+00
1/8/2003	-5.00E+00	#Func!
4/3/2003	-1.80E+01	#Func!
7/8/2003	-6.70E+01	#Func!
10/6/2003	-1.00E+00	#Func!
1/7/2004	5.50E+01	4.01E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.10E+02	5.35E+00
4/23/2002	6.50E+01	4.17E+00
7/16/2002	2.15E+02	5.37E+00
10/8/2002	1.85E+02	5.22E+00
1/7/2003	4.50E+01	3.81E+00
4/2/2003	6.50E+01	4.17E+00
7/9/2003	-3.90E+01	#Func!
10/7/2003	1.38E+02	4.93E+00

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	4.32E+02	N/A	6.07E+00	YES
MW360	Downgradient	Yes	4.33E+02	N/A	6.07E+00	YES
MW363	Downgradient	Yes	3.01E+02	N/A	5.71E+00	YES
MW366	Downgradient	Yes	4.62E+02	N/A	6.14E+00	YES
MW369	Upgradient	Yes	3.85E+02	N/A	5.95E+00	YES
MW372	Upgradient	Yes	3.40E+02	N/A	5.83E+00	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 Fourth Quarter 2023 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)= 6.84E+00      LL(1)=5.71E+00

**Statistics-Transformed Background Data**      X= 1.836      S= 0.031      CV(2)=0.017      K factor\*\*= 2.904      TL(2)= 1.93E+00      LL(2)=1.75E+00

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	6.10E+00	1.81E+00
4/22/2002	6.10E+00	1.81E+00
7/15/2002	6.10E+00	1.81E+00
10/8/2002	6.50E+00	1.87E+00
1/8/2003	6.50E+00	1.87E+00
4/3/2003	6.60E+00	1.89E+00
7/8/2003	6.50E+00	1.87E+00
10/6/2003	6.50E+00	1.87E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	6.10E+00	1.81E+00
4/23/2002	6.12E+00	1.81E+00
7/16/2002	6.10E+00	1.81E+00
10/8/2002	6.06E+00	1.80E+00
1/7/2003	6.26E+00	1.83E+00
4/2/2003	6.15E+00	1.82E+00
7/9/2003	6.30E+00	1.84E+00
10/7/2003	6.40E+00	1.86E+00

**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)?
MW357	Downgradient	Yes	6.13E+00	NO	1.81E+00	N/A
MW360	Downgradient	Yes	6.20E+00	NO	1.82E+00	N/A
MW363	Downgradient	Yes	6.21E+00	NO	1.83E+00	N/A
MW366	Downgradient	Yes	6.10E+00	NO	1.81E+00	N/A
MW369	Upgradient	Yes	6.02E+00	NO	1.80E+00	N/A
MW372	Upgradient	Yes	6.13E+00	NO	1.81E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.89E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= 0.456 S= 0.362 CV(2)=0.794 K factor\*\*= 2.523 TL(2)= 1.37E+00 LL(2)=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.21E+00	7.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	9.66E-01	-3.46E-02
1/8/2003	7.27E-01	-3.19E-01
4/3/2003	8.00E-01	-2.23E-01
7/8/2003	1.62E+00	4.82E-01
10/6/2003	1.14E+00	1.31E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.04E+00	7.13E-01
4/23/2002	2.03E+00	7.08E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	1.54E+00	4.32E-01
1/7/2003	1.88E+00	6.31E-01
4/2/2003	2.09E+00	7.37E-01
7/9/2003	1.78E+00	5.77E-01
10/7/2003	1.79E+00	5.82E-01

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.54E+00	NO	4.32E-01	N/A
MW360	Downgradient	Yes	7.15E-01	NO	-3.35E-01	N/A
MW363	Downgradient	Yes	2.12E+00	NO	7.51E-01	N/A
MW366	Downgradient	Yes	2.10E+00	NO	7.42E-01	N/A
MW369	Upgradient	Yes	5.74E-01	NO	-5.55E-01	N/A
MW372	Upgradient	Yes	2.10E+00	NO	7.42E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.51E+01    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.780    S= 0.242    CV(2)=0.064    K factor\*\*= 2.523    TL(2)= 4.39E+00    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	3.57E+01	3.58E+00
4/22/2002	3.76E+01	3.63E+00
7/15/2002	4.24E+01	3.75E+00
10/8/2002	6.69E+01	4.20E+00
1/8/2003	6.79E+01	4.22E+00
4/3/2003	6.18E+01	4.12E+00
7/8/2003	4.56E+01	3.82E+00
10/6/2003	5.91E+01	4.08E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.72E+01	3.62E+00
4/23/2002	3.86E+01	3.65E+00
7/16/2002	3.56E+01	3.57E+00
10/8/2002	3.75E+01	3.62E+00
1/7/2003	3.41E+01	3.53E+00
4/2/2003	3.44E+01	3.54E+00
7/9/2003	4.41E+01	3.79E+00
10/7/2003	4.31E+01	3.76E+00

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.51E+01	NO	3.56E+00	N/A
MW360	Downgradient	Yes	5.85E+01	NO	4.07E+00	N/A
MW363	Downgradient	Yes	3.57E+01	NO	3.58E+00	N/A
MW366	Downgradient	Yes	4.72E+01	NO	3.85E+00	N/A
MW369	Upgradient	Yes	4.69E+01	NO	3.85E+00	N/A
MW372	Upgradient	Yes	5.90E+01	NO	4.08E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 1.31E+02    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.420    S= 0.981    CV(2)=0.287    K factor\*\*= 2.523    TL(2)= 5.89E+00    LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.55E+01	2.74E+00
4/22/2002	1.58E+01	2.76E+00
7/15/2002	1.38E+01	2.62E+00
10/8/2002	6.90E+00	1.93E+00
1/8/2003	1.05E+01	2.35E+00
4/3/2003	1.05E+01	2.35E+00
7/8/2003	1.09E+01	2.39E+00
10/6/2003	1.63E+01	2.79E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	7.17E+01	4.27E+00
4/23/2002	7.47E+01	4.31E+00
7/16/2002	7.41E+01	4.31E+00
10/8/2002	7.05E+01	4.26E+00
1/7/2003	7.58E+01	4.33E+00
4/2/2003	8.18E+01	4.40E+00
7/9/2003	8.36E+01	4.43E+00
10/7/2003	8.81E+01	4.48E+00

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.67E+01	NO	3.60E+00	N/A
MW360	Downgradient	Yes	9.51E+00	NO	2.25E+00	N/A
MW363	Downgradient	Yes	2.71E+01	NO	3.30E+00	N/A
MW366	Downgradient	Yes	4.76E+01	NO	3.86E+00	N/A
MW369	Upgradient	Yes	8.72E+00	NO	2.17E+00	N/A
MW372	Upgradient	Yes	1.43E+02	YES	4.96E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

**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 Fourth Quarter 2023 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)= 6.63E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 2.770 S= 1.150 CV(2)=0.415 K factor\*\*= 2.523 TL(2)= 3.97E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	4.17E+01	3.73E+00
4/22/2002	5.31E+01	3.97E+00
7/15/2002	1.81E+01	2.90E+00
10/8/2002	1.64E+01	2.80E+00
1/8/2003	3.49E+00	1.25E+00
4/3/2003	9.34E+00	2.23E+00
7/8/2003	1.75E+01	2.86E+00
10/6/2003	1.70E+01	2.83E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	4.48E+01	3.80E+00
4/23/2002	8.02E-01	-2.21E-01
7/16/2002	1.98E+01	2.99E+00
10/8/2002	4.61E+01	3.83E+00
1/7/2003	-9.73E-01	#Func!
4/2/2003	9.07E+00	2.20E+00
7/9/2003	0.00E+00	#Func!
10/7/2003	3.69E+01	3.61E+00

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	3.40E+01	NO	3.53E+00	N/A
MW360	Downgradient	No	6.18E+00	N/A	1.82E+00	N/A
MW363	Downgradient	No	4.47E+00	N/A	1.50E+00	N/A
MW366	Downgradient	Yes	6.63E+01	NO	4.19E+00	N/A
MW369	Upgradient	Yes	7.67E+01	YES	4.34E+00	N/A
MW372	Upgradient	Yes	2.25E+01	NO	3.11E+00	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

## Wells with Exceedances

MW369

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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 Fourth Quarter 2023 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)=** 1.44E+01      **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** 0.851      **S=** 0.828      **CV(2)=**0.973      **K factor\*\*=** 2.523      **TL(2)=** 2.94E+00      **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.70E+00	5.31E-01
4/22/2002	1.60E+00	4.70E-01
7/15/2002	3.10E+00	1.13E+00
10/8/2002	1.77E+01	2.87E+00
1/8/2003	9.00E+00	2.20E+00
4/3/2003	4.00E+00	1.39E+00
7/8/2003	4.90E+00	1.59E+00
10/6/2003	2.40E+00	8.75E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.00E+00	0.00E+00
4/23/2002	1.20E+00	1.82E-01
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.60E+00	4.70E-01
4/2/2003	1.50E+00	4.05E-01
7/9/2003	3.00E+00	1.10E+00
10/7/2003	1.50E+00	4.05E-01

**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	6.48E-01	N/A	-4.34E-01	NO
MW360	Downgradient	Yes	9.84E-01	N/A	-1.61E-02	NO
MW363	Downgradient	Yes	1.18E+00	N/A	1.66E-01	NO
MW366	Downgradient	Yes	7.61E-01	N/A	-2.73E-01	NO
MW369	Upgradient	Yes	8.24E-01	N/A	-1.94E-01	NO
MW372	Upgradient	Yes	1.00E+00	N/A	0.00E+00	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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

**Total Organic Halides (TOX)**

**UNITS: µg/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)= 2.30E+02    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.772    S= 1.023    CV(2)=0.271    K factor\*\*= 2.523    TL(2)= 6.35E+00    LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/22/2002	5.00E+01	3.91E+00
7/15/2002	8.10E+01	4.39E+00
10/8/2002	2.02E+02	5.31E+00
1/8/2003	1.77E+02	5.18E+00
4/3/2003	9.31E+01	4.53E+00
7/8/2003	1.75E+01	2.86E+00
10/6/2003	3.75E+01	3.62E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.84E+02	5.21E+00
4/23/2002	5.00E+01	3.91E+00
7/16/2002	5.00E+01	3.91E+00
10/8/2002	5.00E+01	3.91E+00
1/7/2003	1.00E+01	2.30E+00
4/2/2003	1.27E+01	2.54E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	1.26E+01	2.53E+00

**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	1.00E+01	N/A	2.30E+00	N/A
MW360	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW363	Downgradient	Yes	6.02E+00	NO	1.80E+00	N/A
MW366	Downgradient	Yes	4.08E+00	NO	1.41E+00	N/A
MW369	Upgradient	Yes	7.88E+00	NO	2.06E+00	N/A
MW372	Upgradient	Yes	8.32E+00	NO	2.12E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 5.52E-01      LL(1)=N/A

**Statistics-Transformed Background Data**      X= -2.729      S= 1.014      CV(2)=-0.371      K factor\*\*= 2.523      TL(2)= -1.72E-01      LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/22/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/8/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	7.25E-01	-3.22E-01
4/23/2002	1.00E-01	-2.30E+00
7/16/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-02	-3.35E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00

**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	4.48E-03	N/A	-5.41E+00	NO
MW360	Downgradient	Yes	6.08E-03	N/A	-5.10E+00	NO
MW363	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW366	Downgradient	Yes	3.74E-03	N/A	-5.59E+00	NO
MW369	Upgradient	Yes	9.14E-03	N/A	-4.70E+00	NO
MW372	Upgradient	No	2.00E-02	N/A	-3.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)=** 3.11E+00      **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** -0.235      **S=** 1.006      **CV(2)=**-4.287      **K factor\*\*=** 2.523      **TL(2)=** 2.30E+00      **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	7.90E-01	-2.36E-01
1/7/2003	8.07E-01	-2.14E-01
4/2/2003	1.13E+00	1.22E-01
7/9/2003	1.28E+00	2.47E-01
10/7/2003	1.24E+00	2.15E-01

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.51E-01	NO	-1.05E+00	N/A
MW361	Downgradient	Yes	1.65E-01	NO	-1.80E+00	N/A
MW364	Downgradient	Yes	1.53E-01	NO	-1.88E+00	N/A
MW367	Downgradient	Yes	1.54E-02	NO	-4.17E+00	N/A
MW370	Upgradient	Yes	1.18E-01	NO	-2.14E+00	N/A
MW373	Upgradient	Yes	2.06E+00	NO	7.23E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)=** 1.00E+00      **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** 0.000      **S=** 0.000      **CV(2)=**#Num!      **K factor\*\*=** 2.523      **TL(2)=** 0.00E+00      **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.00E+00	0.00E+00
4/2/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.00E+00	0.00E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.38E-01	NO	-1.08E+00	N/A
MW361	Downgradient	Yes	4.78E-01	NO	-7.38E-01	N/A
MW364	Downgradient	Yes	4.52E-01	NO	-7.94E-01	N/A
MW367	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW370	Upgradient	Yes	5.49E-01	NO	-6.00E-01	N/A
MW373	Upgradient	Yes	4.62E-01	NO	-7.72E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.73E+01 LL(1)=N/A

Statistics-Transformed Background Data X= 3.723 S= 0.323 CV(2)=0.087 K factor\*\*= 2.523 TL(2)= 4.54E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.48E+01	3.55E+00
4/23/2002	4.34E+01	3.77E+00
7/15/2002	3.32E+01	3.50E+00
10/8/2002	2.92E+01	3.37E+00
1/8/2003	3.13E+01	3.44E+00
4/3/2003	3.24E+01	3.48E+00
7/9/2003	2.29E+01	3.13E+00
10/6/2003	2.80E+01	3.33E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	6.19E+01	4.13E+00
4/23/2002	5.92E+01	4.08E+00
7/16/2002	4.76E+01	3.86E+00
10/8/2002	4.61E+01	3.83E+00
1/7/2003	4.92E+01	3.90E+00
4/2/2003	5.78E+01	4.06E+00
7/9/2003	5.27E+01	3.96E+00
10/7/2003	6.49E+01	4.17E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.18E+01	NO	3.46E+00	N/A
MW361	Downgradient	Yes	3.54E+01	NO	3.57E+00	N/A
MW364	Downgradient	Yes	3.37E+01	NO	3.52E+00	N/A
MW367	Downgradient	Yes	1.36E+01	NO	2.61E+00	N/A
MW370	Upgradient	Yes	2.90E+01	NO	3.37E+00	N/A
MW373	Upgradient	Yes	7.90E+01	YES	4.37E+00	N/A

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

## Conclusion of Statistical Analysis on Historical Data

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

## Wells with Exceedances

MW373

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

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

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

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 Fourth Quarter 2023 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)= 1.04E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.658 S= 0.339 CV(2)=0.093 K factor\*\*= 2.523 TL(2)= 4.51E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.50E+01	3.56E+00
4/23/2002	1.34E+02	4.90E+00
7/15/2002	3.50E+01	3.56E+00
10/8/2002	3.50E+01	3.56E+00
1/8/2003	3.50E+01	3.56E+00
4/3/2003	3.50E+01	3.56E+00
7/9/2003	3.50E+01	3.56E+00
10/6/2003	3.50E+01	3.56E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.50E+01	3.56E+00
4/23/2002	4.70E+01	3.85E+00
7/16/2002	3.50E+01	3.56E+00
10/8/2002	3.50E+01	3.56E+00
1/7/2003	3.50E+01	3.56E+00
4/2/2003	3.50E+01	3.56E+00
7/9/2003	3.50E+01	3.56E+00
10/7/2003	3.50E+01	3.56E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW361	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW364	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW367	Downgradient	No	2.00E+01	N/A	3.00E+00	N/A
MW370	Upgradient	Yes	1.32E+01	NO	2.58E+00	N/A
MW373	Upgradient	No	2.00E+01	N/A	3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 Statistical Analysis    Historical Background Comparison

## Chloride

### UNITS: mg/L

### LRGA

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

**Statistics-Background Data**      X= 45.919    S= 7.524    CV(1)=0.164    K factor\*\*= 2.523    TL(1)= 6.49E+01    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.814    S= 0.165    CV(2)=0.043    K factor\*\*= 2.523    TL(2)= 4.23E+00    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	5.55E+01	4.02E+00
10/8/2002	5.36E+01	3.98E+00
1/8/2003	5.29E+01	3.97E+00
4/3/2003	5.36E+01	3.98E+00
7/9/2003	5.19E+01	3.95E+00
10/6/2003	5.30E+01	3.97E+00
1/7/2004	5.30E+01	3.97E+00
4/7/2004	5.16E+01	3.94E+00

