WCI Austin Landfill, LLC.

2023 Coal Combustion Residuals Annual Monitoring Report

SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota 55912
Permit SW-514-001

January 30, 2023

2023 Coal Combustion Residuals Annual Monitoring Report

SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota 55912
Permit SW-514-001

Prepared for:
WCI Austin Landfill, LLC.
251 Starkey Street
St. Paul, MN 55107

Prepared by:
Groundwater & Environmental Services, Inc.
1301 Corporate Center Drive, Suite 190
Eagan, MN 55121
TEL: 800-735-1077
www.gesonline.com

GES Project:
3502297

Date:
January 30, 2024

Nicholas J. Schlagel
Staff Environmental Scientist

Erin M. Letrick, PG
Senior Project Geologist

Bonnie Janowiak, Ph. D.
Principle Chemist

Kevin Michael Lienau, P.E.
Corporate Engineering Manager

Professional Engineer

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

Signature:
Typed or Printed Name: Kevin Michael Lienau
Date: 01/30/2024 License Number: 25086

Table of Contents

Figures

Tables

Appendices

Acronyms

BTV	Background Threshold Value
CCR	Coal Combustion Residuals (CCR)
CFR	Code of Federal Regulations
COC	Chemicals of Concern
Eurofins TA	Eurofins TestAmerica, Inc.
GES	Groundwater & Environmental Services, Inc.
GPS	Groundwater Protection Standards
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
MPCA	Minnesota Pollution Control Agency
NGVD	National Geodetic Vertical Datum
pci/L	picoCuries per liter
QA/QC	Quality Assurance/Quality Control
Report	2023 Coal Combustion Residuals Annual Monitoring Report
SSI	statistically significant increase
US EPA	United States Environmental Protection Agency
USL	Upper Simultaneous Limit

1 Introduction

The *2023 Combustion Coal Residuals Annual Monitoring Report* (Report) was prepared to summarize the results of the 2023 groundwater monitoring events and associated analysis for Appendix III (detection monitoring) and Appendix IV (assessment monitoring), per 40 Code of Federal Regulations (CFR) §§ 257.90 – 257.98, at the SKB Lansing Landfill. The SKB Lansing Landfill operates under Minnesota Pollution Control Agency (MPCA) Site Permit Number SW-514-001. The SKB Lansing Landfill is located at 52563 243rd Street in Austin, Mower County, Minnesota (**Figure 1**).

Two groundwater sampling events were conducted at the SKB Lansing Landfill in the spring and summer of 2023. Groundwater samples were analyzed for parameters included in Appendix III (detection monitoring) and Appendix IV (assessment monitoring). Analytical results from the groundwater monitoring events were compared and evaluated to Background Threshold Values (BTVs) and Groundwater Protection Standards (GPS) established for the SKB Lansing Landfill.

1.1 Scope of Work

The following scope of work was conducted for the 2023 CCR groundwater monitoring events:

- Conduct 2 gauging and sampling events of the site's monitoring wells and piezometers.
- Measure static water elevations for each monitoring well to the nearest 0.01 feet from surveyed reference point.
- Record the volume of water removed from each monitoring well (in gallons) and total well volumes removed before sampling.
- Record field parameter stabilization results from each monitoring well.
- Conduct a statistical evaluation of groundwater sampling analytical data using ProUCL 5.0.00 (Singh, 2013) to determine BTVs for each analyte.
- Select tolerance or prediction interval procedure for future statistical analysis of groundwater monitoring data.
- Prepare a Coal Combustion Residuals (CCR) Annual Monitoring Report summarizing the groundwater sampling and statistical evaluation.

2 Site Background

2.1 Site Location and Description

The site is located within a 115-acre parcel of land in Section 21, Township 103 North, Range 18 West, Lansing Township, Mower County, Minnesota. With reference to roadways, the facility is located west of State Highway 218 along Lansing Township Road T-378 (243rd Street). The facility entrance is off Lansing Township Road T-378 (243rd Street). The facility location is depicted in **Figure 1** and the existing site conditions are presented in **Figure 2**.

Located in the Cedar River watershed, the site has rolling topography ranging in elevation from 1,218 feet above the National Geodetic Vertical Datum of 1929 (NGVD 29) in the southwest corner to 1,314 feet above NGVD 29 in the central portion of the site. Storm water flows either to natural depressions scattered about the site or to storm water retention areas in the south and southwest parts of the property. Storm water ultimately goes to a judicial ditch. The nearest open water body is the Cedar River, located approximately three miles east of the site.

3 Monitoring Network Systems and Sampling Schedule

The CCR sampling groundwater monitoring network at the SKB Lansing Landfill was designed based on the analysis of local and regional hydrologic conditions. Currently, the groundwater monitoring network system consists of 8 monitoring wells (**Figure 2**). Two monitoring wells are used to monitor the shallow till layer. Six monitoring well locations are used to monitor a deeper water-bearing unit beneath the site. Groundwater elevations are also collected from an additional 19 groundwater elevation gauging locations and 7 piezometers. The monitoring wells, groundwater elevation gauging locations, and piezometers used as data collection points have been divided into 2 groups for the purpose of this report:

Gauging and Sampling (8 Monitoring Wells)

- Upgradient Monitoring Points: The upgradient monitoring points consist of monitoring wells located upgradient of the compliance boundary and include MW-1 and MW-1RD.
- Downgradient Monitoring Points: The downgradient monitoring points consist of monitoring wells located downgradient of the compliance boundary and include MW-2R, MW-2RD, MW-3, MW-3R, MW-3RD, and MW-4.

Gauging Only (19 Elevation Gauging Locations and 7 Piezometers)

- Downgradient Elevation Gauging Locations: The downgradient gauging locations consist of monitoring wells located downgradient of the compliance boundary and include MW-5S, MW-5D, MW-6S, MW-7S, MW-7D, MW-8S and MW-8D.
- Piezometer Locations: The piezometer locations consist of shallow monitoring points used exclusively for the collection of groundwater elevations across the site. These locations include PIEZ-1, PIEZ-2, PIEZ-3, PIEZ-4, PIEZ-5, P-10 and P-11.
- Upgradient/Sidegradient Elevation Gauging Locations: Upgradient/sidegradient gauging locations consist of monitoring wells east of the compliance boundary and include wells located at the former Austin or Vonco IV Landfill (MW-1A, MW-2A, MW-3A, MW-4A, MW-101A, MW-102A, MW-103A, MW-104A, MW-105A, MW-106A, MW-107A, and MW-108A).

For the CCR evaluation, a total of 2 groundwater monitoring events were conducted in 2023 on the following dates:

- April 10-11, 2023
- August 3-4, 2023

4 Groundwater Sampling Methodology

During the SKB Lansing Landfill CCR sampling events, static groundwater elevations were measured to the nearest 0.01 feet in each monitoring well with a water interface probe prior to groundwater sample collection. Using a location-dedicated, pneumatic low-flow bladder pump, each well was purged and field stabilization parameters including Temperature, pH, Specific Conductance, Turbidity, Dissolved Oxygen, and Oxidation-Reduction Potential (ORP) were recorded.

Groundwater samples were placed in laboratory-prepared containers and labeled with the following information:

- Unique sample number
- Site name
- Name of sampler
- Time and date

Immediately following collection, samples were placed on ice in a field cooler and shipped with a chain of custody form to a Eurofins Test America, Inc. (Eurofins TA) of Cedar Falls, Iowa.

Groundwater samples obtained during the 2023 sampling events were analyzed for parameters specified in Appendix III (spring and summer) and Appendix IV (spring (full analyte list) and summer (analytes detected in spring event)) per §§ 257.93 – 257.95 and are noted below:

Appendix III

General Chemistry

- Chloride (Method 9056A)
- Fluoride (Method 9056A)
- Sulfate as SO4 (Method 9056A)
- pH (Method 4500 H+ B)
- Total Dissolved Solids (Method 2540C)

Metals

- Boron
- Calcium

Appendix IV

General Chemistry

- Fluoride (Method 300.0)

Metals

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Lead
- Lithium
- Mercury
- Molybdenum
- Radium 226
- Radium 228
- Selenium
- Thallium

The above metals were analyzed by Methods 6020B, and 7470A. Radium was analyzed by Methods 9315 and 9320.

Quality assurance/quality control (QA/QC) samples including duplicate, field, and equipment samples were collected during each sampling event.

5 Groundwater Monitoring Results

5.1 Groundwater Elevation Data

Groundwater elevations recorded during the monitoring events are presented in **Table 1**. Groundwater contours maps were generated for the April 10 and August 3, 2023 gauging events. Based on the shallow well groundwater elevation data, water table contours indicate that the shallow groundwater flows to the southwest (**Figures 3** and **5**). Based on the deeper well groundwater elevation data, potentiometric surface contours indicate a southwest flow direction in the lower aquifer (**Figures 4** and **6**). The groundwater flow directions are consistent with historically recorded flow directions.

5.2 Groundwater Analytical Data

Groundwater analytical results for the CCR monitoring events are presented in **Tables 2** and **3**. QA/QC duplicate samples were collected for precision evaluation, but were not included in the tables. A summary of the stabilization parameter tests performed for each well prior to sampling are provided in **Table 4** and copies of field sampling data sheets are in **Appendix A**. Laboratory analytical reports are included in **Appendix B**.

The calculated BTVs for the SKB Lansing Landfill are provided in **Table 5**. Comparing the 2023 sampling results to the BTVs are summarized below.

Appendix III Analytes - Result Summary of BTV Exceedances

Comparing the 2023 spring and fall sampling groundwater analytical results for Appendix III analytes to the BTVs, indicate no BTVs exceedances.

Appendix IV Analytes - Result Summary of BTV Exceedances

Comparing the 2023 spring and fall sampling groundwater analytical results for Appendix IV analytes to the BTVs, indicate no BTVs exceedances.

6 Statistical Evaluation Data

This groundwater statistical evaluation for landfill monitoring is conducted in accordance with § 257.93(f)(3). Specifically, current concentrations were compared to the interwell upper simultaneous limits (USLs) in order to determine if a potential statistically significant increase (SSI) exists at downgradient wells.

The background dataset was determined for each well using analytical results ranging from spring 2017 to the most recent sampling event in August 2023.

Statistical evaluation of the 2017 - 2023 CCR groundwater monitoring data determined background concentrations and included:

1) Establishing final background datasets for each chemical of concern (COC) including outlier testing.
2) Deriving statistical, upper bound estimates of the background population for each COC using the final background datasets.

To establish final background datasets for each COC, descriptive statistics, outlier analysis and comparative statistical analysis performed on the background datasets confirmed the data in the background dataset for a given COC as representative of the 'true' background population. Descriptive statistics include the number of samples, the number of detections, the detection frequency, the maximum and minimum detected concentrations, the mean, and the standard deviation of the background data, all of which provide a preliminary examination of data.

Outlier analyses identified potential outliers not representative of the true background population. Including real outliers in a dataset can potentially lead to Type I or Type II errors (USEPA, 2009). A Type I error is defined as false positive relative to the initial hypothesis. A Type II error is defined as a false negative relative to the initial hypothesis. Rosner's Outlier Test was performed on background datasets containing four (4) detected values or more (USEPA, 2009). Based on an alpha of 0.05, statistically significant outliers were removed from the background dataset in order to improve the power of the prediction limit (USEPA, 2009). The resulting background dataset for each well and COC is tabulated in **Attachment C**.

For the final background datasets after outlier analyses, summary statistics calculated the number of samples, number of detections, detection frequency, maximum and minimum detected concentrations, mean concentration, and the standard deviation. The final datasets calculations

of the underlying distributions employing Shapiro-Wilks (e.g., normal, lognormal, gamma) using ProUCL 5.0.00 (Singh, 2013) before statistical limits were estimated allowed determination of the appropriate estimates that best describe the background datasets.

The following statistical limits for potential use as a background level (Background Threshold Values (BTVs)) were calculated using ProUCL 5.0.00 (Singh, 2013) for each COC when five or more detections were present:

- 95% upper simultaneous limit (USL)

The 95% USL was selected as the proposed BTVs as:

1) Many of the background datasets contain limited sample sizes and, therefore, are unlikely to represent the full range of natural ambient concentrations in the vicinity of the site.
2) This statistic should result in lower Type I error rates (i.e., false positives) and can be used to compare many observations.

If there were no detected results, the highest detection limit was proposed as the BTV. The calculated BTVs are included in **Table 5**. The statistical evaluation data is included in **Appendix C**.

6.1 Statistically Significant Increase Determination

The detected concentrations for the first and second half 2023 sampling events with the respective USL are listed below. Compliance is determined by comparing the current concentration to the calculated USL. No concentrations at any monitoring wells in 2023 were confirmed as an SSI.

7 Groundwater Protection Standards

Per § 257.95(d)(2), Groundwater Protection Standards (GPS) were established for each Appendix IV constituent detected in the groundwater. GPS were established using United States Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs) for detected Appendix IV constituents. For constituents for which the background level is higher than the MCL, the background value will be the GPS. GPS values are shown in **Table 6**.

Comparing the 2023 spring and fall sampling groundwater analytical results for Appendix IV analytes to the GPS, no GPS exceedances are indicated (**Table 7**).

8 Report Summary and Conclusions

Per 40 CFR §§ 40.257.93 – 257.95, 2 monitoring events (spring and fall) were conducted in 2023 at the SKB Lansing Landfill. Groundwater samples were collected from the monitoring network's 8 monitoring wells (MW-1, MW-1RD, MW-2R, MW-2RD, MW-3, MW-3R, MW-3RD, and MW-4) located at the SKB Lansing Landfill during the 2023 monitoring events. Groundwater samples were analyzed for parameters specified in Appendix III and Appendix IV.

The groundwater data collected in the 2017 – 2023 sampling events were statistically tested following the concepts outlined in this report to form a background data set. Interwell USLs were developed for Appendix III and Appendix IV in 8 monitoring wells. Upper and lower threshold values were developed for pH using USL and box plot statistics. The resulting USLs were compared to the current concentrations for each COC and well pair.

No analytes were reported above the calculated BTVs in 2023:

Groundwater concentrations from the 2023 monitoring events were compared to established GPS values. No analytes were reported above the GPS in 2023. Note that Cobalt was detected above GPS values at downgradient monitoring well MW-3, and Lithium detected above GPS values at upgradient monitoring well MW-1 in 2022. Statistical analysis demonstrated Lithium detections in MW-1 were associated with natural variations in area groundwater quality. The Cobalt concentration was due to laboratory induced Cobalt and was not considered confirmation of elevated concentrations. Therefore, 2023 concentrations confirm concentrations reported above GPS values in 2022 are not associated with landfill operations.

9 Recommendations

CCR groundwater monitoring events will be conducted in 2024 by the following schedule:

Spring 2024

Conduct a groundwater monitoring event of the site's monitoring well network and analyze groundwater samples for constituents listed in Appendix III and Appendix IV (full list).

Late Summer/Early Fall 2024

Conduct a groundwater monitoring event of the site's monitoring well network and analyzed samples for constituents listed in Appendix III and Appendix IV (only analytes detected in spring 2024 event).

An evaluation of groundwater analytical results after each monitoring event will be completed to determine if a significant increase over BTVs for one or more constituents sampled in Appendix III and Appendix IV has occurred at any monitoring well. The evaluation will be performed using a tolerance or prediction interval procedure (§ 257.93(f)(3)). The level of each constituent in the monitoring well will be compared to an established BTV generated as the USL. Any single constituent that exceeds the BTV is considered to be an exceedance. Confirmation sampling will determine whether the BTV exceedance is statistically significant. Additionally, groundwater concentrations of constituents listed in Appendix IV will be compared to the established GPS values.

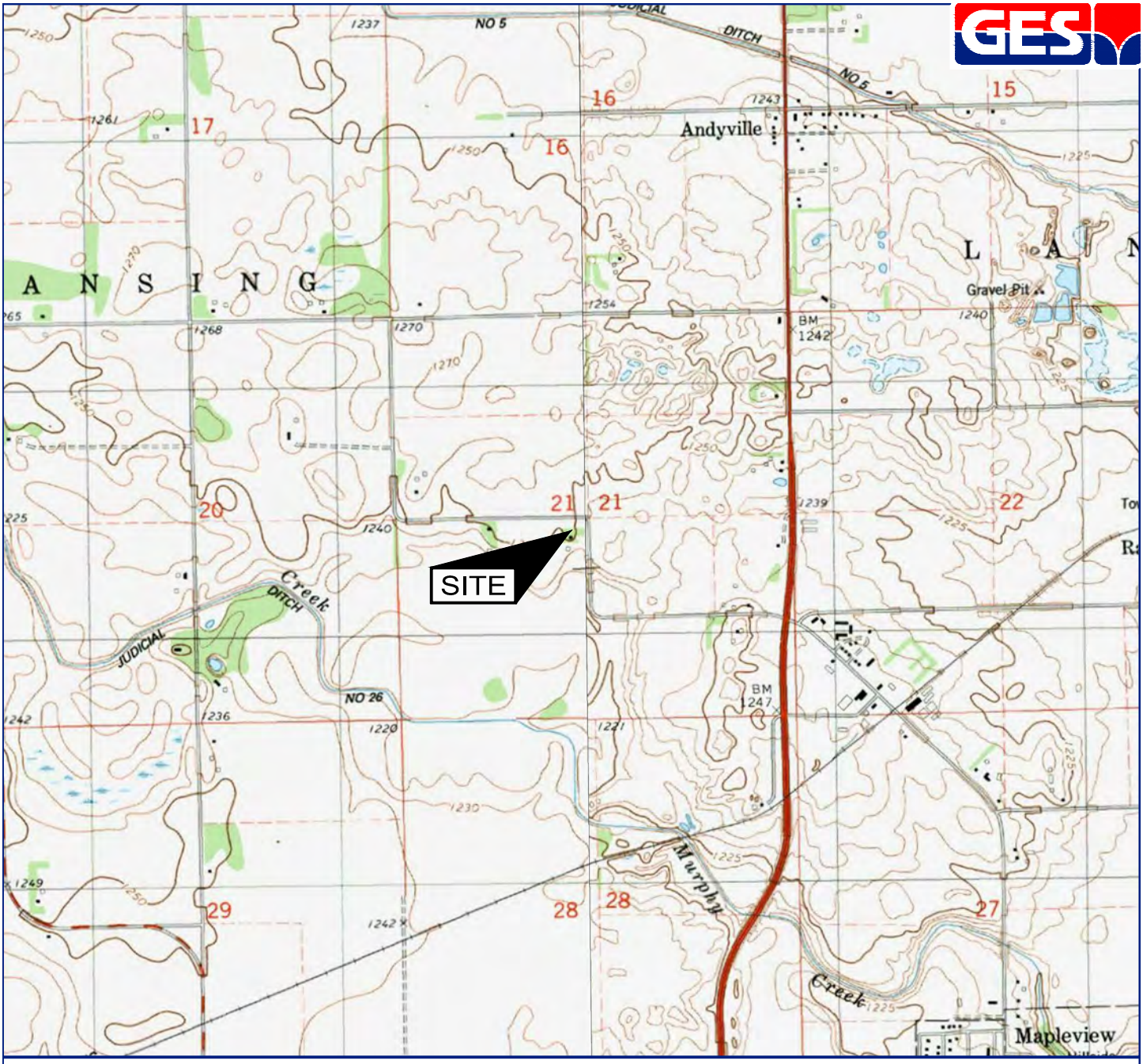
A 2024 Annual Monitoring Report will be prepared and include sampling results from the 2024 CCR groundwater monitoring events and an evaluation of the analytical results as they pertained to BTV and GPS values.

References

Singh and Singh, 2013. *ProUCL Version 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations,* United States Environmental Protection Agency

United States Environmental Protection Agency, 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance.* Office of Resource Conservation and Recovery Program Implementation and Information Division, EPA 530/R-09-007, March 2009.

Figures



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1982
AUSTIN EAST, MINNESOTA
CONTOUR INTERVAL = 5'

QUADRANGLE LOCATION

DRAFTED BY: W.G.S. (N.J.)	SITE LOCATION MAP
CHECKED BY: JFS	WCI AUSTIN LANDFILL LLC SKB LANSING LANDFILL 52563 243rd STREET AUSTIN, MINNESOTA
REVIEWED BY: JFS	Groundwater & Environmental Services, Inc. 1301 CORPORATE CENTER DRIVE, SUITE 120, EAGAN, MN 55121
NORTH	SCALE IN FEET: 0 — 2000 / DATE: 12-15-21 / FIGURE: 1

M:\Graphics\3500-Minnesota\SKB Environmental\Austin-Lansing facility(243rd st)\Austin SLM(243rd st).dwg, Layout1, WShea

Legend

- Monitoring Well
- Piezometer
- Removed Piezometer
- Property Boundary
- Fence
- Phase Boundary
- Approximate Limit of Waste
- Right of Way
- Compliance Boundary

Site Map

WCI Austin Landfill, LLC
SKB Lansing Facility
52563 243rd Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **NJS**

Date **1/30/24**
Figure **2**

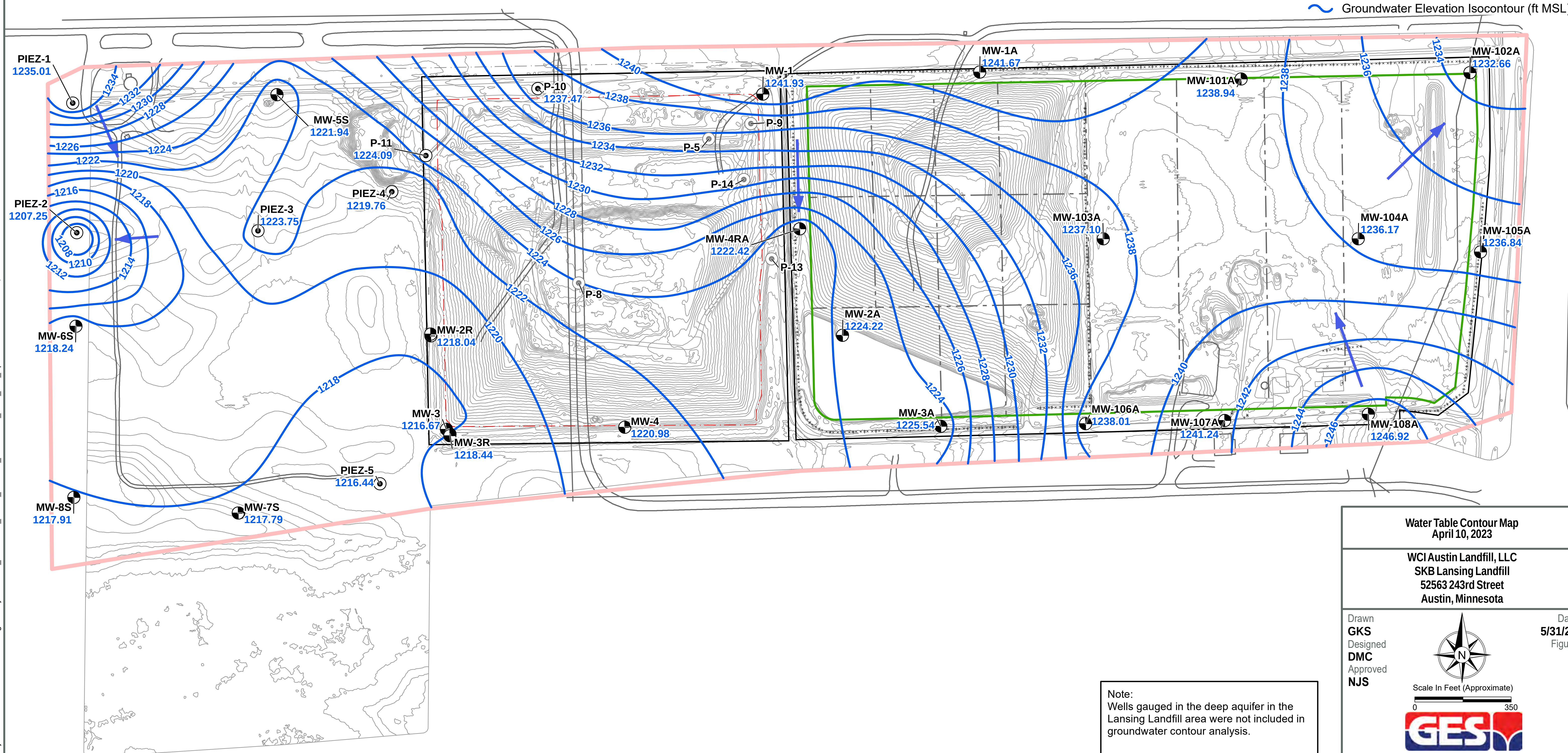
Scale In Feet (Approximate)
0 350

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Combined Austin Landfills\GIS\SKB_Combined_Austin_Landfills_SM.mxd - Scale 1:4,200 - 1/30/2024 11:55:23 AM - GStewart - NAD 1983 StatePlane Minnesota South FIPS 2203 Feet

Legend

- Monitoring Well
- Piezometer
- Removed Piezometer
- Property Boundary
- Fence
- Phase Boundary
- Approximate Limit of Waste
- Right of Way
- Compliance Boundary
- Approximate Flow Direction
- Groundwater Elevation Isocontour (ft MSL)



L:\Projects\SKB Environmental\Lansing Facility\GIS\SKB_Combined_Austin_Landfills_WaterTable_CCR_GW_April2023.mxd - Scale 1:4,200 - 5/31/2023 11:59:53 AM - GStewart - NAD 1983 StatePlane Minnesota South FIPS 2203 Feet

Note:
Wells gauged in the deep aquifer in the Lansing Landfill area were not included in groundwater contour analysis.

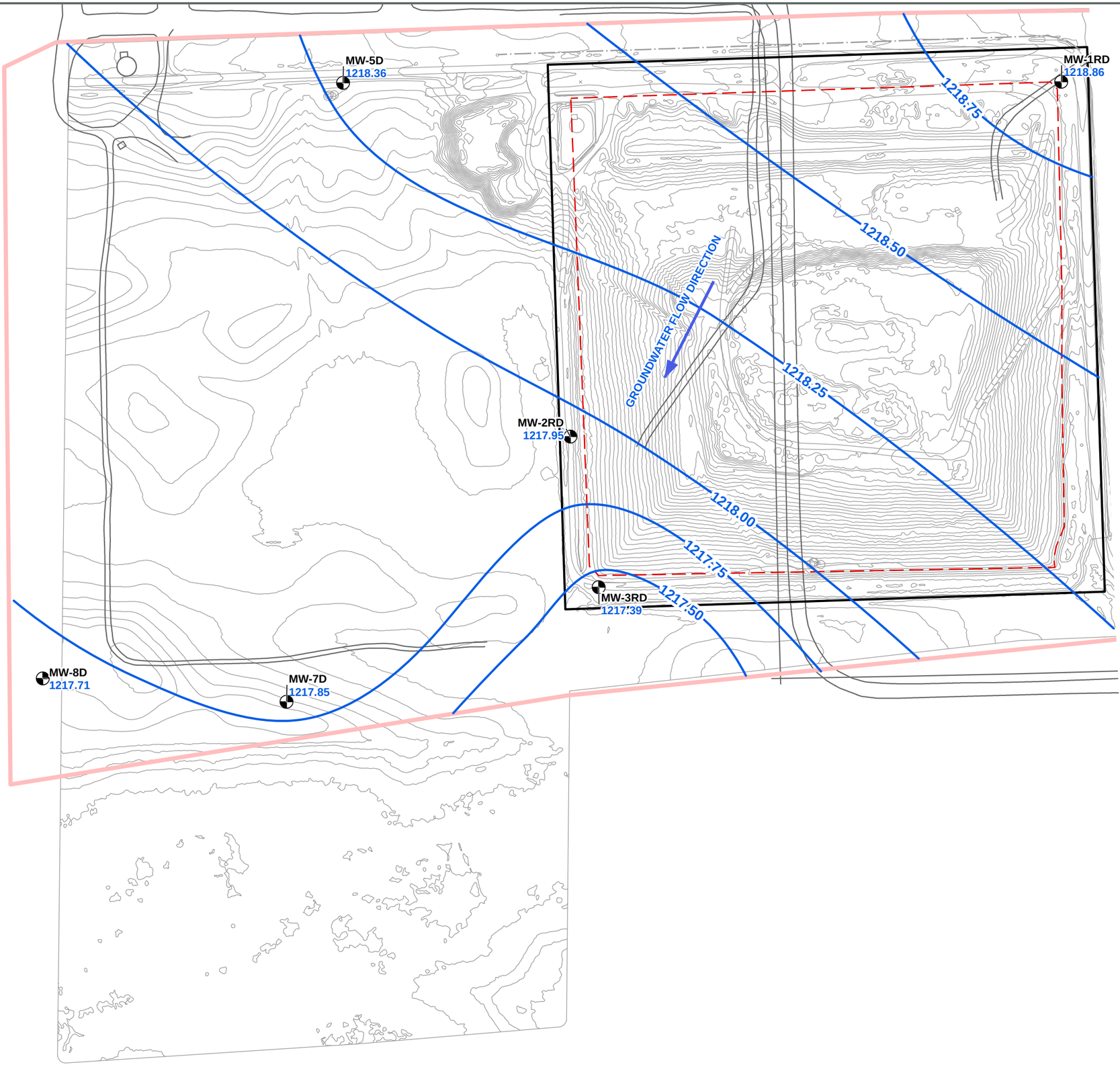
Water Table Contour Map
April 10, 2023

WCI Austin Landfill, LLC
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Drawn **GKS**	Date **5/31/23**
Designed **DMC**	Figure **3**
Approved **NJS**	

Scale In Feet (Approximate)
0 350

Groundwater & Environmental Services, Inc.



LEGEND

- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- PROPERTY BOUNDARY
- RIGHT OF WAY
- APPROXIMATE LIMITS OF WASTE
- FENCE
- 1219.48 MEASURED GROUNDWATER ELEVATION (ft MSL)
- MONITORING WELL
- PIEZOMETER
- REMOVED PIEZOMETER

Potentiometric Surface Contour Map
Deep Zone - April 10, 2023

WCI Austin Landfill, LLC
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **NJS**

Date **5/31/23**
Figure **4**

N

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Lansing Facility\GIS\Lansing_GWE_Pot_Surface_April2023.mxd - Scale 1:3,000 - 5/31/2023 11:28:37 AM - GStewart -

Legend

- Monitoring Well
- Piezometer
- Removed Piezometer
- Property Boundary
- Fence
- Phase Boundary
- Approximate Limit of Waste
- Right of Way
- Compliance Boundary
- Approximate Flow Direction
- Groundwater Elevation Isocontour (ft MSL)

PIEZ-1 1229.83
MW-5S 1215.81
P-10 1234.63
MW-1 1235.99
MW-1A 1233.37
MW-102A 1227.10
MW-101A 1232.97
P-11 1222.65
P-9
P-5
P-14
PIEZ-2 1203.86
PIEZ-3 1218.31
PIEZ-4 1215.94
MW-103A 1234.36
MW-104A 1232.07
MW-105A 1228.24
P-13
MW-4RA 1217.77
P-8
MW-2A 1222.17
MW-6S 1215.09
MW-2R 1215.48
MW-3A 1222.29
MW-3 1212.29
MW-4 1216.23
MW-3R 1214.42
MW-107A 1235.85
MW-108A 1240.05
PIEZ-5 1214.21
MW-106A 1231.04
MW-8S 1214.62
MW-7S 1214.41

Note:
Wells gauged in the deep aquifer in the Lansing Landfill area were not included in groundwater contour analysis.