Well Number: MW373

Date Collected	Result	LN(Result)
7/16/2002	4.06E+01	3.70E+00
10/8/2002	3.88E+01	3.66E+00
1/7/2003	3.90E+01	3.66E+00
4/2/2003	3.84E+01	3.65E+00
7/9/2003	3.81E+01	3.64E+00
10/7/2003	3.80E+01	3.64E+00
1/6/2004	3.79E+01	3.63E+00
4/7/2004	3.88E+01	3.66E+00

#### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.68E+01	NO	3.29E+00	N/A
MW361	Downgradient	Yes	3.69E+01	NO	3.61E+00	N/A
MW364	Downgradient	Yes	3.64E+01	NO	3.59E+00	N/A
MW367	Downgradient	Yes	7.37E+00	NO	2.00E+00	N/A
MW370	Upgradient	Yes	3.94E+01	NO	3.67E+00	N/A
MW373	Upgradient	Yes	3.12E+01	NO	3.44E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 1.08E-01 LL(1)=N/A

**Statistics-Transformed Background Data** X= -4.058 S= 1.011 CV(2)=-0.249 K factor\*\*= 2.523 TL(2)= -1.51E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.74E-02	-4.05E+00
1/8/2003	1.05E-02	-4.56E+00
4/3/2003	9.31E-03	-4.68E+00
7/9/2003	1.37E-01	-1.99E+00
10/6/2003	4.63E-02	-3.07E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/23/2002	3.40E-02	-3.38E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	4.11E-03	-5.49E+00
1/7/2003	3.44E-03	-5.67E+00
4/2/2003	3.68E-03	-5.60E+00
7/9/2003	4.05E-02	-3.21E+00
10/7/2003	8.43E-03	-4.78E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.14E-03	N/A	-5.27E+00	NO
MW361	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW364	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW367	Downgradient	Yes	6.34E-03	N/A	-5.06E+00	NO
MW370	Upgradient	Yes	3.02E-04	N/A	-8.11E+00	NO
MW373	Upgradient	Yes	5.42E-04	N/A	-7.52E+00	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 Fourth Quarter 2023 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)= 1.00E+03 LL(1)=N/A

**Statistics-Transformed Background Data** X= 6.380 S= 0.260 CV(2)=0.041 K factor\*\*= 2.523 TL(2)= 7.04E+00 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	4.06E+02	6.01E+00
4/23/2002	5.43E+02	6.30E+00
7/15/2002	4.76E+02	6.17E+00
10/8/2002	4.41E+02	6.09E+00
1/8/2003	4.86E+02	6.19E+00
4/3/2003	4.66E+02	6.14E+00
7/9/2003	4.79E+02	6.17E+00
10/6/2003	4.35E+02	6.08E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	6.61E+02	6.49E+00
4/23/2002	8.01E+02	6.69E+00
7/16/2002	7.74E+02	6.65E+00
10/8/2002	6.80E+02	6.52E+00
1/7/2003	6.87E+02	6.53E+00
4/2/2003	7.63E+02	6.64E+00
7/9/2003	8.28E+02	6.72E+00
10/7/2003	8.14E+02	6.70E+00

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.99E+02	NO	6.21E+00	N/A
MW361	Downgradient	Yes	5.04E+02	NO	6.22E+00	N/A
MW364	Downgradient	Yes	4.87E+02	NO	6.19E+00	N/A
MW367	Downgradient	Yes	2.30E+02	NO	5.44E+00	N/A
MW370	Upgradient	Yes	4.50E+02	NO	6.11E+00	N/A
MW373	Upgradient	Yes	8.98E+02	NO	6.80E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 5.03E-02 LL(1)=N/A

**Statistics-Transformed Background Data** X= -3.739 S= 0.308 CV(2)=-0.082 K factor\*\*= 2.523 TL(2)= -2.96E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.60E-02	-3.65E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/7/2003	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	9.07E-04	NO	-7.01E+00	N/A
MW361	Downgradient	Yes	1.69E-03	NO	-6.38E+00	N/A
MW364	Downgradient	Yes	1.75E-03	NO	-6.35E+00	N/A
MW367	Downgradient	Yes	8.91E-04	NO	-7.02E+00	N/A
MW370	Upgradient	Yes	2.05E-03	NO	-6.19E+00	N/A
MW373	Upgradient	Yes	1.62E-03	NO	-6.43E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 4.30E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.115 S= 1.207 CV(2)=-10.514 K factor\*\*= 2.523 TL(2)= 2.93E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	4.32E+00	1.46E+00
4/23/2002	1.24E+00	2.15E-01
7/15/2002	7.50E-01	-2.88E-01
10/8/2002	9.40E-01	-6.19E-02
1/8/2003	3.08E+00	1.12E+00
4/3/2003	1.45E+00	3.72E-01
7/9/2003	1.22E+00	1.99E-01
10/6/2003	1.07E+00	6.77E-02

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.04E+00	1.11E+00
4/23/2002	3.00E-02	-3.51E+00
7/16/2002	2.30E-01	-1.47E+00
10/8/2002	8.60E-01	-1.51E-01
1/7/2003	2.10E-01	-1.56E+00
4/2/2003	1.19E+00	1.74E-01
7/9/2003	1.10E+00	9.53E-02
10/7/2003	1.46E+00	3.78E-01

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.40E-01	NO	-3.01E-01	N/A
MW361	Downgradient	Yes	4.04E+00	NO	1.40E+00	N/A
MW364	Downgradient	Yes	3.58E+00	NO	1.28E+00	N/A
MW367	Downgradient	Yes	7.80E-01	NO	-2.48E-01	N/A
MW370	Upgradient	Yes	4.64E+00	YES	1.53E+00	N/A
MW373	Upgradient	Yes	2.00E+00	NO	6.93E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 6.26E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 5.831 S= 0.311 CV(2)=0.053 K factor\*\*= 2.523 TL(2)= 6.62E+00 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	2.36E+02	5.46E+00
4/23/2002	3.37E+02	5.82E+00
7/15/2002	2.66E+02	5.58E+00
10/8/2002	2.40E+02	5.48E+00
1/8/2003	2.82E+02	5.64E+00
4/3/2003	2.38E+02	5.47E+00
7/9/2003	2.48E+02	5.51E+00
10/6/2003	2.24E+02	5.41E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.27E+02	6.06E+00
4/23/2002	5.07E+02	6.23E+00
7/16/2002	4.64E+02	6.14E+00
10/8/2002	4.08E+02	6.01E+00
1/7/2003	4.04E+02	6.00E+00
4/2/2003	4.50E+02	6.11E+00
7/9/2003	4.87E+02	6.19E+00
10/7/2003	4.81E+02	6.18E+00

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.18E+02	NO	5.38E+00	N/A
MW361	Downgradient	Yes	2.69E+02	NO	5.59E+00	N/A
MW364	Downgradient	Yes	2.35E+02	NO	5.46E+00	N/A
MW367	Downgradient	Yes	9.00E+01	NO	4.50E+00	N/A
MW370	Upgradient	Yes	2.30E+02	NO	5.44E+00	N/A
MW373	Upgradient	Yes	5.29E+02	NO	6.27E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.15E+01      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.942      S= 0.713      CV(2)=0.367      K factor\*\*= 2.523      TL(2)= 3.74E+00      LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	9.34E+00	2.23E+00
4/23/2002	4.33E+00	1.47E+00
7/15/2002	3.52E+00	1.26E+00
10/8/2002	7.45E+00	2.01E+00
1/8/2003	7.04E+00	1.95E+00
4/3/2003	4.64E+00	1.53E+00
7/9/2003	1.58E+01	2.76E+00
10/6/2003	6.49E+00	1.87E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.76E+01	3.63E+00
4/23/2002	1.90E+01	2.94E+00
7/16/2002	1.07E+01	2.37E+00
10/8/2002	3.75E+00	1.32E+00
1/7/2003	3.87E+00	1.35E+00
4/2/2003	3.50E+00	1.25E+00
7/9/2003	7.72E+00	2.04E+00
10/7/2003	2.93E+00	1.08E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.31E+00	NO	2.70E-01	N/A
MW361	Downgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW364	Downgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW367	Downgradient	Yes	6.31E+00	NO	1.84E+00	N/A
MW370	Upgradient	Yes	6.22E-02	NO	-2.78E+00	N/A
MW373	Upgradient	Yes	9.56E-02	NO	-2.35E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 3.25E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 2.810 S= 0.343 CV(2)=0.122 K factor\*\*= 2.523 TL(2)= 3.68E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.21E+01	2.49E+00
4/23/2002	1.51E+01	2.71E+00
7/15/2002	1.24E+01	2.52E+00
10/8/2002	1.22E+01	2.50E+00
1/8/2003	1.15E+01	2.44E+00
4/3/2003	1.23E+01	2.51E+00
7/9/2003	1.00E+01	2.30E+00
10/6/2003	1.21E+01	2.49E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.48E+01	3.21E+00
4/23/2002	2.27E+01	3.12E+00
7/16/2002	1.88E+01	2.93E+00
10/8/2002	2.11E+01	3.05E+00
1/7/2003	1.99E+01	2.99E+00
4/2/2003	2.55E+01	3.24E+00
7/9/2003	2.33E+01	3.15E+00
10/7/2003	2.69E+01	3.29E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.36E+01	NO	2.61E+00	N/A
MW361	Downgradient	Yes	1.48E+01	NO	2.69E+00	N/A
MW364	Downgradient	Yes	1.40E+01	NO	2.64E+00	N/A
MW367	Downgradient	Yes	7.00E+00	NO	1.95E+00	N/A
MW370	Upgradient	Yes	1.21E+01	NO	2.49E+00	N/A
MW373	Upgradient	Yes	2.78E+01	NO	3.33E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.78E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= -0.114 S= 0.658 CV(2)=-5.762 K factor\*\*= 2.523 TL(2)= 1.55E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2.44E-01	-1.41E+00
4/23/2002	1.82E+00	5.99E-01
7/15/2002	1.22E+00	1.99E-01
10/8/2002	9.88E-01	-1.21E-02
1/8/2003	7.29E-01	-3.16E-01
4/3/2003	6.37E-01	-4.51E-01
7/9/2003	2.51E+00	9.20E-01
10/6/2003	1.05E+00	4.88E-02

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.55E-01	-1.04E+00
4/23/2002	2.16E+00	7.70E-01
7/16/2002	1.39E+00	3.29E-01
10/8/2002	7.17E-01	-3.33E-01
1/7/2003	5.87E-01	-5.33E-01
4/2/2003	5.45E-01	-6.07E-01
7/9/2003	1.76E+00	5.65E-01
10/7/2003	5.70E-01	-5.62E-01

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.35E-01	NO	-1.09E+00	N/A
MW361	Downgradient	Yes	2.70E-03	NO	-5.91E+00	N/A
MW364	Downgradient	Yes	1.03E-03	NO	-6.88E+00	N/A
MW367	Downgradient	Yes	1.21E+00	NO	1.91E-01	N/A
MW370	Upgradient	Yes	6.96E-03	NO	-4.97E+00	N/A
MW373	Upgradient	Yes	7.09E-02	NO	-2.65E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 7.82E-02 LL(1)=N/A

Statistics-Transformed Background Data X= -4.239 S= 1.087 CV(2)=-0.256 K factor\*\*= 2.523 TL(2)= -1.50E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/9/2003	2.64E-02	-3.63E+00
10/6/2003	9.71E-03	-4.63E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/7/2003	5.00E-03	-5.30E+00
4/2/2003	5.00E-03	-5.30E+00
7/9/2003	1.12E-02	-4.49E+00
10/7/2003	5.00E-03	-5.30E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.33E-02	NO	-4.32E+00	N/A
MW361	Downgradient	No	2.00E-03	N/A	-6.21E+00	N/A
MW364	Downgradient	No	2.00E-03	N/A	-6.21E+00	N/A
MW367	Downgradient	Yes	2.52E-03	NO	-5.98E+00	N/A
MW370	Upgradient	No	2.00E-03	N/A	-6.21E+00	N/A
MW373	Upgradient	Yes	1.79E-03	NO	-6.33E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 2.01E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.829 S= 1.151 CV(2)=0.301 K factor\*\*= 2.523 TL(2)= 4.94E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.40E+02	4.94E+00
4/23/2002	-1.50E+01	#Func!
7/15/2002	5.00E+00	1.61E+00
4/3/2003	4.90E+01	3.89E+00
7/9/2003	-3.50E+01	#Func!
10/6/2003	4.00E+01	3.69E+00
1/7/2004	1.01E+02	4.62E+00
4/7/2004	1.05E+02	4.65E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.40E+02	4.94E+00
4/23/2002	-2.00E+01	#Func!
10/8/2002	1.00E+01	2.30E+00
1/7/2003	1.00E+01	2.30E+00
4/2/2003	6.70E+01	4.20E+00
7/9/2003	-2.90E+01	#Func!
10/7/2003	1.27E+02	4.84E+00
1/6/2004	5.20E+01	3.95E+00

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	1.49E+02	N/A	5.00E+00	YES
MW361	Downgradient	Yes	4.34E+02	N/A	6.07E+00	YES
MW364	Downgradient	Yes	4.50E+02	N/A	6.11E+00	YES
MW367	Downgradient	Yes	2.81E+02	N/A	5.64E+00	YES
MW370	Upgradient	Yes	3.27E+02	N/A	5.79E+00	YES
MW373	Upgradient	Yes	3.57E+02	N/A	5.88E+00	YES

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

### Conclusion of Statistical Analysis on Historical Data

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

### Wells with Exceedances

MW358  
MW361  
MW364  
MW367  
MW370  
MW373

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

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

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

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 Fourth Quarter 2023 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)= 6.74E+00 LL(1)=5.82E+00

**Statistics-Transformed Background Data** X= 1.837 S= 0.025 CV(2)=0.014 K factor\*\*= 2.904 TL(2)= 1.91E+00 LL(2)=1.76E+00

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	6.30E+00	1.84E+00
4/23/2002	6.40E+00	1.86E+00
7/15/2002	6.30E+00	1.84E+00
10/8/2002	6.30E+00	1.84E+00
1/8/2003	6.40E+00	1.86E+00
4/3/2003	6.50E+00	1.87E+00
7/9/2003	6.30E+00	1.84E+00
10/6/2003	6.50E+00	1.87E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	6.00E+00	1.79E+00
4/23/2002	6.30E+00	1.84E+00
7/16/2002	6.45E+00	1.86E+00
10/8/2002	6.18E+00	1.82E+00
1/7/2003	6.35E+00	1.85E+00
4/2/2003	6.14E+00	1.81E+00
7/9/2003	6.10E+00	1.81E+00
10/7/2003	6.00E+00	1.79E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	6.37E+00	NO	1.85E+00	N/A
MW361	Downgradient	Yes	6.03E+00	NO	1.80E+00	N/A
MW364	Downgradient	Yes	6.01E+00	NO	1.79E+00	N/A
MW367	Downgradient	Yes	5.87E+00	NO	1.77E+00	N/A
MW370	Upgradient	Yes	6.10E+00	NO	1.81E+00	N/A
MW373	Upgradient	Yes	6.14E+00	NO	1.81E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 4.14E+00 LL(1)=N/A

**Statistics-Transformed Background Data** X= 1.024 S= 0.167 CV(2)=0.163 K factor\*\*= 2.523 TL(2)= 1.45E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.22E+00	1.17E+00
4/23/2002	3.43E+00	1.23E+00
7/15/2002	2.98E+00	1.09E+00
10/8/2002	2.46E+00	9.00E-01
1/8/2003	2.41E+00	8.80E-01
4/3/2003	2.43E+00	8.88E-01
7/9/2003	2.44E+00	8.92E-01
10/6/2003	2.48E+00	9.08E-01

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34E+00	1.47E+00
4/23/2002	3.04E+00	1.11E+00
7/16/2002	2.93E+00	1.08E+00
10/8/2002	2.30E+00	8.33E-01
1/7/2003	2.45E+00	8.96E-01
4/2/2003	2.70E+00	9.93E-01
7/9/2003	2.68E+00	9.86E-01
10/7/2003	2.88E+00	1.06E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.39E+00	NO	8.71E-01	N/A
MW361	Downgradient	Yes	2.49E+00	NO	9.12E-01	N/A
MW364	Downgradient	Yes	2.01E+00	NO	6.98E-01	N/A
MW367	Downgradient	Yes	2.81E+00	NO	1.03E+00	N/A
MW370	Upgradient	Yes	2.55E+00	NO	9.36E-01	N/A
MW373	Upgradient	Yes	2.70E+00	NO	9.93E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 9.00E+01    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.906    S= 0.272    CV(2)=0.070    K factor\*\*= 2.523    TL(2)= 4.59E+00    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	3.18E+01	3.46E+00
4/23/2002	5.00E+01	3.91E+00
7/15/2002	4.47E+01	3.80E+00
10/8/2002	4.00E+01	3.69E+00
1/8/2003	4.46E+01	3.80E+00
4/3/2003	4.19E+01	3.74E+00
7/9/2003	4.00E+01	3.69E+00
10/6/2003	3.81E+01	3.64E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34E+01	3.77E+00
4/23/2002	7.98E+01	4.38E+00
7/16/2002	8.77E+01	4.47E+00
10/8/2002	6.16E+01	4.12E+00
1/7/2003	5.93E+01	4.08E+00
4/2/2003	6.21E+01	4.13E+00
7/9/2003	5.01E+01	3.91E+00
10/7/2003	4.96E+01	3.90E+00