Water Table Contour Map
August 3, 2023

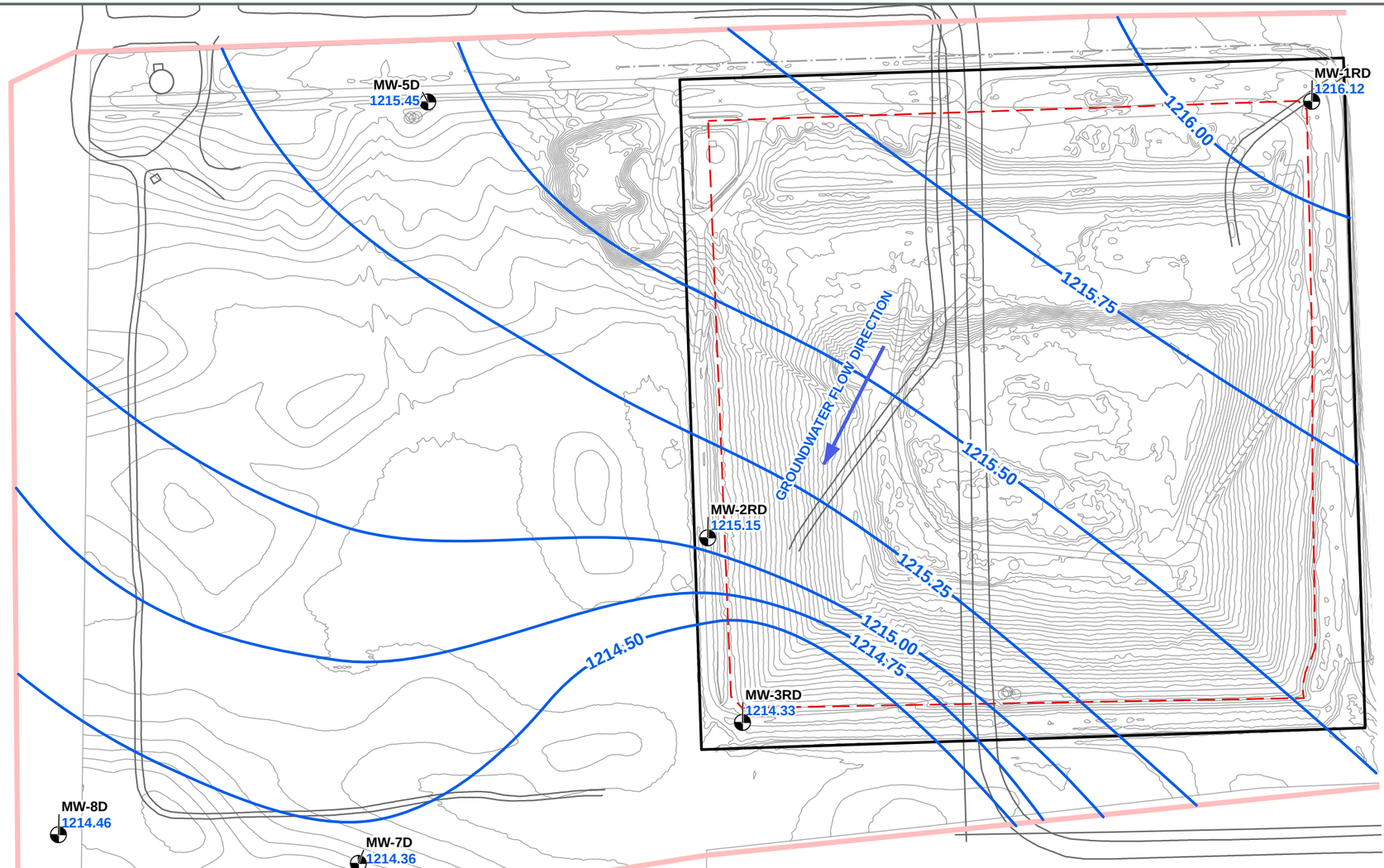
WCI Austin Landfill, LLC
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **NJS**
Date **8/21/23**
Figure **5**

Scale In Feet (Approximate)
0 350

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Lansing Facility\GIS\SKB_Combined_Austin_Landfills_WaterTable_CCR_GW_Aug2023.mxd - Scale 1:4,200 - 8/21/2023 12:14:14 PM - GStewart - NAD 1983 StatePlane Minnesota South FIPS 2203 Feet



LEGEND

- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- PROPERTY BOUNDARY
- RIGHT OF WAY
- APPROXIMATE LIMITS OF WASTE
- FENCE
- 1219.48 MEASURED GROUNDWATER ELEVATION (ft MSL)
- MONITORING WELL
- PIEZOMETER
- REMOVED PIEZOMETER

Potentiometric Surface Contour Map
Deep Zone - August 3, 2023

WCI Austin Landfill, LLC
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **NJS**

Date **8/21/23**
Figure **6**

N

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Lansing Facility\GIS\Lansing_GWE_Pot_Surface_Aug2023.mxd - Scale 1:3,000 - 8/21/2023 11:45:22 AM - GStewart -

Tables

2023 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 1

Groundwater Elevations

Date	MW-1	MW-1RD	MW-2R	MW-2RD	MW-3	MW-3R	MW-3RD	MW-4
04/10/2023	1241.93	1218.86	1218.04	1217.95	1216.67	1218.44	1217.39	1220.98
08/03/2023	1235.99	1216.12	1215.48	1215.15	1212.29	1214.42	1214.33	1216.23

Date	MW-5D	MW-5S	MW-6S	MW-7D	MW-7S	MW-8D	MW-8S	MW-1A
04/10/2023	1218.36	1221.94	1218.24	1217.85	1217.79	1217.71	1217.91	1241.67
08/03/2023	1215.45	1215.81	1215.09	1214.36	1214.41	1214.46	1214.62	1233.37

Date	MW-2A	MW-3A	MW-4RA	MW-101A	MW-102A	MW-103A	MW-104A	MW-105A
04/10/2023	1224.22	1225.54	1222.42	1238.94	1232.66	1237.10	1236.17	1236.84
08/03/2023	1222.17	1222.29	1217.77	1232.97	1227.10	1234.36	1232.07	1228.24

Date	MW-106A	MW-107A	MW-108A	P-10	P-11	PIEZ-1	PIEZ-2	PIEZ-3
04/10/2023	1238.01	1241.24	1246.92	1237.47	1224.09	1235.01	1207.25	1223.75
08/03/2023	1231.04	1235.85	1240.05	1234.63	1222.65	1229.83	1203.86	1218.31

Date	PIEZ-4	PIEZ-5
04/10/2023	1219.76	1216.44
08/03/2023	1215.94	1214.21

2023 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1	04/10/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-1	08/03/2023	Boron	0.18	4.5	mg/l	7440-42-8
MW-1	04/10/2023	Calcium	136	287	mg/l	7440-70-2
MW-1	08/03/2023	Calcium	169	287	mg/l	7440-70-2
MW-1	04/10/2023	Chloride	67	120	mg/l	16887-00-6
MW-1	08/03/2023	Chloride	120	120	mg/l	16887-00-6
MW-1	04/10/2023	pH	7.4	6.4 < 7.7	pH UNITS	PH
MW-1	08/03/2023	pH	7.2	6.4 < 7.7	pH UNITS	PH
MW-1	04/10/2023	Sulfate as SO4	170	481	mg/l	14808-79-8
MW-1	08/03/2023	Sulfate as SO4	160	481	mg/l	14808-79-8
MW-1	04/10/2023	Total Dissolved Solids	626	1,889	mg/l	TDS
MW-1	08/03/2023	Total Dissolved Solids	692	1,889	mg/l	TDS
MW-1RD	04/10/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-1RD	08/03/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-1RD	04/10/2023	Calcium	85.1	287	mg/l	7440-70-2
MW-1RD	08/03/2023	Calcium	87.2	287	mg/l	7440-70-2
MW-1RD	04/10/2023	Chloride	23	120	mg/l	16887-00-6
MW-1RD	08/03/2023	Chloride	25	120	mg/l	16887-00-6
MW-1RD	04/10/2023	pH	7.4	6.4 < 7.7	pH UNITS	PH
MW-1RD	08/03/2023	pH	7.5	6.4 < 7.7	pH UNITS	PH
MW-1RD	04/10/2023	Sulfate as SO4	50	481	mg/l	14808-79-8
MW-1RD	08/03/2023	Sulfate as SO4	59	481	mg/l	14808-79-8
MW-1RD	04/10/2023	Total Dissolved Solids	292	1,889	mg/l	TDS
MW-1RD	08/03/2023	Total Dissolved Solids	350	1,889	mg/l	TDS
MW-2R	04/10/2023	Boron	4.5	4.5	mg/l	7440-42-8
MW-2R	08/03/2023	Boron	3.2	4.5	mg/l	7440-42-8
MW-2R	04/10/2023	Calcium	197	287	mg/l	7440-70-2
MW-2R	08/03/2023	Calcium	246	287	mg/l	7440-70-2
MW-2R	04/10/2023	Chloride	76	120	mg/l	16887-00-6
MW-2R	08/03/2023	Chloride	110	120	mg/l	16887-00-6
MW-2R	04/10/2023	pH	6.8	6.4 < 7.7	pH UNITS	PH
MW-2R	08/03/2023	pH	6.8	6.4 < 7.7	pH UNITS	PH
MW-2R	04/10/2023	Sulfate as SO4	230	481	mg/l	14808-79-8
MW-2R	08/03/2023	Sulfate as SO4	220	481	mg/l	14808-79-8
MW-2R	04/10/2023	Total Dissolved Solids	1,010	1,889	mg/l	TDS
MW-2R	08/03/2023	Total Dissolved Solids	1,100	1,889	mg/l	TDS
MW-2RD	04/10/2023	Boron	0.16	4.5	mg/l	7440-42-8
MW-2RD	08/03/2023	Boron	0.18	4.5	mg/l	7440-42-8
MW-2RD	04/10/2023	Calcium	160	287	mg/l	7440-70-2
MW-2RD	08/03/2023	Calcium	160	287	mg/l	7440-70-2
MW-2RD	04/10/2023	Chloride	39	120	mg/l	16887-00-6
MW-2RD	08/03/2023	Chloride	43	120	mg/l	16887-00-6
MW-2RD	04/10/2023	pH	7.1	6.4 < 7.7	pH UNITS	PH
MW-2RD	08/03/2023	pH	7.1	6.4 < 7.7	pH UNITS	PH
MW-2RD	04/10/2023	Sulfate as SO4	77	481	mg/l	14808-79-8
MW-2RD	08/03/2023	Sulfate as SO4	91	481	mg/l	14808-79-8
MW-2RD	04/10/2023	Total Dissolved Solids	608	1,889	mg/l	TDS
MW-2RD	08/03/2023	Total Dissolved Solids	636	1,889	mg/l	TDS
MW-3	04/11/2023	Boron	0.49	4.5	mg/l	7440-42-8
MW-3	08/03/2023	Boron	0.19	4.5	mg/l	7440-42-8
MW-3	04/11/2023	Calcium	170	287	mg/l	7440-70-2
MW-3	08/03/2023	Calcium	287	287	mg/l	7440-70-2
MW-3	04/11/2023	Chloride	38	120	mg/l	16887-00-6
MW-3	08/03/2023	Chloride	29	120	mg/l	16887-00-6
MW-3	04/11/2023	pH	6.8	6.4 < 7.7	pH UNITS	PH
MW-3	08/03/2023	pH	6.6	6.4 < 7.7	pH UNITS	PH
MW-3	04/11/2023	Sulfate as SO4	29	481	mg/l	14808-79-8
MW-3	08/03/2023	Sulfate as SO4	18	481	mg/l	14808-79-8
MW-3	04/11/2023	Total Dissolved Solids	606	1,889	mg/l	TDS

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-3	08/03/2023	Total Dissolved Solids	970	1,889	mg/l	TDS
MW-3R	04/11/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-3R	08/03/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-3R	04/11/2023	Calcium	252	287	mg/l	7440-70-2
MW-3R	08/03/2023	Calcium	259	287	mg/l	7440-70-2
MW-3R	04/11/2023	Chloride	5.7	120	mg/l	16887-00-6
MW-3R	08/03/2023	Chloride	27	120	mg/l	16887-00-6
MW-3R	04/11/2023	pH	6.7	6.4 < 7.7	pH UNITS	PH
MW-3R	08/03/2023	pH	6.7	6.4 < 7.7	pH UNITS	PH
MW-3R	04/11/2023	Sulfate as SO4	1.8	481	mg/l	14808-79-8
MW-3R	08/03/2023	Sulfate as SO4	7.4	481	mg/l	14808-79-8
MW-3R	04/11/2023	Total Dissolved Solids	852	1,889	mg/l	TDS
MW-3R	08/03/2023	Total Dissolved Solids	866	1,889	mg/l	TDS
MW-3RD	04/11/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-3RD	08/03/2023	Boron	< 0.10	4.5	mg/l	7440-42-8
MW-3RD	04/11/2023	Calcium	123	287	mg/l	7440-70-2
MW-3RD	08/03/2023	Calcium	134	287	mg/l	7440-70-2
MW-3RD	04/11/2023	Chloride	31	120	mg/l	16887-00-6
MW-3RD	08/03/2023	Chloride	29	120	mg/l	16887-00-6
MW-3RD	04/11/2023	pH	7.1	6.4 < 7.7	pH UNITS	PH
MW-3RD	08/03/2023	pH	7.2	6.4 < 7.7	pH UNITS	PH
MW-3RD	04/11/2023	Sulfate as SO4	81	481	mg/l	14808-79-8
MW-3RD	08/03/2023	Sulfate as SO4	91	481	mg/l	14808-79-8
MW-3RD	04/11/2023	Total Dissolved Solids	478	1,889	mg/l	TDS
MW-3RD	08/03/2023	Total Dissolved Solids	524	1,889	mg/l	TDS
MW-4	04/11/2023	Boron	0.19	4.5	mg/l	7440-42-8
MW-4	08/04/2023	Boron	0.32	4.5	mg/l	7440-42-8
MW-4	04/11/2023	Calcium	130	287	mg/l	7440-70-2
MW-4	08/04/2023	Calcium	181	287	mg/l	7440-70-2
MW-4	04/11/2023	Chloride	25	120	mg/l	16887-00-6
MW-4	08/04/2023	Chloride	27	120	mg/l	16887-00-6
MW-4	04/11/2023	pH	7.0	6.4 < 7.7	pH UNITS	PH
MW-4	08/04/2023	pH	7.0	6.4 < 7.7	pH UNITS	PH
MW-4	04/11/2023	Sulfate as SO4	200	481	mg/l	14808-79-8
MW-4	08/04/2023	Sulfate as SO4	230	481	mg/l	14808-79-8
MW-4	04/11/2023	Total Dissolved Solids	634	1,889	mg/l	TDS
MW-4	08/04/2023	Total Dissolved Solids	766	1,889	mg/l	TDS

Results in milligrams per liter (mg/l)

Bold = Indicates concentration above Background Threshold Value

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1	04/10/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-1	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-1	04/10/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-1	08/03/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-1	04/10/2023	Barium	0.11	0.71	mg/l	7440-39-3
MW-1	08/03/2023	Barium	0.14	0.71	mg/l	7440-39-3
MW-1	04/10/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-1	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-1	04/10/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-1	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-1	04/10/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-1	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-1	04/10/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-1	08/03/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-1	04/10/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-1	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-1	04/10/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-1	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-1	04/10/2023	Lithium	0.015	0.041	mg/l	7439-93-2
MW-1	08/03/2023	Lithium	0.040	0.041	mg/l	7439-93-2
MW-1	04/10/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-1	08/03/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-1	04/10/2023	MOLYBDENUM	< 0.0020	0.0221	mg/l	7439-98-7
MW-1	08/03/2023	MOLYBDENUM	< 0.0020	0.0221	mg/l	7439-98-7
MW-1	04/10/2023	Radium (226)	< 0.200	1.874	pci/l	13982-63-3
MW-1	08/03/2023	Radium (226)	< 0.134	1.874	pci/l	13982-63-3
MW-1	04/10/2023	Radium 228	< 0.578	2.234	pci/l	15262-20-1
MW-1	08/03/2023	Radium 228	< 0.609	2.234	pci/l	15262-20-1
MW-1	04/10/2023	Radium-226/228	0.580	4.108	pci/l	425
MW-1	08/03/2023	Radium-226/228	< 0.609	4.108	pci/l	425
MW-1	04/10/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-1	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-1	04/10/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-1	08/03/2023	Thallium	0.0011	0.028	mg/l	7440-28-0
MW-1RD	04/10/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-1RD	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-1RD	04/10/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-1RD	08/03/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-1RD	04/10/2023	Barium	0.15	0.71	mg/l	7440-39-3
MW-1RD	08/03/2023	Barium	0.15	0.71	mg/l	7440-39-3
MW-1RD	04/10/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-1RD	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-1RD	04/10/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-1RD	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-1RD	04/10/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-1RD	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-1RD	04/10/2023	Cobalt	0.00066	0.0076	mg/l	7440-48-4
MW-1RD	08/03/2023	Cobalt	0.00067	0.0076	mg/l	7440-48-4
MW-1RD	04/10/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-1RD	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-1RD	04/10/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-1RD	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-1RD	04/10/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1RD	08/03/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-1RD	04/10/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-1RD	08/03/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-1RD	04/10/2023	MOLYBDENUM	0.0031	0.0221	mg/l	7439-98-7
MW-1RD	08/03/2023	MOLYBDENUM	0.0034	0.0221	mg/l	7439-98-7
MW-1RD	04/10/2023	Radium (226)	0.381	1.874	pci/l	13982-63-3
MW-1RD	08/03/2023	Radium (226)	0.422	1.874	pci/l	13982-63-3
MW-1RD	04/10/2023	Radium 228	1.09	2.234	pci/l	15262-20-1
MW-1RD	08/03/2023	Radium 228	0.932	2.234	pci/l	15262-20-1
MW-1RD	04/10/2023	Radium-226/228	1.47	4.108	pci/l	425
MW-1RD	08/03/2023	Radium-226/228	1.35	4.108	pci/l	425
MW-1RD	04/10/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-1RD	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-1RD	04/10/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-1RD	08/03/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-2R	04/10/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-2R	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-2R	04/10/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-2R	08/03/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-2R	04/10/2023	Barium	0.20	0.71	mg/l	7440-39-3
MW-2R	08/03/2023	Barium	0.26	0.71	mg/l	7440-39-3
MW-2R	04/10/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-2R	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-2R	04/10/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-2R	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-2R	04/10/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-2R	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-2R	04/10/2023	Cobalt	0.0012	0.0076	mg/l	7440-48-4
MW-2R	08/03/2023	Cobalt	0.0017	0.0076	mg/l	7440-48-4
MW-2R	04/10/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-2R	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-2R	04/10/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-2R	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-2R	04/10/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-2R	08/03/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-2R	04/10/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-2R	08/03/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-2R	04/10/2023	MOLYBDENUM	< 0.0020	0.0221	mg/l	7439-98-7
MW-2R	08/03/2023	MOLYBDENUM	0.0020	0.0221	mg/l	7439-98-7
MW-2R	04/10/2023	Radium (226)	< 0.314	1.874	pci/l	13982-63-3
MW-2R	08/03/2023	Radium (226)	0.386	1.874	pci/l	13982-63-3
MW-2R	04/10/2023	Radium 228	< 0.731	2.234	pci/l	15262-20-1
MW-2R	08/03/2023	Radium 228	0.794	2.234	pci/l	15262-20-1
MW-2R	04/10/2023	Radium-226/228	0.760	4.108	pci/l	425
MW-2R	08/03/2023	Radium-226/228	1.18	4.108	pci/l	425
MW-2R	04/10/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-2R	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-2R	04/10/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-2R	08/03/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-2RD	04/10/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-2RD	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-2RD	04/10/2023	Arsenic	0.0021	0.0049	mg/l	7440-38-2
MW-2RD	08/03/2023	Arsenic	0.0023	0.0049	mg/l	7440-38-2

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-2RD	04/10/2023	Barium	0.19	0.71	mg/l	7440-39-3
MW-2RD	08/03/2023	Barium	0.20	0.71	mg/l	7440-39-3
MW-2RD	04/10/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-2RD	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-2RD	04/10/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-2RD	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-2RD	04/10/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-2RD	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-2RD	04/10/2023	Cobalt	0.0026	0.0076	mg/l	7440-48-4
MW-2RD	08/03/2023	Cobalt	0.0031	0.0076	mg/l	7440-48-4
MW-2RD	04/10/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-2RD	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-2RD	04/10/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-2RD	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-2RD	04/10/2023	Lithium	0.012	0.041	mg/l	7439-93-2
MW-2RD	08/03/2023	Lithium	0.012	0.041	mg/l	7439-93-2
MW-2RD	04/10/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-2RD	08/03/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-2RD	04/10/2023	MOLYBDENUM	0.0027	0.0221	mg/l	7439-98-7
MW-2RD	08/03/2023	MOLYBDENUM	0.0025	0.0221	mg/l	7439-98-7
MW-2RD	04/10/2023	Radium (226)	0.697	1.874	pci/l	13982-63-3
MW-2RD	08/03/2023	Radium (226)	0.696	1.874	pci/l	13982-63-3
MW-2RD	04/10/2023	Radium 228	0.617	2.234	pci/l	15262-20-1
MW-2RD	08/03/2023	Radium 228	0.897	2.234	pci/l	15262-20-1
MW-2RD	04/10/2023	Radium-226/228	1.31	4.108	pci/l	425
MW-2RD	08/03/2023	Radium-226/228	1.59	4.108	pci/l	425
MW-2RD	04/10/2023	Selenium	0.033	0.034	mg/l	7782-49-2
MW-2RD	08/03/2023	Selenium	0.030	0.034	mg/l	7782-49-2
MW-2RD	04/10/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-2RD	08/03/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3	04/11/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3	04/11/2023	Arsenic	0.0035	0.0049	mg/l	7440-38-2
MW-3	08/03/2023	Arsenic	0.0028	0.0049	mg/l	7440-38-2
MW-3	04/11/2023	Barium	0.19	0.71	mg/l	7440-39-3
MW-3	08/03/2023	Barium	0.38	0.71	mg/l	7440-39-3
MW-3	04/11/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-3	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-3	04/11/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3	04/11/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3	04/11/2023	Cobalt	0.0046	0.0076	mg/l	7440-48-4
MW-3	08/03/2023	Cobalt	0.0034	0.0076	mg/l	7440-48-4
MW-3	04/11/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-3	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-3	04/11/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3	04/11/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-3	08/03/2023	Lithium	0.018	0.041	mg/l	7439-93-2
MW-3	04/11/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-3	08/03/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-3	04/11/2023	MOLYBDENUM	0.0044	0.0221	mg/l	7439-98-7

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-3	08/03/2023	MOLYBDENUM	0.0052	0.0221	mg/l	7439-98-7
MW-3	04/11/2023	Radium (226)	< 0.313	1.874	pci/l	13982-63-3
MW-3	08/03/2023	Radium (226)	0.402	1.874	pci/l	13982-63-3
MW-3	04/11/2023	Radium 228	0.966	2.234	pci/l	15262-20-1
MW-3	08/03/2023	Radium 228	< 0.886	2.234	pci/l	15262-20-1
MW-3	04/11/2023	Radium-226/228	1.16	4.108	pci/l	425
MW-3	08/03/2023	Radium-226/228	0.945	4.108	pci/l	425
MW-3	04/11/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3	04/11/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3	08/03/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3R	04/11/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3R	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3R	04/11/2023	Arsenic	0.0023	0.0049	mg/l	7440-38-2
MW-3R	08/03/2023	Arsenic	0.0023	0.0049	mg/l	7440-38-2
MW-3R	04/11/2023	Barium	0.64	0.71	mg/l	7440-39-3
MW-3R	08/03/2023	Barium	0.65	0.71	mg/l	7440-39-3
MW-3R	04/11/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-3R	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-3R	04/11/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3R	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3R	04/11/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3R	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3R	04/11/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-3R	08/03/2023	Cobalt	0.00055	0.0076	mg/l	7440-48-4
MW-3R	04/11/2023	Fluoride	< 0.20	0.352	mg/l	16984-48-8
MW-3R	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-3R	04/11/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3R	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3R	04/11/2023	Lithium	0.020	0.041	mg/l	7439-93-2
MW-3R	08/03/2023	Lithium	0.020	0.041	mg/l	7439-93-2
MW-3R	04/11/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-3R	08/03/2023	Mercury	0.00020	0.00030	mg/l	7439-97-6
MW-3R	04/11/2023	MOLYBDENUM	< 0.0020	0.0221	mg/l	7439-98-7
MW-3R	08/03/2023	MOLYBDENUM	< 0.0020	0.0221	mg/l	7439-98-7
MW-3R	04/11/2023	Radium (226)	0.482	1.874	pci/l	13982-63-3
MW-3R	08/03/2023	Radium (226)	0.572	1.874	pci/l	13982-63-3
MW-3R	04/11/2023	Radium 228	< 0.864	2.234	pci/l	15262-20-1
MW-3R	08/03/2023	Radium 228	1.21	2.234	pci/l	15262-20-1
MW-3R	04/11/2023	Radium-226/228	0.953	4.108	pci/l	425
MW-3R	08/03/2023	Radium-226/228	1.78	4.108	pci/l	425
MW-3R	04/11/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3R	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3R	04/11/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3R	08/03/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3RD	04/11/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3RD	08/03/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-3RD	04/11/2023	Arsenic	0.0036	0.0049	mg/l	7440-38-2
MW-3RD	08/03/2023	Arsenic	0.0042	0.0049	mg/l	7440-38-2
MW-3RD	04/11/2023	Barium	0.18	0.71	mg/l	7440-39-3
MW-3RD	08/03/2023	Barium	0.21	0.71	mg/l	7440-39-3
MW-3RD	04/11/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-3RD	08/03/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-3RD	04/11/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3RD	08/03/2023	Cadmium	< 0.00020	0.0436	mg/l	7440-43-9
MW-3RD	04/11/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3RD	08/03/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-3RD	04/11/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-3RD	08/03/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-3RD	04/11/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-3RD	08/03/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-3RD	04/11/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3RD	08/03/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-3RD	04/11/2023	Lithium	0.015	0.041	mg/l	7439-93-2
MW-3RD	04/11/2023	Lithium	0.013	0.041	mg/l	7439-93-2
MW-3RD	08/03/2023	Lithium	0.014	0.041	mg/l	7439-93-2
MW-3RD	08/03/2023	Lithium	0.015	0.041	mg/l	7439-93-2
MW-3RD	04/11/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-3RD	08/03/2023	Mercury	0.00030	0.00030	mg/l	7439-97-6
MW-3RD	04/11/2023	MOLYBDENUM	0.0035	0.0221	mg/l	7439-98-7
MW-3RD	08/03/2023	MOLYBDENUM	0.0047	0.0221	mg/l	7439-98-7
MW-3RD	04/11/2023	Radium (226)	0.750	1.874	pci/l	13982-63-3
MW-3RD	08/03/2023	Radium (226)	0.781	1.874	pci/l	13982-63-3
MW-3RD	04/11/2023	Radium 228	0.861	2.234	pci/l	15262-20-1
MW-3RD	08/03/2023	Radium 228	< 0.550	2.234	pci/l	15262-20-1
MW-3RD	04/11/2023	Radium-226/228	1.61	4.108	pci/l	425
MW-3RD	08/03/2023	Radium-226/228	1.09	4.108	pci/l	425
MW-3RD	04/11/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3RD	08/03/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-3RD	04/11/2023	Thallium	< 0.0010	0.028	mg/l	7440-28-0
MW-3RD	08/03/2023	Thallium	0.0014	0.028	mg/l	7440-28-0
MW-4	04/11/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-4	08/04/2023	Antimony	< 0.0020	0.0200	mg/l	7440-36-0
MW-4	04/11/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-4	08/04/2023	Arsenic	< 0.0020	0.0049	mg/l	7440-38-2
MW-4	04/11/2023	Barium	0.13	0.71	mg/l	7440-39-3
MW-4	08/04/2023	Barium	0.20	0.71	mg/l	7440-39-3
MW-4	04/11/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-4	08/04/2023	Beryllium	< 0.0010	0.0010	mg/l	7440-41-7
MW-4	04/11/2023	Cadmium	0.00040	0.0436	mg/l	7440-43-9
MW-4	08/04/2023	Cadmium	0.00037	0.0436	mg/l	7440-43-9
MW-4	04/11/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-4	08/04/2023	Chromium	< 0.0050	0.0059	mg/l	7440-47-3
MW-4	04/11/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-4	08/04/2023	Cobalt	< 0.00050	0.0076	mg/l	7440-48-4
MW-4	04/11/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-4	08/04/2023	Fluoride	< 1.0	0.352	mg/l	16984-48-8
MW-4	04/11/2023	Lead	0.00062	0.0151	mg/l	7439-92-1
MW-4	08/04/2023	Lead	< 0.00050	0.0151	mg/l	7439-92-1
MW-4	04/11/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-4	08/04/2023	Lithium	< 0.010	0.041	mg/l	7439-93-2
MW-4	04/11/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-4	08/04/2023	Mercury	< 0.00020	0.00030	mg/l	7439-97-6
MW-4	04/11/2023	MOLYBDENUM	0.0023	0.0221	mg/l	7439-98-7
MW-4	08/04/2023	MOLYBDENUM	0.0038	0.0221	mg/l	7439-98-7
MW-4	04/11/2023	Radium (226)	< 0.249	1.874	pci/l	13982-63-3

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-4	08/04/2023	Radium (226)	0.317	1.874	pci/l	13982-63-3
MW-4	04/11/2023	Radium 228	< 0.680	2.234	pci/l	15262-20-1
MW-4	08/04/2023	Radium 228	0.777	2.234	pci/l	15262-20-1
MW-4	04/11/2023	Radium-226/228	< 0.680	4.108	pci/l	425
MW-4	08/04/2023	Radium-226/228	1.09	4.108	pci/l	425
MW-4	04/11/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-4	08/04/2023	Selenium	< 0.0050	0.034	mg/l	7782-49-2
MW-4	04/11/2023	Thallium	0.0035	0.028	mg/l	7440-28-0
MW-4	08/04/2023	Thallium	0.0028	0.028	mg/l	7440-28-0

Results in milligrams per liter (mg/l) or picocuries per liter (pci/l)
Bold = Indicates concentration above Background Threshold Value