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.58E+01	NO	3.58E+00	N/A
MW361	Downgradient	Yes	4.24E+01	NO	3.75E+00	N/A
MW364	Downgradient	Yes	4.12E+01	NO	3.72E+00	N/A
MW367	Downgradient	Yes	1.54E+01	NO	2.73E+00	N/A
MW370	Upgradient	Yes	4.33E+01	NO	3.77E+00	N/A
MW373	Upgradient	Yes	6.46E+01	NO	4.17E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)= 6.15E+02 LL(1)=N/A

**Statistics-Transformed Background Data** X= 3.985 S= 1.323 CV(2)=0.332 K factor\*\*= 2.523 TL(2)= 7.32E+00 LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.74E+01	2.86E+00
4/23/2002	3.79E+01	3.63E+00
7/15/2002	1.57E+01	2.75E+00
10/8/2002	1.34E+01	2.60E+00
1/8/2003	1.44E+01	2.67E+00
4/3/2003	1.81E+01	2.90E+00
7/9/2003	9.60E+00	2.26E+00
10/6/2003	1.65E+01	2.80E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.63E+02	5.10E+00
4/23/2002	8.10E+02	6.70E+00
7/16/2002	1.09E+02	4.70E+00
10/8/2002	1.11E+02	4.71E+00
1/7/2003	1.14E+02	4.73E+00
4/2/2003	1.33E+02	4.89E+00
7/9/2003	1.82E+02	5.20E+00
10/7/2003	1.93E+02	5.26E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.50E+01	N/A	3.81E+00	NO
MW361	Downgradient	Yes	8.01E+01	N/A	4.38E+00	NO
MW364	Downgradient	Yes	6.73E+01	N/A	4.21E+00	NO
MW367	Downgradient	Yes	1.97E+01	N/A	2.98E+00	NO
MW370	Upgradient	Yes	1.88E+01	N/A	2.93E+00	NO
MW373	Upgradient	Yes	1.77E+02	N/A	5.18E+00	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 Fourth Quarter 2023 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)= 4.11E+01 LL(1)=N/A

**Statistics-Transformed Background Data** X= 1.946 S= 0.939 CV(2)=0.483 K factor\*\*= 2.523 TL(2)= 3.83E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.08E+01	2.38E+00
4/23/2002	8.53E+00	2.14E+00
7/15/2002	5.09E+00	1.63E+00
10/8/2002	4.78E+00	1.56E+00
1/8/2003	-5.12E+00	#Func!
4/3/2003	5.11E+00	1.63E+00
7/9/2003	4.25E+00	1.45E+00
10/6/2003	6.54E+00	1.88E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.65E+01	2.80E+00
4/23/2002	3.49E+00	1.25E+00
7/16/2002	1.42E+00	3.51E-01
10/8/2002	-6.06E+00	#Func!
1/7/2003	-8.41E+00	#Func!
4/2/2003	2.63E+01	3.27E+00
7/9/2003	3.06E+00	1.12E+00
10/7/2003	4.62E+01	3.83E+00

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	3.83E+01	N/A	3.65E+00	NO
MW361	Downgradient	Yes	5.03E+01	N/A	3.92E+00	YES
MW364	Downgradient	Yes	6.39E+01	N/A	4.16E+00	YES
MW367	Downgradient	No	-1.51E-01	N/A	#Error	N/A
MW370	Upgradient	No	1.86E+01	N/A	2.92E+00	N/A
MW373	Upgradient	No	1.47E+01	N/A	2.69E+00	N/A

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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 Fourth Quarter 2023 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)= 3.66E+01      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.069      S= 1.014      CV(2)=0.948      K factor\*\*= 2.523      TL(2)= 3.63E+00      LL(2)=N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.20E+00	1.82E-01
4/23/2002	4.30E+00	1.46E+00
7/15/2002	2.60E+00	9.56E-01
10/8/2002	2.30E+00	8.33E-01
1/8/2003	3.00E+00	1.10E+00
4/3/2003	1.20E+00	1.82E-01
7/9/2003	2.60E+00	9.56E-01
10/6/2003	1.70E+00	5.31E-01

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.10E+00	9.53E-02
4/23/2002	1.75E+01	2.86E+00
7/16/2002	4.90E+01	3.89E+00
10/8/2002	2.90E+00	1.06E+00
1/7/2003	3.90E+00	1.36E+00
4/2/2003	2.50E+00	9.16E-01
7/9/2003	1.70E+00	5.31E-01
10/7/2003	1.20E+00	1.82E-01

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.88E+00	N/A	1.36E+00	NO
MW361	Downgradient	Yes	8.27E-01	N/A	-1.90E-01	NO
MW364	Downgradient	Yes	7.62E-01	N/A	-2.72E-01	NO
MW367	Downgradient	Yes	5.37E-01	N/A	-6.22E-01	NO
MW370	Upgradient	Yes	8.46E-01	N/A	-1.67E-01	NO
MW373	Upgradient	Yes	1.33E+00	N/A	2.85E-01	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 Fourth Quarter 2023 Statistical Analysis Historical Background Comparison

**Total Organic Halides (TOX)**

**UNITS: µg/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)=** 2.78E+02    **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** 3.971    **S=** 0.950    **CV(2)=**0.239    **K factor\*\*=** 2.523    **TL(2)=** 6.37E+00    **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	5.00E+01	3.91E+00
4/23/2002	2.28E+02	5.43E+00
7/15/2002	8.80E+01	4.48E+00
10/8/2002	5.80E+01	4.06E+00
1/8/2003	7.24E+01	4.28E+00
4/3/2003	2.66E+01	3.28E+00
7/9/2003	1.64E+01	2.80E+00
10/6/2003	3.11E+01	3.44E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/23/2002	2.76E+02	5.62E+00
7/16/2002	1.77E+02	5.18E+00
10/8/2002	7.60E+01	4.33E+00
1/7/2003	4.59E+01	3.83E+00
4/2/2003	5.78E+01	4.06E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	1.39E+01	2.63E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW361	Downgradient	Yes	5.76E+00	NO	1.75E+00	N/A
MW364	Downgradient	Yes	3.50E+00	NO	1.25E+00	N/A
MW367	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW370	Upgradient	Yes	1.02E+01	NO	2.32E+00	N/A
MW373	Upgradient	Yes	1.30E+01	NO	2.56E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Fourth Quarter 2023 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)=** 1.47E-01      **LL(1)=**N/A

**Statistics-Transformed Background Data**      **X=** -3.131      **S=** 0.691      **CV(2)=**-0.221      **K factor\*\*=** 2.523      **TL(2)=** -1.39E+00      **LL(2)=**N/A

## Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.00E-01	-2.30E+00
4/23/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/23/2002	1.00E-01	-2.30E+00
7/16/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-02	-3.35E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.34E-02	-3.76E+00
10/7/2003	2.00E-02	-3.91E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.02E-03	NO	-5.29E+00	N/A
MW361	Downgradient	Yes	3.84E-03	NO	-5.56E+00	N/A
MW364	Downgradient	Yes	1.19E-02	NO	-4.43E+00	N/A
MW367	Downgradient	Yes	1.05E-02	NO	-4.56E+00	N/A
MW370	Upgradient	Yes	9.63E-03	NO	-4.64E+00	N/A
MW373	Upgradient	Yes	4.86E-03	NO	-5.33E+00	N/A

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

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**ATTACHMENT D2**

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

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# C-746-U Fourth Quarter 2023 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**= 2.941    **S**= 2.127    **CV(1)**=0.723    **K factor\*\***= 2.523    **TL(1)**= 8.31E+00    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 0.830    **S**= 0.762    **CV(2)**=0.918    **K factor\*\***= 2.523    **TL(2)**= 2.75E+00    **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)
10/12/2021	3.36E+00	1.21E+00
1/12/2022	3.82E+00	1.34E+00
4/12/2022	7.49E+00	2.01E+00
7/14/2022	4.25E+00	1.45E+00
10/11/2022	2.87E+00	1.05E+00
1/19/2023	1.24E+00	2.15E-01
4/25/2023	7.75E+00	2.05E+00
7/25/2023	3.30E+00	1.19E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/13/2021	4.40E-01	-8.21E-01
1/13/2022	1.80E+00	5.88E-01
4/12/2022	2.86E+00	1.05E+00
7/14/2022	1.74E+00	5.54E-01
10/11/2022	1.92E+00	6.52E-01
1/19/2023	9.00E-01	-1.05E-01
4/25/2023	2.30E+00	8.33E-01
7/25/2023	1.01E+00	9.95E-03

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	3.07E+00	NO	1.12E+00	N/A
MW365	Downgradient	Yes	6.54E+00	NO	1.88E+00	N/A
MW375	Sidegradient	Yes	3.09E+00	NO	1.13E+00	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 Fourth Quarter 2023 Statistical Analysis

# Current Background Comparison

## Oxidation-Reduction Potential

UNITS: mV

UCRS

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

**Statistics-Background Data**      **X**= 341.063   **S**= 80.621   **CV(1)**=0.236      **K factor\*\***= 2.523      **TL(1)**= 5.44E+02      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 5.798      **S**= 0.289      **CV(2)**=0.050      **K factor\*\***= 2.523      **TL(2)**= 6.53E+00      **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)
10/12/2021	3.44E+02	5.84E+00
1/12/2022	3.89E+02	5.96E+00
4/12/2022	3.75E+02	5.93E+00
7/14/2022	3.78E+02	5.93E+00
10/11/2022	4.09E+02	6.01E+00
1/19/2023	4.20E+02	6.04E+00
4/25/2023	4.04E+02	6.00E+00
7/25/2023	3.72E+02	5.92E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/13/2021	2.02E+02	5.31E+00
1/13/2022	1.92E+02	5.26E+00
4/12/2022	3.53E+02	5.87E+00
7/14/2022	3.45E+02	5.84E+00
10/11/2022	3.30E+02	5.80E+00
1/19/2023	1.72E+02	5.15E+00
4/25/2023	4.21E+02	6.04E+00
7/25/2023	3.51E+02	5.86E+00

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	4.01E+02	NO	5.99E+00	N/A
MW365	Downgradient	Yes	4.65E+02	NO	6.14E+00	N/A
MW371	Upgradient	Yes	3.76E+02	NO	5.93E+00	N/A
MW374	Upgradient	Yes	3.98E+02	NO	5.99E+00	N/A
MW375	Sidegradient	Yes	4.45E+02	NO	6.10E+00	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 Fourth Quarter 2023 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= 22.313 S= 18.210 CV(1)=0.816 K factor\*\*= 2.523 TL(1)= 6.83E+01 LL(1)=N/A

Statistics-Transformed Background Data X= 2.912 S= 0.568 CV(2)=0.195 K factor\*\*= 2.523 TL(2)= 4.34E+00 LL(2)=N/A

## Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
10/12/2021	1.19E+01	2.48E+00
1/12/2022	1.43E+01	2.66E+00
4/12/2022	7.54E+01	4.32E+00
7/14/2022	2.87E+01	3.36E+00
10/11/2022	1.18E+01	2.47E+00
1/19/2023	1.20E+01	2.48E+00
4/25/2023	5.69E+01	4.04E+00
7/25/2023	2.86E+01	3.35E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/13/2021	1.27E+01	2.54E+00
1/13/2022	1.24E+01	2.52E+00
4/12/2022	1.64E+01	2.80E+00
7/14/2022	1.67E+01	2.82E+00
10/11/2022	1.32E+01	2.58E+00
1/19/2023	1.39E+01	2.63E+00
4/25/2023	1.65E+01	2.80E+00
7/25/2023	1.56E+01	2.75E+00

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)
MW362	Downgradient	Yes	2.15E+01	NO	3.07E+00	N/A
MW365	Downgradient	Yes	5.23E+01	NO	3.96E+00	N/A
MW371	Upgradient	Yes	1.58E+01	NO	2.76E+00	N/A
MW375	Sidegradient	Yes	2.23E+01	NO	3.10E+00	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 Fourth Quarter 2023 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= 39.288 S= 24.190 CV(1)=0.616 K factor\*\*= 2.523 TL(1)= 1.00E+02 LL(1)=N/A

Statistics-Transformed Background Data X= 3.452 S= 0.708 CV(2)=0.205 K factor\*\*= 2.523 TL(2)= 5.24E+00 LL(2)=N/A

## Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/12/2021	1.51E+01	2.71E+00
1/12/2022	1.63E+01	2.79E+00
4/12/2022	1.65E+01	2.80E+00
7/14/2022	1.57E+01	2.75E+00
10/11/2022	1.60E+01	2.77E+00
1/19/2023	1.60E+01	2.77E+00
4/24/2023	1.60E+01	2.77E+00
7/25/2023	1.57E+01	2.75E+00

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	6.48E+01	4.17E+00
1/13/2022	6.70E+01	4.20E+00
4/12/2022	6.11E+01	4.11E+00
7/14/2022	6.26E+01	4.14E+00
10/11/2022	6.22E+01	4.13E+00
1/19/2023	6.06E+01	4.10E+00
4/25/2023	6.20E+01	4.13E+00
7/25/2023	6.10E+01	4.11E+00

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

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	6.46E+01	NO	4.17E+00	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 Fourth Quarter 2023 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= 551.938	S= 204.681	CV(1)=0.371	K factor**= 2.523	TL(1)= 1.07E+03	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.248	S= 0.376	CV(2)=0.060	K factor**= 2.523	TL(2)= 7.20E+00	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)
10/12/2021	3.05E+02	5.72E+00
1/12/2022	3.59E+02	5.88E+00
4/12/2022	3.78E+02	5.93E+00
7/14/2022	3.71E+02	5.92E+00
10/11/2022	4.85E+02	6.18E+00
1/19/2023	3.59E+02	5.88E+00
4/24/2023	3.75E+02	5.93E+00
7/25/2023	3.50E+02	5.86E+00

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	4.84E+02	6.18E+00
1/13/2022	7.52E+02	6.62E+00
4/12/2022	7.38E+02	6.60E+00
7/14/2022	7.15E+02	6.57E+00
10/11/2022	9.14E+02	6.82E+00
1/19/2023	7.54E+02	6.63E+00
4/25/2023	7.33E+02	6.60E+00
7/25/2023	7.59E+02	6.63E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	7.47E+02	NO	6.62E+00	N/A

Conclusion of Statistical Analysis on Current Data

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum ([ (background result-X)^2 ]/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K \* S), LL Lower Tolerance Limit, LL = X - (K \* S)
X Mean, X = (sum of background results)/(count of background results)
\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D2-7

# C-746-U Fourth Quarter 2023 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**= 324.625   **S**= 133.859   **CV(1)**=0.412      **K factor\*\***= 2.523      **TL(1)**= 6.62E+02      **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 5.696      **S**= 0.437      **CV(2)**=0.077      **K factor\*\***= 2.523      **TL(2)**= 6.80E+00      **LL(2)**=N/A

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

Well Number: MW369

Date Collected	Result	LN(Result)
10/12/2021	1.79E+02	5.19E+00
1/12/2022	2.00E+02	5.30E+00
4/12/2022	2.34E+02	5.46E+00
7/14/2022	1.96E+02	5.28E+00
10/11/2022	2.12E+02	5.36E+00
1/19/2023	1.86E+02	5.23E+00
4/24/2023	1.93E+02	5.26E+00
7/25/2023	1.75E+02	5.16E+00

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	4.61E+02	6.13E+00
1/13/2022	5.06E+02	6.23E+00
4/12/2022	4.57E+02	6.12E+00
7/14/2022	4.61E+02	6.13E+00
10/11/2022	4.55E+02	6.12E+00
1/19/2023	4.28E+02	6.06E+00
4/25/2023	4.28E+02	6.06E+00
7/25/2023	4.23E+02	6.05E+00

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

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	4.47E+02	NO	6.10E+00	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 Fourth Quarter 2023 Statistical Analysis

# Current 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 statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data X= 0.002 S= 0.001 CV(1)=0.531 K factor\*\*= 2.523 TL(1)= 5.70E-03 LL(1)=N/A

Statistics-Transformed Background Data X= -6.182 S= 0.625 CV(2)=-0.101 K factor\*\*= 2.523 TL(2)= -4.60E+00 LL(2)=N/A

## Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/12/2021	2.79E-03	-5.88E+00
1/12/2022	3.31E-03	-5.71E+00
4/12/2022	4.28E-03	-5.45E+00
7/14/2022	2.88E-03	-5.85E+00
10/11/2022	3.26E-03	-5.73E+00
1/19/2023	2.78E-03	-5.89E+00
4/24/2023	3.49E-03	-5.66E+00
7/25/2023	4.62E-03	-5.38E+00

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	2.00E-03	-6.21E+00
1/13/2022	3.57E-03	-5.64E+00
4/12/2022	7.93E-04	-7.14E+00
7/14/2022	1.10E-03	-6.81E+00
10/11/2022	1.25E-03	-6.68E+00
1/19/2023	1.04E-03	-6.87E+00
4/25/2023	8.89E-04	-7.03E+00
7/25/2023	9.29E-04	-6.98E+00

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)
MW363	Downgradient	Yes	8.13E-02	YES	-2.51E+00	N/A

## Conclusion of Statistical Analysis on Current Data

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

## Wells with Exceedances

MW363

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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 Fourth Quarter 2023 Statistical Analysis
Oxidation-Reduction Potential

Current Background Comparison
UNITS: mV
URGA

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

Statistics-Background Data	X= 407.125	S= 33.898	CV(1)=0.083	K factor**= 2.523	TL(1)= 4.93E+02	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.006	S= 0.082	CV(2)=0.014	K factor**= 2.523	TL(2)= 6.21E+00	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)
10/12/2021	3.43E+02	5.84E+00
1/12/2022	3.92E+02	5.97E+00
4/12/2022	3.82E+02	5.95E+00
7/14/2022	4.20E+02	6.04E+00
10/11/2022	4.06E+02	6.01E+00
1/19/2023	4.80E+02	6.17E+00
4/24/2023	4.39E+02	6.08E+00
7/25/2023	4.06E+02	6.01E+00
Well Number: MW372		
Date Collected	Result	LN(Result)
10/13/2021	3.90E+02	5.97E+00
1/13/2022	3.76E+02	5.93E+00
4/12/2022	4.02E+02	6.00E+00
7/14/2022	4.02E+02	6.00E+00
10/11/2022	4.16E+02	6.03E+00
1/19/2023	4.03E+02	6.00E+00
4/25/2023	4.70E+02	6.15E+00
7/25/2023	3.87E+02	5.96E+00

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.32E+02	NO	6.07E+00	N/A
MW360	Downgradient	Yes	4.33E+02	NO	6.07E+00	N/A
MW363	Downgradient	Yes	3.01E+02	NO	5.71E+00	N/A
MW366	Downgradient	Yes	4.62E+02	NO	6.14E+00	N/A
MW369	Upgradient	Yes	3.85E+02	NO	5.95E+00	N/A
MW372	Upgradient	Yes	3.40E+02	NO	5.83E+00	N/A

Conclusion of Statistical Analysis on Current Data

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.  
CV    Coefficient-of-Variation, CV = S/X    If CV is less than or equal to 1 assume normal distribution.  
S     Standard Deviation, S = [Sum ([{(background result-X)^2}/[count of background results -1])]<sup>0.5</sup>  
TL    Upper Tolerance Limit, TL = X + (K \* S),        LL    Lower Tolerance Limit, LL = X - (K \* S)  
X     Mean, X = (sum of background results)/(count of background results)  
\*\*    Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D2-10



# C-746-U Fourth Quarter 2023 Statistical Analysis

# Current Background Comparison

Sulfate

UNITS: mg/L

URGA

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

Statistics-Background Data X= 75.476 S= 69.754 CV(1)=0.924 K factor\*\*= 2.523 TL(1)= 2.51E+02 LL(1)=N/A

Statistics-Transformed Background Data X= 3.524 S= 1.486 CV(2)=0.422 K factor\*\*= 2.523 TL(2)= 7.27E+00 LL(2)=N/A

## Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/12/2021	8.82E+00	2.18E+00
1/12/2022	7.80E+00	2.05E+00
4/12/2022	8.93E+00	2.19E+00
7/14/2022	8.16E+00	2.10E+00
10/11/2022	8.07E+00	2.09E+00
1/19/2023	7.93E+00	2.07E+00
4/24/2023	7.00E+00	1.95E+00
7/25/2023	7.91E+00	2.07E+00

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	1.47E+02	4.99E+00
1/13/2022	1.45E+02	4.98E+00
4/12/2022	1.44E+02	4.97E+00
7/14/2022	1.45E+02	4.98E+00
10/11/2022	1.31E+02	4.88E+00
1/19/2023	1.35E+02	4.91E+00
4/25/2023	1.51E+02	5.02E+00
7/25/2023	1.45E+02	4.98E+00

## Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	1.43E+02	NO	4.96E+00	N/A

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

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 Fourth Quarter 2023 Statistical Analysis  
Technetium-99

Current Background Comparison  
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= 56.394	S= 16.438	CV(1)=0.291	K factor**= 2.523	TL(1)= 9.79E+01	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.983	S= 0.349	CV(2)=0.088	K factor**= 2.523	TL(2)= 4.86E+00	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)
10/12/2021	5.98E+01	4.09E+00
1/12/2022	5.28E+01	3.97E+00
4/12/2022	5.72E+01	4.05E+00
7/14/2022	5.08E+01	3.93E+00
10/11/2022	5.64E+01	4.03E+00
1/19/2023	6.16E+01	4.12E+00
4/24/2023	3.91E+01	3.67E+00
7/25/2023	5.61E+01	4.03E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW369	Upgradient	Yes	7.67E+01	NO	4.34E+00	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
10/13/2021	5.59E+01	4.02E+00
1/13/2022	4.76E+01	3.86E+00
4/12/2022	7.94E+01	4.37E+00
7/14/2022	7.42E+01	4.31E+00
10/11/2022	6.97E+01	4.24E+00
1/19/2023	8.54E+01	4.45E+00
4/25/2023	3.63E+01	3.59E+00
7/25/2023	2.00E+01	3.00E+00

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.

D2-12

# C-746-U Fourth Quarter 2023 Statistical Analysis

# Current Background Comparison

## Calcium

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 48.500 S= 20.054 CV(1)=0.413 K factor\*\*= 2.523 TL(1)= 9.91E+01 LL(1)=N/A

Statistics-Transformed Background Data X= 3.796 S= 0.433 CV(2)=0.114 K factor\*\*= 2.523 TL(2)= 4.89E+00 LL(2)=N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
10/12/2021	2.61E+01	3.26E+00
1/12/2022	3.00E+01	3.40E+00
4/12/2022	3.05E+01	3.42E+00
7/14/2022	2.92E+01	3.37E+00
10/11/2022	2.89E+01	3.36E+00
1/19/2023	3.05E+01	3.42E+00
4/24/2023	3.09E+01	3.43E+00
7/25/2023	2.93E+01	3.38E+00

Well Number: MW373

Date Collected	Result	LN(Result)
10/13/2021	6.78E+01	4.22E+00
1/13/2022	6.72E+01	4.21E+00
4/12/2022	6.28E+01	4.14E+00
7/14/2022	6.28E+01	4.14E+00
10/11/2022	6.56E+01	4.18E+00
1/19/2023	6.46E+01	4.17E+00
4/25/2023	7.11E+01	4.26E+00
7/25/2023	7.87E+01	4.37E+00

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)
MW373	Upgradient	Yes	7.90E+01	NO	4.37E+00	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 Fourth Quarter 2023 Statistical Analysis

# Current 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 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**= 3.266    **S**= 1.119    **CV(1)**=0.343    **K factor\*\***= 2.523    **TL(1)**= 6.09E+00    **LL(1)**=N/A

**Statistics-Transformed Background Data**      **X**= 1.124    **S**= 0.362    **CV(2)**=0.322    **K factor\*\***= 2.523    **TL(2)**= 2.04E+00    **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)
10/12/2021	4.60E+00	1.53E+00
1/12/2022	4.36E+00	1.47E+00
4/12/2022	3.45E+00	1.24E+00
7/14/2022	4.73E+00	1.55E+00
10/11/2022	4.80E+00	1.57E+00
1/19/2023	4.00E+00	1.39E+00
4/24/2023	4.26E+00	1.45E+00
7/25/2023	4.01E+00	1.39E+00

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	4.64E+00	NO	1.53E+00	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
10/13/2021	2.00E+00	6.93E-01
1/13/2022	2.72E+00	1.00E+00
4/12/2022	2.79E+00	1.03E+00
7/14/2022	2.42E+00	8.84E-01
10/11/2022	2.31E+00	8.37E-01
1/19/2023	2.11E+00	7.47E-01
4/25/2023	2.00E+00	6.93E-01
7/25/2023	1.69E+00	5.25E-01

### 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 Fourth Quarter 2023 Statistical Analysis

Oxidation-Reduction Potential

Current Background Comparison

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= 404.938	S= 32.567	CV(1)=0.080	K factor**= 2.523	TL(1)= 4.87E+02	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.001	S= 0.078	CV(2)=0.013	K factor**= 2.523	TL(2)= 6.20E+00	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)
10/12/2021	3.59E+02	5.88E+00
1/12/2022	4.02E+02	6.00E+00
4/12/2022	3.90E+02	5.97E+00
7/14/2022	4.15E+02	6.03E+00
10/11/2022	4.27E+02	6.06E+00
1/19/2023	4.68E+02	6.15E+00
4/24/2023	4.60E+02	6.13E+00
7/25/2023	3.88E+02	5.96E+00
Well Number: MW373		
Date Collected	Result	LN(Result)
10/13/2021	3.72E+02	5.92E+00
1/13/2022	3.76E+02	5.93E+00
4/12/2022	3.99E+02	5.99E+00
7/14/2022	3.82E+02	5.95E+00
10/11/2022	4.01E+02	5.99E+00
1/19/2023	3.99E+02	5.99E+00
4/25/2023	4.57E+02	6.12E+00
7/25/2023	3.84E+02	5.95E+00

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.49E+02	NO	5.00E+00	N/A
MW361	Downgradient	Yes	4.34E+02	NO	6.07E+00	N/A
MW364	Downgradient	Yes	4.50E+02	NO	6.11E+00	N/A
MW367	Downgradient	Yes	2.81E+02	NO	5.64E+00	N/A
MW370	Upgradient	Yes	3.27E+02	NO	5.79E+00	N/A
MW373	Upgradient	Yes	3.57E+02	NO	5.88E+00	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

D2-15

C-746-U Fourth Quarter 2023 Statistical Analysis  
Technetium-99

Current Background Comparison  
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= 18.389	S= 10.112	CV(1)=0.550	K factor**= 2.523	TL(1)= 4.39E+01	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.886	S= 0.461	CV(2)=0.160	K factor**= 2.523	TL(2)= 3.67E+00	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370		
Date Collected	Result	LN(Result)
10/12/2021	3.92E+01	3.67E+00
1/12/2022	2.56E+01	3.24E+00
4/12/2022	2.34E+01	3.15E+00
7/14/2022	2.40E+01	3.18E+00
10/11/2022	2.09E+01	3.04E+00
1/19/2023	3.07E+01	3.42E+00
4/24/2023	2.83E+01	3.34E+00
7/25/2023	2.03E+01	3.01E+00
Well Number: MW373		
Date Collected	Result	LN(Result)
10/13/2021	8.12E+00	2.09E+00
1/13/2022	1.12E+01	2.42E+00
4/12/2022	1.48E+01	2.69E+00
7/14/2022	9.69E+00	2.27E+00
10/11/2022	-1.78E+00	#Func!
1/19/2023	1.25E+01	2.53E+00
4/25/2023	1.40E+01	2.64E+00
7/25/2023	1.33E+01	2.59E+00

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)
MW361	Downgradient	Yes	5.03E+01	YES	3.92E+00	N/A
MW364	Downgradient	Yes	6.39E+01	YES	4.16E+00	N/A

Conclusion of Statistical Analysis on Current Data

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

Wells with Exceedances

MW361  
MW364

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

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

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

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

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

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

D2-16

**ATTACHMENT D3**

**STATISTICIAN QUALIFICATION STATEMENT**

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January 15, 2024

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 fourth quarter 2023 monitoring well data collected from the C-746-S&T and C-746-U Landfills were performed in accordance with guidance provided in the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Sincerely,



Bryan Smith

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**APPENDIX E**

**GROUNDWATER FLOW RATE AND DIRECTION**

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## GROUNDWATER FLOW RATE AND DIRECTION

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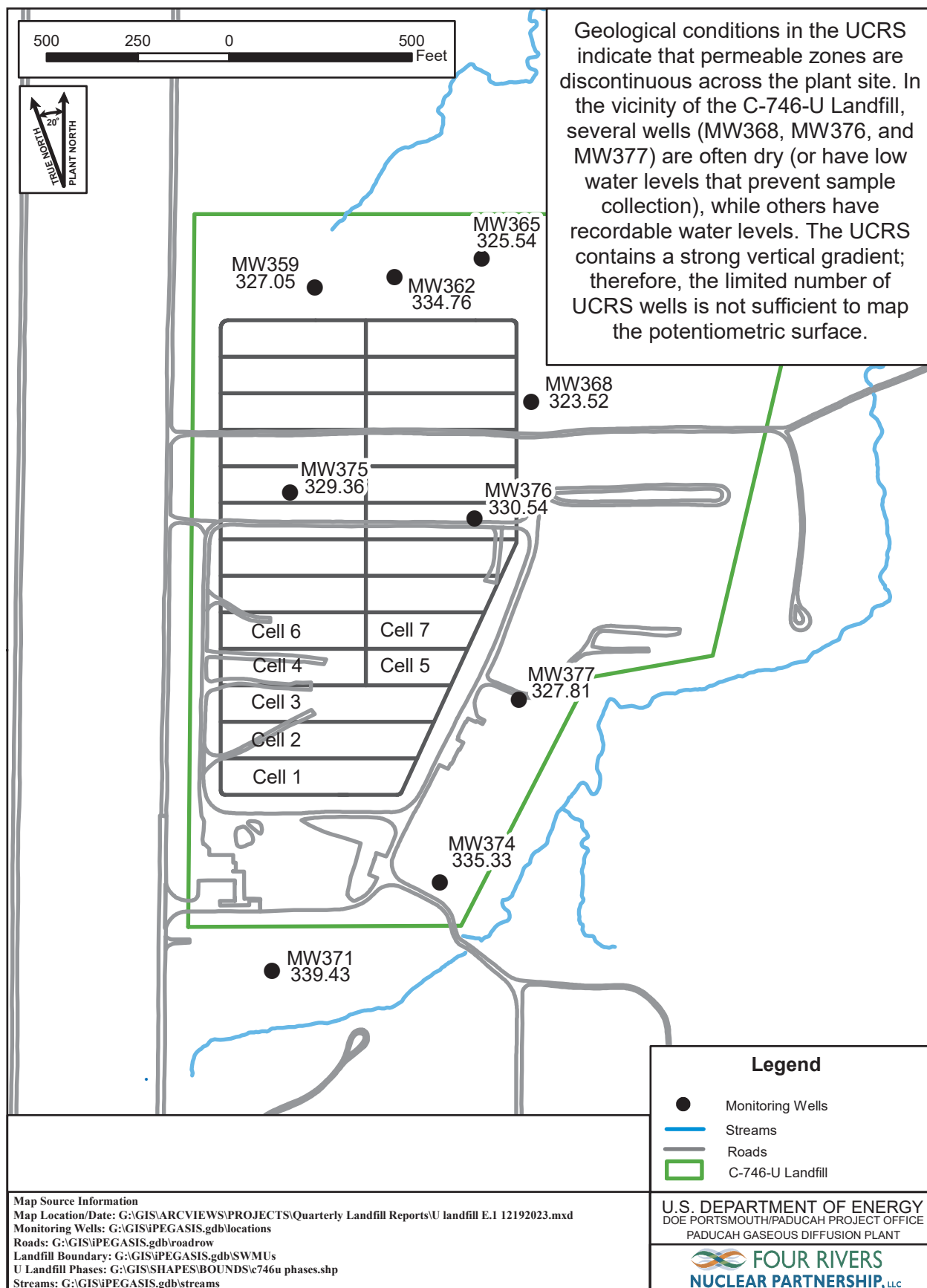
Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently 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 fourth quarter 2023 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on October 23, 2023. As shown on Figure E.1, with the exceptions of Upper Continental Recharge System (UCRS) wells MW359, MW368, MW376, and MW377, all UCRS wells had sufficient water to permit water level measurement and sampling for laboratory analysis during this reporting period.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradients for the URGA and LRGA at the C-746-U Landfill, as measured along the defined groundwater flow directions, were  $6.14 \times 10^{-4}$  ft/ft and  $7.08 \times 10^{-4}$  ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was  $3.08 \times 10^{-4}$  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 October 2023, 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, October 23, 2023**