Table 4

Well Stabilization Data

Well ID	Sample Date	Purge Rate (ml/min)	Purge Volume (gallons)	Field pH (pH)	Field Specific Conductivity (umhos/cm)	Field Temp (°C)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	ORP (mV)
MW-1	4/10/2023	1000	0.1	7.73	810	13.82	7.70	15.1	130
MW-1	4/10/2023	1000	4	7.53	904	6.92	7.35	12.7	156
MW-1	4/10/2023	1000	8	7.48	919	6.82	7.24	26.7	164
MW-1	4/10/2023	1000	11.1	7.44	922	6.68	7.28	4.0	19
MW-1	4/10/2023			7.44	922	6.67	7.32	3.2	171
MW-1	8/3/2023	1000	0.1	6.98	1260	11.14	6.74	10.4	-18
MW-1	8/3/2023	1000	3	6.98	1260	11.13	6.79	10.2	-17
MW-1	8/3/2023	1000	6	6.98	1260	11.14	6.82	10.1	-16
MW-1	8/3/2023	1000	8.5	6.98	1260	11.13	6.82	10.6	-15
MW-1	8/3/2023			6.97	1260	11.12	6.84	10.1	-12
MW-1RD	4/10/2023	1000	0.1	7.61	560	9.55	7.84	11.0	-34
MW-1RD	4/10/2023	1000	8	7.61	559	9.55	6.87	0.0	-43
MW-1RD	4/10/2023	1000	16	7.62	559	9.55	6.80	0.0	-43
MW-1RD	4/10/2023	1000	24	7.62	559	9.55	6.76	0.0	-44
MW-1RD	4/10/2023			7.62	558	9.56	6.44	0.0	-47
MW-1RD	8/3/2023	1000	0.1	7.96	609	11.14	1.79	10.4	-4
MW-1RD	8/3/2023	1000	10	7.53	657	9.40	0.00	11.0	-133
MW-1RD	8/3/2023	1000	20	7.38	660	9.32	0.00	9.7	-133
MW-1RD	8/3/2023	1000	23	7.34	660	9.36	0.00	7.7	-132
MW-1RD	8/3/2023			7.32	660	9.36	0.00	8.1	-132
MW-2R	4/10/2023	1000	0.1	6.53	1260	10.91	11.17	392	145
MW-2R	4/10/2023	1000	1	6.52	1270	11.20	11.06	392	155
MW-2R	4/10/2023	1000	1.5	6.52	1310	11.42	10.81	391	161
MW-2R	4/10/2023	1000	2	6.52	1390	11.44	10.80	391	162
MW-2R	4/10/2023			6.52	1300	11.57	10.72	392	165
MW-2R	8/3/2023	1000	0.1	6.98	1520	16.63	4.33	60.6	-5
MW-2R	8/3/2023	1000	0.5	6.89	1540	16.01	3.63	55.2	-32
MW-2R	8/3/2023	1000	1	6.84	1550	15.66	3.37	52.0	-55
MW-2R	8/3/2023	1000	1.5	6.82	1550	15.40	3.30	45.9	-75
MW-2R	8/3/2023			6.82	1550	15.40	3.30	45.9	-75
MW-2RD	4/10/2023	1000	0.1	7.33	859	12.12	0.12	11.5	82
MW-2RD	4/10/2023	1000	4	7.33	861	12.17	0.14	11.5	75
MW-2RD	4/10/2023	1000	8	7.32	864	12.20	0.05	10.5	69
MW-2RD	4/10/2023	1000	13	7.32	864	12.20	0.04	10.2	68
MW-2RD	4/10/2023			7.31	866	12.21	0.01	10.5	67
MW-2RD	8/3/2023	1000	0.1	7.06	1100	9.65	0.00	6.2	-103
MW-2RD	8/3/2023	1000	4	7.13	1110	9.62	0.00	6.2	-104
MW-2RD	8/3/2023	1000	8	7.00	1120	9.60	0.00	5.1	-96
MW-2RD	8/3/2023	1000	12	7.11	1130	9.57	0.00	5.0	-105
MW-2RD	8/3/2023			7.14	1130	9.55	0.00	5.0	-107
MW-3	4/11/2023	1000	0.1	6.92	885	10.10	0.00	26.5	-92
MW-3	4/11/2023	1000	2	6.92	885	10.09	0.00	24.3	-91
MW-3	4/11/2023	1000	4	6.92	884	10.07	0.00	24.7	-90
MW-3	4/11/2023	1000	6.5	6.92	883	10.05	0.00	23.7	-89
MW-3	4/11/2023			6.92	881	9.96	0.00	21.2	-87
MW-3	8/3/2023	1000	0.1	6.83	1630	10.52	0.00	7.1	-177
MW-3	8/3/2023	1000	1.5	6.82	1630	10.45	0.00	6.8	-175
MW-3	8/3/2023	1000	3	6.82	1630	10.45	0.00	6.6	-175
MW-3	8/3/2023	1000	4.5	6.82	1630	10.45	0.00	6.7	-175

Table 4

Well Stabilization Data

Well ID	Sample Date	Purge Rate (ml/min)	Purge Volume (gallons)	Field pH (pH)	Field Specific Conductivity (umhos/cm)	Field Temp (°C)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	ORP (mV)
MW-3	8/3/2023			6.81	1630	10.42	0.00	7.4	-175
MW-3R	4/11/2023	1000	0.1	7.49	1230	10.05	12.29	203	-74
MW-3R	4/11/2023	1000	3.5	7.19	1270	9.10	5.99	31.9	-112
MW-3R	4/11/2023	1000	7	7.01	1260	9.10	8.22	28.7	-120
MW-3R	4/11/2023	1000	10.5	6.91	1240	9.17	5.33	50.2	-125
MW-3R	4/11/2023			6.90	1240	9.16	9.64	31.3	-125
MW-3R	8/3/2023	1000	0.1	6.96	1470	9.74	0.73	159	-128
MW-3R	8/3/2023	1000	3	6.96	1490	9.26	0.25	30.9	-165
MW-3R	8/3/2023	1000	6	6.88	1510	9.13	0.56	117	-178
MW-3R	8/3/2023	1000	8.5	6.87	1530	9.10	0.33	40.9	-185
MW-3R	8/3/2023			6.86	1540	9.08	0.39	19.1	-185
MW-3RD	4/11/2023	1000	0.1	7.33	790	9.32	10.32	29.7	-77
MW-3RD	4/11/2023	1000	6.5	7.33	755	9.71	9.34	47.2	-90
MW-3RD	4/11/2023	1000	13	7.33	777	9.72	8.52	37.0	-93
MW-3RD	4/11/2023	1000	19	7.34	781	9.74	8.35	34.7	-92
MW-3RD	4/11/2023			7.34	780	9.74	7.82	32.0	-94
MW-3RD	8/3/2023	1000	0.1	7.15	914	9.66	1.05	31.7	-190
MW-3RD	8/3/2023	1000	6	7.26	923	9.52	0.08	37.5	-185
MW-3RD	8/3/2023	1000	12	7.34	912	9.48	0.00	75.1	-187
MW-3RD	8/3/2023	1000	17.5	7.31	934	9.49	0.00	78.9	-185
MW-3RD	8/3/2023			7.32	926	9.51	0.00	6.4	-184
MW-4	4/11/2023	1000	0.1	7.48	951	11.75	3.18	3.1	73
MW-4	4/11/2023	1000	2	7.44	876	8.95	0.00	7.1	66
MW-4	4/11/2023	1000	4	7.41	875	8.45	0.00	0.0	60
MW-4	4/11/2023	1000	6	7.39	882	8.16	0.00	0.0	58
MW-4	4/11/2023			7.39	885	8.09	0.00	0.0	57
MW-4	8/4/2023	1000	0.1	7.52	1160	12.27	2.32	5.1	32
MW-4	8/4/2023	1000	1.5	7.32	1190	11.73	0.06	0.0	44
MW-4	8/4/2023	1000	3	7.25	1200	11.38	0.00	0.0	48
MW-4	8/4/2023	1000	4.5	7.19	1200	11.21	0.00	0.0	50
MW-4	8/4/2023			7.19	1200	11.20	0.00	2.9	51

Notes:

ml/min	milliliters per minute
umhos/cm	micromhos per centimeter
°C	degrees Celsius
mg/L	milligrams per Liter
NTU	Nephelometric Turbidity Units
ORP	oxidation-reduction potential
mV	millivolts

Table 5

Background Threshold Values

Appendix III to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Boron	4.5	mg/l	7440-42-8
Calcium	287	mg/l	7440-70-2
Chloride	120	mg/l	16887-00-6
Fluoride	0.351	mg/l	15984-48-8
pH	lower 6.4 higher 7.7	pH UNITS	PH
Sulfate as SO4	481	mg/l	14808-79-8
Total Dissolved Solids	1889	mg/l	TDS

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Antimony	0.0200	mg/l	7440-36-0
Arsenic	0.0049	mg/l	7440-38-2
Barium	0.71	mg/l	7440-39-3
Beryllium	0.0010	mg/l	7440-41-7
Cadmium	0.0436	mg/l	7440-43-9
Chromium	0.0059	mg/l	7440-47-3
Cobalt	0.0076	mg/l	7440-48-4
Fluoride	0.352	mg/l	15984-48-8
Lead	0.0151	mg/l	7439-92-1
Lithium	0.041	mg/l	7439-93-2
Mercury	0.00030	mg/l	7439-97-6
Molybdenum	0.0221	mg/l	7439-98-7
Radium 226	1.874	pci/l	13982-63-3
Radium 228	2.234	pci/l	15262-20-1
Radium 226/228	4.108	pci/l	EDF-206
Selenium	0.034	mg/l	7782-49-2
Thallium	0.028	mg/l	7440-28-0

Results in milligrams per liter (mg/l) or picocuries per liter (pci/l)

Table 6

2023 Groundwater Protection Standards

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	EPA Maximum Contaminate Level (MCL)	Groundwater Protection Standard (GPS)	Units	CAS #
Antimony	0.0200	0.006	0.006	mg/l	7440-36-0
Arsenic	0.0049	0.010	0.0259	mg/l	7440-38-2
Barium	0.71	2	2	mg/l	7440-39-3
Beryllium	0.0010	0.004	0.004	mg/l	7440-41-7
Cadmium	0.0436	0.005	0.0502	mg/l	7440-43-9
Chromium	0.0059	0.1	0.1	mg/l	7440-47-3
Cobalt	0.0076	0.006	0.0081	mg/l	7440-48-4
Fluoride	0.352	4	4	mg/l	15984-48-8
Lead	0.0151	0.015	0.0179	mg/l	7439-92-1
Lithium	0.041	0.04	0.0455	mg/l	7439-93-2
Mercury	0.00030	0.002	0.002	mg/l	7439-97-6
Molybdenum	0.0221	0.1	0.1	mg/l	7439-98-7
Radium 226	1.874	--	--	pci/l	13982-63-3
Radium 228	2.234	--	--	pci/l	15262-20-1
Radium 226/228	4.108	5	5	pci/l	EDF-206
Selenium	0.034	0.05	0.05	mg/l	7782-49-2
Thallium	0.028	0.002	0.0102	mg/l	7440-28-0

Results in milligrams per liter (mg/l) or picocuries per liter (pci/l)

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1	04/10/2023	Antimony	< 0.0020	0.006	mg/l	7440-36-0
MW-1	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-1	04/10/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-1	08/03/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-1	04/10/2023	Barium	0.11	2	mg/l	7440-39-3
MW-1	08/03/2023	Barium	0.14	2	mg/l	7440-39-3
MW-1	04/10/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-1	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-1	04/10/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-1	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-1	04/10/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-1	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-1	04/10/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-1	08/03/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-1	04/10/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-1	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-1	04/10/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-1	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-1	04/10/2023	Lithium	0.015	0.0455	mg/l	7439-93-2
MW-1	08/03/2023	Lithium	0.040	0.0455	mg/l	7439-93-2
MW-1	04/10/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1	08/03/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1	04/10/2023	MOLYBDENUM	< 0.0020	0.1	mg/l	7439-98-7
MW-1	08/03/2023	MOLYBDENUM	< 0.0020	0.1	mg/l	7439-98-7
MW-1	04/10/2023	Radium (226)	< 0.200	--	pci/l	13982-63-3
MW-1	08/03/2023	Radium (226)	< 0.134	--	pci/l	13982-63-3
MW-1	04/10/2023	Radium 228	< 0.578	--	pci/l	15262-20-1
MW-1	08/03/2023	Radium 228	< 0.609	--	pci/l	15262-20-1
MW-1	04/10/2023	Radium-226/228	0.580	5	pci/l	425
MW-1	08/03/2023	Radium-226/228	< 0.609	5	pci/l	425
MW-1	04/10/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-1	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-1	04/10/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-1	08/03/2023	Thallium	0.0011	0.0102	mg/l	7440-28-0
MW-1RD	04/10/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-1RD	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-1RD	04/10/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-1RD	08/03/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-1RD	04/10/2023	Barium	0.15	2	mg/l	7440-39-3
MW-1RD	08/03/2023	Barium	0.15	2	mg/l	7440-39-3
MW-1RD	04/10/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-1RD	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-1RD	04/10/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-1RD	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-1RD	04/10/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-1RD	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-1RD	04/10/2023	Cobalt	0.00066	0.0081	mg/l	7440-48-4
MW-1RD	08/03/2023	Cobalt	0.00067	0.0081	mg/l	7440-48-4
MW-1RD	04/10/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-1RD	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-1RD	04/10/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-1RD	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1RD	04/10/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-1RD	08/03/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-1RD	04/10/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1RD	08/03/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1RD	04/10/2023	MOLYBDENUM	0.0031	0.1	mg/l	7439-98-7
MW-1RD	08/03/2023	MOLYBDENUM	0.0034	0.1	mg/l	7439-98-7
MW-1RD	04/10/2023	Radium (226)	0.381	--	pci/l	13982-63-3
MW-1RD	08/03/2023	Radium (226)	0.422	--	pci/l	13982-63-3
MW-1RD	04/10/2023	Radium 228	1.09	--	pci/l	15262-20-1
MW-1RD	08/03/2023	Radium 228	0.932	--	pci/l	15262-20-1
MW-1RD	04/10/2023	Radium-226/228	1.47	5	pci/l	425
MW-1RD	08/03/2023	Radium-226/228	1.35	5	pci/l	425
MW-1RD	04/10/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-1RD	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-1RD	04/10/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-1RD	08/03/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-2R	04/10/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-2R	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-2R	04/10/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-2R	08/03/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-2R	04/10/2023	Barium	0.20	2	mg/l	7440-39-3
MW-2R	08/03/2023	Barium	0.26	2	mg/l	7440-39-3
MW-2R	04/10/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-2R	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-2R	04/10/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-2R	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-2R	04/10/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-2R	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-2R	04/10/2023	Cobalt	0.0012	0.0081	mg/l	7440-48-4
MW-2R	08/03/2023	Cobalt	0.0017	0.0081	mg/l	7440-48-4
MW-2R	04/10/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-2R	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-2R	04/10/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-2R	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-2R	04/10/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-2R	08/03/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-2R	04/10/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2R	08/03/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2R	04/10/2023	MOLYBDENUM	< 0.0020	0.1	mg/l	7439-98-7
MW-2R	08/03/2023	MOLYBDENUM	0.0020	0.1	mg/l	7439-98-7
MW-2R	04/10/2023	Radium (226)	< 0.314	--	pci/l	13982-63-3
MW-2R	08/03/2023	Radium (226)	0.386	--	pci/l	13982-63-3
MW-2R	04/10/2023	Radium 228	< 0.731	--	pci/l	15262-20-1
MW-2R	08/03/2023	Radium 228	0.794	--	pci/l	15262-20-1
MW-2R	04/10/2023	Radium-226/228	0.760	5	pci/l	425
MW-2R	08/03/2023	Radium-226/228	1.18	5	pci/l	425
MW-2R	04/10/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-2R	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-2R	04/10/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-2R	08/03/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-2RD	04/10/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-2RD	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-2RD	04/10/2023	Arsenic	0.0021	0.0259	mg/l	7440-38-2
MW-2RD	08/03/2023	Arsenic	0.0023	0.0259	mg/l	7440-38-2
MW-2RD	04/10/2023	Barium	0.19	2	mg/l	7440-39-3
MW-2RD	08/03/2023	Barium	0.20	2	mg/l	7440-39-3
MW-2RD	04/10/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-2RD	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-2RD	04/10/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-2RD	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-2RD	04/10/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-2RD	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-2RD	04/10/2023	Cobalt	0.0026	0.0081	mg/l	7440-48-4
MW-2RD	08/03/2023	Cobalt	0.0031	0.0081	mg/l	7440-48-4
MW-2RD	04/10/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-2RD	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-2RD	04/10/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-2RD	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-2RD	04/10/2023	Lithium	0.012	0.0455	mg/l	7439-93-2
MW-2RD	08/03/2023	Lithium	0.012	0.0455	mg/l	7439-93-2
MW-2RD	04/10/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2RD	08/03/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2RD	04/10/2023	MOLYBDENUM	0.0027	0.1	mg/l	7439-98-7
MW-2RD	08/03/2023	MOLYBDENUM	0.0025	0.1	mg/l	7439-98-7
MW-2RD	04/10/2023	Radium (226)	0.697	--	pci/l	13982-63-3
MW-2RD	08/03/2023	Radium (226)	0.696	--	pci/l	13982-63-3
MW-2RD	04/10/2023	Radium 228	0.617	--	pci/l	15262-20-1
MW-2RD	08/03/2023	Radium 228	0.897	--	pci/l	15262-20-1
MW-2RD	04/10/2023	Radium-226/228	1.31	5	pci/l	425
MW-2RD	08/03/2023	Radium-226/228	1.59	5	pci/l	425
MW-2RD	04/10/2023	Selenium	0.033	0.05	mg/l	7782-49-2
MW-2RD	08/03/2023	Selenium	0.030	0.05	mg/l	7782-49-2
MW-2RD	04/10/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-2RD	08/03/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3	04/11/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3	04/11/2023	Arsenic	0.0035	0.0259	mg/l	7440-38-2
MW-3	08/03/2023	Arsenic	0.0028	0.0259	mg/l	7440-38-2
MW-3	04/11/2023	Barium	0.19	2	mg/l	7440-39-3
MW-3	08/03/2023	Barium	0.38	2	mg/l	7440-39-3
MW-3	04/11/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3	04/11/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3	04/11/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3	04/11/2023	Cobalt	0.0046	0.0081	mg/l	7440-48-4
MW-3	08/03/2023	Cobalt	0.0034	0.0081	mg/l	7440-48-4
MW-3	04/11/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-3	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-3	04/11/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3	04/11/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-3	08/03/2023	Lithium	0.018	0.0455	mg/l	7439-93-2

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3	04/11/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3	08/03/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3	04/11/2023	MOLYBDENUM	0.0044	0.1	mg/l	7439-98-7
MW-3	08/03/2023	MOLYBDENUM	0.0052	0.1	mg/l	7439-98-7
MW-3	04/11/2023	Radium (226)	< 0.313	--	pci/l	13982-63-3
MW-3	08/03/2023	Radium (226)	0.402	--	pci/l	13982-63-3
MW-3	04/11/2023	Radium 228	0.966	--	pci/l	15262-20-1
MW-3	08/03/2023	Radium 228	< 0.886	--	pci/l	15262-20-1
MW-3	04/11/2023	Radium-226/228	1.16	5	pci/l	425
MW-3	08/03/2023	Radium-226/228	0.945	5	pci/l	425
MW-3	04/11/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3	04/11/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3	08/03/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3R	04/11/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3R	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3R	04/11/2023	Arsenic	0.0023	0.0259	mg/l	7440-38-2
MW-3R	08/03/2023	Arsenic	0.0023	0.0259	mg/l	7440-38-2
MW-3R	04/11/2023	Barium	0.64	2	mg/l	7440-39-3
MW-3R	08/03/2023	Barium	0.65	2	mg/l	7440-39-3
MW-3R	04/11/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3R	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3R	04/11/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3R	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3R	04/11/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3R	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3R	04/11/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-3R	08/03/2023	Cobalt	0.00055	0.0081	mg/l	7440-48-4
MW-3R	04/11/2023	Fluoride	< 0.20	4	mg/l	16984-48-8
MW-3R	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-3R	04/11/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3R	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3R	04/11/2023	Lithium	0.020	0.0455	mg/l	7439-93-2
MW-3R	08/03/2023	Lithium	0.020	0.0455	mg/l	7439-93-2
MW-3R	04/11/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3R	08/03/2023	Mercury	0.00020	0.002	mg/l	7439-97-6
MW-3R	04/11/2023	MOLYBDENUM	< 0.0020	0.1	mg/l	7439-98-7
MW-3R	08/03/2023	MOLYBDENUM	< 0.0020	0.1	mg/l	7439-98-7
MW-3R	04/11/2023	Radium (226)	0.482	--	pci/l	13982-63-3
MW-3R	08/03/2023	Radium (226)	0.572	--	pci/l	13982-63-3
MW-3R	04/11/2023	Radium 228	< 0.864	--	pci/l	15262-20-1
MW-3R	08/03/2023	Radium 228	1.21	--	pci/l	15262-20-1
MW-3R	04/11/2023	Radium-226/228	0.953	5	pci/l	425
MW-3R	08/03/2023	Radium-226/228	1.78	5	pci/l	425
MW-3R	04/11/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3R	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3R	04/11/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3R	08/03/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3RD	04/11/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3RD	08/03/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-3RD	04/11/2023	Arsenic	0.0036	0.0259	mg/l	7440-38-2
MW-3RD	08/03/2023	Arsenic	0.0042	0.0259	mg/l	7440-38-2

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3RD	04/11/2023	Barium	0.18	2	mg/l	7440-39-3
MW-3RD	08/03/2023	Barium	0.21	2	mg/l	7440-39-3
MW-3RD	04/11/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3RD	08/03/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-3RD	04/11/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3RD	08/03/2023	Cadmium	< 0.00020	0.0502	mg/l	7440-43-9
MW-3RD	04/11/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3RD	08/03/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-3RD	04/11/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-3RD	08/03/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-3RD	04/11/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-3RD	08/03/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-3RD	04/11/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3RD	08/03/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-3RD	04/11/2023	Lithium	0.015	0.0455	mg/l	7439-93-2
MW-3RD	04/11/2023	Lithium	0.013	0.0455	mg/l	7439-93-2
MW-3RD	08/03/2023	Lithium	0.014	0.0455	mg/l	7439-93-2
MW-3RD	08/03/2023	Lithium	0.015	0.0455	mg/l	7439-93-2
MW-3RD	04/11/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3RD	08/03/2023	Mercury	0.00030	0.002	mg/l	7439-97-6
MW-3RD	04/11/2023	MOLYBDENUM	0.0035	0.1	mg/l	7439-98-7
MW-3RD	08/03/2023	MOLYBDENUM	0.0047	0.1	mg/l	7439-98-7
MW-3RD	04/11/2023	Radium (226)	0.750	--	pci/l	13982-63-3
MW-3RD	08/03/2023	Radium (226)	0.781	--	pci/l	13982-63-3
MW-3RD	04/11/2023	Radium 228	0.861	--	pci/l	15262-20-1
MW-3RD	08/03/2023	Radium 228	< 0.550	--	pci/l	15262-20-1
MW-3RD	04/11/2023	Radium-226/228	1.61	5	pci/l	425
MW-3RD	08/03/2023	Radium-226/228	1.09	5	pci/l	425
MW-3RD	04/11/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3RD	08/03/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-3RD	04/11/2023	Thallium	< 0.0010	0.0102	mg/l	7440-28-0
MW-3RD	08/03/2023	Thallium	0.0014	0.0102	mg/l	7440-28-0
MW-4	04/11/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-4	08/04/2023	Antimony	< 0.0020	0.0060	mg/l	7440-36-0
MW-4	04/11/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-4	08/04/2023	Arsenic	< 0.0020	0.0259	mg/l	7440-38-2
MW-4	04/11/2023	Barium	0.13	2	mg/l	7440-39-3
MW-4	08/04/2023	Barium	0.20	2	mg/l	7440-39-3
MW-4	04/11/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-4	08/04/2023	Beryllium	< 0.0010	0.004	mg/l	7440-41-7
MW-4	04/11/2023	Cadmium	0.00040	0.0502	mg/l	7440-43-9
MW-4	08/04/2023	Cadmium	0.00037	0.0502	mg/l	7440-43-9
MW-4	04/11/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-4	08/04/2023	Chromium	< 0.0050	0.1	mg/l	7440-47-3
MW-4	04/11/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-4	08/04/2023	Cobalt	< 0.00050	0.0081	mg/l	7440-48-4
MW-4	04/11/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-4	08/04/2023	Fluoride	< 1.0	4	mg/l	16984-48-8
MW-4	04/11/2023	Lead	0.00062	0.0179	mg/l	7439-92-1
MW-4	08/04/2023	Lead	< 0.00050	0.0179	mg/l	7439-92-1
MW-4	04/11/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2
MW-4	08/04/2023	Lithium	< 0.010	0.0455	mg/l	7439-93-2

Table 7

**Groundwater Analytical Data vs.
Groundwater Protection Standards - Appendix IV**

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-4	04/11/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-4	08/04/2023	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-4	04/11/2023	MOLYBDENUM	0.0023	0.1	mg/l	7439-98-7
MW-4	08/04/2023	MOLYBDENUM	0.0038	0.1	mg/l	7439-98-7
MW-4	04/11/2023	Radium (226)	< 0.249	--	pci/l	13982-63-3
MW-4	08/04/2023	Radium (226)	0.317	--	pci/l	13982-63-3
MW-4	04/11/2023	Radium 228	< 0.680	--	pci/l	15262-20-1
MW-4	08/04/2023	Radium 228	0.777	--	pci/l	15262-20-1
MW-4	04/11/2023	Radium-226/228	< 0.680	5	pci/l	425
MW-4	08/04/2023	Radium-226/228	1.09	5	pci/l	425
MW-4	04/11/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-4	08/04/2023	Selenium	< 0.0050	0.05	mg/l	7782-49-2
MW-4	04/11/2023	Thallium	0.0035	0.0102	mg/l	7440-28-0
MW-4	08/04/2023	Thallium	0.0028	0.0102	mg/l	7440-28-0

Bold = Indicates concentration above Background Threshold Value
Results in milligrams per liter (mg/l) or picocuries per liter (pci/l)

Appendix A – Field Data Sheets

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/10/22 12:50

Initial Water Level (feet): 2.91' ~~7.3~~

Ground Water Elevation (ft, msl): ~~1237.54~~

Top of Casing (ft, msl) 1244.84

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-1

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlegel

Casing Length (ft) 25.6

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 3.70 ~~3.1~~

Total Volume Purged (gal): 11.1

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 3.27

Date/Time Completed: 4/10/22 13:4~~5~~

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
12:50	1000	0.1	13.82	7.73	810	15.1	7.70	130
13:~~00~~	1000	4.0	6.92	7.53	904	12.7	7.38	156
13:30	1000	8.0	6.82	7.48	919	26.7	7.24	164
13:~~45~~	1000	11.1	6.88	7.44	922	4.0	7.28	170

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: 5 MW-1 12

Water Lever @ Sampling (ft): 3.27 Well Collection Sequence 5 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
4/10/23 13:45	VOCs: 100 Other: 1000	6.67	7.44	922	3.2	7.32	171

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 72°F, sunny, 5-10 mph SW

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: (Yes) No (circle)

Notes: _____

Minnesota Unique Well ID: 684911

Date: 4/10/23 By: M. Schlagel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/10/23 12:50

Initial Water Level (feet): 26.66' ~~28.61~~

Ground Water Elevation (ft, msl): ~~1216.91~~

Top of Casing (ft, msl) 1245.52

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-1RD

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): M. Schlegel

Casing Length (ft) 75.5

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 7.96 ~~7.9~~

Total Volume Purged (gal): 24.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 26.98'

Date/Time Completed: 4/10/23 13:40

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
1250	1000	0.1	9.55	7.61	560	11.0	7.84	-34
13:05	1000	8.0	9.55	7.61	559	0.0	6.87	-43
13:20	1000	16.0	9.55	7.62	559	0.0	6.80	-43
13:35	1000	24.0	9.55	7.62	559	0.0	6.76	-44

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-1RD

Water Lever @ Sampling (ft): 26.96'

Well Collection Sequence: 6 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
4/10/22 13:40	VOCs: 100 / Other: 1000	9.56	7.62	558	0.0	6.44	-47

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 72°F, sunny, 5-10 mph SW

Sampling Characteristics: Under

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785087

Date: 4/10/22 By: [signature] Title: Staff env. scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/10/23 14:20

Initial Water Level (feet): 8.49 ~~10.2~~

Ground Water Elevation (ft, msl): 1216.03

Top of Casing (ft, msl) 1226.23

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-2R

Duplicate Collected: No

Field Blank Collected: Yes

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): M. Schlagel

Casing Length (ft) 18.35

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.66 ~~201.2~~

Total Volume Purged (gal): 2.0 slow recharge

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 16.87

Date/Time Completed: 4/10/23 14:40

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
14:20	1000	0.1	12.91	6.53	1,260	392	11.17	145
14:25	1000	1.0	11.20	6.52	1,270	392	11.06	155
14:30	1000	1.5	11.42	6.52	1,310	391	10.92	161
14:35	1000	2.0	11.44	6.52	1,390	>91	10.80	162

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-2R

Water Lever @ Sampling (ft): 16.87 Well Collection Sequence 7 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
4/1/23 1440	VOCs: 100 Other: 100	11.57	6.52	1,300	392	10.72	165

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 72°F, sunny 10-15 mph SW

Sampling Characteristics: Clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785081

Date: 4/10/23 By: N. Schlorf Title: Staff Engr Scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/10/23

Initial Water Level (feet): 8.[illegible]' ~~10.32~~

Ground Water Elevation (ft, msl): 1216.05

Top of Casing (ft, msl) 1226.37

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-2RD

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlegel

Casing Length (ft) 35

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 4.33 ~~198.4~~

Total Volume Purged (gal): 13.0 [illegible]

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 8.71'

Date/Time Completed: 4/10/23 14:45

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
14:20	1000	0.1	~~10.9~~ 12.12	~~6.5~~ 7.33	859	~~392~~ 11.5	~~1.47~~ 0.12	~~148~~ 82
14:25	1000	4.0	12.17	7.33	861	11.5	0.14	75
14:30	1000	8.0	12.20	7.32	864	10.5	0.05	69
14:35	1000	13.0	12.20	7.32	864	10.2	0.04	68

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-2RD

Water Lever @ Sampling (ft): 9.76 Well Collection Sequence 8 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
14:45 4/10/23	VOCs: Other:	12.21	7.91	866	10.5	0.01	67

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 72 °F, sunny 10-15 mph SW

Sampling Characteristics: Clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785083

Date: 4/10/23 By: M. Schlagel Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/11/23 7:45

Initial Water Level (feet): 6.75' ~~9.35~~

Ground Water Elevation (ft, msl): ~~1215.84~~

Top of Casing (ft, msl) 1225.19

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-3R

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N.Schlegel

Casing Length (ft) 27.5

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 3.38 ~~199.6~~

Total Volume Purged (gal): 10.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 6.97'

Date/Time Completed: 4/11/23 8:05

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
7:45	1000	0.1	10.05	7.49	1,230	203	12.29	-74
7:50	1000	3.5	9.10	7.19	1,270	31.9	5.99	-112
7:55	1000	7.0	9.10	7.01	1,260	28.7	8.22	-120
8:00	1000	10.5	9.17	6.91	1,240	50.2	5.33	-125

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-3R

Water Lever @ Sampling (ft): 6.97' Well Collection Sequence 9 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: 1 Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
4/11/23 9:05	VOCs: 100 Other: 100	9.16	6.90	1,240	31.3	9.64	-125

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 52 °F, sunny, 0-5 mph SE

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/8

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785082

Date: 4/11/23 By: M. Schlorff Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 7:45 4/11/23

Initial Water Level (feet): 6.49 ~~9.3~~

Ground Water Elevation (ft, msl): ~~1213~~.85

Top of Casing (ft, msl) 1223.15

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-3

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): M. Schlegel

Casing Length (ft) 19.7

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 2.15 ~~1.7~~

Total Volume Purged (gal): 6.5

Purged Dry?: Yes No (circle)

Water Level After Purge (ft): 6.84'

Date/Time Completed: 4/11/23 8:20

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
7:45	1000	0.1	10.10	6.92	995	26.8	0.00	-92
7:55	1000	2.0	10.09	6.92	995	24.3	0.00	-91
8:05	1000	4.0	10.07	6.92	994	22.7	0.00	-90
8:15	1000	6.5	10.05	6.92	993	23.7	0.00	-89

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-3

Water Lever @ Sampling (ft): 6.84' Well Collection Sequence 10 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
9:20 5/11/23	VOCs: 100 Other: 100	9.96	6.92	991	21.2	0.00	-97

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 52°F, sunny, 0-5 mph SE

Sampling Characteristics: _____

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: 9/9

Well Closed and Locked: (Yes) No (circle)

Notes: _____

Minnesota Unique Well ID: 664913

Date: 5/11/23 By: M. Sullivan Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated:

Initial Water Level (feet): 7.62' ~~9.47~~

Ground Water Elevation (ft, msl): ~~1215.54~~

Top of Casing (ft, msl) 1225.01

PID (Background) 0.6 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-3RD

Duplicate Collected: Yes - DUP2

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: Yes

Sampler(s): N. Schlagel

Casing Length (ft) 46.25

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 6.3 ~~6.2~~

Total Volume Purged (gal): 19.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 7.84'