**Table E.1. C-746-U Landfill Fourth Quarter 2023 (October) Water Levels**

C-746-U Landfill (October 2023) 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)
10/23/2023	9:06	MW357	URGA	368.77	30.15	0.00	47.17	321.60	47.17	321.60
10/23/2023	9:08	MW358	LRGA	368.92	30.15	0.00	47.32	321.60	47.32	321.60
10/23/2023	9:07	MW359	UCRS	368.91	30.15	0.00	41.86	327.05	41.86	327.05
10/23/2023	9:01	MW360	URGA	362.07	30.15	0.00	40.48	321.59	40.48	321.59
10/23/2023	9:03	MW361	LRGA	361.32	30.15	0.00	39.75	321.57	39.75	321.57
10/23/2023	9:02	MW362	UCRS	361.85	30.15	0.00	27.09	334.76	27.09	334.76
10/23/2023	9:15	MW363	URGA	368.56	30.15	0.00	47.06	321.50	47.06	321.50
10/23/2023	9:17	MW364	LRGA	368.17	30.15	0.00	46.79	321.38	46.79	321.38
10/23/2023	9:16	MW365	UCRS	368.14	30.15	0.00	42.60	325.54	42.60	325.54
10/23/2023	9:19	MW366	URGA	368.95	30.15	0.00	47.32	321.63	47.32	321.63
10/23/2023	9:22	MW367	LRGA	369.37	30.15	0.00	47.75	321.62	47.75	321.62
10/23/2023	9:21	MW368	UCRS	368.98	30.15	0.00	45.46	323.52	45.46	323.52
10/23/2023	9:46	MW369	URGA	364.23	30.15	0.00	41.42	322.81	41.42	322.81
10/23/2023	9:48	MW370	LRGA	365.12	30.15	0.00	42.31	322.81	42.31	322.81
10/23/2023	9:47	MW371	UCRS	364.64	30.15	0.00	25.21	339.43	25.21	339.43
10/23/2023	9:42	MW372	URGA	359.42	30.15	0.00	36.61	322.81	36.61	322.81
10/23/2023	9:44	MW373	LRGA	359.73	30.15	0.00	36.92	322.81	36.92	322.81
10/23/2023	9:43	MW374	UCRS	359.44	30.15	0.00	24.11	335.33	24.11	335.33
10/23/2023	9:35	MW375	UCRS	370.36	30.15	0.00	41.00	329.36	41.00	329.36
10/23/2023	9:38	MW376	UCRS	370.39	30.15	0.00	39.85	330.54	39.85	330.54
10/23/2023	9:40	MW377	UCRS	365.74	30.15	0.00	37.93	327.81	37.93	327.81
Reference Barometric Pressure					30.15					
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										

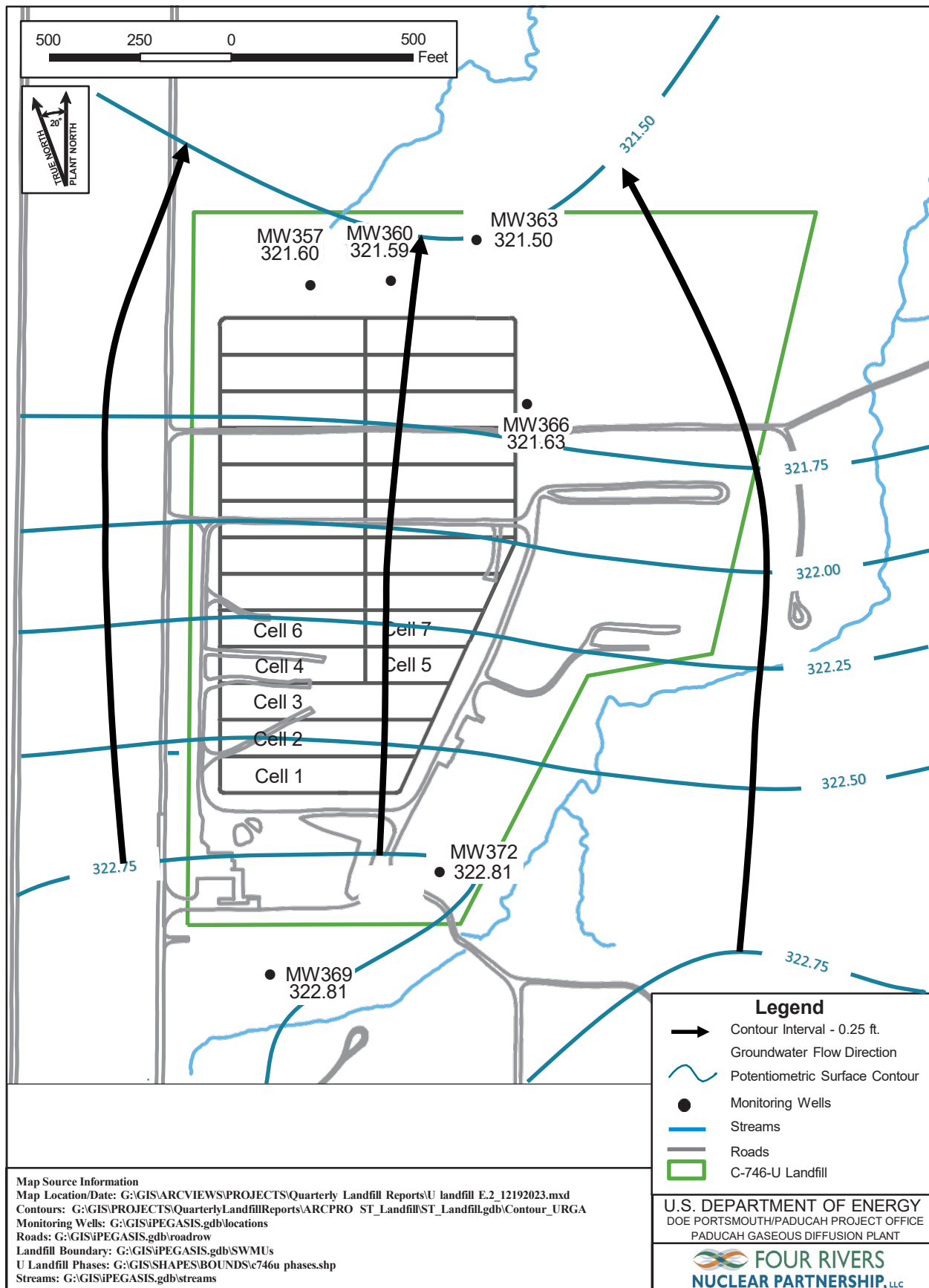


Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer  
 at the C-746-U Landfill, October 23, 2023



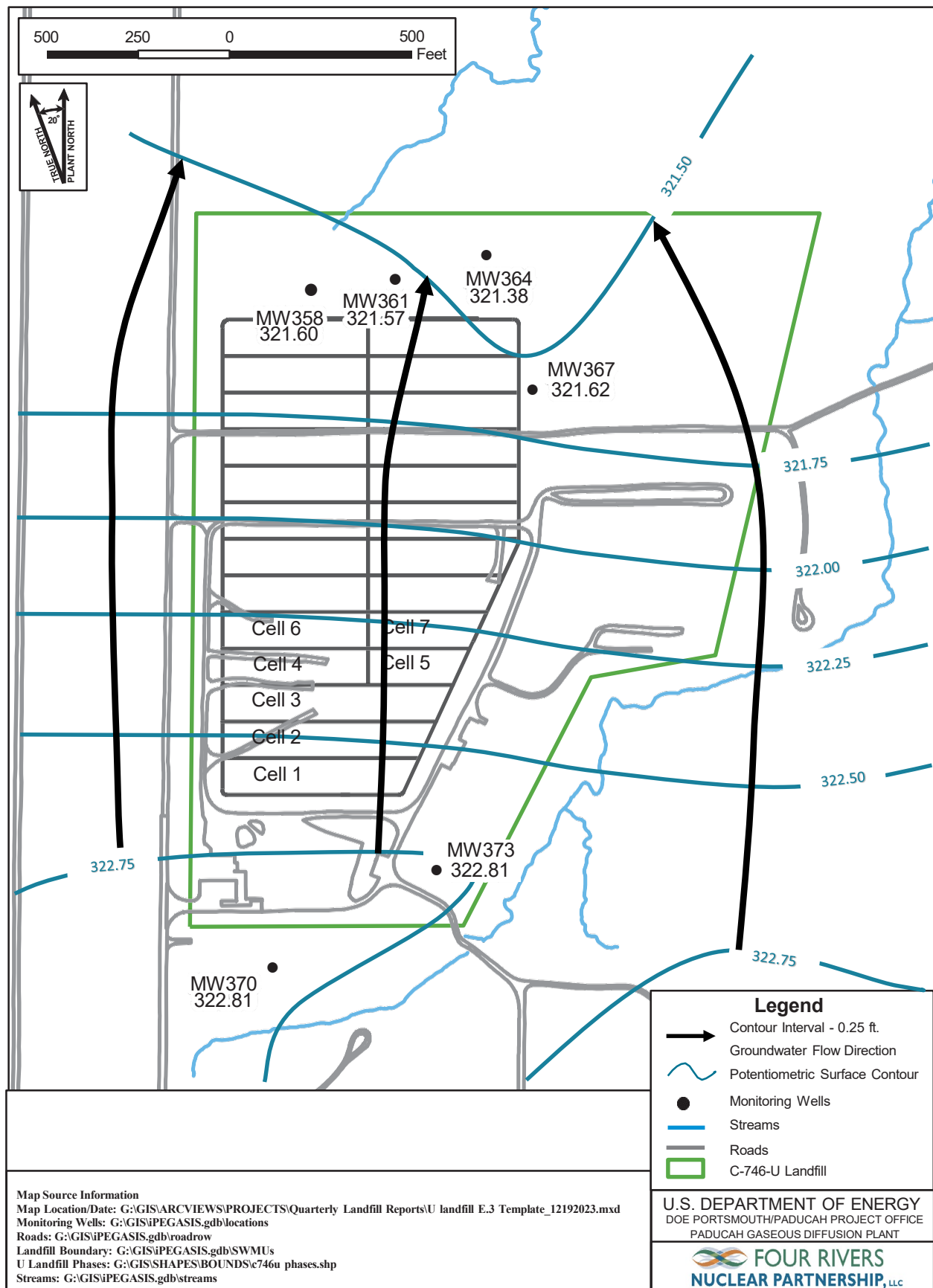


Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer  
 at the C-746-U Landfill, October 23, 2023

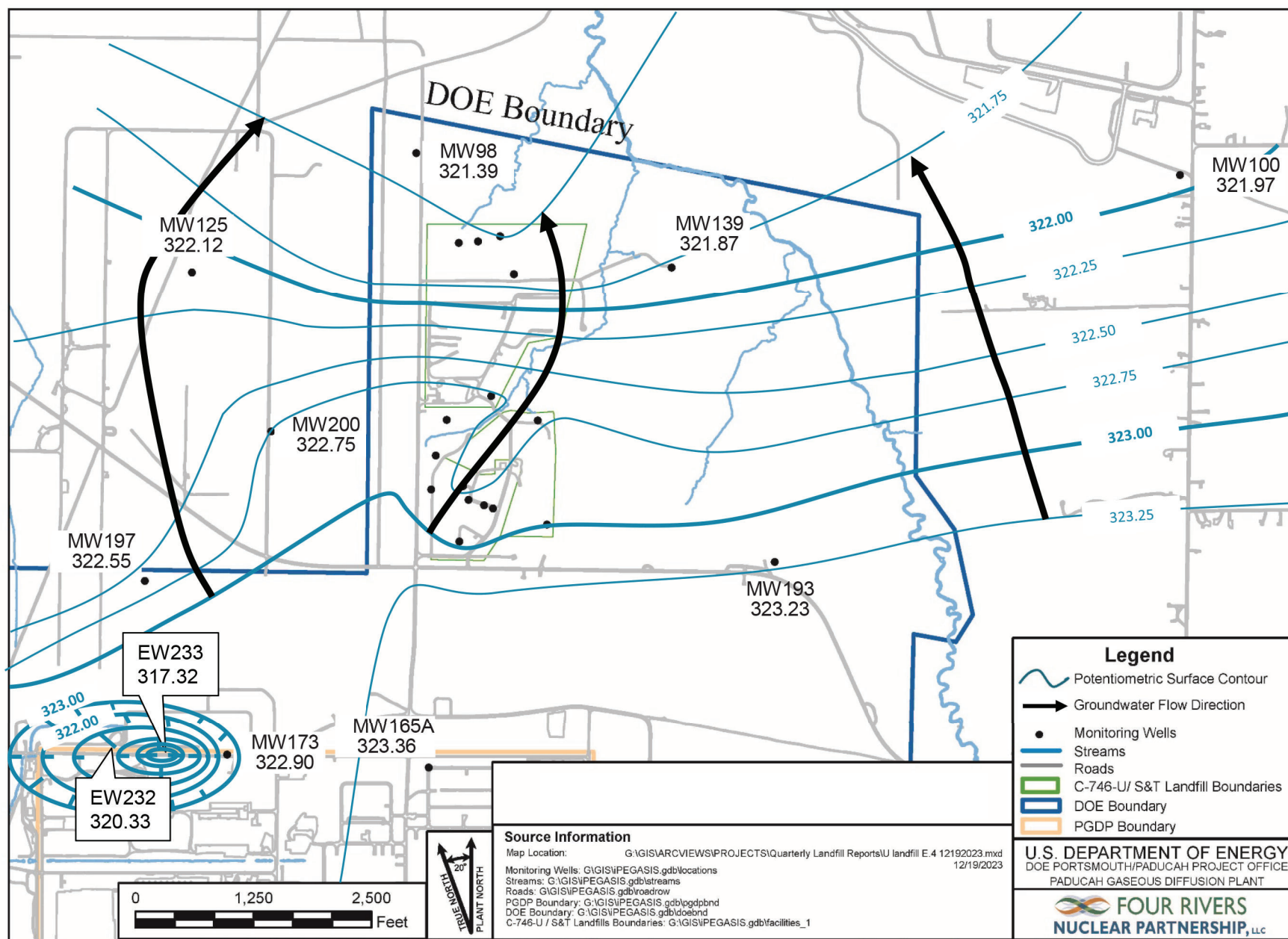


Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, October 23, 2023

**Table E.2. C-746-U Landfill Hydraulic Gradients**

		ft/ft
Beneath Landfill—Upper RGA		$6.14 \times 10^{-4}$
Beneath Landfill—Lower RGA		$7.08 \times 10^{-4}$
Vicinity		$3.08 \times 10^{-4}$

**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
<u>Upper RGA</u>					
725	0.256	0.445	$1.57 \times 10^{-4}$	1.78	$6.29 \times 10^{-4}$
425	0.150	0.261	$9.21 \times 10^{-5}$	1.04	$3.69 \times 10^{-4}$
<u>Lower RGA</u>					
725	0.256	0.513	$1.81 \times 10^{-4}$	2.05	$7.25 \times 10^{-4}$
425	0.150	0.301	$1.06 \times 10^{-4}$	1.20	$4.25 \times 10^{-4}$

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**APPENDIX F**  
**NOTIFICATIONS**

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## NOTIFICATIONS

In accordance with 401 *KAR* 48:300 § 7, the notification for parameters that exceed (or did not exceed) the maximum contaminant level (MCL) has been submitted to the Kentucky Division of Waste Management. There were no MCL exceedances in the current reporting period. 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 fourth quarter 2023 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>	Nickel	MW363
	Technetium-99	MW369
<b>Lower Regional Gravel Aquifer</b>	Technetium-99	MW361, MW364

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.

11/14/2023

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

AKGWA	Station	Analysis	Method	Results	Units	MCL
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No exceedances reported.

NOTE 1: MCLs are defined in 401 KAR 47:030.

NOTE 2: MW369, MW370, MW372, and MW373 are down-gradient wells for the C-746-S and C-746-T Landfills and upgradient for the C-746-U Landfill. These wells are sampled with the C-746-U Landfill monitoring well network. These wells are reported on the exceedance reports for C-746-S, C-746-T, and C-746-U.