Date/Time Completed: 4/11/23 9:25

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
8:50	1000	0.1	9.32	7.34	790	29.7	10.32	-77
9:00	1000	6.5	9.71	7.33	755	47.2	9.34	-90
9:10	1000	13.0	9.72	7.33	777	37.0	8.52	-93
9:20	1000	19.0	9.74	7.34	781	34.7	8.35	-92

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-3RD

Water Lever @ Sampling (ft): 7.84' Well Collection Sequence 11 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
4/1/23 9:25	VOCs: 100 Other: 1000	9.74	7.34	700	32.0	7.02	-94

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 61 °F, sunny, 10-15 mph SW

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 785084

Date: 4/1/23 By: N. Schlagel Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/11/23 10:10

Initial Water Level (feet): 4.49 ~~8.63~~

Ground Water Elevation (ft, msl): ~~1217.34~~

Top of Casing (ft, msl) 1225.97

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-4

Duplicate Collected: No

Field Blank Collected: Yes

Equipment Blank Collected: Yes

MS/MSD Collected: No

Sampler(s): M. Schubert

Casing Length (ft) 18.3

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 2.17 ~~1.6~~

Total Volume Purged (gal): 6.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 5.87

Date/Time Completed: 4/11/23 10:45

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
10:10	1000	0.1	11.75	7.48	951	3.1	3.18	73
10:20	1000	2.0	8.95	7.44	876	2.1	0.00	68
10:30	1000	4.0	8.45	7.41	875	0.0	0.00	60
10:40	1000	6.0	8.16	7.39	882	0.0	0.00	58

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: MW-4

Water Lever @ Sampling (ft): 5.87 Well Collection Sequence 12 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
1022 4/11/23	VOCs: 100 Other: 1000	8.09	7.39	885	0.0	0.00	57

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 66 °F, sunny, 10-15 mph SW

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 604914

Date: 4/11/23 By: N. Schlaski Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

INSTRUMENT CALIBRATION DATA:

Start of day: (Date/Time)	4/10/22 7:30
End of day: (Date/Time)	4/10/22 20:00
YSI Model Number	V-5000
YSI Serial Number	38 10 AB 40
Sonde Model Number	V-52
Sonde Serial Number	V1056188X

Sampling Event

Time:	Value:		
7:30	-	NTU std =	DI Water
	100	NTU std =	100
	1409	uS std =	1409
	4.00	pH std =	4
	7.00	pH std =	7
	10.00	pH std =	10

Calibration Notes:

Groundwater Elevation Measurements
SKB Landfill (Lansing)

Site: SKB Lansing
Personnel: M. Schlegel

Well ID	Date	Time	Depth To Water:	Notes:
MW-101A	4/10/23	8:19	4.26'	
MW-102A		8:21	5.18'	
MW-103A		8:15	5.31'	
MW-104A		8:10	3.99'	
MW-105A		8:25	5.10'	
MW-106A		8:35	4.41'	
MW-107A		8:32	3.06'	
MW-108A		8:30	7.39'	
MW-1A		9:41	4.42'	
MW-2A		11:05	5.50'	
MW-3A		8:46	10.87'	
MW-4RA		10:26	21.45'	
MW-1		12:48	2.91	
MW-1RD		12:49	26.66'	
MW-2R		14:18	8.14'	
MW-2RD		14:19	8.42'	
MW-3		15:30	6.48'	
MW-3R		15:31	6.75'	
MW-3RD		15:32	7.62'	
MW-4		15:35	4.99'	
PIEZ-4		15:39	6.25'	
MW-5S		15:42	23.57'	
MW-5D		15:43	26.96'	
PIEZ-3		15:45	4.70'	
PIEZ-1		15:49	8.88'	
PIEZ-2		15:50	16.46'	
MW-6S		15:52	2.93'	
MW-8S		15:55	14.75'	
MW-8D		15:56	14.56'	
MW-7S		15:58	15.49'	
MW-7D		15:59	15.32'	
PIEZ-5		16:01	4.34'	
P-11		14:13	22.12'	
P-10		14:10	18.04'	

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

Eurofins Minneapolis SC 213

eurofins | Environment Testing America

Client Information	Sampler: N. Schlagel	Lab PM: Bindert, Zach T	Carrier Tracking No(s):	COC No: 310-68661-19671.1
Client Contact: Mr. Nicholas Schlagel	Phone: 651-792-6888	E-Mail: Zach.Bindert@Eurofinset.com	State of Origin: MN	Page: Page 1 of 1
Company: Groundwater & Environmental Services Inc	PWSID:			Job #:
Address: 1301 Corporate Center Drive Suite 190	Due Date Requested:			
City: Eagan	TAT Requested (days): Standard			
State, Zip: MN, 55121-1562	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order Requested			
Email: NSchlagel@gesonline.com	WO #:			
Project Name: SKB Lansing CCR Monitoring	Project #: 31013984			
Site: Minnesota	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Radium 226	Ra226Ra228_GFPC - Local Method	9320_Ra228 - Radium 228	9056A_ORGFM_28D - Chloride, Fluoride, Sulfate	Total Metals - 6020B - (Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,Li,Mo,Se,Tl) 7470A - Mercury	2540C_Calcd - TDS SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	D	N		
MW-1 - CCR	4/10/23	15:45	C	Water			X	X	X	X	X	X	5	
MW-1RD - CCR	4/10/23	13:40	G	Water			X	X	X	X	X	X	5	
MW-2R - CCR	4/10/23	14:40	G	Water			X	X	X	X	X	X	5	
MW-3 - CCR	4/11/23	8:20	G	Water			X	X	X	X	X	X	5	
MW-3R - CCR	4/11/23	8:05	G	Water			X	X	X	X	X	X	5	
MW-3RD - CCR	4/11/23	9:25	G	Water		Y	X	X	X	X	X	X	5	MS/MSD
MW-4 - CCR	4/11/23	10:45	G	Water			X	X	X	X	X	X	5	
MW-2RD - CCR	4/10/23	14:48	G	Water			X	X	X	X	X	X	5	
Field Blank 1 - CCR	4/10/23	16:15	G	Water			X	X	X	X	X	X	5	
Duplicate 1 - CCR	4/11/23	0:-	G	Water			X	X	X	X	X	X	5	
Equipment Blank - CCR	4/11/23	11:00	G	Water			X	X	X	X	X	X	5	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 4/11/23 1400	Company 1400 GES	Received by:	Date/Time: 4/11/23 1400	Company Eurofins
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23 13:40

Initial Water Level (feet): 8.85' ~~7.3~~

Ground Water Elevation (ft, msl): ~~1237.54~~

Top of Casing (ft, msl) ~~1244.84~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-1

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlegel

Casing Length (ft) 25.6

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 2.73 ~~3.1~~

Total Volume Purged (gal): 8.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 8.95'

Date/Time Completed: 8/3/23 14:35

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
13:40	1000	0.1	11.14	6.98	1,260	10.4	6.74	-18
13:58	1000	3.0	11.13	6.98	1,260	10.2	6.79	-17
14:12	1000	6.0	11.14	6.98	1,260	10.1	6.82	-16
14:30	1000	8.5	11.13	6.98	1,260	10.6	6.82	-15

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Water Lever @ Sampling (ft): 8.95

Sample Point ID: MW-1

Well Collection Sequence: 5 of 12

Parameters: Annual X Semiannual: _____

Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
14:35 8/3/23	VOCs: 100 Other: 1000	11.12	6.47	1,260	10.1	6.04	-12

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 87°F, partly cloudy 0-5 mph SW

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes / No (circle)

# of Bottles Collected: 9/5/2 (PFAS)

Well Closed and Locked: Yes / No (circle)

Notes: _____

Minnesota Unique Well ID: 664911

Date: 8/3/23 By: N. Schlegel Title: Staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23

Initial Water Level (feet): 29.40 ~~28.61~~

Ground Water Elevation (ft, msl): ~~1216.91~~

Top of Casing (ft, msl) ~~1245.52~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-1RD

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlodt

Casing Length (ft) 75.5

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 7.51 ~~7.9~~

Total Volume Purged (gal): 23.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 29.50

Date/Time Completed: 8/3/23 14:40

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
13:40	1000	0.1	11.14	7.96	609	10.4	1.79	-4
14:05	1000	18.0	9.40	7.53	657	11.0	0.00	-13
14:25	1000	20.0	9.32	7.38	680	9.7	0.00	~~-13~~ -133
14:30	1000	23.0	9.36	7.34	680	7.7	0.00	-132

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-1RD

Water Lever @ Sampling (ft): 29.50'

Well Collection Sequence 6 of 12

Parameters: Annual X Semiannual: _____

Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
11:40 8/3/23	VOCs: 100 Other: 1000	9.36	7.32	660	8.1	0.00	-132

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 86°F, partly cloudy

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle)

# of Bottles Collected: 9/5/2(PFAS)

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785087

Date: 8/3/23 By: N Schlegel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

Sample Location: MW-2R

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlegel

Casing Length (ft): 18.35

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.24 ~~201.2~~

Total Volume Purged (gal): 1.5 slow recharge

Purged Dry?: (Yes) No (circle)

Water Level After Purge (ft): 16.85

Date/Time Completed: 8/3/23 15:40

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23 15:20

Initial Water Level (feet): 10.75 ~~10.2~~

Ground Water Elevation (ft, msl): ~~1216.03~~

Top of Casing (ft, msl) ~~1226.23~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
15:20	1000	0.1	16.63	6.98	1,520	60.6	4.33	-5
15:25	1000	0.5	16.01	6.89	1,540	55.2	3.63	-32
15:30	1000	1.0	15.66	6.84	1,550	52.0	3.37	-55
15:35	1000	1.5	15.40	6.82	1,550	45.9	3.30	-75

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-2R

Water Lever @ Sampling (ft): 16.85

Well Collection Sequence 7 of 12

Parameters: Annual X Semiannual: _____

Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
15:40 8/3/23	VOCs: 100 Other: 1000	15.40	6.92	1,550	45.9	3.30	-75

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 88°F, partly cloudy 0-5 mph SW

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle)

# of Bottles Collected: 9/5/2 (PFAS)

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 785081

Date: 8/3/23 By: N-Schlagel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23 15:20

Initial Water Level (feet): 11.22' ~~10.32~~

Ground Water Elevation (ft, msl): ~~1216.05~~

Top of Casing (ft, msl) ~~1226.37~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-2RD

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): M. Schlegel

Casing Length (ft) 35

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 3.88 ~~198.4~~

Total Volume Purged (gal): 12.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 11.30'

Date/Time Completed: 8/3/23 16:00

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
15:20	1000	0.1	9.65	7.06	1,100	6.2	0.00	-103
15:30	1000	4.0	9.62	7.13	1,110	6.2	0.00	-104
15:40	1000	8.0	9.60	7.00	1,120	5.1	0.00	-96
15:50	1000	12.0	9.57	7.11	1,130	5.0	0.00	-105

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-2RD

Water Lever @ Sampling (ft): 11.30

Well Collection Sequence 8 of 12

Parameters: Annual _____ Semiannual: _____ Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
16:00 8/3/23	VOCs: 100 Other: 1000	9.55	7.14	1,130	5.0	0.00	-107

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 88° partly cloudy

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle)

# of Bottles Collected: 9/5/2 (PFAS)

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785083

Date: 8/3/23 By: N. Schlegel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

Sample Location: MW-3R

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): M. Schlagel

Casing Length (ft) 27.5

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23 1640

Initial Water Level (feet): 10.77 ~~9.35~~

Ground Water Elevation (ft, msl): ~~1215.84~~

Top of Casing (ft, msl) ~~1225.19~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 2.7 ~~199.6~~

Total Volume Purged (gal): 95

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 10.98'

Date/Time Completed: 8/3/23 1700

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
16:40	1000	0.1	9.74	6.96	1,470	159	0.73	-120
16:45	1000	3.0	9.26	6.96	1,490	30.9	0.25	-165
16:50	1000	6.6	9.13	6.98	1,510	117	0.56	-178
16:54	1000	8.5	9.10	6.97	1,530	40.9	0.33	-185

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-3R

Water Lever @ Sampling (ft): 10.98

Well Collection Sequence 9 of 12

Parameters: Annual X Semiannual: _____ Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
1700 9/13/23	VOCs: 100 Other: 1000	9.08	6.86	1,540	19.1	0.39	-185

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 90°F partly cloudy

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5/2 (PFAS)

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 785082

Date: 9/13/23 By: N Schlegel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 16:40

Initial Water Level (feet): 10.86' ~~9.3~~

Ground Water Elevation (ft, msl): ~~1213.85~~

Top of Casing (ft, msl) ~~1223.15~~

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

PURGE DATA

Sample Location: MW-3

Duplicate Collected: No

Field Blank Collected: No

Equipment Blank Collected: No

MS/MSD Collected: No

Sampler(s): N. Schlegel

Casing Length (ft) 19.7

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.44 ~~1.7~~

Total Volume Purged (gal): 4.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 12.25'

Date/Time Completed: 8/1/23 17:05

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
16:40	1000	0.1	~~10.52~~	6.88	1,630	~~5.2~~ 7.1	0.08	~~-178~~
16:45	1000	1.5	10.45	6.87	1,630	6.8	0.00	-175
16:50	1000	3.0	10.45	6.92	1,630	6.6	0.00	-175
16:55	1000	4.5	10.45	6.87	1,630	6.7	0.00	-175

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-3

Water Lever @ Sampling (ft): 12.25

Well Collection Sequence 10 of 12

Parameters: Annual X Semiannual: _____ Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
1725 8/15/23	VOCs: 100 Other: 1000	10.42	6.81	1,630	7.4	0.00	-175

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 88°F partly cloudy 0-5 mph SW

Sampling Characteristics: Clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: 9/5/2-PFAS

Well Closed and Locked: (Yes) No (circle)

Notes: _____

Minnesota Unique Well ID: 664913

Date: 8/15/23 By: N. Sundgren Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/3/23 17:25

Initial Water Level (feet): 10.68' ~~9.47~~

Ground Water Elevation (ft, msl): ~~1215.54~~

Top of Casing (ft, msl) 1225.01

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-3RD

Duplicate Collected: Yes Dup 2 ~~(LR)~~ (LR)

Field Blank Collected: ~~No~~ Yes (LR)

Equipment Blank Collected: No

MS/MSD Collected: Yes (LR)

Sampler(s): N Schlagel

Casing Length (ft) 46.25

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 5.8 ~~6.2~~

Total Volume Purged (gal): 17.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 10.88'

Date/Time Completed: 8/3/23 18:00

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
17:25	1000	0.1	9.66	7.16	914	31.7	1.05	-190
17:35	1000	6.0	9.52	7.26	923	37.5	0.08	-185
17:45	1000	12.0	9.48	7.34	912	75.1	0.00	-187
17:55	1000	17.5	9.49	7.31	934	78.9	0.00	-185

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-3RD

Water Lever @ Sampling (ft): 10.88'

Well Collection Sequence 11 of 12

Parameters: Annual X Semiannual: _____ Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
1800 8/3/21	VOCs: 100 Other: 1000	9.51	7.32	926	6.4	0.05	-104

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 88°F partly cloudy

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 9/5/2 PFAS

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 785084

Date: 8/3/21 By: M-Schlagel Title: staff env scientist

Company: Groundwater and Environmental Services, Inc.

FIELD INFORMATION LOG Part 1

Facility: SKB Landfill (Lansing)

Location: Austin, MN

Sample Matrix: Groundwater

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 8/4/23 6:45

Initial Water Level (feet): 9.47' ~~8.63~~

Ground Water Elevation (ft, msl): ~~1217.34~~

Top of Casing (ft, msl) 1225.97

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Sample Location: MW-4

Duplicate Collected: NO

Field Blank Collected: Yes (CLR)

Equipment Blank Collected: Yes

MS/MSD Collected: No

Sampler(s): N. Schlagel

Casing Length (ft) 18.3

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.44 ~~1.6~~

Total Volume Purged (gal): 4.5

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 9.75'

Date/Time Completed: 8/4/23 7:20

PURGE DATA

Time	Purge Rate (mL/min)	Cumulative Volume (gal)	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Disolved Oxygen (mg/L)	ORP (mV)
6:45	1000	0.1	12.27	7.52	1,160	5.1	2.32	32
6:55	1000	1.5	11.73	7.32	1,190	0.0	0.06	44
7:05	1000	3.0	11.38	7.25	1,200	0.0	0.00	48
7:15	1000	4.5	11.24	7.19	1,206	0.0	0.00	50

FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: MW-4

Water Lever @ Sampling (ft): 9.75'

Well Collection Sequence 12 of 12

Parameters: Annual X Semiannual: _____

Quarterly: _____ Monthly: _____ Other: _____

SAMPLE DATA:

Time & Date	Sample Rate	Temp (°C)	pH (std units)	Specific Conductance (uS - umhos/cm)	Turbidity (NTU)	Dissolved O_2 (mg/L)	O_2 Reduction Potential (mV)
8/4/23 7:20	VOCs: 100 Other: 1000	11.20	7.19	1,200	2.9	0.00	51

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 65°F sunny calm

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle)

# of Bottles Collected: 9/5/2 (PFAS)

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 664914

Date: 8/4/23 By: N. Scanlan Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

Groundwater Elevation Measurements
SKB Landfill (Lansing)

Site: SKB Lansing
Personnel: N. Schlagel

Well ID	Date	Time	Depth To Water:	Notes:
MW-101A	8/3/23	7:56	10.23'	
MW-102A		8:04	10.74'	
MW-103A		7:47	8.05'	
MW-104A		8:01	8.09'	
MW-105A		8:08	13.70'	
MW-106A		8:22	11.38	
MW-107A		8:19	8.45'	
MW-108A		8:17	14.25'	
MW-1A		9:25	12.72'	
MW-2A		11:15	7.55'	
MW-3A		8:40	14.12'	
MW-4RA		10:20	26.10'	
MW-1		13:38	8.85'	
MW-1RD		13:40	29.40'	
MW-2R		15:14	10.75'	
MW-2RD		15:20	11.22'	
MW-3		16:37	10.86'	
MW-3RB		16:38	10.77'	
MW-3RD		16:39	10.68'	
MW-4		19:52	9.74'	
PIEZ-4		18:59	10.07'	
MW-5S		19:02	29.70'	
MW-5D		19:04	29.87'	
PIEZ-3		19:07	10.14'	
PIEZ-1		19:11	11.06'	
PIEZ-2		19:16	19.85'	
MW-6S		19:20	6.08'	
MW-8S		19:24	18.04'	
MW-8D		19:25	17.91'	
MW-7S		19:28	18.86'	
MW-7D		19:29	18.81'	
PIEZ-5		19:37	6.57'	
P-11		15:12	23.58	
P-10	↓	13:24	20.88'	

INSTRUMENT CALIBRATION DATA:

Start of day: (Date/Time) 8/3/23 7:00

End of day: (Date/Time) 8/4/23 15:00

YSI Model Number V-5000

YSI Serial Number 05804JX

Sonde Model Number V-52

Sonde Serial Number V108312X

Sampling Event

Time:	Value:		
7:00	-	NTU std =	DI Water
	100	NTU std =	100
	1409	uS std =	1409
	4.00	pH std =	4
	7.00	pH std =	7
↓	10.00	pH std =	10

Calibration Notes:

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Eurofins Minneapolis SC
213

Chain of Custody Record

Eurofins Minneapolis SC

eurofins | Environment Testing America

Client Information	Sampler: N-Schlagel	Lab PM: Bindert, Zach T	Carrier Tracking No(s):	COC No: 310-68661-19671.1
Client Contact: Mr. Nicholas Schlagel	Phone: 651-792-6085	E-Mail: Zach.Bindert@Eurofinset.com	State of Origin: MN	Page: Page 1 of 2
Company: Groundwater & Environmental Services Inc	PWSID:			Job #:
Address: 1301 Corporate Center Drive Suite 190	Due Date Requested:			
City: Eagan	TAT Requested (days): Standard			
State, Zip: MN, 55121-1562	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order Requested			
Email: NSchlagel@gesonline.com	WO #:			
Project Name: SKB Lansing CCR Monitoring	Project #: 31013984			
Site: Minnesota	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Radium 226	Ra226Ra228_GFPC - Local Method	9320_Ra228 - Radium 228	9056A_ORGFM_28D - Chloride, Fluoride, Sulfate	Total Metals - 6020B - (Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,Li,Mo,Se,Tl) 7470A - Mercury	2540C_Calcd - TDS SM4500_H+ - pH							Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	D	N									
MW-1 - CCR	8/3/23	14:35	G	Water			X	X	X	X	X	X								5	
MW-1RD - CCR	8/3/23	14:40	G	Water			X	X	X	X	X	X								5	
MW-2R - CCR	8/3/23	15:40	G	Water			X	X	X	X	X	X								5	
MW-3 - CCR	8/3/23	17:05	G	Water			X	X	X	X	X	X								5	
MW-3R - CCR	8/3/23	17:00	G	Water			X	X	X	X	X	X								5	
MW-3RD - CCR	8/3/23	18:00	G	Water		Y	X	X	X	X	X	X								5	MS/MSD
MW-4 - CCR	8/4/23	7:20	G	Water			X	X	X	X	X	X								5	
MW-2RD - CCR	8/3/23	16:00	G	Water			X	X	X	X	X	X								5	
Field Blank 1 - CCR	8/4/23	7:30	G	Water			X	X	X	X	X	X								5	
Duplicate 1 - CCR	8/3/23	-	G	Water			X	X	X	X	X	X								5	
Equipment Blank - CCR	8/4/23	7:35	G	Water			X	X	X	X	X	X								5	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/23	GES		8/4/23 1700	
Relinquished by:	Date/Time: 8/4/23 1700		Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Appendix B – Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Megan Lindstrom
Waste Connections, Inc.
13425 Courthouse Blvd
Rosemount, Minnesota 55068

Generated 5/16/2023 1:15:56 PM

JOB DESCRIPTION

SKB Lansing CCR Monitoring
CCR Monitoring

JOB NUMBER

310-253383-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
5/16/2023 1:15:56 PM

Authorized for release by
Zach Bindert, Project Manager I
Zach.Bindert@et.eurofinsus.com
(319)277-2401

Table of Contents

Job ID: 310-253383-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-253383-1

Receipt
The samples were received on 4/12/2023 2:50 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.8°C, 1.5°C and 2.8°C

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 6020B: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-3R - CCR (310-253383-5). The sample(s) was preserved to the appropriate pH in the laboratory.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-253383-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-253383-2

Receipt
The samples were received on 4/12/2023 2:50 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.8°C, 1.5°C and 2.8°C

Gas Flow Proportional Counter
Method 9315_Ra226: Radium-226 batch 608368Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.MW-1 - CCR (310-253383-1), MW-1RD - CCR (310-253383-2), MW-2R - CCR (310-253383-3), MW-3 - CCR (310-253383-4), MW-3R - CCR (310-253383-5), MW-3RD - CCR (310-253383-6), MW-3RD - CCR (310-253383-6[MS]), MW-3RD - CCR (310-253383-6[MSD]), MW-4 - CCR (310-253383-7), MW-2RD - CCR (310-253383-8), Field Blank 1 - CCR (310-253383-9), Duplicate 1 - CCR (310-253383-10), Equipment Blank - CCR (310-253383-11), (LCS 160-608368/2-A) and (MB 160-608368/1-A)

Method 9320_Ra228: Radium-228 batch 608380The LCS recovered at (128%). The limits in our LIMS system at 75-125 reflect the requirements of a regulatory agency that represents a large amount of our work. However the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (62-148%) per method requirements. The LCS passes, no further action is required (LCS 160-608380/2-A)

Method 9320_Ra228: Radium-228 batch 608380Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.MW-1 - CCR (310-253383-1), MW-1RD - CCR (310-253383-2), MW-2R - CCR (310-253383-3), MW-3 - CCR (310-253383-4), MW-3R - CCR (310-253383-5), MW-3RD - CCR (310-253383-6), MW-3RD - CCR (310-253383-6[MS]), MW-3RD - CCR (310-253383-6[MSD]), MW-4 - CCR (310-253383-7), MW-2RD - CCR (310-253383-8), Field Blank 1 - CCR (310-253383-9), Duplicate 1 - CCR (310-253383-10), Equipment Blank - CCR

Job ID: 310-253383-2 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

(310-253383-11), (LCS 160-608380/2-A) and (MB 160-608380/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rad

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-253383-1	MW-1 - CCR	Water	04/10/23 13:45	04/12/23 14:50
310-253383-2	MW-1RD - CCR	Water	04/10/23 13:40	04/12/23 14:50
310-253383-3	MW-2R - CCR	Water	04/10/23 14:40	04/12/23 14:50
310-253383-4	MW-3 - CCR	Water	04/11/23 08:20	04/12/23 14:50
310-253383-5	MW-3R - CCR	Water	04/11/23 08:05	04/12/23 14:50
310-253383-6	MW-3RD - CCR	Water	04/11/23 09:25	04/12/23 14:50
310-253383-7	MW-4 - CCR	Water	04/11/23 10:45	04/12/23 14:50
310-253383-8	MW-2RD - CCR	Water	04/10/23 14:45	04/12/23 14:50
310-253383-9	Field Blank 1 - CCR	Water	04/10/23 16:15	04/12/23 14:50
310-253383-10	Duplicate 1 - CCR	Water	04/11/23 00:00	04/12/23 14:50
310-253383-11	Equipment Blank - CCR	Water	04/11/23 11:00	04/12/23 14:50

Detection Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-1 - CCR — Lab Sample ID: 310-253383-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	67		5.0		mg/L	5		9056A	Total/NA
Sulfate	170		5.0		mg/L	5		9056A	Total/NA
Barium	0.11		0.0020		mg/L	1		6020B	Total/NA
Calcium	136		0.50		mg/L	1		6020B	Total/NA
Lithium	0.015		0.010		mg/L	1		6020B	Total/NA
Total Dissolved Solids	626		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD - CCR — Lab Sample ID: 310-253383-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	23		5.0		mg/L	5		9056A	Total/NA
Sulfate	50		5.0		mg/L	5		9056A	Total/NA
Barium	0.15		0.0020		mg/L	1		6020B	Total/NA
Calcium	85.1		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.00066		0.00050		mg/L	1		6020B	Total/NA
Molybdenum	0.0031		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	292		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R - CCR — Lab Sample ID: 310-253383-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	76		5.0		mg/L	5		9056A	Total/NA
Sulfate	230		5.0		mg/L	5		9056A	Total/NA
Barium	0.20		0.0020		mg/L	1		6020B	Total/NA
Boron	4.5		0.10		mg/L	1		6020B	Total/NA
Calcium	197		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0012		0.00050		mg/L	1		6020B	Total/NA
Total Dissolved Solids	1010		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 - CCR — Lab Sample ID: 310-253383-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	38		5.0		mg/L	5		9056A	Total/NA
Sulfate	29		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0035		0.0020		mg/L	1		6020B	Total/NA
Barium	0.19		0.0020		mg/L	1		6020B	Total/NA
Boron	0.49		0.10		mg/L	1		6020B	Total/NA
Calcium	170		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0046		0.00050		mg/L	1		6020B	Total/NA
Molybdenum	0.0044		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	606		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3R - CCR — Lab Sample ID: 310-253383-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.7		1.0		mg/L	1		9056A	Total/NA
Sulfate	1.8		1.0		mg/L	1		9056A	Total/NA
Arsenic	0.0023		0.0020		mg/L	1		6020B	Total/NA
Barium	0.64		0.0020		mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-3R - CCR (Continued) — Lab Sample ID: 310-253383-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	252		0.50		mg/L	1		6020B	Total/NA
Lithium	0.020		0.010		mg/L	1		6020B	Total/NA
Total Dissolved Solids	852		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD - CCR — Lab Sample ID: 310-253383-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	31		5.0		mg/L	5		9056A	Total/NA
Sulfate	81		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0036		0.0020		mg/L	1		6020B	Total/NA
Barium	0.18	F1	0.0020		mg/L	1		6020B	Total/NA
Calcium	123		0.50		mg/L	1		6020B	Total/NA
Lithium	0.013		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0035		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	478		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4 - CCR — Lab Sample ID: 310-253383-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25		5.0		mg/L	5		9056A	Total/NA
Sulfate	200		5.0		mg/L	5		9056A	Total/NA
Barium	0.13		0.0020		mg/L	1		6020B	Total/NA
Boron	0.19		0.10		mg/L	1		6020B	Total/NA
Cadmium	0.00040		0.00020		mg/L	1		6020B	Total/NA
Calcium	130		0.50		mg/L	1		6020B	Total/NA
Lead	0.00062		0.00050		mg/L	1		6020B	Total/NA
Molybdenum	0.0023		0.0020		mg/L	1		6020B	Total/NA
Thallium	0.0035		0.0010		mg/L	1		6020B	Total/NA
Total Dissolved Solids	634		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2RD - CCR — Lab Sample ID: 310-253383-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	39		5.0		mg/L	5		9056A	Total/NA
Sulfate	77		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0021		0.0020		mg/L	1		6020B	Total/NA
Barium	0.19		0.0020		mg/L	1		6020B	Total/NA
Boron	0.16		0.10		mg/L	1		6020B	Total/NA
Calcium	160		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0026		0.00050		mg/L	1		6020B	Total/NA
Lithium	0.012		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0027		0.0020		mg/L	1		6020B	Total/NA
Selenium	0.033		0.0050		mg/L	1		6020B	Total/NA
Total Dissolved Solids	608		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Field Blank 1 - CCR — Lab Sample ID: 310-253383-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	0.64		0.50		mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Field Blank 1 - CCR (Continued)
Lab Sample ID: 310-253383-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Duplicate 1 - CCR
Lab Sample ID: 310-253383-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	40		5.0		mg/L	5		9056A	Total/NA
Sulfate	78		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0040		0.0020		mg/L	1		6020B	Total/NA
Barium	0.20		0.0020		mg/L	1		6020B	Total/NA
Calcium	132		0.50		mg/L	1		6020B	Total/NA
Lithium	0.015		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0039		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	466		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Equipment Blank - CCR
Lab Sample ID: 310-253383-11

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1 - CCR

Date Collected: 04/10/23 13:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**67**		5.0		mg/L			04/18/23 18:01	5
Fluoride	<1.0		1.0		mg/L			04/18/23 18:01	5
Sulfate	**170**		5.0		mg/L			04/18/23 18:01	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:08	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:08	1
Barium	**0.11**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:08	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:08	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 01:08	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:08	1
Calcium	**136**		0.50		mg/L		04/14/23 08:45	04/22/23 01:08	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:08	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:08	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:08	1
Lithium	**0.015**		0.010		mg/L		04/14/23 08:45	04/22/23 01:08	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:08	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:08	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:08	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**626**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.4**	**HF**	0.1		SU			04/12/23 18:50	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.200	U	0.118	0.118	1.00	0.200	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*83.3*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.578	U	0.378	0.381	1.00	0.578	pCi/L	04/21/23 13:16	05/13/23 10:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*83.3*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*
Y Carrier	*83.0*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-1 - CCR
Date Collected: 04/10/23 13:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-1
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.580		0.396	0.399	5.00	0.578	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-1RD - CCR

Date Collected: 04/10/23 13:40
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**23**		5.0		mg/L			04/18/23 18:17	5
Fluoride	<1.0		1.0		mg/L			04/18/23 18:17	5
Sulfate	**50**		5.0		mg/L			04/18/23 18:17	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:11	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:11	1
Barium	**0.15**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:11	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:11	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 01:11	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:11	1
Calcium	**85.1**		0.50		mg/L		04/14/23 08:45	04/22/23 01:11	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:11	1
Cobalt	**0.00066**		0.00050		mg/L		04/14/23 08:45	04/22/23 01:11	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:11	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 01:11	1
Molybdenum	**0.0031**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:11	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:11	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:11	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**292**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.4**	**HF**	0.1		SU			04/12/23 18:53	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.381**		0.171	0.175	1.00	0.198	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*84.8*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.09**		0.446	0.457	1.00	0.581	pCi/L	04/21/23 13:16	05/13/23 10:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*84.8*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*
Y Carrier	*84.9*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-1RD - CCR
Date Collected: 04/10/23 13:40
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-2
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.47		0.478	0.489	5.00	0.581	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-2R - CCR