**APPENDIX G**  
**CHART OF MCL AND UTL EXCEEDANCES**

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# **Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
ACETONE																						
Quarter 3, 2002										*	*	*										
Quarter 4, 2002										*	*	*										
Quarter 1, 2003																						
Quarter 2, 2003																						
Quarter 3, 2003	*						*			*	*	*			*			*				
Quarter 4, 2003							*	*		*	*			*								
Quarter 3, 2004							*									*						
Quarter 3, 2005							*															
Quarter 4, 2005							*															
ALPHA ACTIVITY																						
Quarter 1, 2004																						
Quarter 2, 2004							■														■	
Quarter 3, 2009							■															
ALUMINUM																						
Quarter 3, 2003										*												
BETA ACTIVITY																						
Quarter 1, 2004																■						
Quarter 2, 2004																■					■	
Quarter 3, 2004																■						
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																■					■	
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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																■				■		
Quarter 4, 2020																				■		
BROMIDE																						
Quarter 2, 2004												*										

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
CALCIUM																						
Quarter 3, 2003										*												
Quarter 2, 2005																					*	
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	*							*							*							
Quarter 4, 2020															*							
Quarter 1, 2021															*							
Quarter 2, 2021								*							*							
Quarter 3, 2021															*							
Quarter 4, 2021															*							
Quarter 1, 2022															*							
Quarter 2, 2022															*							
Quarter 3, 2022															*							
Quarter 4, 2022															*							
Quarter 1, 2023															*							
Quarter 2, 2023															*							
Quarter 3, 2023															*						*	
Quarter 4, 2023															*						*	
CARBON DISULFIDE																						
Quarter 3, 2003										*												
Quarter 2, 2005							*															
Quarter 3, 2005						*																
Quarter 4, 2005						*																
Quarter 1, 2006						*																
Quarter 2, 2006						*																
Quarter 3, 2010		*								*												
Quarter 4, 2010														*								
Quarter 1, 2011															*							
CHEMICAL OXYGEN DEMAND																						
Quarter 3, 2002										*	*	*	*	*	*							
Quarter 4, 2002										*	*	*	*	*	*							
Quarter 1, 2003										*	*	*	*	*	*							
Quarter 2, 2003										*	*	*	*	*	*							
Quarter 3, 2003	*									*	*	*	*	*	*	*						
Quarter 4, 2003					*					*	*	*	*	*	*							
Quarter 3, 2004										*	*	*	*	*	*							
Quarter 3, 2005					*					*	*	*	*	*	*	*			*			
Quarter 4, 2005					*					*	*	*	*	*	*			*	*			
Quarter 1, 2006																		*				
Quarter 4, 2016																	*					
Quarter 1, 2017										*	*	*	*	*	*							
Quarter 2, 2019											*				*							
Quarter 3, 2019															*						*	
Quarter 4, 2019															*							
CHLORIDE																						
Quarter 1, 2006																				*		
Quarter 2, 2014															*							
COBALT																						
Quarter 3, 2003	*					*				*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2004					*								*	*	*	*	*	*	*	*	*	
Quarter 2, 2016														*								

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
	D	S	S	S	D	D	D	U	U		D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>CONDUCTIVITY</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 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															*	*						
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															*	*						
Quarter 4, 2020															*	*						
Quarter 1, 2021															*	*						
Quarter 2, 2021															*	*						
Quarter 3, 2021															*	*						
Quarter 1, 2022															*	*						
Quarter 2, 2022															*	*						
Quarter 3, 2022															*	*						
Quarter 4, 2022															*	*						
Quarter 1, 2023															*	*						
Quarter 2, 2023															*	*						
Quarter 3, 2023															*	*						
Quarter 4, 2023															*	*						
<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								*														

**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
<b>DISSOLVED OXYGEN</b>																						
Quarter 1, 2009							*															
Quarter 2, 2009					*			*	*													
Quarter 3, 2009					*			*	*													
Quarter 1, 2010					*	*	*	*	*												*	*
Quarter 2, 2010					*	*	*	*	*													
Quarter 3, 2010					*	*	*	*	*												*	*
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	*				*	*	*	*	*					*				*				
Quarter 4, 2020	*				*	*	*	*	*					*				*				
Quarter 1, 2021					*	*	*	*	*					*				*			*	
Quarter 2, 2021					*	*	*	*	*					*				*				
Quarter 3, 2021	*				*	*	*	*	*					*				*			*	
Quarter 4, 2021	*				*	*	*	*	*					*				*			*	
Quarter 1, 2022	*				*	*	*	*	*					*				*			*	
Quarter 2, 2022	*				*	*	*	*	*					*				*			*	
Quarter 3, 2022	*	*			*	*	*	*	*					*				*			*	
Quarter 4, 2022		*			*	*	*	*	*					*				*			*	
Quarter 2, 2023	*				*	*	*	*	*					*				*				
Quarter 3, 2023					*	*	*	*	*					*				*				
Quarter 4, 2023	*				*	*	*	*	*					*				*			*	
<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															*		*				*	

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
DISSOLVED SOLIDS																						
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															*							
Quarter 4, 2020															*							
Quarter 1, 2021															*							
Quarter 2, 2021															*							
Quarter 3, 2021															*							
Quarter 4, 2021															*							
Quarter 1, 2022															*							
Quarter 2, 2022															*							
Quarter 3, 2022															*							
Quarter 4, 2022															*							
Quarter 1, 2023															*							
Quarter 2, 2023															*							
Quarter 3, 2023															*							
Quarter 4, 2023															*							
IODIDE																						
Quarter 2, 2003																*						
Quarter 3, 2003	*									*												
Quarter 4, 2003						*		*										*				
Quarter 3, 2010							*		*				*					*				
IODINE-131																						
Quarter 3, 2010																		■				
IODOMETHANE																						
Quarter 4, 2003						*																
IRON																						
Quarter 4, 2002						*																
Quarter 3, 2003																*						
Quarter 4, 2003											*					*						
Quarter 1, 2004											*					*						
Quarter 2, 2004											*					*						
Quarter 3, 2004											*					*						
Quarter 3, 2005																*						
MAGNESIUM																						
Quarter 2, 2005															*						*	
Quarter 3, 2005						*										*					*	
Quarter 2, 2006															*						*	
Quarter 3, 2006															*							
Quarter 1, 2007															*							
Quarter 2, 2008															*							
Quarter 2, 2009															*							
Quarter 3, 2009															*							
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															*							
Quarter 4, 2020															*							
Quarter 1, 2021															*							
Quarter 2, 2021															*							
Quarter 3, 2021															*							
Quarter 4, 2021															*							
Quarter 1, 2022															*							
Quarter 2, 2022															*							
Quarter 3, 2022								*							*							
Quarter 1, 2023								*							*							
Quarter 2, 2023								*							*							

# **Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
MANGANESE																						
Quarter 3, 2002										*	*											
Quarter 4, 2002		*					*	*		*	*		*									
Quarter 2, 2003										*	*											
Quarter 3, 2003										*	*	*	*			*	*	*	*			
Quarter 4, 2003										*	*	*	*			*	*	*	*			
Quarter 1, 2004										*	*	*	*			*	*	*				
Quarter 2, 2004							*			*	*	*	*			*		*				
Quarter 3, 2004							*			*	*	*	*			*		*				
Quarter 4, 2004										*	*	*	*			*		*				
Quarter 1, 2005										*	*					*						
Quarter 2, 2005										*	*											
Quarter 3, 2005										*	*					*						
Quarter 4, 2005										*						*						
Quarter 1, 2006										*						*						
Quarter 2, 2006							*			*	*					*						
Quarter 3, 2006										*						*						
Quarter 4, 2006										*						*						
Quarter 1, 2007										*						*						
Quarter 2, 2007							*			*						*						
Quarter 3, 2007							*			*						*						
Quarter 3, 2008							*			*						*						
Quarter 4, 2008							*			*						*						
Quarter 3, 2009							*			*						*						
Quarter 3, 2011							*			*						*						
Quarter 2, 2016														*								
Quarter 3, 2016									*													
Quarter 1, 2022																			*			
NICKEL																						
Quarter 3, 2003										*												
Quarter 1, 2022																			*			
Quarter 4, 2022																			*			
Quarter 1, 2023																			*			
Quarter 2, 2023																			*			
Quarter 4, 2023												*										
NITRATE AS NITROGEN																						
Quarter 4, 2021																						
OXIDATION-REDUCTION POTENTIAL																						
Quarter 4, 2002																	*		*			
Quarter 1, 2003																	*		*			
Quarter 2, 2003																			*			
Quarter 3, 2003	*																					
Quarter 4, 2003					*																	
Quarter 2, 2004												*	*	*			*			*	*	
Quarter 3, 2004					*			*				*	*	*			*			*	*	
Quarter 4, 2004												*					*			*	*	
Quarter 1, 2005																	*			*	*	
Quarter 2, 2005							*					*	*	*			*			*	*	
Quarter 3, 2005					*	*		*			*	*	*				*		*	*	*	
Quarter 4, 2005		*					*					*	*				*		*	*	*	
Quarter 1, 2006					*		*	*									*			*	*	
Quarter 2, 2006					*	*	*	*				*	*	*			*		*	*	*	
Quarter 3, 2006					*	*	*	*				*	*	*			*		*	*	*	
Quarter 4, 2006					*	*	*	*			*	*	*				*		*	*	*	
Quarter 1, 2007		*			*	*	*	*			*	*	*	*			*		*	*	*	
Quarter 2, 2007		*			*	*	*	*			*	*	*	*			*		*	*	*	
Quarter 3, 2007					*	*	*	*				*	*	*			*		*	*	*	
Quarter 4, 2007					*	*	*	*				*	*	*			*		*	*	*	
Quarter 1, 2008					*	*	*	*			*	*	*	*			*		*	*	*	
Quarter 2, 2008					*	*	*	*	*		*	*	*	*			*	*	*	*	*	
Quarter 3, 2008					*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	
Quarter 4, 2008					*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	
Quarter 1, 2009					*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	
Quarter 2, 2009					*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	
Quarter 3, 2009	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2009	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2010	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2010					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2010	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2010	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2011					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2011	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2011	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2011	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2012	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2012	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2012	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2013	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2013	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2013	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2013	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2014	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2014	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2014	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2014	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2015	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2015	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2015	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2015	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	



# **Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
	D	S	S	S	D	D	D	U	U		D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
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	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 4, 2020	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 1, 2021	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 2, 2021	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 3, 2021	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 4, 2021	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 1, 2022	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 2, 2022	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 3, 2022	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 4, 2022	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 1, 2023	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 2, 2023	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 3, 2023	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 4, 2023	*	*			*		*	*	*		*		*	*	*	*	*	*	*	*	*	*
<b>PCB, TOTAL</b>																						
Quarter 4, 2003													*					*				
Quarter 3, 2004													*									
Quarter 3, 2005							*															
Quarter 2, 2006							*															
Quarter 3, 2006							*															
Quarter 1, 2007							*															
Quarter 2, 2007							*															
Quarter 3, 2007							*															
Quarter 1, 2008							*															
Quarter 2, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 1, 2010							*															
Quarter 2, 2010							*															
Quarter 4, 2010							*															
<b>PCB-1016</b>																						
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							*															
<b>PCB-1242</b>																						
Quarter 3, 2006							*						*									
Quarter 4, 2006							*					*										
Quarter 1, 2008							*															
Quarter 2, 2012							*															
<b>PCB-1248</b>																						
Quarter 2, 2008							*															
<b>PCB-1260</b>																						
Quarter 2, 2006							*															
<b>pH</b>																						
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																	*					

# **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	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
<b>pH</b>																						
Quarter 3, 2018					*						*	*						*	*	*		
Quarter 4, 2018																	*	*	*			
Quarter 3, 2019																	*	*	*			
Quarter 1, 2021																	*	*	*		*	
Quarter 3, 2021																	*	*	*		*	
Quarter 4, 2021																	*	*	*		*	
<b>POTASSIUM</b>																						
Quarter 1, 2014																	*					
<b>RADIUM-228</b>																						
Quarter 2, 2005																						
Quarter 4, 2005						■							■						■			
<b>SELENIUM</b>																						
Quarter 4, 2003									■													
<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	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
SULFATE																						
Quarter 2, 2015	*	*			*		*								*							
Quarter 3, 2015	*	*			*	*	*	*							*							
Quarter 4, 2015	*	*			*	*	*	*														
Quarter 1, 2016	*	*			*	*	*	*														
Quarter 2, 2016	*	*			*	*	*	*														
Quarter 3, 2016	*	*			*	*	*	*														
Quarter 4, 2016	*	*			*	*	*	*														
Quarter 1, 2017	*	*			*	*	*	*														
Quarter 2, 2017	*	*			*	*	*	*														
Quarter 3, 2017	*	*			*	*	*	*														
Quarter 4, 2017	*	*			*	*	*	*														
Quarter 1, 2018	*	*			*	*	*	*														
Quarter 2, 2018	*	*			*	*	*	*														
Quarter 3, 2018	*	*			*	*	*	*														
Quarter 4, 2018	*	*			*	*	*	*														
Quarter 1, 2019	*	*			*	*	*	*														
Quarter 2, 2019	*	*			*	*	*	*														
Quarter 3, 2019	*	*			*	*	*	*														
Quarter 4, 2019	*	*			*	*	*	*														
Quarter 1, 2020	*	*			*	*	*	*														
Quarter 2, 2020	*	*			*	*	*	*														
Quarter 3, 2020	*	*			*	*	*	*														
Quarter 4, 2020	*	*			*	*	*	*														
Quarter 1, 2021	*	*			*	*	*	*							*							
Quarter 2, 2021	*	*			*	*	*	*							*							
Quarter 3, 2021	*	*			*	*	*	*							*							
Quarter 4, 2021	*	*			*	*	*	*							*							
Quarter 1, 2022	*	*			*	*	*	*							*							
Quarter 2, 2022	*	*			*	*	*	*	*						*							
Quarter 3, 2022	*	*			*	*	*	*	*						*							
Quarter 4, 2022	*	*			*	*	*	*	*						*							
Quarter 1, 2023	*	*			*	*	*	*	*						*							
Quarter 2, 2023	*	*			*	*	*	*	*						*							
Quarter 3, 2023	*	*			*	*	*	*	*						*							
Quarter 4, 2023	*	*			*	*	*	*	*						*							
TECHNETIUM-99																						
Quarter 4, 2002																*	*	*	*			
Quarter 2, 2003							*					*			*	*	*	*			*	
Quarter 3, 2003															*	*	*	*				
Quarter 4, 2003															*	*	*	*			*	
Quarter 1, 2004															*	*	*	*			*	
Quarter 2, 2004															*	*	*	*			*	
Quarter 3, 2004															*	*	*	*			*	
Quarter 4, 2004															*	*	*	*			*	
Quarter 3, 2005															*	*	*	*			*	
Quarter 1, 2006															*	*	*	*			*	
Quarter 2, 2006		*							*						*	*	*	*			*	
Quarter 3, 2006															*	*	*	*			*	
Quarter 4, 2006															*	*	*	*			*	
Quarter 1, 2007															*	*	*	*			*	
Quarter 2, 2007												*			*	*	*	*			*	
Quarter 3, 2007												*			*	*	*	*			*	
Quarter 4, 2007									*			*			*	*	*	*			*	
Quarter 1, 2008												*			*	*	*	*			*	
Quarter 2, 2008							*	*				*			*	*	*	*			*	
Quarter 3, 2008												*			*	*	*	*			*	
Quarter 4, 2008											*				*	*	*	*			*	
Quarter 1, 2009									*			*			*	*	*	*			*	
Quarter 2, 2009								*	*			*			*	*	*	*			*	
Quarter 3, 2009							*	*	*			*			*	*	*	*			*	
Quarter 4, 2009									*			*			*	*	*	*			*	
Quarter 2, 2010									*			*			*	*	*	*			*	
Quarter 3, 2010									*			*			*	*	*	*			*	
Quarter 4, 2010									*			*			*	*	*	*			*	
Quarter 1, 2011		*							*			*			*	*	*	*			*	
Quarter 2, 2011												*			*	*	*	*			*	
Quarter 1, 2012								*				*			*	*	*	*			*	
Quarter 2, 2012							*					*			*	*	*	*			*	
Quarter 3, 2012												*			*	*	*	*			*	
Quarter 4, 2012												*			*	*	*	*			*	
Quarter 1, 2013												*			*	*	*	*			*	
Quarter 2, 2013												*			*	*	*	*			*	
Quarter 3, 2013									*			*			*	*	*	*			*	
Quarter 4, 2013												*			*	*	*	*			*	
Quarter 1, 2014												*			*	*	*	*			*	
Quarter 2, 2014												*			*	*	*	*			*	
Quarter 3, 2014												*			*	*	*	*			*	
Quarter 4, 2014												*			*	*	*	*			*	
Quarter 1, 2015												*			*	*	*	*			*	
Quarter 2, 2015												*			*	*	*	*			*	
Quarter 3, 2015												*			*	*	*	*			*	
Quarter 4, 2015												*			*	*	*	*			*	
Quarter 1, 2016												*			*	*	*	*			*	
Quarter 2, 2016												*			*	*	*	*			*	
Quarter 3, 2016												*			*	*	*	*			*	
Quarter 4, 2016									*			*			*	*	*	*			*	
Quarter 1, 2017												*			*	*	*	*			*	
Quarter 2, 2017												*			*	*	*	*			*	
Quarter 3, 2017												*			*	*	*	*			*	
Quarter 4, 2017												*			*	*	*	*			*	
Quarter 1, 2018												*			*	*	*	*			*	