Date Collected: 04/10/23 14:40
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**76**		5.0		mg/L			04/18/23 18:32	5
Fluoride	<1.0		1.0		mg/L			04/18/23 18:32	5
Sulfate	**230**		5.0		mg/L			04/18/23 18:32	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:14	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:14	1
Barium	**0.20**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:14	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:14	1
Boron	**4.5**		0.10		mg/L		04/14/23 08:45	04/22/23 01:14	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:14	1
Calcium	**197**		0.50		mg/L		04/14/23 08:45	04/22/23 01:14	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:14	1
Cobalt	**0.0012**		0.00050		mg/L		04/14/23 08:45	04/22/23 01:14	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:14	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 01:14	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:14	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:14	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:14	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1010**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.8**	**HF**	0.1		SU			04/12/23 18:55	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.314	U	0.203	0.204	1.00	0.314	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.7*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.731	U	0.466	0.469	1.00	0.731	pCi/L	04/21/23 13:16	05/13/23 10:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.7*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*
Y Carrier	*81.9*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-2R - CCR
Date Collected: 04/10/23 14:40
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-3
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.760		0.508	0.511	5.00	0.731	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-3 - CCR

Date Collected: 04/11/23 08:20
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**38**		5.0		mg/L			04/18/23 18:48	5
Fluoride	<1.0		1.0		mg/L			04/18/23 18:48	5
Sulfate	**29**		5.0		mg/L			04/18/23 18:48	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:17	1
Arsenic	**0.0035**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:17	1
Barium	**0.19**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:17	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:17	1
Boron	**0.49**		0.10		mg/L		04/14/23 08:45	04/22/23 01:17	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:17	1
Calcium	**170**		0.50		mg/L		04/14/23 08:45	04/22/23 01:17	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:17	1
Cobalt	**0.0046**		0.00050		mg/L		04/14/23 08:45	04/22/23 01:17	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:17	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 01:17	1
Molybdenum	**0.0044**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:17	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:17	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:17	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**606**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.8**	**HF**	0.1		SU			04/12/23 18:56	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.313	U	0.198	0.199	1.00	0.313	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*81.6*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.966**		0.566	0.573	1.00	0.819	pCi/L	04/21/23 13:16	05/13/23 10:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*81.6*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*
Y Carrier	*83.0*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-3 - CCR
Date Collected: 04/11/23 08:20
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-4
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.16		0.600	0.607	5.00	0.819	pCi/L		05/16/23 11:20	1

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-3R - CCR

Date Collected: 04/11/23 08:05
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**5.7**		1.0		mg/L			04/18/23 19:03	1
Fluoride	<0.20		0.20		mg/L			04/18/23 19:03	1
Sulfate	**1.8**		1.0		mg/L			04/18/23 19:03	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:20	1
Arsenic	**0.0023**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:20	1
Barium	**0.64**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:20	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:20	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 01:20	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:20	1
Calcium	**252**		0.50		mg/L		04/14/23 08:45	04/22/23 01:20	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:20	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:20	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:20	1
Lithium	**0.020**		0.010		mg/L		04/14/23 08:45	04/22/23 01:20	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:20	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:20	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:20	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**852**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.7**	**HF**	0.1		SU			04/12/23 18:57	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.482**		0.221	0.226	1.00	0.260	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*90.2*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.864	U	0.528	0.530	1.00	0.864	pCi/L	04/21/23 13:16	05/13/23 10:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*90.2*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*
Y Carrier	*77.8*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-3R - CCR
Date Collected: 04/11/23 08:05
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-5
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.953		0.572	0.576	5.00	0.864	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-3RD - CCR

Date Collected: 04/11/23 09:25
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-6

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**31**		5.0		mg/L			04/18/23 19:19	5
Fluoride	<1.0		1.0		mg/L			04/18/23 19:19	5
Sulfate	**81**		5.0		mg/L			04/18/23 19:19	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:22	1
Arsenic	**0.0036**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:22	1
Barium	**0.18**	**F1**	0.0020		mg/L		04/14/23 08:45	04/22/23 01:22	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:22	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 01:22	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:22	1
Calcium	**123**		0.50		mg/L		04/14/23 08:45	04/22/23 01:22	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:22	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:22	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:22	1
Lithium	**0.013**		0.010		mg/L		04/14/23 08:45	04/22/23 01:22	1
Molybdenum	**0.0035**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:22	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:22	1
Thallium	<0.0010	F1	0.0010		mg/L		04/14/23 08:45	04/22/23 01:22	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**478**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.1**	**HF**	0.1		SU			04/12/23 18:59	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.750**		0.212	0.222	1.00	0.194	pCi/L	04/21/23 12:23	05/15/23 18:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.9*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:33*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.861**		0.366	0.374	1.00	0.466	pCi/L	04/21/23 13:16	05/13/23 10:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.9*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*
Y Carrier	*87.1*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:41*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-3RD - CCR
Date Collected: 04/11/23 09:25
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-6
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.61		0.423	0.435	5.00	0.466	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-4 - CCR

Date Collected: 04/11/23 10:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25**		5.0		mg/L			04/18/23 20:37	5
Fluoride	<1.0		1.0		mg/L			04/18/23 20:37	5
Sulfate	**200**		5.0		mg/L			04/18/23 20:37	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:51	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:51	1
Barium	**0.13**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:51	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:51	1
Boron	**0.19**		0.10		mg/L		04/14/23 08:45	04/22/23 01:51	1
Cadmium	**0.00040**		0.00020		mg/L		04/14/23 08:45	04/22/23 01:51	1
Calcium	**130**		0.50		mg/L		04/14/23 08:45	04/22/23 01:51	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:51	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:51	1
Lead	**0.00062**		0.00050		mg/L		04/14/23 08:45	04/22/23 01:51	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 01:51	1
Molybdenum	**0.0023**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:51	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:51	1
Thallium	**0.0035**		0.0010		mg/L		04/14/23 08:45	04/22/23 01:51	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**634**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.0**	**HF**	0.1		SU			04/12/23 19:10	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.249	U	0.156	0.157	1.00	0.249	pCi/L	04/21/23 12:23	05/15/23 18:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*89.9*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:33*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.680	U	0.408	0.409	1.00	0.680	pCi/L	04/21/23 13:16	05/13/23 10:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*89.9*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*
Y Carrier	*84.1*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-4 - CCR
Date Collected: 04/11/23 10:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-7
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.680	U	0.437	0.438	5.00	0.680	pCi/L		05/16/23 11:20	1

Client Sample ID: MW-2RD - CCR

Date Collected: 04/10/23 14:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-8

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**39**		5.0		mg/L			04/18/23 20:52	5
Fluoride	<1.0		1.0		mg/L			04/18/23 20:52	5
Sulfate	**77**		5.0		mg/L			04/18/23 20:52	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:54	1
Arsenic	**0.0021**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:54	1
Barium	**0.19**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:54	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:54	1
Boron	**0.16**		0.10		mg/L		04/14/23 08:45	04/22/23 01:54	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:54	1
Calcium	**160**		0.50		mg/L		04/14/23 08:45	04/22/23 01:54	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:54	1
Cobalt	**0.0026**		0.00050		mg/L		04/14/23 08:45	04/22/23 01:54	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:54	1
Lithium	**0.012**		0.010		mg/L		04/14/23 08:45	04/22/23 01:54	1
Molybdenum	**0.0027**		0.0020		mg/L		04/14/23 08:45	04/22/23 01:54	1
Selenium	**0.033**		0.0050		mg/L		04/14/23 08:45	04/22/23 01:54	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:54	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**608**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.1**	**HF**	0.1		SU			04/12/23 19:03	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.697**		0.218	0.227	1.00	0.222	pCi/L	04/21/23 12:23	05/15/23 18:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.4*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:33*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.617**		0.352	0.357	1.00	0.498	pCi/L	04/21/23 13:16	05/13/23 10:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.4*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*
Y Carrier	*83.4*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-2RD - CCR
Date Collected: 04/10/23 14:45
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-8
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.31		0.414	0.423	5.00	0.498	pCi/L		05/16/23 11:20	1

Client Sample ID: Field Blank 1 - CCR

Date Collected: 04/10/23 16:15
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-9

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			04/18/23 21:08	1
Fluoride	<0.20		0.20		mg/L			04/18/23 21:08	1
Sulfate	<1.0		1.0		mg/L			04/18/23 21:08	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:57	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:57	1
Barium	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:57	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:57	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 01:57	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 01:57	1
Calcium	**0.64**		0.50		mg/L		04/14/23 08:45	04/22/23 01:57	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:57	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:57	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 01:57	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 01:57	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 01:57	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 01:57	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 01:57	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**5.9**	**HF**	0.1		SU			04/12/23 19:00	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.219	U	0.0842	0.0846	1.00	0.219	pCi/L	04/21/23 12:23	05/15/23 18:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.5*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:33*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.568	U	0.273	0.274	1.00	0.568	pCi/L	04/21/23 13:16	05/13/23 10:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.5*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*
Y Carrier	*80.0*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:42*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: Field Blank 1 - CCR

Lab Sample ID: 310-253383-9

Date Collected: 04/10/23 16:15

Matrix: Water

Date Received: 04/12/23 14:50

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.568	U	0.286	0.287	5.00	0.568	pCi/L		05/16/23 11:20	1

Client Sample ID: Duplicate 1 - CCR

Date Collected: 04/11/23 00:00
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-10

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**40**		5.0		mg/L			04/18/23 21:24	5
Fluoride	<1.0		1.0		mg/L			04/18/23 21:24	5
Sulfate	**78**		5.0		mg/L			04/18/23 21:24	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 02:00	1
Arsenic	**0.0040**		0.0020		mg/L		04/14/23 08:45	04/22/23 02:00	1
Barium	**0.20**		0.0020		mg/L		04/14/23 08:45	04/22/23 02:00	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 02:00	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 02:00	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 02:00	1
Calcium	**132**		0.50		mg/L		04/14/23 08:45	04/22/23 02:00	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 02:00	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 02:00	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 02:00	1
Lithium	**0.015**		0.010		mg/L		04/14/23 08:45	04/22/23 02:00	1
Molybdenum	**0.0039**		0.0020		mg/L		04/14/23 08:45	04/22/23 02:00	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 02:00	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 02:00	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**466**		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.2**	**HF**	0.1		SU			04/12/23 19:02	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.816**		0.229	0.240	1.00	0.200	pCi/L	04/21/23 12:23	05/15/23 18:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.0*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:33*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.621	U	0.396	0.398	1.00	0.621	pCi/L	04/21/23 13:16	05/13/23 10:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.0*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:34*	*1*
Y Carrier	*80.4*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:34*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: Duplicate 1 - CCR

Date Collected: 04/11/23 00:00
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-10

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.29		0.457	0.465	5.00	0.621	pCi/L		05/16/23 11:20	1

Client Sample ID: Equipment Blank - CCR

Date Collected: 04/11/23 11:00
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-11

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			04/18/23 21:39	1
Fluoride	<0.20		0.20		mg/L			04/18/23 21:39	1
Sulfate	<1.0		1.0		mg/L			04/18/23 21:39	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 02:03	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 02:03	1
Barium	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 02:03	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 02:03	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 02:03	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 02:03	1
Calcium	<0.50		0.50		mg/L		04/14/23 08:45	04/22/23 02:03	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 02:03	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 02:03	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 02:03	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 02:03	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 02:03	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 02:03	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 02:03	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			04/14/23 14:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.4**	**HF**	0.1		SU			04/12/23 19:33	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.170	U	0.0685	0.0686	1.00	0.170	pCi/L	04/21/23 12:23	05/15/23 18:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.7*		*30 - 110*	*04/21/23 12:23*	*05/15/23 18:35*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.671**		0.370	0.375	1.00	0.515	pCi/L	04/21/23 13:16	05/13/23 10:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.7*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:34*	*1*
Y Carrier	*82.6*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:34*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: Equipment Blank - CCR

Lab Sample ID: 310-253383-11

Date Collected: 04/11/23 11:00

Matrix: Water

Date Received: 04/12/23 14:50

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.640		0.376	0.381	5.00	0.515	pCi/L		05/16/23 11:20	1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-384817/39
Matrix: Water
Analysis Batch: 384817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			04/19/23 22:57	1
Fluoride	<0.20		0.20		mg/L			04/19/23 22:57	1
Sulfate	<1.0		1.0		mg/L			04/19/23 22:57	1

Lab Sample ID: LCS 310-384817/33
Matrix: Water
Analysis Batch: 384817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	10.2		mg/L		102	90 - 110

Lab Sample ID: LCS 310-384817/4
Matrix: Water
Analysis Batch: 384817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.88		mg/L		99	90 - 110
Fluoride	2.00	2.05		mg/L		103	90 - 110

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 384817

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	31		5.00	10.4	4	mg/L		-417	80 - 120
Fluoride	<1.0		1.00	0.946		mg/L		95	80 - 120
Sulfate	81		5.00	21.0	4	mg/L		-1206	80 - 120

Lab Sample ID: 310-253383-6 MSD
Matrix: Water
Analysis Batch: 384817

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	31		5.00	10.3	4	mg/L		-419	80 - 120	1	15
Fluoride	<1.0		1.00	0.920		mg/L		92	80 - 120	3	15
Sulfate	81		5.00	21.1	4	mg/L		-1204	80 - 120	0	15

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-384267/1-A
Matrix: Water
Analysis Batch: 385211

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 00:34	1
Arsenic	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 00:34	1
Barium	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 00:34	1
Beryllium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 00:34	1
Boron	<0.10		0.10		mg/L		04/14/23 08:45	04/22/23 00:34	1
Cadmium	<0.00020		0.00020		mg/L		04/14/23 08:45	04/22/23 00:34	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-384267/1-A
Matrix: Water
Analysis Batch: 385211

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<0.50		0.50		mg/L		04/14/23 08:45	04/22/23 00:34	1
Chromium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 00:34	1
Cobalt	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 00:34	1
Lead	<0.00050		0.00050		mg/L		04/14/23 08:45	04/22/23 00:34	1
Lithium	<0.010		0.010		mg/L		04/14/23 08:45	04/22/23 00:34	1
Molybdenum	<0.0020		0.0020		mg/L		04/14/23 08:45	04/22/23 00:34	1
Selenium	<0.0050		0.0050		mg/L		04/14/23 08:45	04/22/23 00:34	1
Thallium	<0.0010		0.0010		mg/L		04/14/23 08:45	04/22/23 00:34	1

Lab Sample ID: LCS 310-384267/2-A
Matrix: Water
Analysis Batch: 385211

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.215		mg/L		107	80 - 120
Arsenic	0.200	0.183		mg/L		91	80 - 120
Barium	0.100	0.0965		mg/L		97	80 - 120
Beryllium	0.100	0.0946		mg/L		95	80 - 120
Boron	0.200	0.172		mg/L		86	80 - 120
Cadmium	0.100	0.0911		mg/L		91	80 - 120
Calcium	2.00	2.01		mg/L		100	80 - 120
Chromium	0.100	0.0896		mg/L		90	80 - 120
Cobalt	0.100	0.0903		mg/L		90	80 - 120
Lead	0.200	0.201		mg/L		101	80 - 120
Lithium	0.200	0.197		mg/L		98	80 - 120
Molybdenum	0.200	0.186		mg/L		93	80 - 120
Selenium	0.400	0.368		mg/L		92	80 - 120

Lab Sample ID: LCS 310-384267/2-A
Matrix: Water
Analysis Batch: 385266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	0.200	0.169		mg/L		85	80 - 120

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 385211

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 384267

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.0020		0.200	0.229		mg/L		114	75 - 125
Arsenic	0.0036		0.200	0.199		mg/L		97	75 - 125
Barium	0.18	F1	0.100	0.296		mg/L		112	75 - 125
Beryllium	<0.0010		0.100	0.101		mg/L		101	75 - 125
Boron	<0.10		0.200	0.226		mg/L		113	75 - 125
Cadmium	<0.00020		0.100	0.0945		mg/L		94	75 - 125
Calcium	123		2.00	127.9	4	mg/L		235	75 - 125
Chromium	<0.0050		0.100	0.0922		mg/L		92	75 - 125
Cobalt	<0.00050		0.100	0.0927		mg/L		92	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 385211

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 384267

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	<0.00050		0.200	0.208		mg/L		104	75 - 125
Lithium	0.013		0.200	0.216		mg/L		102	75 - 125
Molybdenum	0.0035		0.200	0.201		mg/L		99	75 - 125
Selenium	<0.0050		0.400	0.395		mg/L		99	75 - 125
Thallium	<0.0010	F1	0.200	0.145	F1	mg/L		72	75 - 125

Lab Sample ID: 310-253383-6 MSD
Matrix: Water
Analysis Batch: 385211

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 384267

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<0.0020		0.200	0.246		mg/L		123	75 - 125	7	20
Arsenic	0.0036		0.200	0.214		mg/L		105	75 - 125	8	20
Barium	0.18	F1	0.100	0.315	F1	mg/L		131	75 - 125	6	20
Beryllium	<0.0010		0.100	0.108		mg/L		108	75 - 125	7	20
Boron	<0.10		0.200	0.247		mg/L		123	75 - 125	9	20
Cadmium	<0.00020		0.100	0.0998		mg/L		100	75 - 125	5	20
Calcium	123		2.00	137.3	4	mg/L		708	75 - 125	7	20
Chromium	<0.0050		0.100	0.100		mg/L		100	75 - 125	8	20
Cobalt	<0.00050		0.100	0.0988		mg/L		98	75 - 125	6	20
Lead	<0.00050		0.200	0.227		mg/L		113	75 - 125	9	20
Lithium	0.013		0.200	0.234		mg/L		110	75 - 125	8	20
Molybdenum	0.0035		0.200	0.220		mg/L		108	75 - 125	9	20
Selenium	<0.0050		0.400	0.429		mg/L		107	75 - 125	8	20
Thallium	<0.0010	F1	0.200	0.163		mg/L		82	75 - 125	12	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-384510/1-A
Matrix: Water
Analysis Batch: 384701

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384510

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		04/17/23 11:18	04/18/23 14:12	1

Lab Sample ID: LCS 310-384510/2-A
Matrix: Water
Analysis Batch: 384701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.00168		mg/L		101	80 - 120

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 384701

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 384510

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00020		0.00167	0.00169		mg/L		102	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 310-253383-6 MSD
Matrix: Water
Analysis Batch: 384701

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 384510

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00167	0.00168		mg/L		101	80 - 120	0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-384370/1
Matrix: Water
Analysis Batch: 384370

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			04/14/23 14:16	1

Lab Sample ID: LCS 310-384370/2
Matrix: Water
Analysis Batch: 384370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	976.0		mg/L		98	90 - 110

Lab Sample ID: 310-253383-6 DU
Matrix: Water
Analysis Batch: 384370

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	478		478.0		mg/L		0	20

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-384131/1
Matrix: Water
Analysis Batch: 384131

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: LCS 310-384131/26
Matrix: Water
Analysis Batch: 384131

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.1		SU		101	98 - 102

Lab Sample ID: 310-253383-1 DU
Matrix: Water
Analysis Batch: 384131

Client Sample ID: MW-1 - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.4	HF	7.3		SU		0.4	20

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: 310-253383-6 DU
Matrix: Water
Analysis Batch: 384131

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.1	HF	7.1		SU		0.1	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-608368/1-A
Matrix: Water
Analysis Batch: 611628

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 608368

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.198	U	0.115	0.115	1.00	0.198	pCi/L	04/21/23 12:23	05/15/23 15:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*92.1*		*30 - 110*	*04/21/23 12:23*	*05/15/23 15:35*	*1*

Lab Sample ID: LCS 160-608368/2-A
Matrix: Water
Analysis Batch: 611628

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 608368

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.35		1.19	1.00	0.223	pCi/L	91	75 - 113

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*86.0*		*30 - 110*

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 611628

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 608368

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	0.750		11.3	10.23		1.19	1.00	0.232	pCi/L	84	60 - 140

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Barium	*79.6*		*30 - 110*

Lab Sample ID: 310-253383-6 MSD
Matrix: Water
Analysis Batch: 611628

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 608368

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	0.750		11.3	10.69		1.23	1.00	0.197	pCi/L	88	60 - 140	0.19	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Barium	*82.8*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-608380/1-A
Matrix: Water
Analysis Batch: 611455

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 608380

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.542	U	0.309	0.309	1.00	0.542	pCi/L	04/21/23 13:16	05/13/23 10:39	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*92.1*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*
Y Carrier	*83.4*		*30 - 110*	*04/21/23 13:16*	*05/13/23 10:39*	*1*

Lab Sample ID: LCS 160-608380/2-A
Matrix: Water
Analysis Batch: 611455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 608380

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			7.96	10.17		1.42	1.00	0.686	pCi/L	128	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*86.0*		*30 - 110*
Y Carrier	*81.5*		*30 - 110*

Lab Sample ID: 310-253383-6 MS
Matrix: Water
Analysis Batch: 611455

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 608380

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228	0.861		7.97	9.293		1.34	1.00	0.647	pCi/L	106	60 - 140		

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Barium	*79.6*		*30 - 110*
Y Carrier	*84.1*		*30 - 110*

Lab Sample ID: 310-253383-6 MSD
Matrix: Water
Analysis Batch: 611455

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 608380

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228	0.861		7.95	9.825		1.39	1.00	0.608	pCi/L	113	60 - 140	0.20	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Barium	*82.8*		*30 - 110*
Y Carrier	*80.7*		*30 - 110*

HPLC/IC

Analysis Batch: 384817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	9056A	
310-253383-2	MW-1RD - CCR	Total/NA	Water	9056A	
310-253383-3	MW-2R - CCR	Total/NA	Water	9056A	
310-253383-4	MW-3 - CCR	Total/NA	Water	9056A	
310-253383-5	MW-3R - CCR	Total/NA	Water	9056A	
310-253383-6	MW-3RD - CCR	Total/NA	Water	9056A	
310-253383-7	MW-4 - CCR	Total/NA	Water	9056A	
310-253383-8	MW-2RD - CCR	Total/NA	Water	9056A	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	9056A	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	9056A	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	9056A	
MB 310-384817/39	Method Blank	Total/NA	Water	9056A	
LCS 310-384817/33	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-384817/4	Lab Control Sample	Total/NA	Water	9056A	
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	9056A	
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	9056A	

Metals

Prep Batch: 384267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	3005A	
310-253383-2	MW-1RD - CCR	Total/NA	Water	3005A	
310-253383-3	MW-2R - CCR	Total/NA	Water	3005A	
310-253383-4	MW-3 - CCR	Total/NA	Water	3005A	
310-253383-5	MW-3R - CCR	Total/NA	Water	3005A	
310-253383-6	MW-3RD - CCR	Total/NA	Water	3005A	
310-253383-7	MW-4 - CCR	Total/NA	Water	3005A	
310-253383-8	MW-2RD - CCR	Total/NA	Water	3005A	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	3005A	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	3005A	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	3005A	
MB 310-384267/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-384267/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	3005A	
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	3005A	

Prep Batch: 384510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	7470A	
310-253383-2	MW-1RD - CCR	Total/NA	Water	7470A	
310-253383-3	MW-2R - CCR	Total/NA	Water	7470A	
310-253383-4	MW-3 - CCR	Total/NA	Water	7470A	
310-253383-5	MW-3R - CCR	Total/NA	Water	7470A	
310-253383-6	MW-3RD - CCR	Total/NA	Water	7470A	
310-253383-7	MW-4 - CCR	Total/NA	Water	7470A	
310-253383-8	MW-2RD - CCR	Total/NA	Water	7470A	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	7470A	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	7470A	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	7470A	
MB 310-384510/1-A	Method Blank	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 384510 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-384510/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	7470A	
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	7470A	

Analysis Batch: 384701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	7470A	384510
310-253383-2	MW-1RD - CCR	Total/NA	Water	7470A	384510
310-253383-3	MW-2R - CCR	Total/NA	Water	7470A	384510
310-253383-4	MW-3 - CCR	Total/NA	Water	7470A	384510
310-253383-5	MW-3R - CCR	Total/NA	Water	7470A	384510
310-253383-6	MW-3RD - CCR	Total/NA	Water	7470A	384510
310-253383-7	MW-4 - CCR	Total/NA	Water	7470A	384510
310-253383-8	MW-2RD - CCR	Total/NA	Water	7470A	384510
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	7470A	384510
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	7470A	384510
310-253383-11	Equipment Blank - CCR	Total/NA	Water	7470A	384510
MB 310-384510/1-A	Method Blank	Total/NA	Water	7470A	384510
LCS 310-384510/2-A	Lab Control Sample	Total/NA	Water	7470A	384510
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	7470A	384510
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	7470A	384510

Analysis Batch: 385211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	6020B	384267
310-253383-2	MW-1RD - CCR	Total/NA	Water	6020B	384267
310-253383-3	MW-2R - CCR	Total/NA	Water	6020B	384267
310-253383-4	MW-3 - CCR	Total/NA	Water	6020B	384267
310-253383-5	MW-3R - CCR	Total/NA	Water	6020B	384267
310-253383-6	MW-3RD - CCR	Total/NA	Water	6020B	384267
310-253383-7	MW-4 - CCR	Total/NA	Water	6020B	384267
310-253383-8	MW-2RD - CCR	Total/NA	Water	6020B	384267
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	6020B	384267
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	6020B	384267
310-253383-11	Equipment Blank - CCR	Total/NA	Water	6020B	384267
MB 310-384267/1-A	Method Blank	Total/NA	Water	6020B	384267
LCS 310-384267/2-A	Lab Control Sample	Total/NA	Water	6020B	384267
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	6020B	384267
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	6020B	384267

Analysis Batch: 385266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-384267/2-A	Lab Control Sample	Total/NA	Water	6020B	384267

General Chemistry

Analysis Batch: 384131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-2	MW-1RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-3	MW-2R - CCR	Total/NA	Water	SM 4500 H+ B	

General Chemistry (Continued)

Analysis Batch: 384131 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-4	MW-3 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-5	MW-3R - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-6	MW-3RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-7	MW-4 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-8	MW-2RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	SM 4500 H+ B	
LCS 310-384131/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCS 310-384131/26	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-253383-1 DU	MW-1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-253383-6 DU	MW-3RD - CCR	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 384370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	SM 2540C	
310-253383-2	MW-1RD - CCR	Total/NA	Water	SM 2540C	
310-253383-3	MW-2R - CCR	Total/NA	Water	SM 2540C	
310-253383-4	MW-3 - CCR	Total/NA	Water	SM 2540C	
310-253383-5	MW-3R - CCR	Total/NA	Water	SM 2540C	
310-253383-6	MW-3RD - CCR	Total/NA	Water	SM 2540C	
310-253383-7	MW-4 - CCR	Total/NA	Water	SM 2540C	
310-253383-8	MW-2RD - CCR	Total/NA	Water	SM 2540C	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	SM 2540C	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	SM 2540C	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	SM 2540C	
MB 310-384370/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-384370/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-253383-6 DU	MW-3RD - CCR	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 608368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	PrecSep-21	
310-253383-2	MW-1RD - CCR	Total/NA	Water	PrecSep-21	
310-253383-3	MW-2R - CCR	Total/NA	Water	PrecSep-21	
310-253383-4	MW-3 - CCR	Total/NA	Water	PrecSep-21	
310-253383-5	MW-3R - CCR	Total/NA	Water	PrecSep-21	
310-253383-6	MW-3RD - CCR	Total/NA	Water	PrecSep-21	
310-253383-7	MW-4 - CCR	Total/NA	Water	PrecSep-21	
310-253383-8	MW-2RD - CCR	Total/NA	Water	PrecSep-21	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	PrecSep-21	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	PrecSep-21	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	PrecSep-21	
MB 160-608368/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-608368/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	PrecSep-21	
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	PrecSep-21	

QC Association Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Rad

Prep Batch: 608380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253383-1	MW-1 - CCR	Total/NA	Water	PrecSep_0	
310-253383-2	MW-1RD - CCR	Total/NA	Water	PrecSep_0	
310-253383-3	MW-2R - CCR	Total/NA	Water	PrecSep_0	
310-253383-4	MW-3 - CCR	Total/NA	Water	PrecSep_0	
310-253383-5	MW-3R - CCR	Total/NA	Water	PrecSep_0	
310-253383-6	MW-3RD - CCR	Total/NA	Water	PrecSep_0	
310-253383-7	MW-4 - CCR	Total/NA	Water	PrecSep_0	
310-253383-8	MW-2RD - CCR	Total/NA	Water	PrecSep_0	
310-253383-9	Field Blank 1 - CCR	Total/NA	Water	PrecSep_0	
310-253383-10	Duplicate 1 - CCR	Total/NA	Water	PrecSep_0	
310-253383-11	Equipment Blank - CCR	Total/NA	Water	PrecSep_0	
MB 160-608380/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-608380/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
310-253383-6 MS	MW-3RD - CCR	Total/NA	Water	PrecSep_0	
310-253383-6 MSD	MW-3RD - CCR	Total/NA	Water	PrecSep_0	

Client Sample ID: MW-1 - CCR

Lab Sample ID: 310-253383-1

Date Collected: 04/10/23 13:45

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 18:01
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:08
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:19
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:50
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 15:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:39
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-1RD - CCR

Lab Sample ID: 310-253383-2

Date Collected: 04/10/23 13:40

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 18:17
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:11
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:21
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:53
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 15:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:39
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-2R - CCR

Lab Sample ID: 310-253383-3

Date Collected: 04/10/23 14:40

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 18:32
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:14
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:23
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:55

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-2R - CCR

Lab Sample ID: 310-253383-3

Date Collected: 04/10/23 14:40

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 15:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:39
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-3 - CCR

Lab Sample ID: 310-253383-4

Date Collected: 04/11/23 08:20

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 18:48
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:17
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:25
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:56
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 15:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:41
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-3R - CCR

Lab Sample ID: 310-253383-5

Date Collected: 04/11/23 08:05

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	384817	QTZ5	EET CF	04/18/23 19:03
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:20
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:27
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:57
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 15:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:41
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-3RD - CCR

Lab Sample ID: 310-253383-6

Date Collected: 04/11/23 09:25

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 19:19
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:22
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:29
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 18:59
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 18:33
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:41
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-4 - CCR

Lab Sample ID: 310-253383-7

Date Collected: 04/11/23 10:45

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 20:37
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:51
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:40
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 19:10
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 18:33
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:42
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: MW-2RD - CCR

Lab Sample ID: 310-253383-8

Date Collected: 04/10/23 14:45

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 20:52
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:54
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:42
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 19:03

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: MW-2RD - CCR

Lab Sample ID: 310-253383-8

Date Collected: 04/10/23 14:45

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 18:33
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:42
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: Field Blank 1 - CCR

Lab Sample ID: 310-253383-9

Date Collected: 04/10/23 16:15

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	384817	QTZ5	EET CF	04/18/23 21:08
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 01:57
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:44
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 19:00
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 18:33
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611455	FLC	EET SL	05/13/23 10:42
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Client Sample ID: Duplicate 1 - CCR

Lab Sample ID: 310-253383-10

Date Collected: 04/11/23 00:00

Matrix: Water

Date Received: 04/12/23 14:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	384817	QTZ5	EET CF	04/18/23 21:24
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 02:00
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:47
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 19:02
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611628	FLC	EET SL	05/15/23 18:33
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611456	FLC	EET SL	05/13/23 10:34
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Client Sample ID: Equipment Blank - CCR

Date Collected: 04/11/23 11:00
Date Received: 04/12/23 14:50

Lab Sample ID: 310-253383-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	384817	QTZ5	EET CF	04/18/23 21:39
Total/NA	Prep	3005A			384267	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385211	ZRI4	EET CF	04/22/23 02:03
Total/NA	Prep	7470A			384510	XXW3	EET CF	04/17/23 11:18
Total/NA	Analysis	7470A		1	384701	XXW3	EET CF	04/18/23 14:49
Total/NA	Analysis	SM 2540C		1	384370	HE7K	EET CF	04/14/23 14:16
Total/NA	Analysis	SM 4500 H+ B		1	384131	DN3P	EET CF	04/12/23 19:33
Total/NA	Prep	PrecSep-21			608368	KAC	EET SL	04/21/23 12:23
Total/NA	Analysis	9315		1	611503	FLC	EET SL	05/15/23 18:35
Total/NA	Prep	PrecSep_0			608380	KAC	EET SL	04/21/23 13:16
Total/NA	Analysis	9320		1	611456	FLC	EET SL	05/13/23 10:34
Total/NA	Analysis	Ra226_Ra228		1	611841	SCB	EET SL	05/16/23 11:20

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 310-253383-1
Project/Site: SKB Lansing CCR Monitoring

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Minnesota	NELAP	019-999-319	12-31-23

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-23
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-23
Kentucky (DW)	State	KY90125	12-31-23
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-23
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-23
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	03-31-24
North Carolina (DW)	State	29700	07-31-23
North Dakota	State	R-207	06-30-23
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-24
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	06-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-23
West Virginia DEP	State	381	10-31-23

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

eurofins | Environment Testing America

310-253383 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY Eagan STATE MN Project:

Receipt Information

Date/Time Received: DATE 4/12/23 TIME 1450 Received By: LR

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 1 of 3

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

MW-2R-CCR, MW-2RD-CCR, MW-1RD-CCR, Field Blank 1-CCR, MW-1-CCR

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: P Correction Factor (°C): +0.2

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.6 Corrected Temp (°C): 2.8

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:	1L Plastic NP	
Uncorrected Temp (°C):	1.1	
Corrected Temp (°C):	1.3	

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY Eagan STATE MN Project:

Receipt Information

Date/Time Received: DATE 4/12/23 TIME 1450 Received By: LR

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 2 of 3

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Equipment Blank-CCR, MW-4-CCR, MW-3RD MS, MW-3RD MSD

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: P Correction Factor (°C): +0.2

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.3 Corrected Temp (°C): 1.5

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:	1L PI NP	
Uncorrected Temp (°C):	2.1	
Corrected Temp (°C):	2.3	

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY Eagan STATE MN Project:

Receipt Information

Date/Time Received: DATE 4/12/23 TIME 1450 Received By: LR

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 3 of 3

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Duplicate 1-CCR, MW-3RD-CCR, MW-3-CCR, MW-3R-CCR

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: P Correction Factor (°C): +0.2

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.6 Corrected Temp (°C): 0.8

Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):	1.	
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE. If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

Eurofins Minneapolis SC 213

eurofins | Environment Testing America

Client Information	Sampler: N. Schlagel	Lab PM: Bindert, Zach T	Carrier Tracking No(s):	COC No: 310-68661-19671 1
Client Contact: Mr Nicholas Schlagel	Phone: 651-792-6888	E-Mail: Zach.Bindert@Eurofinset.com	State of Origin: MN	Page: Page 1 of 1
Company: Groundwater & Environmental Services Inc	PWSID:			Job #:
Address: 1301 Corporate Center Drive Suite 190	Due Date Requested			
City: Eagan	TAT Requested (days): Standard			
State, Zip: MN, 55121-1562	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order Requested			
Email: NSchlagel@gesonline.com	WO #:			
Project Name: SKB Lansing CCR Monitoring	Project #: 31013984			
Site: Minnesota	SSOW#:			

Analysis Requested

Preservation Codes.

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Radium 226	Ra226Ra228_GFPC - Local Method	9320_Ra228 - Radium 228	9056A_ORGFM_28D - Chloride, Fluoride, Sulfate	Total Metals - 6020B - (Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,Li,Mo,Se,Tl) 7470A - Mercury	2540C_Calcd - TDS SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	D	N		
MW-1 - CCR	4/10/23	13:45	G	Water			X	X	X	X	X	X	5	
MW-1RD - CCR	4/10/23	13:40	G	Water			X	X	X	X	X	X	5	
MW-2R - CCR	4/10/23	14:40	G	Water			X	X	X	X	X	X	5	
MW-3 - CCR	4/11/23	8:20	G	Water			X	X	X	X	X	X	5	
MW-3R - CCR	4/11/23	8:25	G	Water			X	X	X	X	X	X	5	
MW-3RD - CCR	4/11/23	9:25	G	Water		Y	X	X	X	X	X	X	5	MS/MSD
MW-4 - CCR	4/11/23	10:45	G	Water			X	X	X	X	X	X	5	
MW-2RD - CCR	4/10/23	14:45	G	Water			X	X	X	X	X	X	5	
Field Blank 1 - CCR	4/10/23	16:15	G	Water			X	X	X	X	X	X	5	
Duplicate 1 - CCR	4/11/23	-	G	Water			X	X	X	X	X	X	5	
Equipment Blank - CCR	4/11/23	11:30	G	Water			X	X	X	X	X	X	5	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	4/11/23 1400	WGC GES	[signature]	4/11/23 1400	Eurofins
2	[signature]	4-11-23 1700	Eurofins	[signature]	4/12/23 1450	
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 310-253383-1

Login Number: 253383
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 310-253383-1

Login Number: 253383
List Number: 2
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	N/A	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Tracer/Carrier Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing CCR Monitoring

Job ID: 310-253383-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)
310-253383-1	MW-1 - CCR	83.3
310-253383-2	MW-1RD - CCR	84.8
310-253383-3	MW-2R - CCR	85.7
310-253383-4	MW-3 - CCR	81.6
310-253383-5	MW-3R - CCR	90.2
310-253383-6	MW-3RD - CCR	91.9
310-253383-6 MS	MW-3RD - CCR	79.6
310-253383-6 MSD	MW-3RD - CCR	82.8
310-253383-7	MW-4 - CCR	89.9
310-253383-8	MW-2RD - CCR	91.4
310-253383-9	Field Blank 1 - CCR	87.5
310-253383-10	Duplicate 1 - CCR	85.0
310-253383-11	Equipment Blank - CCR	85.7
LCS 160-608368/2-A	Lab Control Sample	86.0
MB 160-608368/1-A	Method Blank	92.1

Tracer/Carrier Legend

Ba = Barium

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)	Y (30-110)
310-253383-1	MW-1 - CCR	83.3	83.0
310-253383-2	MW-1RD - CCR	84.8	84.9
310-253383-3	MW-2R - CCR	85.7	81.9
310-253383-4	MW-3 - CCR	81.6	83.0
310-253383-5	MW-3R - CCR	90.2	77.8
310-253383-6	MW-3RD - CCR	91.9	87.1
310-253383-6 MS	MW-3RD - CCR	79.6	84.1
310-253383-6 MSD	MW-3RD - CCR	82.8	80.7
310-253383-7	MW-4 - CCR	89.9	84.1
310-253383-8	MW-2RD - CCR	91.4	83.4
310-253383-9	Field Blank 1 - CCR	87.5	80.0
310-253383-10	Duplicate 1 - CCR	85.0	80.4
310-253383-11	Equipment Blank - CCR	85.7	82.6
LCS 160-608380/2-A	Lab Control Sample	86.0	81.5
MB 160-608380/1-A	Method Blank	92.1	83.4

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Megan Lindstrom
Waste Connections, Inc.
13425 Courthouse Blvd
Rosemount, Minnesota 55068

Generated 9/5/2023 12:46:37 PM

JOB DESCRIPTION

SKB Lansing and Austin

JOB NUMBER

310-261947-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
9/5/2023 12:46:37 PM

Authorized for release by
Zach Bindert, Client Service Manager
Zach.Bindert@et.eurofinsus.com
(319)277-2401

Table of Contents

Job ID: 310-261947-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-261947-1

Receipt
The samples were received on 8/5/2023 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.6°C, 1.3°C, 1.5°C and 1.8°C

Receipt Exceptions
The reference method requires samples to have a pH of <2. The following samples were received with a pH of 7: MW-3RD - CCR (310-261947-6[MS]) and MW-3RD - CCR (310-261947-6[MSD]). The samples were adjusted to the appropriate pH in the laboratory.

HPLC/IC
Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: MW-1 - CCR (310-261947-1), MW-1RD - CCR (310-261947-2), MW-2R - CCR (310-261947-3), MW-3 - CCR (310-261947-4), MW-3R - CCR (310-261947-5), MW-3RD - CCR (310-261947-6), MW-4 - CCR (310-261947-7), MW-2RD - CCR (310-261947-8) and Duplicate 1 - CCR (310-261947-10). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 6020B: The reference method requires samples to be preserved to a pH of <2. The following samples were received with insufficient preservation at a pH of >2: MW-2R - CCR (310-261947-3), MW-3 - CCR (310-261947-4) and MW-3R - CCR (310-261947-5). The sample(s) was preserved to the appropriate pH in the laboratory.

Method 6020B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 310-395977 and analytical batch 310-397263 was outside control limits. Sample matrix interference and/or non-homogeneity is suspected.

Method 7470A: The reference method requires samples to be preserved to a pH of <2. The following samples were received with insufficient preservation at a pH of >2: MW-2R - CCR (310-261947-3) and MW-3 - CCR (310-261947-4). The sample(s) was preserved to the appropriate pH in the laboratory.

Method 7470A: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-3R - CCR (310-261947-5). The sample(s) was preserved to the appropriate pH in the laboratory.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-261947-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-261947-2

Receipt
The samples were received on 8/5/2023 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.6°C, 1.3°C, 1.5°C and 1.8°C

Job ID: 310-261947-2 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

Receipt Exceptions

The reference method requires samples to have a pH of <2. The following samples were received with a pH of 7: MW-3RD - CCR (310-261947-6[MS]) and MW-3RD - CCR (310-261947-6[MSD]). The samples were adjusted to the appropriate pH in the laboratory.

Gas Flow Proportional Counter

Method 9315_Ra226: Radium 226 batch 623455Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.MW-1 - CCR (310-261947-1), MW-1RD - CCR (310-261947-2), MW-2R - CCR (310-261947-3), MW-3 - CCR (310-261947-4), MW-3R - CCR (310-261947-5), MW-3RD - CCR (310-261947-6), MW-3RD - CCR (310-261947-6[MS]), MW-3RD - CCR (310-261947-6[MSD]), MW-4 - CCR (310-261947-7), MW-2RD - CCR (310-261947-8), Field Blank 1 (310-261947-9), Duplicate 1 - CCR (310-261947-10), Equipment Blank - CCR (310-261947-11), (LCS 160-623455/2-A) and (MB 160-623455/1-A)

Method 9320_Ra228: Radium-228 Prep Batch 160-623456The following sample(s) were prepared at a reduced aliquot due to matrix. The sample 460-285531-1 was brown and cloudy. The sample 380-57110-1 was cloudy. The rest of the selected samples were slightly cloudy.

Method 9320_Ra228: Radium-228 batch 623456The LCS recovered at (130%). The limits in our LIMS system at 75-125 reflect the requirements of a regulatory agency that represents a large amount of our work. However the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (63-150%) per method requirements. The LCS passes, no further action is required (LCS 160-623456/2-A)

Method 9320_Ra228: Radium 228 batch 623456Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.MW-1 - CCR (310-261947-1), MW-1RD - CCR (310-261947-2), MW-2R - CCR (310-261947-3), MW-3 - CCR (310-261947-4), MW-3R - CCR (310-261947-5), MW-3RD - CCR (310-261947-6), MW-3RD - CCR (310-261947-6[MS]), MW-3RD - CCR (310-261947-6[MSD]), MW-4 - CCR (310-261947-7), MW-2RD - CCR (310-261947-8), Field Blank 1 (310-261947-9), Duplicate 1 - CCR (310-261947-10), Equipment Blank - CCR (310-261947-11), (LCS 160-623456/2-A) and (MB 160-623456/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rad

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-261947-1	MW-1 - CCR	Water	08/03/23 14:35	08/05/23 10:15
310-261947-2	MW-1RD - CCR	Water	08/03/23 14:40	08/05/23 10:15
310-261947-3	MW-2R - CCR	Water	08/03/23 15:40	08/05/23 10:15
310-261947-4	MW-3 - CCR	Water	08/03/23 17:05	08/05/23 10:15
310-261947-5	MW-3R - CCR	Water	08/03/23 17:00	08/05/23 10:15
310-261947-6	MW-3RD - CCR	Water	08/03/23 18:00	08/05/23 10:15
310-261947-7	MW-4 - CCR	Water	08/04/23 07:20	08/05/23 10:15
310-261947-8	MW-2RD - CCR	Water	08/03/23 16:00	08/05/23 10:15
310-261947-9	Field Blank 1	Water	08/04/23 07:30	08/05/23 10:15
310-261947-10	Duplicate 1 - CCR	Water	08/03/23 00:00	08/05/23 10:15
310-261947-11	Equipment Blank - CCR	Water	08/04/23 07:35	08/05/23 10:15

Detection Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-1 - CCR — Lab Sample ID: 310-261947-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	120		5.0		mg/L	5		9056A	Total/NA
Sulfate	160		5.0		mg/L	5		9056A	Total/NA
Barium	0.14		0.0020		mg/L	1		6020B	Total/NA
Boron	0.18		0.10		mg/L	1		6020B	Total/NA
Calcium	169		0.50		mg/L	1		6020B	Total/NA
Lithium	0.040		0.010		mg/L	1		6020B	Total/NA
Thallium	0.0011		0.0010		mg/L	1		6020B	Total/NA
Total Dissolved Solids	692		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD - CCR — Lab Sample ID: 310-261947-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25		5.0		mg/L	5		9056A	Total/NA
Sulfate	59		5.0		mg/L	5		9056A	Total/NA
Barium	0.15		0.0020		mg/L	1		6020B	Total/NA
Calcium	87.2		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.00067		0.00050		mg/L	1		6020B	Total/NA
Molybdenum	0.0034		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	350		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R - CCR — Lab Sample ID: 310-261947-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	110		5.0		mg/L	5		9056A	Total/NA
Sulfate	220		5.0		mg/L	5		9056A	Total/NA
Barium	0.26		0.0020		mg/L	1		6020B	Total/NA
Boron	3.2		0.10		mg/L	1		6020B	Total/NA
Calcium	246		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0017		0.00050		mg/L	1		6020B	Total/NA
Molybdenum	0.0020		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	1100		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 - CCR — Lab Sample ID: 310-261947-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	29		5.0		mg/L	5		9056A	Total/NA
Sulfate	18		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0028		0.0020		mg/L	1		6020B	Total/NA
Barium	0.38		0.0020		mg/L	1		6020B	Total/NA
Boron	0.19		0.10		mg/L	1		6020B	Total/NA
Calcium	287		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0034		0.00050		mg/L	1		6020B	Total/NA
Lithium	0.018		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0052		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	970		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3R - CCR — Lab Sample ID: 310-261947-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27		5.0		mg/L	5		9056A	Total/NA
Sulfate	7.4		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0023		0.0020		mg/L	1		6020B	Total/NA
Barium	0.65		0.0020		mg/L	1		6020B	Total/NA
Calcium	259		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.00055		0.00050		mg/L	1		6020B	Total/NA
Lithium	0.020		0.010		mg/L	1		6020B	Total/NA
Mercury	0.00020		0.00020		mg/L	1		7470A	Total/NA
Total Dissolved Solids	866		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD - CCR — Lab Sample ID: 310-261947-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	29		5.0		mg/L	5		9056A	Total/NA
Sulfate	91		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0042	F1 F2	0.0020		mg/L	1		6020B	Total/NA
Barium	0.21	F1	0.0020		mg/L	1		6020B	Total/NA
Calcium	134		0.50		mg/L	1		6020B	Total/NA
Lithium	0.015	F1 F2	0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0047	F1 F2	0.0020		mg/L	1		6020B	Total/NA
Thallium	0.0014	F1 F2	0.0010		mg/L	1		6020B	Total/NA
Mercury	0.00030		0.00020		mg/L	1		7470A	Total/NA
Total Dissolved Solids	524		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4 - CCR — Lab Sample ID: 310-261947-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27		5.0		mg/L	5		9056A	Total/NA
Sulfate	230		5.0		mg/L	5		9056A	Total/NA
Barium	0.20		0.0020		mg/L	1		6020B	Total/NA
Boron	0.32		0.10		mg/L	1		6020B	Total/NA
Cadmium	0.00037		0.00020		mg/L	1		6020B	Total/NA
Calcium	181		0.50		mg/L	1		6020B	Total/NA
Molybdenum	0.0038		0.0020		mg/L	1		6020B	Total/NA
Thallium	0.0028		0.0010		mg/L	1		6020B	Total/NA
Total Dissolved Solids	766		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2RD - CCR — Lab Sample ID: 310-261947-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	43		5.0		mg/L	5		9056A	Total/NA
Sulfate	91		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0023		0.0020		mg/L	1		6020B	Total/NA
Barium	0.20		0.0020		mg/L	1		6020B	Total/NA
Boron	0.18		0.10		mg/L	1		6020B	Total/NA
Calcium	160		0.50		mg/L	1		6020B	Total/NA
Cobalt	0.0031		0.00050		mg/L	1		6020B	Total/NA
Lithium	0.012		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0025		0.0020		mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-2RD - CCR (Continued) — Lab Sample ID: 310-261947-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.030		0.0050		mg/L	1		6020B	Total/NA
Total Dissolved Solids	636		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Field Blank 1 — Lab Sample ID: 310-261947-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Duplicate 1 - CCR — Lab Sample ID: 310-261947-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	30		5.0		mg/L	5		9056A	Total/NA
Sulfate	96		5.0		mg/L	5		9056A	Total/NA
Arsenic	0.0039		0.0020		mg/L	1		6020B	Total/NA
Barium	0.20		0.0020		mg/L	1		6020B	Total/NA
Calcium	131		0.50		mg/L	1		6020B	Total/NA
Lithium	0.014		0.010		mg/L	1		6020B	Total/NA
Molybdenum	0.0041		0.0020		mg/L	1		6020B	Total/NA
Total Dissolved Solids	534		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Equipment Blank - CCR — Lab Sample ID: 310-261947-11

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1 - CCR

Date Collected: 08/03/23 14:35
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**120**		5.0		mg/L			08/15/23 12:21	5
Fluoride	<1.0		1.0		mg/L			08/15/23 12:21	5
Sulfate	**160**		5.0		mg/L			08/15/23 12:21	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:28	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:28	1
Barium	**0.14**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:28	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:28	1
Boron	**0.18**		0.10		mg/L		08/09/23 09:00	08/21/23 09:17	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:28	1
Calcium	**169**		0.50		mg/L		08/09/23 09:00	08/18/23 06:28	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:28	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:28	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:28	1
Lithium	**0.040**		0.010		mg/L		08/09/23 09:00	08/18/23 06:28	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:28	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:28	1
Thallium	**0.0011**		0.0010		mg/L		08/09/23 09:00	08/18/23 06:28	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/18/23 10:56	08/21/23 11:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**692**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.2**	**HF**	0.1		SU			08/05/23 11:12	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.134	U	0.0759	0.0760	1.00	0.134	pCi/L	08/09/23 09:52	08/31/23 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*82.4*		*30 - 110*	*08/09/23 09:52*	*08/31/23 12:10*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.609	U	0.368	0.369	1.00	0.609	pCi/L	08/09/23 10:11	08/22/23 15:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*82.4*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:01*	*1*
Y Carrier	*80.0*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:01*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-1 - CCR

Date Collected: 08/03/23 14:35
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-1

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.609	U	0.376	0.377	5.00	0.609	pCi/L		09/05/23 11:37	1

Client Sample ID: MW-1RD - CCR

Date Collected: 08/03/23 14:40
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25**		5.0		mg/L			08/15/23 12:33	5
Fluoride	<1.0		1.0		mg/L			08/15/23 12:33	5
Sulfate	**59**		5.0		mg/L			08/15/23 12:33	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:30	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:30	1
Barium	**0.15**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:30	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:30	1
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:19	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:30	1
Calcium	**87.2**		0.50		mg/L		08/09/23 09:00	08/18/23 06:30	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:30	1
Cobalt	**0.00067**		0.00050		mg/L		08/09/23 09:00	08/18/23 06:30	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:30	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 06:30	1
Molybdenum	**0.0034**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:30	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:30	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:30	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/18/23 10:56	08/21/23 11:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**350**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.5**	**HF**	0.1		SU			08/05/23 11:13	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.422**		0.128	0.134	1.00	0.121	pCi/L	08/09/23 09:52	08/31/23 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*79.9*		*30 - 110*	*08/09/23 09:52*	*08/31/23 12:10*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.932**		0.435	0.443	1.00	0.570	pCi/L	08/09/23 10:11	08/22/23 15:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*79.9*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:00*	*1*
Y Carrier	*77.8*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:00*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-1RD - CCR

Date Collected: 08/03/23 14:40
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-2

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.35		0.453	0.463	5.00	0.570	pCi/L		09/05/23 11:37	1

Client Sample ID: MW-2R - CCR

Date Collected: 08/03/23 15:40
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		5.0		mg/L			08/15/23 12:45	5
Fluoride	<1.0		1.0		mg/L			08/15/23 12:45	5
Sulfate	**220**		5.0		mg/L			08/15/23 12:45	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:32	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:32	1
Barium	**0.26**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:32	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:32	1
Boron	**3.2**		0.10		mg/L		08/09/23 09:00	08/21/23 09:21	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:32	1
Calcium	**246**		0.50		mg/L		08/09/23 09:00	08/18/23 06:32	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:32	1
Cobalt	**0.0017**		0.00050		mg/L		08/09/23 09:00	08/18/23 06:32	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:32	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 06:32	1
Molybdenum	**0.0020**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:32	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:32	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:32	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/18/23 10:56	08/21/23 11:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1100**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.8**	**HF**	0.1		SU			08/05/23 11:10	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.386**		0.145	0.149	1.00	0.149	pCi/L	08/09/23 09:52	08/31/23 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*86.5*		*30 - 110*	*08/09/23 09:52*	*08/31/23 12:10*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.794**		0.494	0.499	1.00	0.714	pCi/L	08/09/23 10:11	08/22/23 15:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*86.5*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:00*	*1*
Y Carrier	*80.4*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:00*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-2R - CCR

Date Collected: 08/03/23 15:40
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-3

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.18		0.515	0.521	5.00	0.714	pCi/L		09/05/23 11:37	1

Client Sample ID: MW-3 - CCR

Date Collected: 08/03/23 17:05
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**29**		5.0		mg/L			08/15/23 12:57	5
Fluoride	<1.0		1.0		mg/L			08/15/23 12:57	5
Sulfate	**18**		5.0		mg/L			08/15/23 12:57	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:35	1
Arsenic	**0.0028**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:35	1
Barium	**0.38**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:35	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:35	1
Boron	**0.19**		0.10		mg/L		08/09/23 09:00	08/21/23 09:24	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:35	1
Calcium	**287**		0.50		mg/L		08/09/23 09:00	08/18/23 06:35	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:35	1
Cobalt	**0.0034**		0.00050		mg/L		08/09/23 09:00	08/18/23 06:35	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:35	1
Lithium	**0.018**		0.010		mg/L		08/09/23 09:00	08/18/23 06:35	1
Molybdenum	**0.0052**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:35	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:35	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:35	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/18/23 10:56	08/21/23 11:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**970**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.6**	**HF**	0.1		SU			08/05/23 11:23	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.402**		0.153	0.157	1.00	0.163	pCi/L	08/09/23 09:52	08/31/23 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*83.3*		*30 - 110*	*08/09/23 09:52*	*08/31/23 12:10*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.886	U	0.549	0.551	1.00	0.886	pCi/L	08/09/23 10:11	08/22/23 15:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*83.3*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:05*	*1*
Y Carrier	*77.0*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:05*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3 - CCR

Date Collected: 08/03/23 17:05
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-4

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.945		0.570	0.573	5.00	0.886	pCi/L		09/05/23 11:37	1

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3R - CCR

Date Collected: 08/03/23 17:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**		5.0		mg/L			08/15/23 13:09	5
Fluoride	<1.0		1.0		mg/L			08/15/23 13:09	5
Sulfate	**7.4**		5.0		mg/L			08/15/23 13:09	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:37	1
Arsenic	**0.0023**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:37	1
Barium	**0.65**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:37	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:37	1
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:26	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:37	1
Calcium	**259**		0.50		mg/L		08/09/23 09:00	08/18/23 06:37	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:37	1
Cobalt	**0.00055**		0.00050		mg/L		08/09/23 09:00	08/18/23 06:37	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:37	1
Lithium	**0.020**		0.010		mg/L		08/09/23 09:00	08/18/23 06:37	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:37	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:37	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:37	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.00020**		0.00020		mg/L		08/22/23 11:39	08/23/23 10:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**866**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.7**	**HF**	0.1		SU			08/05/23 11:20	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.572**		0.172	0.180	1.00	0.169	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.0*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.21**		0.544	0.555	1.00	0.709	pCi/L	08/09/23 10:11	08/22/23 15:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.0*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:05*	*1*
Y Carrier	*81.1*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:05*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3R - CCR

Date Collected: 08/03/23 17:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-5

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.78		0.571	0.583	5.00	0.709	pCi/L		09/05/23 11:37	1

Client Sample ID: MW-3RD - CCR

Date Collected: 08/03/23 18:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-6
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**29**		5.0		mg/L			08/15/23 13:21	5
Fluoride	<1.0		1.0		mg/L			08/15/23 13:21	5
Sulfate	**91**		5.0		mg/L			08/15/23 13:21	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020	F1 F2	0.0020		mg/L		08/09/23 09:00	08/18/23 01:21	1
Arsenic	**0.0042**	**F1 F2**	0.0020		mg/L		08/09/23 09:00	08/18/23 01:21	1
Barium	**0.21**	**F1**	0.0020		mg/L		08/09/23 09:00	08/18/23 01:21	1
Beryllium	<0.0010	F1 F2	0.0010		mg/L		08/09/23 09:00	08/18/23 01:21	1
Boron	<0.10	F1 F2	0.10		mg/L		08/09/23 09:00	08/21/23 09:35	1
Cadmium	<0.00020	F1 F2	0.00020		mg/L		08/09/23 09:00	08/18/23 01:21	1
Calcium	**134**		0.50		mg/L		08/09/23 09:00	08/18/23 01:21	1
Chromium	<0.0050	F1 F2	0.0050		mg/L		08/09/23 09:00	08/18/23 01:21	1
Cobalt	<0.00050	F1 F2	0.00050		mg/L		08/09/23 09:00	08/18/23 01:21	1
Lead	<0.00050	F1 F2	0.00050		mg/L		08/09/23 09:00	08/18/23 01:21	1
Lithium	**0.015**	**F1 F2**	0.010		mg/L		08/09/23 09:00	08/18/23 01:21	1
Molybdenum	**0.0047**	**F1 F2**	0.0020		mg/L		08/09/23 09:00	08/18/23 01:21	1
Selenium	<0.0050	F1 F2	0.0050		mg/L		08/09/23 09:00	08/18/23 01:21	1
Thallium	**0.0014**	**F1 F2**	0.0010		mg/L		08/09/23 09:00	08/18/23 01:21	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.00030**		0.00020		mg/L		08/22/23 11:39	08/23/23 10:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**524**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.2**	**HF**	0.1		SU			08/05/23 11:06	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.781**		0.164	0.179	1.00	0.123	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.7*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.550	U	0.338	0.339	1.00	0.550	pCi/L	08/09/23 10:11	08/22/23 15:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.7*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*
Y Carrier	*80.4*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3RD - CCR

Date Collected: 08/03/23 18:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-6

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.09		0.376	0.383	5.00	0.550	pCi/L		09/05/23 11:37	1

Client Sample ID: MW-4 - CCR

Date Collected: 08/04/23 07:20
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**		5.0		mg/L			08/15/23 14:22	5
Fluoride	<1.0		1.0		mg/L			08/15/23 14:22	5
Sulfate	**230**		5.0		mg/L			08/15/23 14:22	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:45	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:45	1
Barium	**0.20**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:45	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:45	1
Boron	**0.32**		0.10		mg/L		08/09/23 09:00	08/21/23 09:41	1
Cadmium	**0.00037**		0.00020		mg/L		08/09/23 09:00	08/18/23 06:45	1
Calcium	**181**		0.50		mg/L		08/09/23 09:00	08/18/23 06:45	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:45	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:45	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:45	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 06:45	1
Molybdenum	**0.0038**		0.0020		mg/L		08/09/23 09:00	08/18/23 06:45	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:45	1
Thallium	**0.0028**		0.0010		mg/L		08/09/23 09:00	08/18/23 06:45	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 10:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**766**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.0**	**HF**	0.1		SU			08/05/23 11:15	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.317**		0.121	0.124	1.00	0.123	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*72.1*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.777**		0.438	0.443	1.00	0.605	pCi/L	08/09/23 10:11	08/22/23 15:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*72.1*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*
Y Carrier	*80.4*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-4 - CCR
Date Collected: 08/04/23 07:20
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-7
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.09		0.454	0.460	5.00	0.605	pCi/L		09/05/23 11:37	1

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-2RD - CCR

Date Collected: 08/03/23 16:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-8

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**43**		5.0		mg/L			08/15/23 14:34	5
Fluoride	<1.0		1.0		mg/L			08/15/23 14:34	5
Sulfate	**91**		5.0		mg/L			08/15/23 14:34	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:01	1
Arsenic	**0.0023**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:01	1
Barium	**0.20**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:01	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:01	1
Boron	**0.18**		0.10		mg/L		08/09/23 09:00	08/21/23 09:44	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 07:01	1
Calcium	**160**		0.50		mg/L		08/09/23 09:00	08/18/23 07:01	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:01	1
Cobalt	**0.0031**		0.00050		mg/L		08/09/23 09:00	08/18/23 07:01	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:01	1
Lithium	**0.012**		0.010		mg/L		08/09/23 09:00	08/18/23 07:01	1
Molybdenum	**0.0025**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:01	1
Selenium	**0.030**		0.0050		mg/L		08/09/23 09:00	08/18/23 07:01	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:01	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 11:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**636**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.1**	**HF**	0.1		SU			08/05/23 11:09	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.696**		0.162	0.173	1.00	0.122	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*80.6*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.897**		0.475	0.482	1.00	0.671	pCi/L	08/09/23 10:11	08/22/23 15:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*80.6*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*
Y Carrier	*79.6*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:04*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-2RD - CCR
Date Collected: 08/03/23 16:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-8
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.59		0.502	0.512	5.00	0.671	pCi/L		09/05/23 11:37	1

Client Sample ID: Field Blank 1

Date Collected: 08/04/23 07:30
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-9

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			08/15/23 14:46	1
Fluoride	<0.20		0.20		mg/L			08/15/23 14:46	1
Sulfate	<1.0		1.0		mg/L			08/15/23 14:46	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:04	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:04	1
Barium	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:04	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:04	1
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:46	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 07:04	1
Calcium	<0.50		0.50		mg/L		08/09/23 09:00	08/18/23 07:04	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:04	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:04	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:04	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 07:04	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:04	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:04	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:04	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 11:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			08/09/23 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**5.6**	**HF**	0.1		SU			08/05/23 11:24	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.146	U	0.0651	0.0651	1.00	0.146	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*78.7*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.854	U	0.547	0.550	1.00	0.854	pCi/L	08/09/23 10:11	08/22/23 15:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*78.7*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*
Y Carrier	*68.8*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: Field Blank 1
Date Collected: 08/04/23 07:30
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-9
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.854	U	0.551	0.554	5.00	0.854	pCi/L		09/05/23 11:37	1