**Chart of MCL and Historical UTL Exceedances  
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U	
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
TECHNETIUM-99																						
Quarter 2, 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																*	*	*	*	*		
Quarter 4, 2020																*	*	*	*	*		
Quarter 1, 2021																	*	*	*	*		
Quarter 2, 2021										*						*	*	*	*	*		
Quarter 3, 2021														*	*		*	*	*	*		
Quarter 4, 2021																	*	*	*	*		
Quarter 1, 2022										*						*	*	*	*	*		
Quarter 2, 2022										*						*	*	*	*	*		
Quarter 3, 2022										*						*	*	*	*	*		
Quarter 4, 2022										*						*	*	*	*	*		
Quarter 1, 2023										*						*	*	*	*	*		
Quarter 2, 2023										*						*	*	*	*	*		
Quarter 3, 2023																	*	*	*	*		
Quarter 4, 2023														*			*	*	*	*		
THORIUM-230																						
Quarter 4, 2015																*						
Quarter 2, 2016										*												
Quarter 4, 2016	*										*					*			*			
Quarter 4, 2017												*										
Quarter 2, 2018										*			*									
Quarter 2, 2021									*				*									
TOLUENE																						
Quarter 2, 2014										*				*								
TOTAL ORGANIC CARBON																						
Quarter 3, 2002										*	*	*		*							*	
Quarter 4, 2002										*	*	*		*								
Quarter 1, 2003										*	*	*		*								
Quarter 3, 2003	*									*	*	*		*		*						
Quarter 4, 2003										*	*	*		*								
Quarter 1, 2004										*	*	*		*								
Quarter 3, 2005						*				*	*	*		*	*			*	*	*		
Quarter 4, 2005						*				*	*	*		*	*			*	*	*		
Quarter 1, 2006																		*	*	*		
TOTAL ORGANIC HALIDES																						
Quarter 4, 2002										*												
Quarter 1, 2003										*												
Quarter 2, 2003										*												
Quarter 1, 2004																*						
TRICHLOROETHENE																						
Quarter 3, 2002														■						■		
Quarter 4, 2002															■					■		
Quarter 1, 2003																				■	■	
Quarter 2, 2003																■				■	■	
Quarter 3, 2003							■													■	■	
Quarter 4, 2003																■				■	■	
Quarter 1, 2004																■				■	■	
Quarter 2, 2004																■				■	■	
Quarter 3, 2004																■				■	■	
Quarter 4, 2004																■				■	■	
Quarter 1, 2005																■				■	■	
Quarter 2, 2005																■				■	■	
Quarter 3, 2005																■				■	■	
Quarter 4, 2005																■				■	■	
Quarter 1, 2006																■				■	■	
Quarter 2, 2006																■				■	■	
Quarter 3, 2006																■				■	■	
Quarter 4, 2006																■				■	■	
Quarter 1, 2007																■				■	■	
Quarter 2, 2007																■				■	■	
Quarter 3, 2007																■				■	■	
Quarter 4, 2007																■				■	■	
Quarter 1, 2008																■				■	■	
Quarter 2, 2008																■				■	■	
Quarter 3, 2008																■			■	■	■	
Quarter 4, 2008																■				■	■	
Quarter 1, 2009																■				■	■	
Quarter 2, 2009																■				■	■	
Quarter 3, 2009																■				■	■	
Quarter 4, 2009						■	■				■		■	■			■				■	
Quarter 1, 2010												■		■							■	
Quarter 2, 2010												■		■							■	
Quarter 3, 2010												■		■							■	
Quarter 4, 2010												■		■							■	
Quarter 2, 2011															■					■	■	
Quarter 3, 2011													■		■				■	■	■	
Quarter 4, 2011													■		■					■	■	
Quarter 1, 2012													■		■			■	■	■	■	
Quarter 2, 2012															■					■	■	

# **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, 2012															■						■	
Quarter 4, 2012														■	■						■	
Quarter 1, 2013													■		■						■	
Quarter 2, 2013													■		■				■		■	
Quarter 3, 2013																						
Quarter 3, 2013													■		■						■	
Quarter 4, 2013													■	■	■				■		■	
Quarter 1, 2014													■		■						■	
Quarter 2, 2014																	■				■	
Quarter 3, 2014													■		■				■		■	
Quarter 4, 2014													■	■	■				■		■	
Quarter 1, 2015													■		■				■		■	
Quarter 2, 2015					■										■				■		■	
Quarter 3, 2015													■		■						■	
Quarter 4, 2015													■		■						■	
Quarter 1, 2016													■		■				■		■	
Quarter 2, 2016												■			■				■		■	
Quarter 3, 2016													■		■				■		■	
Quarter 4, 2016													■		■				■		■	
Quarter 1, 2017													■		■				■		■	
Quarter 2, 2017															■				■		■	
Quarter 3, 2017															■				■		■	
Quarter 4, 2017										■			■	■					■		■	
Quarter 1, 2018															■				■		■	
Quarter 2, 2018													■		■				■		■	
Quarter 3, 2018										■					■				■		■	
Quarter 4, 2018										■			■		■				■		■	
Quarter 1, 2019										■					■				■		■	
Quarter 2, 2019										■					■				■		■	
Quarter 3, 2019																			■			
Quarter 4, 2019																			■			
Quarter 1, 2020																						
Quarter 2, 2020															■							
Quarter 3, 2020																						
Quarter 4, 2020																						
Quarter 1, 2021																						
Quarter 2, 2021																						
Quarter 3, 2021																						
Quarter 4, 2021																						
Quarter 1, 2022																						
Quarter 2, 2022																						
Quarter 3, 2022																						
Quarter 1, 2023													■	■	■						■	
Quarter 2, 2023															■							
Quarter 3, 2023											■		■		■					■		
TURBIDITY																						
Quarter 1, 2003											*											
URANIUM																						
Quarter 4, 2002		*			*	*	*			*	*	*	*	*	*	*		*	*	*	*	
Quarter 4, 2006																					*	
ZINC																						
Quarter 3, 2005																			*			
* Statistical test results indicate an elevated concentration (i.e., a statistical exceedance).																						
■ MCL Exceedance																						
■ Previously reported as an MCL exceedance; however, result was equal to MCL																						
UCRS Upper Continental Recharge System																						
URGA Upper Regional Gravel Aquifer																						
LRGA Lower Regional Gravel Aquifer																						

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**APPENDIX H**  
**METHANE MONITORING DATA**

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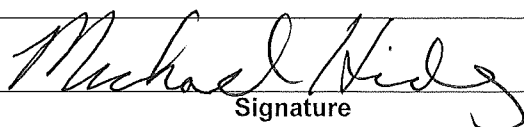


# CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

Date:	November 7, 2023	Time:	1300	Monitor:	Michael Hideg
Weather Conditions: Mostly sunny, Approximately 78°, humidity: 56%					
Monitoring Equipment: Multi RAE – Serial # 4495					
Monitoring Location					Reading (% LEL)
C-746-U1	Checked at close to ground level				0
C-746-U2	Checked at close to ground level				0
C-746-U-T-14	Checked at close to ground level				0
C-746-U15	Checked at close to ground level				0
MG1	Checked inside casing				0
MG2	Checked inside casing				0
MG3	Checked inside casing				0
MG4	Checked inside casing				0
Suspect or Problem Areas	No problems noted				None
Remarks: N/A					
Performed by: 					
					11/13/23 Date

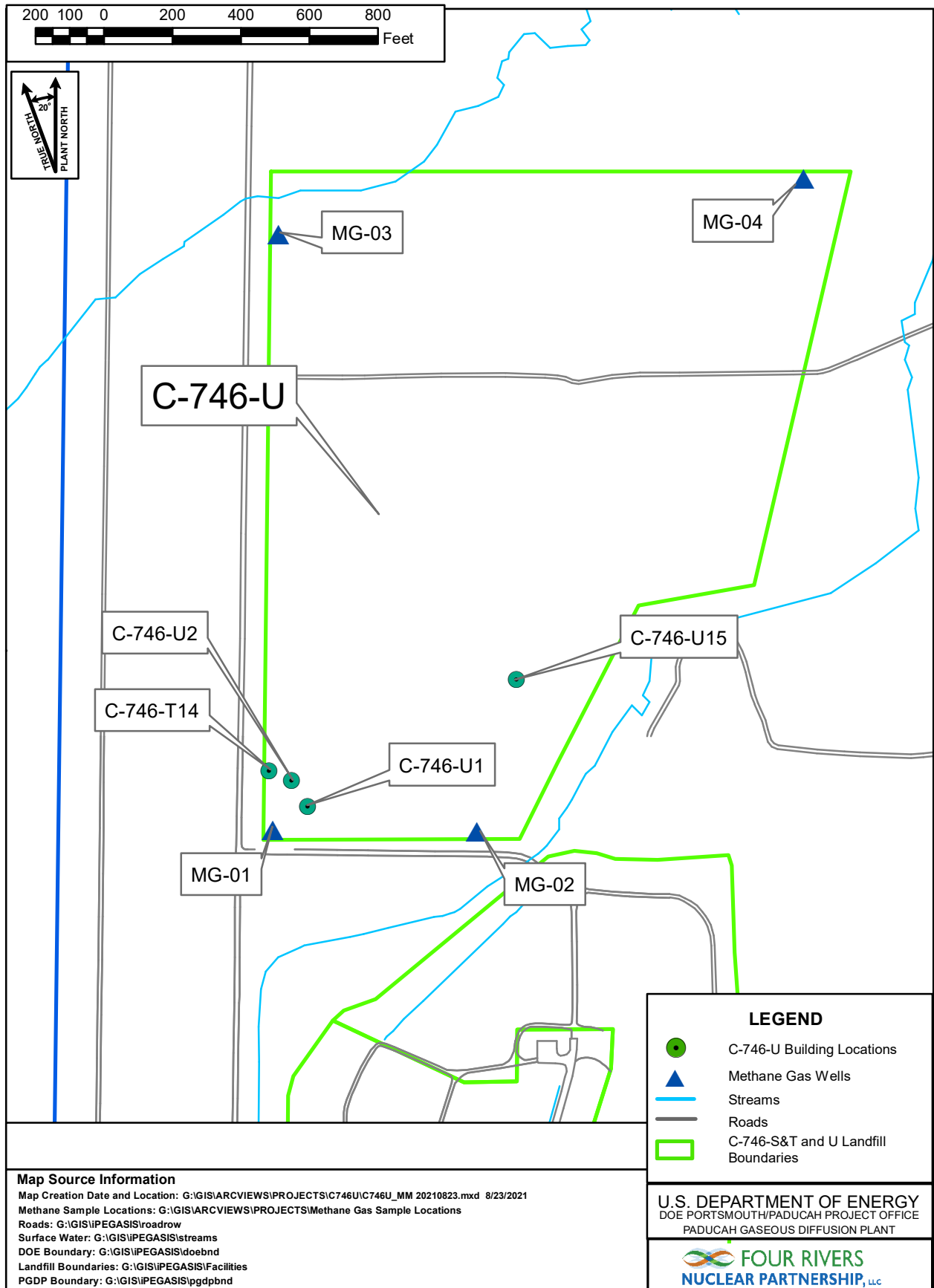


Figure H.1. C-746-U Landfill Methane Monitoring Locations

## **APPENDIX I**

### **SURFACE WATER ANALYSES AND LABORATORY REPORTS**

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**Paducah OREIS**  
**SURFACE WATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** L150 **INSTREAM** **Period:** 4th Quarter 2023

**SAMPLE ID:** L150DUS1-24 **Sample Type:** FR

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	20.5	mg/L	1	10/29/2023			EPA-300.0	X
Sulfate	W	50.3	mg/L	2	10/29/2023			EPA-300.0	X
Iron		0.236	mg/L	0.1	10/29/2023			EPA-200.8	X
Sodium		12.7	mg/L	0.25	10/29/2023			EPA-200.8	X
Uranium		0.000858	mg/L	0.0002	10/29/2023			EPA-200.8	X
Alpha activity	U	4	pCi/L	8.74	10/29/2023	5.16	5.2	SW846-9310	X
Beta activity	U	6.68	pCi/L	6.86	10/29/2023	4.73	4.86	SW846-9310	X
Dissolved Solids		198	mg/L	10	10/29/2023			EPA-160.1	X
Suspended Solids		17	mg/L	2.5	10/29/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		20.5	mg/L	20	10/29/2023			EPA-410.4	X
Total Solids		217	mg/L	10	10/29/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		8.29	mg/L	1	10/29/2023			SW846-9060A	X

**Paducah OREIS**  
**SURFACE WATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** L150 **INSTREAM** **Period:** 4th Quarter 2023

**SAMPLE ID:** L150US1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	20.2	mg/L	1	10/29/2023			EPA-300.0	X
Sulfate	W	49.4	mg/L	2	10/29/2023			EPA-300.0	X
Conductivity		276	µmhos/cm		10/29/2023				X
pH		7.8	Std Unit		10/29/2023				X
Iron		0.313	mg/L	0.1	10/29/2023			EPA-200.8	X
Sodium		12.1	mg/L	0.25	10/29/2023			EPA-200.8	X
Uranium		0.000904	mg/L	0.0002	10/29/2023			EPA-200.8	X
Alpha activity	U	4.57	pCi/L	7.44	10/29/2023	4.85	4.92	SW846-9310	X
Beta activity	U	6.2	pCi/L	13.7	10/29/2023	8.11	8.18	SW846-9310	X
Dissolved Solids		196	mg/L	10	10/29/2023			EPA-160.1	X
Suspended Solids		15	mg/L	2.5	10/29/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		25	mg/L	20	10/29/2023			EPA-410.4	X
Total Solids		231	mg/L	10	10/29/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		8.04	mg/L	1	10/29/2023			SW846-9060A	X

**Paducah OREIS**  
**SURFACE WATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** L154 **INSTREAM** **Period:** 4th Quarter 2023

**SAMPLE ID:** L154US1-24 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	5.77	mg/L	0.2	10/29/2023			EPA-300.0	X
Sulfate	W	5.5	mg/L	0.4	10/29/2023			EPA-300.0	X
Conductivity		261	µmhos/cm		10/29/2023				X
pH		6.94	Std Unit		10/29/2023				X
Iron		0.676	mg/L	0.1	10/29/2023			EPA-200.8	X
Sodium		2.3	mg/L	0.25	10/29/2023			EPA-200.8	X
Uranium		0.00101	mg/L	0.0002	10/29/2023			EPA-200.8	X
Alpha activity	U	-0.465	pCi/L	8.19	10/29/2023	3.28	3.28	SW846-9310	X
Beta activity		26.3	pCi/L	10.2	10/29/2023	8.22	9.32	SW846-9310	X
Dissolved Solids		159	mg/L	10	10/29/2023			EPA-160.1	X
Suspended Solids		10	mg/L	6.25	10/29/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		139	mg/L	20	10/29/2023			EPA-410.4	X
Total Solids		171	mg/L	10	10/29/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		44.3	mg/L	10	10/29/2023			SW846-9060A	X

**Paducah OREIS**  
**SURFACE WATER MONITORING REPORT**

**Facility:** C-746-U Landfill      **County:** McCracken      **Permit #:** SW07300014,SW07300015,SW07300045  
**Sampling Point:** L351      DOWNSTREAM      **Period:** 4th Quarter 2023  
**SAMPLE ID:** L351US1-24      Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	30.3	mg/L	2	10/29/2023			EPA-300.0	X
Sulfate	W	102	mg/L	4	10/29/2023			EPA-300.0	X
Conductivity		259	µmhos/cm		10/29/2023				X
pH		7.62	Std Unit		10/29/2023				X
Iron		1.03	mg/L	0.1	10/29/2023			EPA-200.8	X
Sodium		65	mg/L	1.25	10/29/2023			EPA-200.8	X
Uranium		0.0646	mg/L	0.0002	10/29/2023			EPA-200.8	X
Alpha activity		29.9	pCi/L	9.88	10/29/2023	11	12.1	SW846-9310	X
Beta activity		44.9	pCi/L	9.13	10/29/2023	9.47	12.1	SW846-9310	X
Dissolved Solids		469	mg/L	10	10/29/2023			EPA-160.1	X
Suspended Solids		34.5	mg/L	12.5	10/29/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		150	mg/L	20	10/29/2023			EPA-410.4	X
Total Solids		497	mg/L	10	10/29/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		38.1	mg/L	10	10/29/2023			SW846-9060A	X