Client Sample ID: Duplicate 1 - CCR

Date Collected: 08/03/23 00:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-10

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**30**		5.0		mg/L			08/15/23 14:58	5
Fluoride	<1.0		1.0		mg/L			08/15/23 14:58	5
Sulfate	**96**		5.0		mg/L			08/15/23 14:58	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:06	1
Arsenic	**0.0039**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:06	1
Barium	**0.20**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:06	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:06	1
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:48	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 07:06	1
Calcium	**131**		0.50		mg/L		08/09/23 09:00	08/18/23 07:06	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:06	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:06	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:06	1
Lithium	**0.014**		0.010		mg/L		08/09/23 09:00	08/18/23 07:06	1
Molybdenum	**0.0041**		0.0020		mg/L		08/09/23 09:00	08/18/23 07:06	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:06	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:06	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 11:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**534**		50.0		mg/L			08/08/23 14:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**7.2**	**HF**	0.1		SU			08/05/23 11:08	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.745**		0.169	0.182	1.00	0.123	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*81.9*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.708	U	0.460	0.463	1.00	0.708	pCi/L	08/09/23 10:11	08/22/23 15:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*81.9*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*
Y Carrier	*76.6*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*

Client Sample Results

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: Duplicate 1 - CCR

Date Collected: 08/03/23 00:00
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-10

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.34		0.490	0.497	5.00	0.708	pCi/L		09/05/23 11:37	1

Client Sample ID: Equipment Blank - CCR

Lab Sample ID: 310-261947-11

Date Collected: 08/04/23 07:35

Matrix: Water

Date Received: 08/05/23 10:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			08/15/23 21:42	1
Fluoride	<0.20		0.20		mg/L			08/15/23 21:42	1
Sulfate	<1.0		1.0		mg/L			08/15/23 21:42	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:08	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:08	1
Barium	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:08	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:08	1
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:50	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 07:08	1
Calcium	<0.50		0.50		mg/L		08/09/23 09:00	08/18/23 07:08	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:08	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:08	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 07:08	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 07:08	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 07:08	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 07:08	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 07:08	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 11:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			08/09/23 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**6.2**	**HF**	0.1		SU			08/05/23 11:14	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.119	U	0.0742	0.0744	1.00	0.119	pCi/L	08/09/23 09:52	08/31/23 18:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*86.0*		*30 - 110*	*08/09/23 09:52*	*08/31/23 18:48*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.696	U	0.443	0.446	1.00	0.696	pCi/L	08/09/23 10:11	08/22/23 15:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*86.0*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*
Y Carrier	*80.7*		*30 - 110*	*08/09/23 10:11*	*08/22/23 15:06*	*1*

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: Equipment Blank - CCR
Date Collected: 08/04/23 07:35
Date Received: 08/05/23 10:15

Lab Sample ID: 310-261947-11
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.696	U	0.449	0.452	5.00	0.696	pCi/L		09/05/23 11:37	1

Definitions/Glossary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Qualifiers

Metals

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-396707/3
Matrix: Water
Analysis Batch: 396707

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			08/15/23 09:32	1
Fluoride	<0.20		0.20		mg/L			08/15/23 09:32	1
Sulfate	<1.0		1.0		mg/L			08/15/23 09:32	1

Lab Sample ID: LCS 310-396707/4
Matrix: Water
Analysis Batch: 396707

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.0		mg/L		100	90 - 110
Fluoride	2.00	2.08		mg/L		104	90 - 110
Sulfate	10.0	10.6		mg/L		106	90 - 110

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 396707

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	29		25.0	55.2		mg/L		103	80 - 120
Fluoride	<1.0		5.00	5.39		mg/L		108	80 - 120
Sulfate	91		25.0	118		mg/L		109	80 - 120

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 396707

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	29		25.0	55.7		mg/L		105	80 - 120	1	15
Fluoride	<1.0		5.00	5.53		mg/L		111	80 - 120	2	15
Sulfate	91		25.0	120		mg/L		116	80 - 120	1	15

Lab Sample ID: MB 310-396823/3
Matrix: Water
Analysis Batch: 396823

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0		mg/L			08/15/23 21:18	1
Fluoride	<0.20		0.20		mg/L			08/15/23 21:18	1
Sulfate	<1.0		1.0		mg/L			08/15/23 21:18	1

Lab Sample ID: LCS 310-396823/4
Matrix: Water
Analysis Batch: 396823

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.99		mg/L		100	90 - 110
Fluoride	2.00	2.08		mg/L		104	90 - 110
Sulfate	10.0	10.8		mg/L		108	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-395977/1-A
Matrix: Water
Analysis Batch: 397106

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 395977

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 01:17	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 01:17	1
Barium	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 01:17	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 01:17	1
Boron	<0.10	^+	0.10		mg/L		08/09/23 09:00	08/18/23 01:17	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 01:17	1
Calcium	<0.50		0.50		mg/L		08/09/23 09:00	08/18/23 01:17	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 01:17	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 01:17	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 01:17	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 01:17	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 01:17	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 01:17	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 01:17	1

Lab Sample ID: MB 310-395977/1-A
Matrix: Water
Analysis Batch: 397107

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 395977

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:10	1
Arsenic	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:10	1
Barium	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:10	1
Beryllium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:10	1
Cadmium	<0.00020		0.00020		mg/L		08/09/23 09:00	08/18/23 06:10	1
Calcium	<0.50		0.50		mg/L		08/09/23 09:00	08/18/23 06:10	1
Chromium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:10	1
Cobalt	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:10	1
Lead	<0.00050		0.00050		mg/L		08/09/23 09:00	08/18/23 06:10	1
Lithium	<0.010		0.010		mg/L		08/09/23 09:00	08/18/23 06:10	1
Molybdenum	<0.0020		0.0020		mg/L		08/09/23 09:00	08/18/23 06:10	1
Selenium	<0.0050		0.0050		mg/L		08/09/23 09:00	08/18/23 06:10	1
Thallium	<0.0010		0.0010		mg/L		08/09/23 09:00	08/18/23 06:10	1

Lab Sample ID: MB 310-395977/1-A
Matrix: Water
Analysis Batch: 397263

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 395977

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.10		0.10		mg/L		08/09/23 09:00	08/21/23 09:09	1

Lab Sample ID: LCS 310-395977/2-A
Matrix: Water
Analysis Batch: 397107

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.229		mg/L		115	80 - 120
Arsenic	0.200	0.215		mg/L		108	80 - 120
Barium	0.100	0.114		mg/L		114	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-395977/2-A
Matrix: Water
Analysis Batch: 397107

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	0.100	0.101		mg/L		101	80 - 120
Cadmium	0.100	0.109		mg/L		109	80 - 120
Calcium	2.00	2.07		mg/L		104	80 - 120
Chromium	0.100	0.107		mg/L		107	80 - 120
Cobalt	0.100	0.105		mg/L		105	80 - 120
Lead	0.200	0.229		mg/L		114	80 - 120
Lithium	0.200	0.210		mg/L		105	80 - 120
Molybdenum	0.200	0.219		mg/L		109	80 - 120
Selenium	0.400	0.450		mg/L		112	80 - 120
Thallium	0.200	0.192		mg/L		96	80 - 120

Lab Sample ID: LCS 310-395977/2-A
Matrix: Water
Analysis Batch: 397263

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	0.200	0.227		mg/L		113	80 - 120

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 397106

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.0020	F1 F2	0.200	0.350	F1	mg/L		175	75 - 125
Arsenic	0.0042	F1 F2	0.200	0.305	F1	mg/L		151	75 - 125
Barium	0.21	F1	0.100	0.365	F1	mg/L		153	75 - 125
Beryllium	<0.0010	F1 F2	0.100	0.164	F1	mg/L		164	75 - 125
Cadmium	<0.00020	F1 F2	0.100	0.156	F1	mg/L		156	75 - 125
Calcium	134		2.00	140.3	4	mg/L		324	75 - 125
Chromium	<0.0050	F1 F2	0.100	0.160	F1	mg/L		160	75 - 125
Cobalt	<0.00050	F1 F2	0.100	0.145	F1	mg/L		145	75 - 125
Lead	<0.00050	F1 F2	0.200	0.303	F1	mg/L		152	75 - 125
Lithium	0.015	F1 F2	0.200	0.345	F1	mg/L		165	75 - 125
Molybdenum	0.0047	F1 F2	0.200	0.323	F1	mg/L		159	75 - 125
Selenium	<0.0050	F1 F2	0.400	0.615	E F1	mg/L		154	75 - 125
Thallium	0.0014	F1 F2	0.200	0.257	F1	mg/L		128	75 - 125

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 397263

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	<0.10	F1 F2	0.200	0.333	F1	mg/L		166	75 - 125

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 397106

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<0.0020	F1 F2	0.200	0.517	E F1 F2	mg/L		259	75 - 125	38	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 397106

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	0.0042	F1 F2	0.200	0.450	F1 F2	mg/L		223	75 - 125	38	20
Barium	0.21	F1	0.100	0.438	F1	mg/L		226	75 - 125	18	20
Beryllium	<0.0010	F1 F2	0.100	0.244	F1 F2	mg/L		244	75 - 125	39	20
Cadmium	<0.00020	F1 F2	0.100	0.235	F1 F2	mg/L		235	75 - 125	40	20
Calcium	134		2.00	139.8	4	mg/L		301	75 - 125	0	20
Chromium	<0.0050	F1 F2	0.100	0.237	F1 F2	mg/L		237	75 - 125	39	20
Cobalt	<0.00050	F1 F2	0.100	0.231	F1 F2	mg/L		231	75 - 125	46	20
Lead	<0.00050	F1 F2	0.200	0.449	F1 F2	mg/L		225	75 - 125	39	20
Lithium	0.015	F1 F2	0.200	0.507	F1 F2	mg/L		246	75 - 125	38	20
Molybdenum	0.0047	F1 F2	0.200	0.533	F1 F2	mg/L		264	75 - 125	49	20
Selenium	<0.0050	F1 F2	0.400	0.909	E F1 F2	mg/L		227	75 - 125	39	20
Thallium	0.0014	F1 F2	0.200	0.389	F1 F2	mg/L		194	75 - 125	41	20

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 397263

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	<0.10	F1 F2	0.200	0.469	F1 F2	mg/L		235	75 - 125	34	20

Lab Sample ID: 310-261947-11 DU
Matrix: Water
Analysis Batch: 397107

Client Sample ID: Equipment Blank - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Antimony	<0.0020			<0.0020		mg/L				NC	20
Arsenic	<0.0020			<0.0020		mg/L				NC	20
Barium	<0.0020			<0.0020		mg/L				NC	20
Beryllium	<0.0010			<0.0010		mg/L				NC	20
Boron	ND	*+		<0.10	*+	mg/L				NC	20
Cadmium	<0.00020			<0.00020		mg/L				NC	20
Calcium	<0.50			<0.50		mg/L				NC	20
Chromium	<0.0050			<0.0050		mg/L				NC	20
Cobalt	<0.00050			<0.00050		mg/L				NC	20
Lead	<0.00050			<0.00050		mg/L				NC	20
Lithium	<0.010			<0.010		mg/L				NC	20
Molybdenum	<0.0020			<0.0020		mg/L				NC	20
Selenium	<0.0050			<0.0050		mg/L				NC	20
Thallium	<0.0010			<0.0010		mg/L				NC	20

Lab Sample ID: 310-261947-11 DU
Matrix: Water
Analysis Batch: 397263

Client Sample ID: Equipment Blank - CCR
Prep Type: Total/NA
Prep Batch: 395977

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Boron	<0.10			<0.10		mg/L				NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-397128/1-A
Matrix: Water
Analysis Batch: 397312

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 397128

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/18/23 10:56	08/21/23 11:03	1

Lab Sample ID: LCS 310-397128/2-A
Matrix: Water
Analysis Batch: 397312

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 397128

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.00172		mg/L		103	80 - 120

Lab Sample ID: MB 310-397394/1-A
Matrix: Water
Analysis Batch: 397562

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 397394

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		08/22/23 11:39	08/23/23 10:29	1

Lab Sample ID: LCS 310-397394/2-A
Matrix: Water
Analysis Batch: 397562

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 397394

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.00170		mg/L		102	80 - 120

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 397562

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 397394

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00030		0.00167	0.00188		mg/L		95	80 - 120

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 397562

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 397394

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.00030		0.00167	0.00182		mg/L		91	80 - 120	3	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-395950/1
Matrix: Water
Analysis Batch: 395950

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			08/08/23 14:17	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 310-395950/2
Matrix: Water
Analysis Batch: 395950

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1020		mg/L		102	90 - 110		

Lab Sample ID: 310-261947-6 DU
Matrix: Water
Analysis Batch: 395950

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	524			512.0		mg/L				2	20

Lab Sample ID: MB 310-396086/1
Matrix: Water
Analysis Batch: 396086

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			08/09/23 12:08	1

Lab Sample ID: LCS 310-396086/2
Matrix: Water
Analysis Batch: 396086

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1028		mg/L		103	90 - 110		

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-395703/1
Matrix: Water
Analysis Batch: 395703

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	98 - 102		

Lab Sample ID: 310-261947-5 DU
Matrix: Water
Analysis Batch: 395703

Client Sample ID: MW-3R - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7	HF		6.6		SU				0.9	20

Lab Sample ID: 310-261947-6 DU
Matrix: Water
Analysis Batch: 395703

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.2	HF		7.1		SU				1	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-623455/1-A
Matrix: Water
Analysis Batch: 626304

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 623455

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.147	U	0.0740	0.0740	1.00	0.147	pCi/L	08/09/23 09:52	08/31/23 12:12	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*86.5*		*30 - 110*	*08/09/23 09:52*	*08/31/23 12:12*	*1*

Lab Sample ID: LCS 160-623455/2-A
Matrix: Water
Analysis Batch: 626304

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 623455

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.25		1.09	1.00	0.116	pCi/L	90	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*79.9*		*30 - 110*

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 626308

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 623455

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226	0.781		11.4	12.21		1.26	1.00	0.128	pCi/L	100	60 - 140		

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Barium	*87.7*		*30 - 110*

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 626308

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 623455

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	0.781		11.4	12.90		1.32	1.00	0.105	pCi/L	106	60 - 140	0.27	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Barium	*87.7*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-623456/1-A
Matrix: Water
Analysis Batch: 625104

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 623456

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.567	U	0.365	0.368	1.00	0.567	pCi/L	08/09/23 10:11	08/22/23 15:01	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	86.5		30 - 110	08/09/23 10:11	08/22/23 15:01	1
Y Carrier	78.9		30 - 110	08/09/23 10:11	08/22/23 15:01	1

Lab Sample ID: LCS 160-623456/2-A
Matrix: Water
Analysis Batch: 625104

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 623456

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			7.94	10.35		1.45	1.00	0.596	pCi/L	130	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Barium	79.9		30 - 110
Y Carrier	78.9		30 - 110

Lab Sample ID: 310-261947-6 MS
Matrix: Water
Analysis Batch: 625099

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 623456

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228	<0.550	U	7.97	11.08		1.51	1.00	0.649	pCi/L	135	60 - 140		

Carrier	MS %Yield	MS Qualifier	Limits
Barium	87.7		30 - 110
Y Carrier	80.0		30 - 110

Lab Sample ID: 310-261947-6 MSD
Matrix: Water
Analysis Batch: 625099

Client Sample ID: MW-3RD - CCR
Prep Type: Total/NA
Prep Batch: 623456

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228	<0.550	U	7.99	9.306		1.32	1.00	0.570	pCi/L	113	60 - 140	0.63	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Barium	87.7		30 - 110
Y Carrier	80.4		30 - 110

HPLC/IC

Analysis Batch: 396707

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	9056A	
310-261947-2	MW-1RD - CCR	Total/NA	Water	9056A	
310-261947-3	MW-2R - CCR	Total/NA	Water	9056A	
310-261947-4	MW-3 - CCR	Total/NA	Water	9056A	
310-261947-5	MW-3R - CCR	Total/NA	Water	9056A	
310-261947-6	MW-3RD - CCR	Total/NA	Water	9056A	
310-261947-7	MW-4 - CCR	Total/NA	Water	9056A	
310-261947-8	MW-2RD - CCR	Total/NA	Water	9056A	
310-261947-9	Field Blank 1	Total/NA	Water	9056A	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	9056A	
MB 310-396707/3	Method Blank	Total/NA	Water	9056A	
LCS 310-396707/4	Lab Control Sample	Total/NA	Water	9056A	
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	9056A	
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	9056A	

Analysis Batch: 396823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-11	Equipment Blank - CCR	Total/NA	Water	9056A	
MB 310-396823/3	Method Blank	Total/NA	Water	9056A	
LCS 310-396823/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 395977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	3005A	
310-261947-2	MW-1RD - CCR	Total/NA	Water	3005A	
310-261947-3	MW-2R - CCR	Total/NA	Water	3005A	
310-261947-4	MW-3 - CCR	Total/NA	Water	3005A	
310-261947-5	MW-3R - CCR	Total/NA	Water	3005A	
310-261947-6	MW-3RD - CCR	Total/NA	Water	3005A	
310-261947-7	MW-4 - CCR	Total/NA	Water	3005A	
310-261947-8	MW-2RD - CCR	Total/NA	Water	3005A	
310-261947-9	Field Blank 1	Total/NA	Water	3005A	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	3005A	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	3005A	
MB 310-395977/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-395977/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	3005A	
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	3005A	
310-261947-11 DU	Equipment Blank - CCR	Total/NA	Water	3005A	

Analysis Batch: 397106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-6	MW-3RD - CCR	Total/NA	Water	6020B	395977
MB 310-395977/1-A	Method Blank	Total/NA	Water	6020B	395977
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	6020B	395977
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	6020B	395977

Metals

Analysis Batch: 397107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	6020B	395977
310-261947-2	MW-1RD - CCR	Total/NA	Water	6020B	395977
310-261947-3	MW-2R - CCR	Total/NA	Water	6020B	395977
310-261947-4	MW-3 - CCR	Total/NA	Water	6020B	395977
310-261947-5	MW-3R - CCR	Total/NA	Water	6020B	395977
310-261947-7	MW-4 - CCR	Total/NA	Water	6020B	395977
310-261947-8	MW-2RD - CCR	Total/NA	Water	6020B	395977
310-261947-9	Field Blank 1	Total/NA	Water	6020B	395977
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	6020B	395977
310-261947-11	Equipment Blank - CCR	Total/NA	Water	6020B	395977
MB 310-395977/1-A	Method Blank	Total/NA	Water	6020B	395977
LCS 310-395977/2-A	Lab Control Sample	Total/NA	Water	6020B	395977
310-261947-11 DU	Equipment Blank - CCR	Total/NA	Water	6020B	395977

Prep Batch: 397128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	7470A	
310-261947-2	MW-1RD - CCR	Total/NA	Water	7470A	
310-261947-3	MW-2R - CCR	Total/NA	Water	7470A	
310-261947-4	MW-3 - CCR	Total/NA	Water	7470A	
MB 310-397128/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-397128/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 397263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	6020B	395977
310-261947-2	MW-1RD - CCR	Total/NA	Water	6020B	395977
310-261947-3	MW-2R - CCR	Total/NA	Water	6020B	395977
310-261947-4	MW-3 - CCR	Total/NA	Water	6020B	395977
310-261947-5	MW-3R - CCR	Total/NA	Water	6020B	395977
310-261947-6	MW-3RD - CCR	Total/NA	Water	6020B	395977
310-261947-7	MW-4 - CCR	Total/NA	Water	6020B	395977
310-261947-8	MW-2RD - CCR	Total/NA	Water	6020B	395977
310-261947-9	Field Blank 1	Total/NA	Water	6020B	395977
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	6020B	395977
310-261947-11	Equipment Blank - CCR	Total/NA	Water	6020B	395977
MB 310-395977/1-A	Method Blank	Total/NA	Water	6020B	395977
LCS 310-395977/2-A	Lab Control Sample	Total/NA	Water	6020B	395977
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	6020B	395977
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	6020B	395977
310-261947-11 DU	Equipment Blank - CCR	Total/NA	Water	6020B	395977

Analysis Batch: 397312

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	7470A	397128
310-261947-2	MW-1RD - CCR	Total/NA	Water	7470A	397128
310-261947-3	MW-2R - CCR	Total/NA	Water	7470A	397128
310-261947-4	MW-3 - CCR	Total/NA	Water	7470A	397128
MB 310-397128/1-A	Method Blank	Total/NA	Water	7470A	397128
LCS 310-397128/2-A	Lab Control Sample	Total/NA	Water	7470A	397128

Metals

Prep Batch: 397394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-5	MW-3R - CCR	Total/NA	Water	7470A	
310-261947-6	MW-3RD - CCR	Total/NA	Water	7470A	
310-261947-7	MW-4 - CCR	Total/NA	Water	7470A	
310-261947-8	MW-2RD - CCR	Total/NA	Water	7470A	
310-261947-9	Field Blank 1	Total/NA	Water	7470A	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	7470A	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	7470A	
MB 310-397394/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-397394/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	7470A	
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	7470A	

Analysis Batch: 397562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-5	MW-3R - CCR	Total/NA	Water	7470A	397394
310-261947-6	MW-3RD - CCR	Total/NA	Water	7470A	397394
310-261947-7	MW-4 - CCR	Total/NA	Water	7470A	397394
310-261947-8	MW-2RD - CCR	Total/NA	Water	7470A	397394
310-261947-9	Field Blank 1	Total/NA	Water	7470A	397394
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	7470A	397394
310-261947-11	Equipment Blank - CCR	Total/NA	Water	7470A	397394
MB 310-397394/1-A	Method Blank	Total/NA	Water	7470A	397394
LCS 310-397394/2-A	Lab Control Sample	Total/NA	Water	7470A	397394
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	7470A	397394
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	7470A	397394

General Chemistry

Analysis Batch: 395703

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-2	MW-1RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-3	MW-2R - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-4	MW-3 - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-5	MW-3R - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-6	MW-3RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-7	MW-4 - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-8	MW-2RD - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-9	Field Blank 1	Total/NA	Water	SM 4500 H+ B	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	SM 4500 H+ B	
LCS 310-395703/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-261947-5 DU	MW-3R - CCR	Total/NA	Water	SM 4500 H+ B	
310-261947-6 DU	MW-3RD - CCR	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 395950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	SM 2540C	
310-261947-2	MW-1RD - CCR	Total/NA	Water	SM 2540C	
310-261947-3	MW-2R - CCR	Total/NA	Water	SM 2540C	
310-261947-4	MW-3 - CCR	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 395950 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-5	MW-3R - CCR	Total/NA	Water	SM 2540C	
310-261947-6	MW-3RD - CCR	Total/NA	Water	SM 2540C	
310-261947-7	MW-4 - CCR	Total/NA	Water	SM 2540C	
310-261947-8	MW-2RD - CCR	Total/NA	Water	SM 2540C	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	SM 2540C	
MB 310-395950/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-395950/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-261947-6 DU	MW-3RD - CCR	Total/NA	Water	SM 2540C	

Analysis Batch: 396086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-9	Field Blank 1	Total/NA	Water	SM 2540C	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	SM 2540C	
MB 310-396086/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-396086/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 623455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	PrecSep-21	
310-261947-2	MW-1RD - CCR	Total/NA	Water	PrecSep-21	
310-261947-3	MW-2R - CCR	Total/NA	Water	PrecSep-21	
310-261947-4	MW-3 - CCR	Total/NA	Water	PrecSep-21	
310-261947-5	MW-3R - CCR	Total/NA	Water	PrecSep-21	
310-261947-6	MW-3RD - CCR	Total/NA	Water	PrecSep-21	
310-261947-7	MW-4 - CCR	Total/NA	Water	PrecSep-21	
310-261947-8	MW-2RD - CCR	Total/NA	Water	PrecSep-21	
310-261947-9	Field Blank 1	Total/NA	Water	PrecSep-21	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	PrecSep-21	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	PrecSep-21	
MB 160-623455/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-623455/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	PrecSep-21	
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	PrecSep-21	

Prep Batch: 623456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-1	MW-1 - CCR	Total/NA	Water	PrecSep_0	
310-261947-2	MW-1RD - CCR	Total/NA	Water	PrecSep_0	
310-261947-3	MW-2R - CCR	Total/NA	Water	PrecSep_0	
310-261947-4	MW-3 - CCR	Total/NA	Water	PrecSep_0	
310-261947-5	MW-3R - CCR	Total/NA	Water	PrecSep_0	
310-261947-6	MW-3RD - CCR	Total/NA	Water	PrecSep_0	
310-261947-7	MW-4 - CCR	Total/NA	Water	PrecSep_0	
310-261947-8	MW-2RD - CCR	Total/NA	Water	PrecSep_0	
310-261947-9	Field Blank 1	Total/NA	Water	PrecSep_0	
310-261947-10	Duplicate 1 - CCR	Total/NA	Water	PrecSep_0	
310-261947-11	Equipment Blank - CCR	Total/NA	Water	PrecSep_0	
MB 160-623456/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-623456/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 623456 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261947-6 MS	MW-3RD - CCR	Total/NA	Water	PrecSep_0	
310-261947-6 MSD	MW-3RD - CCR	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-1 - CCR

Lab Sample ID: 310-261947-1

Date Collected: 08/03/23 14:35

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 12:21
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:28
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:17
Total/NA	Prep	7470A			397128	NFT2	EET CF	08/18/23 10:56
Total/NA	Analysis	7470A		1	397312	NFT2	EET CF	08/21/23 11:42
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:12
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 12:10
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625104	FLC	EET SL	08/22/23 15:01
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-1RD - CCR

Lab Sample ID: 310-261947-2

Date Collected: 08/03/23 14:40

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 12:33
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:30
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:19
Total/NA	Prep	7470A			397128	NFT2	EET CF	08/18/23 10:56
Total/NA	Analysis	7470A		1	397312	NFT2	EET CF	08/21/23 11:44
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:13
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 12:10
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625104	FLC	EET SL	08/22/23 15:00
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-2R - CCR

Lab Sample ID: 310-261947-3

Date Collected: 08/03/23 15:40

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 12:45
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:32

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-2R - CCR

Lab Sample ID: 310-261947-3

Date Collected: 08/03/23 15:40

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:21
Total/NA	Prep	7470A			397128	NFT2	EET CF	08/18/23 10:56
Total/NA	Analysis	7470A		1	397312	NFT2	EET CF	08/21/23 11:46
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:10
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 12:10
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625104	FLC	EET SL	08/22/23 15:00
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-3 - CCR

Lab Sample ID: 310-261947-4

Date Collected: 08/03/23 17:05

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 12:57
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:35
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:24
Total/NA	Prep	7470A			397128	NFT2	EET CF	08/18/23 10:56
Total/NA	Analysis	7470A		1	397312	NFT2	EET CF	08/21/23 11:48
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:23
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 12:10
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:05
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-3R - CCR

Lab Sample ID: 310-261947-5

Date Collected: 08/03/23 17:00

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 13:09
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:37
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:26
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 10:40

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-3R - CCR

Lab Sample ID: 310-261947-5

Date Collected: 08/03/23 17:00
Matrix: Water
Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:20
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:05
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-3RD - CCR

Lab Sample ID: 310-261947-6

Date Collected: 08/03/23 18:00
Matrix: Water
Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 13:21
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397106	A6US	EET CF	08/18/23 01:21
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:35
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 10:42
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:06
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:04
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-4 - CCR

Lab Sample ID: 310-261947-7

Date Collected: 08/04/23 07:20
Matrix: Water
Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 14:22
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 06:45
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:41
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 10:56
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:15
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: MW-4 - CCR

Lab Sample ID: 310-261947-7

Date Collected: 08/04/23 07:20

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:04
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: MW-2RD - CCR

Lab Sample ID: 310-261947-8

Date Collected: 08/03/23 16:00

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 14:34
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 07:01
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:44
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 11:02
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:09
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:04
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: Field Blank 1

Lab Sample ID: 310-261947-9

Date Collected: 08/04/23 07:30

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	396707	QTZ5	EET CF	08/15/23 14:46
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 07:04
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:46
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 11:07
Total/NA	Analysis	SM 2540C		1	396086	ENB7	EET CF	08/09/23 12:08
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:24
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:06
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Lab Chronicle

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Client Sample ID: Duplicate 1 - CCR

Lab Sample ID: 310-261947-10

Date Collected: 08/03/23 00:00

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	396707	QTZ5	EET CF	08/15/23 14:58
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 07:06
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:48
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 11:09
Total/NA	Analysis	SM 2540C		1	395950	ENB7	EET CF	08/08/23 14:17
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:08
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:06
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Client Sample ID: Equipment Blank - CCR

Lab Sample ID: 310-261947-11

Date Collected: 08/04/23 07:35

Matrix: Water

Date Received: 08/05/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	396823	QTZ5	EET CF	08/15/23 21:42
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397107	A6US	EET CF	08/18/23 07:08
Total/NA	Prep	3005A			395977	KCK5	EET CF	08/09/23 09:00
Total/NA	Analysis	6020B		1	397263	A6US	EET CF	08/21/23 09:50
Total/NA	Prep	7470A			397394	NFT2	EET CF	08/22/23 11:39
Total/NA	Analysis	7470A		1	397562	NFT2	EET CF	08/23/23 11:11
Total/NA	Analysis	SM 2540C		1	396086	ENB7	EET CF	08/09/23 12:08
Total/NA	Analysis	SM 4500 H+ B		1	395703	A3GU	EET CF	08/05/23 11:14
Total/NA	Prep	PrecSep-21			623455	KAC	EET SL	08/09/23 09:52
Total/NA	Analysis	9315		1	626308	FLC	EET SL	08/31/23 18:48
Total/NA	Prep	PrecSep_0			623456	KAC	EET SL	08/09/23 10:11
Total/NA	Analysis	9320		1	625099	FLC	EET SL	08/22/23 15:06
Total/NA	Analysis	Ra226_Ra228		1	626553	EMH	EET SL	09/05/23 11:37

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Minnesota	NELAP	019-999-319	12-31-23

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-23
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-23
Kentucky (DW)	State	KY90125	12-31-23
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-23
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-23
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-24
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-24
South Carolina	State	85002001	06-30-23 *
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO000542021-14	07-31-23 *
Virginia	NELAP	10310	06-15-25
West Virginia DEP	State	381	10-31-23

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

eurofins | Environment Testing America

310-261947-01 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY | STATE MN | Project:

Receipt Information

Date/Time Received: DATE 8-5-23 | TIME 1015 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 1 of 4

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: 12 | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.6 | Corrected Temp (°C): 0.6

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY | STATE MN | Project:

Receipt Information

Date/Time Received: DATE 8-5-23 | TIME 1015 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 2 of 4
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: 12 | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.3 | Corrected Temp (°C): 1.3

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE. If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY | STATE MN | Project:

Receipt Information

Date/Time Received: DATE 8-5-23 | TIME 1015 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 3 of 4

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: 12 | Correction Factor (°C): 0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.5 | Corrected Temp (°C): 1.5

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE. If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

anning label

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GES

City/State: CITY | STATE MN | Project:

Receipt Information

Date/Time Received: DATE 8-5-23 | TIME 1015 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 4 of 4

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: 12 | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.8 | Corrected Temp (°C): 1.8

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE. If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Eurofins Minneapolis SC