**Paducah OREIS**  
**SURFACE WATER MONITORING REPORT**

**Facility:** C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

**Sampling Point:** QC **Period:** 4th Quarter 2023

**SAMPLE ID:** FB1US1-24 **Sample Typ** FB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	JW	0.155	mg/L	0.2	10/29/2023			EPA-300.0	X
Sulfate	UW	0.4	mg/L	0.4	10/29/2023			EPA-300.0	X
Iron	U	0.1	mg/L	0.1	10/29/2023			EPA-200.8	X
Sodium	U	0.25	mg/L	0.25	10/29/2023			EPA-200.8	X
Uranium	U	0.0002	mg/L	0.0002	10/29/2023			EPA-200.8	X
Alpha activity	U	4.52	pCi/L	9.39	10/29/2023	5.58	5.63	SW846-9310	X
Beta activity	U	-1.58	pCi/L	11.8	10/29/2023	6.2	6.2	SW846-9310	X

Qualifier Code Definitions	
B	Analyte found in the associated blank
H	Analysis performed outside holding time requirement
J	Estimated value
L	LCS or LCSD recovery outside of control limits
L1	LCS/LCSD RPD outside acceptance criteria
N	Sample spike (MS/MSD) recovery not within control limits
N1	MS/MSD RPD outside acceptance criteria
P	Difference between results from two GC columns outside control limits
S	Sample surrogate recovery outside acceptance criteria
T	Tracer recovery outside control limits of 30-110%
U	Analyte analyzed for but not detected at or below the lowest concentration reported.
W	Post-digestion spike recovery out of control limits
W1	Post-digestion spike and post-digestion spike duplicate RPD out of control limits
X	Other specific flags and footnotes may be required to properly define the results.
Y1	MS/MSD recovery outside acceptance criteria
Y2	MS/MSD RPD outside acceptance criteria

RGA Type Code Definitions	
LRGA	Lower Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
NA	

Sample Type Code Definitions	
REG	Regular
FR	Field Replicate (code used for Field Duplicate)
RI	Equipment Rinsate Blank
FB	Field Blank
TB	Trip Blank

Validation Code Definitions	
=	Validated result, no additional qualifier necessary
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	Analyte not detected above the reported detection limit, and the reported detection limit is approximated due to quality deficiency.
X	Not validated

**ATTACHMENT II**

**GEL LABORATORIES CERTIFICATE OF ANALYSIS**

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# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L150DUS1-24  
Sample ID: 643256001  
Matrix: WS  
Collect Date: 29-OCT-23  
Receive Date: 31-OCT-23  
Collector: Client

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, liquid "As Received"</i>														
Alpha	U	4.00	+/-5.16	8.74	+/-5.20	15.0	pCi/L			KP1	11/15/23	1209	2520317	1
Beta	U	6.68	+/-4.73	6.86	+/-4.86	50.0	pCi/L							

### The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
---------------------------	------	----------	-----------	-------------------

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L150US1-24

Project: FRNP00514

Sample ID: 643256002

Client ID: FRNP005

Matrix: WS

Collect Date: 29-OCT-23

Receive Date: 31-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, liquid "As Received"</i>														
Alpha	U	4.57	+/-4.85	7.44	+/-4.92	15.0	pCi/L			KP1	11/15/23	1209	2520317	1
Beta	U	6.20	+/-8.11	13.7	+/-8.18	50.0	pCi/L							

### The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
---------------------------	------	----------	-----------	-------------------

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L154US1-24

Project: FRNP00514

Sample ID: 643256003

Client ID: FRNP005

Matrix: WS

Collect Date: 29-OCT-23

Receive Date: 31-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, liquid "As Received"</i>														
Alpha	U	-0.465	+/-3.28	8.19	+/-3.28	15.0	pCi/L			KP1	11/15/23	1209	2520317	1
Beta		26.3	+/-8.22	10.2	+/-9.32	50.0	pCi/L							

### The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
---------------------------	------	----------	-----------	-------------------

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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DF: Dilution Factor

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MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L351US1-24

Project: FRNP00514

Sample ID: 643256004

Client ID: FRNP005

Matrix: WS

Collect Date: 29-OCT-23

Receive Date: 31-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, liquid "As Received"</i>														
Alpha		29.9	+/-11.0	9.88	+/-12.1	15.0	pCi/L			KP1	11/15/23	1209	2520317	1
Beta		44.9	+/-9.47	9.13	+/-12.1	50.0	pCi/L							

### The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
---------------------------	------	----------	-----------	-------------------

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

Mtd.: Method

DL: Detection Limit

PF: Prep Factor

Lc/LC: Critical Level

RL: Reporting Limit

MDA: Minimum Detectable Activity

TPU: Total Propagated Uncertainty

MDC: Minimum Detectable Concentration



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Four Rivers Nuclear Partnership,  
Address : LLC  
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: January 31, 2024

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: FB1US1-24

Project: FRNP00514

Sample ID: 643256005

Client ID: FRNP005

Matrix: WATER

Collect Date: 29-OCT-23

Receive Date: 31-OCT-23

Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, liquid "As Received"</i>														
Alpha	U	4.52	+/-5.58	9.39	+/-5.63	15.0	pCi/L			KP1	11/21/23	0956	2520317	1
Beta	U	-1.58	+/-6.20	11.8	+/-6.20	50.0	pCi/L							

### The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
---------------------------	------	----------	-----------	-------------------

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

*Column headers are defined as follows:*

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID:	L150DUS1-24	Project:	FRNP00514
Sample ID:	643256001	Client ID:	FRNP005
Matrix:	WS		
Collect Date:	29-OCT-23 11:55		
Receive Date:	31-OCT-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		8.29	0.330	1.00	mg/L		1	RM3	11/04/23	0825	2517921	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	20.5	0.335	1.00	mg/L		5	HXC1	11/01/23	2314	2517328	2
Sulfate	W	50.3	0.665	2.00	mg/L		5					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		0.236	0.0330	0.100	mg/L	1.00	1	RM4	11/16/23	2239	2517370	3
Sodium		12.7	0.0800	0.250	mg/L	1.00	1					
Uranium		0.000858	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		198	2.38	10.0	mg/L			CH6	11/01/23	1313	2517443	4
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		17.0	0.570	2.50	mg/L			CH6	11/03/23	1015	2518322	5
SM 2540 B Solids, Total "As Received"												
Total Solids		217	6.29	10.0	mg/L			CH6	11/02/23	0844	2518320	6
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		20.5	8.95	20.0	mg/L		1	JW2	10/31/23	1630	2517168	7

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JD2	11/14/23	0740	2517369

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## *Certificate of Analysis*

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L150DUS1-24  
Sample ID: 643256001

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description										Analyst Comments	
1	SW846 9060A											
2	EPA 300.0											
3	EPA 200.8											
4	EPA 160.1											
5	EPA 160.2											
6	SM 2540B											
7	EPA 410.4											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L150US1-24 Project: FRNP00514  
Sample ID: 643256002 Client ID: FRNP005  
Matrix: WS  
Collect Date: 29-OCT-23 11:55  
Receive Date: 31-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		8.04	0.330	1.00	mg/L		1	RM3	11/11/23	0158	2523955	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	20.2	0.335	1.00	mg/L		5	HXC1	11/01/23	2344	2517328	2
Sulfate	W	49.4	0.665	2.00	mg/L		5					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		0.313	0.0330	0.100	mg/L	1.00	1	RM4	11/16/23	2242	2517370	3
Sodium		12.1	0.0800	0.250	mg/L	1.00	1					
Uranium		0.000904	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		196	2.38	10.0	mg/L			CH6	11/01/23	1313	2517443	4
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		15.0	0.570	2.50	mg/L			CH6	11/03/23	1015	2518322	5
SM 2540 B Solids, Total "As Received"												
Total Solids		231	6.29	10.0	mg/L			CH6	11/02/23	0844	2518320	6
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		25.0	8.95	20.0	mg/L		1	JW2	10/31/23	1630	2517168	7

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JD2	11/14/23	0740	2517369

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L150US1-24  
Sample ID: 643256002

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description										Analyst Comments	
1	SW846 9060A											
2	EPA 300.0											
3	EPA 200.8											
4	EPA 160.1											
5	EPA 160.2											
6	SM 2540B											
7	EPA 410.4											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L154US1-24 Project: FRNP00514  
Sample ID: 643256003 Client ID: FRNP005  
Matrix: WS  
Collect Date: 29-OCT-23 12:10  
Receive Date: 31-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		44.3	3.30	10.0	mg/L		10	RM3	11/13/23	1707	2523955	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	5.77	0.0670	0.200	mg/L		1	HXC1	11/01/23	0110	2517328	2
Sulfate	W	5.50	0.133	0.400	mg/L		1					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		0.676	0.0330	0.100	mg/L	1.00	1	RM4	11/16/23	2246	2517370	3
Sodium		2.30	0.0800	0.250	mg/L	1.00	1					
Uranium		0.00101	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		159	2.38	10.0	mg/L			CH6	11/01/23	1313	2517443	4
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		10.0	1.43	6.25	mg/L			CH6	11/03/23	1015	2518322	5
SM 2540 B Solids, Total "As Received"												
Total Solids		171	6.29	10.0	mg/L			CH6	11/02/23	0844	2518320	6
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		139	8.95	20.0	mg/L		1	JW2	10/31/23	1632	2517168	7

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JD2	11/14/23	0740	2517369

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L154US1-24  
Sample ID: 643256003

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description		Analyst Comments									
1	SW846 9060A											
2	EPA 300.0											
3	EPA 200.8											
4	EPA 160.1											
5	EPA 160.2											
6	SM 2540B											
7	EPA 410.4											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L351US1-24 Project: FRNP00514  
Sample ID: 643256004 Client ID: FRNP005  
Matrix: WS  
Collect Date: 29-OCT-23 11:43  
Receive Date: 31-OCT-23  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		38.1	3.30	10.0	mg/L		10	RM3	11/13/23	1746	2523955	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	30.3	0.670	2.00	mg/L		10	HXC1	11/02/23	0015	2517328	2
Sulfate	W	102	1.33	4.00	mg/L		10					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Sodium		65.0	0.400	1.25	mg/L	1.00	5	RM4	11/17/23	1320	2517370	3
Iron		1.03	0.0330	0.100	mg/L	1.00	1	RM4	11/16/23	2250	2517370	4
Uranium		0.0646	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		469	2.38	10.0	mg/L			CH6	11/01/23	1313	2517443	5
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		34.5	2.85	12.5	mg/L			CH6	11/03/23	1015	2518322	6
SM 2540 B Solids, Total "As Received"												
Total Solids		497	6.29	10.0	mg/L			CH6	11/02/23	0844	2518320	7
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		150	8.95	20.0	mg/L		1	JW2	10/31/23	1632	2517168	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JD2	11/14/23	0740	2517369



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: L351US1-24  
Sample ID: 643256004

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description										Analyst Comments	
1	SW846 9060A											
2	EPA 300.0											
3	EPA 200.8											
4	EPA 200.8											
5	EPA 160.1											
6	EPA 160.2											
7	SM 2540B											
8	EPA 410.4											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 31, 2024

Company : Four Rivers Nuclear Partnership, LLC  
Address : 5600 Hobbs Road

Contact: Kevil, Kentucky 42053  
Project: Ms. Jaime Morrow  
C-746-U Landfill Surface Water Quarterly(US24-01)

Client Sample ID: FB1US1-24  
Sample ID: 643256005  
Matrix: WATER  
Collect Date: 29-OCT-23 12:00  
Receive Date: 31-OCT-23  
Collector: Client

Project: FRNP00514  
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	JW	0.155	0.0670	0.200	mg/L		1	HXC1	11/01/23	0313	2517328	1
Sulfate	UW	0.400	0.133	0.400	mg/L		1					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1	RM4	11/16/23	2254	2517370	2
Sodium	U	0.250	0.0800	0.250	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JD2	11/14/23	0740	2517369

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 200.8	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

## **APPENDIX J**

### **ANALYTICAL LABORATORY CERTIFICATION**

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# Accredited Laboratory

A2LA has accredited

**GEL LABORATORIES, LLC**

*Charleston, SC*

for technical competence in the field of

**Environmental Testing**

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 and 2016 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 5.4 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 26<sup>th</sup> day of June 2023.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2567.01  
Valid to June 30, 2025

*For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.*

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**APPENDIX K**

**LABORATORY ANALYTICAL METHODS**

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# LABORATORY ANALYTICAL METHODS

Analytical Method	Preparation Method	Product
SM 2540B		Solids, Total
SW846 8260D		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 8082A	SW846 3535A	Analysis of Polychlorinated Biphenyls by GC/ECD by ECD
SW846 6020B	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 9056A		Ion Chromatography
EPA 160.1		Solids, Total Dissolved
EPA 160.2		Solids, Total Suspended
EPA 200.8	EPA 200.2	Determination of Metals by ICP-MS
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 Modified		904.0Mod, Ra228, Liquid
SW846 9310		9310, Alpha/Beta Activity, liquid
EPA 905.0 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
SW846 9020B		Total Organic Halogens (TOX)

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## **APPENDIX L**

### **MICRO-PURGING STABILITY PARAMETERS**

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**Micro-Purge Stability Parameters  
for the C-746-U Contained Landfill**

	Temperature (°F)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)		Temperature (°F)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
<b>MW357</b>						<b>MW358</b>					
Date Collected:10/9/23						Date Collected:10/9/23					
1153	63.3	410	6.16	5.00	3.64	1243	62.7	498	6.46	1.16	3.46
1156	64.0	405	6.14	4.58	3.50	1246	62.6	500	6.40	0.77	3.26
1159	64.5	404	6.13	4.50	3.41	1249	62.8	499	6.37	0.74	3.08
<b>MW360</b>						<b>MW361</b>					
Date Collected:10/9/23						Date Collected: 10/9/23					
0724	57.3	384	6.10	2.10	4.86	0812	57.9	504	6.07	4.20	3.40
0727	57.5	384	6.16	1.77	4.23	0815	57.7	506	6.05	3.99	3.90
0730	57.4	385	6.20	1.71	4.17	0818	57.8	504	6.03	4.04	3.23
<b>MW362</b>						<b>MW363</b>					
Date Collected:10/9/23						Date Collected: 10/9/23					
0914	59.2	612	7.03	3.96	6.44	1332	62.5	366	6.30	1.96	3.94
0917	59.0	614	7.01	3.16	6.53	1335	63.0	364	6.20	0.79	3.61
0920	59.1	614	7.02	3.07	6.30	1338	63.3	360	6.21	0.77	3.44
<b>MW364</b>						<b>MW365</b>					
Date Collected:10/10/23						Date Collected:10/10/23					
0736	58.0	487	6.11	3.91	2.34	0835	59.5	370	6.40	7.01	3.00
0739	58.2	488	6.00	3.66	2.20	0838	60.4	372	6.35	6.59	3.11
0742	58.3	487	6.01	3.58	2.31	0841	60.8	372	6.31	6.54	2.94
<b>MW366</b>						<b>MW367</b>					
Date Collected: 10/10/23						Date Collected:10/10/23					
0922	60.8	491	6.18	4.11	2.43	1247	61.0	230	5.94	1.23	15.96
0925	60.9	488	6.12	3.82	2.33	1250	61.7	229	5.90	0.83	13.99
0928	60.8	489	6.10	3.80	2.16	1253	62.2	230	5.87	0.78	13.07
<b>MW369</b>						<b>MW370</b>					
Date Collected:10/11/23						Date Collected:10/11/23					
0734	58.7	339	6.17	6.56	7.01	0821	59.7	449	6.07	5.98	4.79
0737	58.8	341	6.04	3.53	6.98	0824	59.6	449	6.12	4.62	4.70
0740	58.7	345	6.02	3.49	6.84	0827	59.7	450	6.10	4.64	4.66
<b>MW371</b>						<b>MW372</b>					
Date Collected:10/11/23						Date Collected:10/11/23					
0923	60.0	695	6.51	1.96	11.86	1010	60.4	738	6.27	5.84	4.54
0926	60.0	696	6.47	1.30	11.20	1013	60.6	743	6.17	3.29	4.10
0929	59.9	695	6.46	1.33	10.84	1016	60.6	747	6.13	3.24	4.00
<b>MW373</b>						<b>MW374</b>					
Date Collected:10/11/23						Date Collected: 10/11/23					
1228	64.8	895	6.30	2.69	3.76	1312	66.7	887	6.09	1.89	4.44
1231	64.9	897	6.20	2.06	3.61	1315	66.3	883	6.12	1.81	3.98
1234	64.7	898	6.14	2.00	3.68	1318	66.0	882	6.13	1.84	3.61
<b>MW375</b>											
Date Collected:10/10/23											
1155	64.5	333	6.44	3.66	5.09						
1158	64.4	331	6.41	3.17	5.24						
1201	64.6	330	6.39	3.09	5.11						

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