213 Chain of Custody Record

Eurofins Minneapolis SC

eurofins Environment Testing America

Client Information	Sampler: N-Schlagel	Lab PM: Bindert, Zach T	Carrier Tracking No(s):	COC No: 310-68661-19671 1
Client Contact: Mr Nicholas Schlagel	Phone: 651-792-6065	E-Mail: Zach Bindert@Eurofinset.com	State of Origin: MN	Page: Page 1 of 2
Company: Groundwater & Environmental Services Inc	PWSID:			Job #:
Address: 1301 Corporate Center Drive Suite 190	Due Date Requested:			
City: Eagan	TAT Requested (days): Standard			
State, Zip: MN 55121-1562	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order Requested			
Email: NSchlagel@gesonline.com	WO #:			
Project Name: SKB Lansing CCR Monitoring	Project #: 31013984			
Site: Minnesota	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Radium 226	Ra226Ra228_GFPC - Local Method	9320_Ra228 - Radium 228	9056A_ORGFM_28D - Chloride, Fluoride, Sulfate	Total Metals - 6020B - (Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,Li,Mo,Se,Tl) 7470A - Mercury	2540C_Calcd - TDS SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	D	N		
MW-1 - CCR	8/3/23	14:35	G	Water			X	X	X	X	X	X	5	
MW-1RD - CCR	8/3/23	14:40	G	Water			X	X	X	X	X	X	5	
MW-2R - CCR	8/3/23	15:40	G	Water			X	X	X	X	X	X	5	
MW-3 - CCR	8/3/23	17:05	G	Water			X	X	X	X	X	X	5	
MW-3R - CCR	8/3/23	17:00	G	Water			X	X	X	X	X	X	5	
MW-3RD - CCR	8/3/23	18:00	G	Water		Y	X	X	X	X	X	X	5	MS/MSD
MW-4 - CCR	8/4/23	7:20	G	Water			X	X	X	X	X	X	5	
MW-2RD - CCR	8/3/23	16:00	G	Water			X	X	X	X	X	X	5	
Field Blank 1 - CCR	8/4/23	7:30	G	Water			X	X	X	X	X	X	5	
Duplicate 1 - CCR	8/3/23	-	G	Water			X	X	X	X	X	X	5	
Equipment Blank - CCR	8/4/23	7:35	G	Water			X	X	X	X	X	X	5	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/23	GES		8/5/23 1700	
	8/4/23 1700		ST	8/5/23 1015	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:
	-	

Ver 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 310-261947-1

Login Number: 261947
List Number: 1
Creator: Yang, Mary E

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 310-261947-1

Login Number: 261947
List Number: 2
Creator: Yang, Mary E

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time (Excluding tests with immediate HTs)..		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Tracer/Carrier Summary

Client: Waste Connections, Inc.
Project/Site: SKB Lansing and Austin

Job ID: 310-261947-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)
310-261947-1	MW-1 - CCR	82.4
310-261947-2	MW-1RD - CCR	79.9
310-261947-3	MW-2R - CCR	86.5
310-261947-4	MW-3 - CCR	83.3
310-261947-5	MW-3R - CCR	87.0
310-261947-6	MW-3RD - CCR	87.7
310-261947-6 MS	MW-3RD - CCR	87.7
310-261947-6 MSD	MW-3RD - CCR	87.7
310-261947-7	MW-4 - CCR	72.1
310-261947-8	MW-2RD - CCR	80.6
310-261947-9	Field Blank 1	78.7
310-261947-10	Duplicate 1 - CCR	81.9
310-261947-11	Equipment Blank - CCR	86.0
LCS 160-623455/2-A	Lab Control Sample	79.9
MB 160-623455/1-A	Method Blank	86.5

Tracer/Carrier Legend

Ba = Barium

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)	Y (30-110)
310-261947-1	MW-1 - CCR	82.4	80.0
310-261947-2	MW-1RD - CCR	79.9	77.8
310-261947-3	MW-2R - CCR	86.5	80.4
310-261947-4	MW-3 - CCR	83.3	77.0
310-261947-5	MW-3R - CCR	87.0	81.1
310-261947-6	MW-3RD - CCR	87.7	80.4
310-261947-6 MS	MW-3RD - CCR	87.7	80.0
310-261947-6 MSD	MW-3RD - CCR	87.7	80.4
310-261947-7	MW-4 - CCR	72.1	80.4
310-261947-8	MW-2RD - CCR	80.6	79.6
310-261947-9	Field Blank 1	78.7	68.8
310-261947-10	Duplicate 1 - CCR	81.9	76.6
310-261947-11	Equipment Blank - CCR	86.0	80.7
LCS 160-623456/2-A	Lab Control Sample	79.9	78.9
MB 160-623456/1-A	Method Blank	86.5	78.9

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

Appendix C – Statistical Evaluation Data

1				**Background Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			Date/Time of Computation	ProUCL 5.11/18/2024 12:52:41 AM								
4			From File	ProUCL 2023.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	95%								
7			Coverage	95%								
8			Different or Future K Observations	1								
9			Number of Bootstrap Operations	2000								
10												
11	**Antimony**											
12												
13						**General Statistics**							
14					Total Number of Observations	114			Number of Missing Observations	27		
15					Number of Distinct Observations	5						
16					Number of Detects	2			Number of Non-Detects	112		
17					Number of Distinct Detects	2			Number of Distinct Non-Detects	3		
18					Minimum Detect	3.6000E-4			Minimum Non-Detect	0.001		
19					Maximum Detect	0.0032			Maximum Non-Detect	0.02		
20					Variance Detected	4.0328E-6			Percent Non-Detects	98.25%		
21					Mean Detected	0.00178			SD Detected	0.00201		
22					Mean of Detected Logged Data	-6.837			SD of Detected Logged Data	1.545		
23												
24						**Warning: Data set has only 2 Detected Values.**							
25						**This is not enough to compute meaningful or reliable statistics and estimates.**						
26												
27												
28						**Critical Values for Background Threshold Values (BTVs)**							
29					Tolerance Factor K (For UTL)	1.904			d2max (for USL)	3.254		
30												
31						**Normal GOF Test on Detects Only**							
32						**Not Enough Data to Perform GOF Test**							
33						**Nonparametric Distribution Free Background Statistics**							
34						**Data do not follow a Discernible Distribution (0.05)**							
35												
36						**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**							
37					Order of Statistic, r	111			95% UTL with95% Coverage	0.02		
38					Approx, f used to compute achieved CC	1.461			Approximate Actual Confidence Coefficient achieved by UTL	0.827		
39					Approximate Sample Size needed to achieve specified CC	153			95% UPL	0.02		
40					95% USL	0.02			95% KM Chebyshev UPL	0.00159		
41												
42						Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
43						Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
44						and consists of observations collected from clean unimpacted locations.						
45						The use of USL tends to provide a balance between false positives and false negatives provided the data						
46						represents a background data set and when many onsite observations need to be compared with the BTV.						
47												
48	**Arsenic**											
49												
50						**General Statistics**							
51					Total Number of Observations	139			Number of Missing Observations	42		
52					Number of Distinct Observations	31						

53					Number of Detects	78					Number of Non-Detects	61
54					Number of Distinct Detects	31					Number of Distinct Non-Detects	2
55					Minimum Detect	0.001					Minimum Non-Detect	0.001
56					Maximum Detect	0.0049					Maximum Non-Detect	0.002
57					Variance Detected	9.7833E-7					Percent Non-Detects	43.88%
58					Mean Detected	0.00276					SD Detected	9.8911E-4
59					Mean of Detected Logged Data	-5.962					SD of Detected Logged Data	0.381
60												
61					**Critical Values for Background Threshold Values (BTVs)**							
62					Tolerance Factor K (For UTL)	1.877					d2max (for USL)	3.319
63												
64					**Normal GOF Test on Detects Only**							
65					Shapiro Wilk Test Statistic	0.931	**Normal GOF Test on Detected Observations Only**					
66					5% Shapiro Wilk P Value	3.8160E-4	Data Not Normal at 5% Significance Level					
67					Lilliefors Test Statistic	0.152	**Lilliefors GOF Test**					
68					5% Lilliefors Critical Value	0.1	Data Not Normal at 5% Significance Level					
69					**Data Not Normal at 5% Significance Level**							
70					**Data do not follow a Discernible Distribution (0.05)**							
71												
72					**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**							
73					Order of Statistic, r	136	95% UTL with95% Coverage					0.0044
74					Approx, f used to compute achieved CC	1.789	Approximate Actual Confidence Coefficient achieved by UTL					0.921
75					Approximate Sample Size needed to achieve specified CC	153	95% UPL					0.0042
76					95% USL	0.0049	95% KM Chebyshev UPL					0.00685
77												
78					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
79					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
80					and consists of observations collected from clean unimpacted locations.							
81					The use of USL tends to provide a balance between false positives and false negatives provided the data							
82					represents a background data set and when many onsite observations need to be compared with the BTV.							
83												
84	**Barium**											
85												
86	**General Statistics**											
87					Total Number of Observations	142	Number of Distinct Observations					40
88							Number of Missing Observations					39
89					Minimum	0.062	First Quartile					0.16
90					Second Largest	0.68	Median					0.19
91					Maximum	0.71	Third Quartile					0.24
92					Mean	0.234	SD					0.143
93					Coefficient of Variation	0.609	Skewness					1.897
94					Mean of logged Data	-1.587	SD of logged Data					0.496
95												
96					**Critical Values for Background Threshold Values (BTVs)**							
97					Tolerance Factor K (For UTL)	1.875	d2max (for USL)					3.325
98												
99					**Normal GOF Test**							
100					Shapiro Wilk Test Statistic	0.732	**Normal GOF Test**					
101					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
102					Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**					
103					5% Lilliefors Critical Value	0.0747	Data Not Normal at 5% Significance Level					
104					**Data Not Normal at 5% Significance Level**							

105												
106	**Nonparametric Distribution Free Background Statistics**											
107	**Data do not follow a Discernible Distribution (0.05)**											
108												
109	**Nonparametric Upper Limits for Background Threshold Values**											
110						Order of Statistic, r	138			95% UTL with 95% Coverage	0.64	
111						Approx, f used to compute achieved CC	1.453			Approximate Actual Confidence Coefficient achieved by UTL	0.843	
112										Approximate Sample Size needed to achieve specified CC	181	
113						95% Percentile Bootstrap UTL with 95% Coverage	0.64			95% BCA Bootstrap UTL with 95% Coverage	0.64	
114						95% UPL	0.6			90% Percentile	0.532	
115						90% Chebyshev UPL	0.664			95% Percentile	0.599	
116						95% Chebyshev UPL	0.859			99% Percentile	0.668	
117						95% USL	0.71					
118												
119	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
120	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
121	and consists of observations collected from clean unimpacted locations.											
122	The use of USL tends to provide a balance between false positives and false negatives provided the data											
123	represents a background data set and when many onsite observations need to be compared with the BTV.											
124												
125	**Beryllium**											
126												
127	**General Statistics**											
128						Total Number of Observations	108			Number of Missing Observations	33	
129						Number of Distinct Observations	6					
130						Number of Detects	3			Number of Non-Detects	105	
131						Number of Distinct Detects	3			Number of Distinct Non-Detects	3	
132						Minimum Detect	4.1000E-5			Minimum Non-Detect	7.0000E-4	
133						Maximum Detect	1.6000E-4			Maximum Non-Detect	0.002	
134						Variance Detected	3.5770E-9			Percent Non-Detects	97.22%	
135						Mean Detected	9.7000E-5			SD Detected	5.9808E-5	
136						Mean of Detected Logged Data	-9.386			SD of Detected Logged Data	0.684	
137												
138	**Warning: Data set has only 3 Detected Values.**											
139	**This is not enough to compute meaningful or reliable statistics and estimates.**											
140												
141												
142	**Critical Values for Background Threshold Values (BTVs)**											
143						Tolerance Factor K (For UTL)	1.912			d2max (for USL)	3.236	
144												
145	**Normal GOF Test on Detects Only**											
146						Shapiro Wilk Test Statistic	0.99			**Shapiro Wilk GOF Test**		
147						5% Shapiro Wilk Critical Value	0.767			Detected Data appear Normal at 5% Significance Level		
148						Lilliefors Test Statistic	0.213			**Lilliefors GOF Test**		
149						5% Lilliefors Critical Value	0.425			Detected Data appear Normal at 5% Significance Level		
150	**Detected Data appear Normal at 5% Significance Level**											
151												
152	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
153						KM Mean	9.7000E-5			KM SD	4.8833E-5	
154						95% UTL95% Coverage	1.9036E-4			95% KM UPL (t)	1.7840E-4	
155						90% KM Percentile (z)	1.5958E-4			95% KM Percentile (z)	1.7732E-4	
156						99% KM Percentile (z)	2.1060E-4			95% KM USL	2.5500E-4	

157											
158	**DL/2 Substitution Background Statistics Assuming Normal Distribution**										
159					Mean	4.3001E-4				SD	1.8132E-4
160					95% UTL95% Coverage	7.7666E-4				95% UPL (t)	7.3225E-4
161					90% Percentile (z)	6.6238E-4				95% Percentile (z)	7.2825E-4
162					99% Percentile (z)	8.5182E-4				95% USL	0.00102
163	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**										
164											
165	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
166	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
167	and consists of observations collected from clean unimpacted locations.										
168	The use of USL tends to provide a balance between false positives and false negatives provided the data										
169	represents a background data set and when many onsite observations need to be compared with the BTV.										
170											
171	**Cadmium**										
172											
173	**General Statistics**										
174					Total Number of Observations	131				Number of Missing Observations	50
175					Number of Distinct Observations	16					
176					Number of Detects	16				Number of Non-Detects	115
177					Number of Distinct Detects	13				Number of Distinct Non-Detects	3
178					Minimum Detect	1.3000E-4				Minimum Non-Detect	1.0000E-4
179					Maximum Detect	0.0014				Maximum Non-Detect	5.0000E-4
180					Variance Detected	1.4768E-7				Percent Non-Detects	87.79%
181					Mean Detected	5.0125E-4				SD Detected	3.8429E-4
182					Mean of Detected Logged Data	-7.846				SD of Detected Logged Data	0.723
183											
184	**Critical Values for Background Threshold Values (BTVs)**										
185					Tolerance Factor K (For UTL)	1.885				d2max (for USL)	3.299
186											
187	**Normal GOF Test on Detects Only**										
188					Shapiro Wilk Test Statistic	0.824				**Shapiro Wilk GOF Test**	
189					5% Shapiro Wilk Critical Value	0.887				Data Not Normal at 5% Significance Level	
190					Lilliefors Test Statistic	0.229				**Lilliefors GOF Test**	
191					5% Lilliefors Critical Value	0.213				Data Not Normal at 5% Significance Level	
192	**Data Not Normal at 5% Significance Level**										
193											
194	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**										
195					KM Mean	1.7514E-4				KM SD	1.8370E-4
196					95% UTL95% Coverage	5.2140E-4				95% KM UPL (t)	4.8063E-4
197					90% KM Percentile (z)	4.1056E-4				95% KM Percentile (z)	4.7730E-4
198					99% KM Percentile (z)	6.0249E-4				95% KM USL	7.8124E-4
199											
200	**DL/2 Substitution Background Statistics Assuming Normal Distribution**										
201					Mean	2.0740E-4				SD	1.8517E-4
202					95% UTL95% Coverage	5.5644E-4				95% UPL (t)	5.1534E-4
203					90% Percentile (z)	4.4471E-4				95% Percentile (z)	5.1199E-4
204					99% Percentile (z)	6.3818E-4				95% USL	8.1835E-4
205	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**										
206											
207	**Gamma GOF Tests on Detected Observations Only**										
208					A-D Test Statistic	0.382				**Anderson-Darling GOF Test**	

209					5% A-D Critical Value	0.749	Detected data appear Gamma Distributed at 5% Significance Level					
210					K-S Test Statistic	0.16	**Kolmogorov-Smirnov GOF**					
211					5% K-S Critical Value	0.218	Detected data appear Gamma Distributed at 5% Significance Level					
212	**Detected data appear Gamma Distributed at 5% Significance Level**											
213												
214	**Gamma Statistics on Detected Data Only**											
215					k hat (MLE)	2.171	k star (bias corrected MLE)					1.805
216					Theta hat (MLE)	2.3091E-4	Theta star (bias corrected MLE)					2.7764E-4
217					nu hat (MLE)	69.46	nu star (bias corrected)					57.77
218					MLE Mean (bias corrected)	5.0125E-4						
219					MLE Sd (bias corrected)	3.7305E-4	95% Percentile of Chisquare (2kstar)					8.85
220												
221	**Gamma ROS Statistics using Imputed Non-Detects**											
222	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
223	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
224	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
225	This is especially true when the sample size is small.											
226	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
227					Minimum	1.3000E-4	Mean					0.00884
228					Maximum	0.01	Median					0.01
229					SD	0.00312	CV					0.354
230					k hat (MLE)	1.985	k star (bias corrected MLE)					1.945
231					Theta hat (MLE)	0.00445	Theta star (bias corrected MLE)					0.00455
232					nu hat (MLE)	520.1	nu star (bias corrected)					509.6
233					MLE Mean (bias corrected)	0.00884	MLE Sd (bias corrected)					0.00634
234					95% Percentile of Chisquare (2kstar)	9.308	90% Percentile					0.0173
235					95% Percentile	0.0212	99% Percentile					0.0297
236	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
237	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
238						WH	HW				WH	HW
239					95% Approx. Gamma UTL with 95% Coverage	0.0234	0.0266	95% Approx. Gamma UPL			0.021	0.0234
240					95% Gamma USL	0.0436	0.0555					
241												
242	**Estimates of Gamma Parameters using KM Estimates**											
243					Mean (KM)	1.7514E-4	SD (KM)					1.8370E-4
244					Variance (KM)	3.3747E-8	SE of Mean (KM)					1.8984E-5
245					k hat (KM)	0.909	k star (KM)					0.893
246					nu hat (KM)	238.1	nu star (KM)					234
247					theta hat (KM)	1.9269E-4	theta star (KM)					1.9608E-4
248					80% gamma percentile (KM)	2.8427E-4	90% gamma percentile (KM)					4.1461E-4
249					95% gamma percentile (KM)	5.4614E-4	99% gamma percentile (KM)					8.5414E-4
250												
251	**The following statistics are computed using gamma distribution and KM estimates**											
252	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
253						WH	HW				WH	HW
254					95% Approx. Gamma UTL with 95% Coverage	4.1404E-4	4.0374E-4	95% Approx. Gamma UPL			3.7351E-4	3.6322E-4
255					95% KM Gamma Percentile	3.7033E-4	3.6005E-4	95% Gamma USL			7.4287E-4	7.4711E-4
256												
257	**Lognormal GOF Test on Detected Observations Only**											
258					Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**					
259					5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level					
260					Lilliefors Test Statistic	0.113	**Lilliefors GOF Test**					

261				5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level						
262	**Detected Data appear Lognormal at 5% Significance Level**											
263												
264	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
265				Mean in Original Scale	1.4575E-4					Mean in Log Scale	-9.388	
266				SD in Original Scale	2.0160E-4					SD in Log Scale	1.041	
267				95% UTL95% Coverage	5.9551E-4					95% BCA UTL95% Coverage	6.8000E-4	
268				95% Bootstrap (%) UTL95% Coverage	6.8000E-4					95% UPL (t)	4.7270E-4	
269				90% Percentile (z)	3.1783E-4					95% Percentile (z)	4.6387E-4	
270				99% Percentile (z)	9.4278E-4					95% USL	0.0026	
271												
272	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
273				KM Mean of Logged Data	-8.854					95% KM UTL (Lognormal)95% Coverage	3.7754E-4	
274				KM SD of Logged Data	0.516					95% KM UPL (Lognormal)	3.3671E-4	
275				95% KM Percentile Lognormal (z)	3.3358E-4					95% KM USL (Lognormal)	7.8297E-4	
276												
277	**Background DL/2 Statistics Assuming Lognormal Distribution**											
278				Mean in Original Scale	2.0740E-4					Mean in Log Scale	-8.696	
279				SD in Original Scale	1.8517E-4					SD in Log Scale	0.608	
280				95% UTL95% Coverage	5.2615E-4					95% UPL (t)	4.5974E-4	
281				90% Percentile (z)	3.6459E-4					95% Percentile (z)	4.5471E-4	
282				99% Percentile (z)	6.8813E-4					95% USL	0.00124	
283	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
284												
285	**Nonparametric Distribution Free Background Statistics**											
286	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
287												
288	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
289				Order of Statistic, r	128					95% UTL with95% Coverage	6.8000E-4	
290				Approx, f used to compute achieved CC	1.684					Approximate Actual Confidence Coefficient achieved by UTL	0.898	
291				Approximate Sample Size needed to achieve specified CC	153					95% UPL	5.0800E-4	
292				95% USL	0.0014					95% KM Chebyshev UPL	9.7893E-4	
293												
294	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
295	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
296	and consists of observations collected from clean unimpacted locations.											
297	The use of USL tends to provide a balance between false positives and false negatives provided the data											
298	represents a background data set and when many onsite observations need to be compared with the BTV.											
299												
300	**Chromium (total)**											
301												
302	**General Statistics**											
303				Total Number of Observations	131					Number of Missing Observations	50	
304				Number of Distinct Observations	4							
305				Number of Detects	3					Number of Non-Detects	128	
306				Number of Distinct Detects	3					Number of Distinct Non-Detects	2	
307				Minimum Detect	0.004					Minimum Non-Detect	0.004	
308				Maximum Detect	0.012					Maximum Non-Detect	0.005	
309				Variance Detected	1.6333E-5					Percent Non-Detects	97.71%	
310				Mean Detected	0.00833					SD Detected	0.00404	
311				Mean of Detected Logged Data	-4.885					SD of Detected Logged Data	0.57	
312												

	A	B	C	D	E	F	G	H	I	J	K	L
313	**Warning: Data set has only 3 Detected Values.**											
314	**This is not enough to compute meaningful or reliable statistics and estimates.**											
315												
316												
317	**Critical Values for Background Threshold Values (BTVs)**											
318					Tolerance Factor K (For UTL)	1.885			d2max (for USL)			3.299
319												
320	**Normal GOF Test on Detects Only**											
321					Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**					
322					5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level					
323					Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**					
324					5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level					
325	**Detected Data appear Normal at 5% Significance Level**											
326												
327	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
328					KM Mean	0.0041			KM SD			8.1826E-4
329					95% UTL95% Coverage	0.00564			95% KM UPL (t)			0.00546
330					90% KM Percentile (z)	0.00515			95% KM Percentile (z)			0.00545
331					99% KM Percentile (z)	0.006			95% KM USL			0.0068
332												
333	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
334					Mean	0.0024			SD			0.00107
335					95% UTL95% Coverage	0.00441			95% UPL (t)			0.00418
336					90% Percentile (z)	0.00377			95% Percentile (z)			0.00416
337					99% Percentile (z)	0.00489			95% USL			0.00593
338	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
339												
340	**Gamma GOF Tests on Detected Observations Only**											
341	**Not Enough Data to Perform GOF Test**											
342												
343	**Gamma Statistics on Detected Data Only**											
344					k hat (MLE)	5.292			k star (bias corrected MLE)			N/A
345					Theta hat (MLE)	0.00157			Theta star (bias corrected MLE)			N/A
346					nu hat (MLE)	31.75			nu star (bias corrected)			N/A
347					MLE Mean (bias corrected)	N/A						
348					MLE Sd (bias corrected)	N/A			95% Percentile of Chisquare (2kstar)			N/A
349												
350	**Gamma ROS Statistics using Imputed Non-Detects**											
351	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
352	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
353	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
354	This is especially true when the sample size is small.											
355	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
356					Minimum	0.004			Mean			0.00996
357					Maximum	0.012			Median			0.01
358					SD	5.6028E-4			CV			0.0562
359					k hat (MLE)	193.7			k star (bias corrected MLE)			189.3
360					Theta hat (MLE)	5.1419E-5			Theta star (bias corrected MLE)			5.2622E-5
361					nu hat (MLE)	50760			nu star (bias corrected)			49599
362					MLE Mean (bias corrected)	0.00996			MLE Sd (bias corrected)			7.2403E-4
363					95% Percentile of Chisquare (2kstar)	425			90% Percentile			0.0109
364					95% Percentile	0.0112			99% Percentile			0.0117

365	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
366	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
367					WH	HW					WH	HW
368				95% Approx. Gamma UTL with 95% Coverage	0.0114	0.0114				95% Approx. Gamma UPL	0.0112	0.0112
369				95% Gamma USL	0.0125	0.0126						
370												
371	**Estimates of Gamma Parameters using KM Estimates**											
372						Mean (KM)	0.0041				SD (KM)	8.1826E-4
373						Variance (KM)	6.6954E-7				SE of Mean (KM)	8.7559E-5
374						k hat (KM)	25.1				k star (KM)	24.53
375						nu hat (KM)	6576				nu star (KM)	6426
376						theta hat (KM)	1.6333E-4				theta star (KM)	1.6713E-4
377						80% gamma percentile (KM)	0.00477				90% gamma percentile (KM)	0.00519
378						95% gamma percentile (KM)	0.00555				99% gamma percentile (KM)	0.00627
379												
380	**The following statistics are computed using gamma distribution and KM estimates**											
381	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
382					WH	HW					WH	HW
383				95% Approx. Gamma UTL with 95% Coverage	0.00524	0.00519				95% Approx. Gamma UPL	0.00509	0.00505
384				95% KM Gamma Percentile	0.00508	0.00504				95% Gamma USL	0.00625	0.00618
385												
386	**Lognormal GOF Test on Detected Observations Only**											
387						Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk GOF Test**				
388						5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level				
389						Lilliefors Test Statistic	0.287	**Lilliefors GOF Test**				
390						5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level				
391	**Detected Data appear Lognormal at 5% Significance Level**											
392												
393	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
394						Mean in Original Scale	4.7277E-4				Mean in Log Scale	-9.32
395						SD in Original Scale	0.00141				SD in Log Scale	1.861
396						95% UTL95% Coverage	0.00299				95% BCA UTL95% Coverage	0.00291
397						95% Bootstrap (%) UTL95% Coverage	0.00319				95% UPL (t)	0.00198
398						90% Percentile (z)	9.7285E-4				95% Percentile (z)	0.00191
399						99% Percentile (z)	0.0068				95% USL	0.0415
400												
401	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
402						KM Mean of Logged Data	-5.507				95% KM UTL (Lognormal)95% Coverage	0.00507
403						KM SD of Logged Data	0.118				95% KM UPL (Lognormal)	0.00494
404						95% KM Percentile Lognormal (z)	0.00493				95% KM USL (Lognormal)	0.006
405												
406	**Background DL/2 Statistics Assuming Lognormal Distribution**											
407						Mean in Original Scale	0.0024				Mean in Log Scale	-6.072
408						SD in Original Scale	0.00107				SD in Log Scale	0.225
409						95% UTL95% Coverage	0.00352				95% UPL (t)	0.00335
410						90% Percentile (z)	0.00308				95% Percentile (z)	0.00334
411						99% Percentile (z)	0.00389				95% USL	0.00484
412	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
413												
414	**Nonparametric Distribution Free Background Statistics**											
415	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
416												

	A	B	C	D	E	F	G	H	I	J	K	L
417	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
418					Order of Statistic, r	128				95% UTL with95% Coverage		0.005
419					Approx, f used to compute achieved CC	1.684				Approximate Actual Confidence Coefficient achieved by UTL		0.898
420					Approximate Sample Size needed to achieve specified CC	153				95% UPL		0.005
421					95% USL	0.012				95% KM Chebyshev UPL		0.00768
422												
423	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
424	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
425	and consists of observations collected from clean unimpacted locations.											
426	The use of USL tends to provide a balance between false positives and false negatives provided the data											
427	represents a background data set and when many onsite observations need to be compared with the BTV.											
428												
429	**Cobalt**											
430												
431	**General Statistics**											
432					Total Number of Observations	122				Number of Missing Observations		19
433					Number of Distinct Observations	63						
434					Number of Detects	90				Number of Non-Detects		32
435					Number of Distinct Detects	61				Number of Distinct Non-Detects		3
436					Minimum Detect	3.0000E-4				Minimum Non-Detect		3.0000E-4
437					Maximum Detect	0.0076				Maximum Non-Detect		0.004
438					Variance Detected	2.8849E-6				Percent Non-Detects		26.23%
439					Mean Detected	0.00184				SD Detected		0.0017
440					Mean of Detected Logged Data	-6.663				SD of Detected Logged Data		0.842
441												
442	**Critical Values for Background Threshold Values (BTVs)**											
443					Tolerance Factor K (For UTL)	1.894				d2max (for USL)		3.276
444												
445	**Normal GOF Test on Detects Only**											
446					Shapiro Wilk Test Statistic	0.777				**Normal GOF Test on Detected Observations Only**		
447					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
448					Lilliefors Test Statistic	0.202				**Lilliefors GOF Test**		
449					5% Lilliefors Critical Value	0.0936				Data Not Normal at 5% Significance Level		
450	**Data Not Normal at 5% Significance Level**											
451												
452	**Nonparametric Distribution Free Background Statistics**											
453	**Data do not follow a Discernible Distribution (0.05)**											
454												
455	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
456					Order of Statistic, r	119				95% UTL with95% Coverage		0.0055
457					Approx, f used to compute achieved CC	1.566				Approximate Actual Confidence Coefficient achieved by UTL		0.864
458					Approximate Sample Size needed to achieve specified CC	153				95% UPL		0.0054
459					95% USL	0.0076				95% KM Chebyshev UPL		0.00843
460												
461	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
462	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
463	and consists of observations collected from clean unimpacted locations.											
464	The use of USL tends to provide a balance between false positives and false negatives provided the data											
465	represents a background data set and when many onsite observations need to be compared with the BTV.											
466												
467	**Lead**											
468												

	A	B	C	D	E	F	G	H	I	J	K	L
469	**General Statistics**											
470	Total Number of Observations					130	Number of Missing Observations					51
471	Number of Distinct Observations					9						
472	Number of Detects					7	Number of Non-Detects					123
473	Number of Distinct Detects					6	Number of Distinct Non-Detects					3
474	Minimum Detect					6.2000E-4	Minimum Non-Detect					5.0000E-4
475	Maximum Detect					0.018	Maximum Non-Detect					0.05
476	Variance Detected					5.8061E-5	Percent Non-Detects					94.62%
477	Mean Detected					0.00873	SD Detected					0.00762
478	Mean of Detected Logged Data					-5.437	SD of Detected Logged Data					1.53
479												
480	**Critical Values for Background Threshold Values (BTVs)**											
481	Tolerance Factor K (For UTL)					1.886	d2max (for USL)					3.297
482												
483	**Normal GOF Test on Detects Only**											
484	Shapiro Wilk Test Statistic					0.85	**Shapiro Wilk GOF Test**					
485	5% Shapiro Wilk Critical Value					0.803	Detected Data appear Normal at 5% Significance Level					
486	Lilliefors Test Statistic					0.244	**Lilliefors GOF Test**					
487	5% Lilliefors Critical Value					0.304	Detected Data appear Normal at 5% Significance Level					
488	**Detected Data appear Normal at 5% Significance Level**											
489												
490	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
491	KM Mean					9.5558E-4	KM SD					0.00249
492	95% UTL95% Coverage					0.00564	95% KM UPL (t)					0.00509
493	90% KM Percentile (z)					0.00414	95% KM Percentile (z)					0.00505
494	99% KM Percentile (z)					0.00674	95% KM USL					0.00915
495												
496	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
497	Mean					0.00276	SD					0.00373
498	95% UTL95% Coverage					0.0098	95% UPL (t)					0.00897
499	90% Percentile (z)					0.00754	95% Percentile (z)					0.0089
500	99% Percentile (z)					0.0114	95% USL					0.0151
501	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
502	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
503	and consists of observations collected from clean unimpacted locations.											
504	The use of USL tends to provide a balance between false positives and false negatives provided the data											
505	represents a background data set and when many onsite observations need to be compared with the BTV.											
506												
507	**Mercury**											
508												
509	**General Statistics**											
510	Total Number of Observations					131	Number of Missing Observations					49
511	Number of Distinct Observations					2						
512	Number of Detects					2	Number of Non-Detects					129
513	Number of Distinct Detects					2	Number of Distinct Non-Detects					1
514	Minimum Detect					2.0000E-4	Minimum Non-Detect					2.0000E-4
515	Maximum Detect					3.0000E-4	Maximum Non-Detect					2.0000E-4
516	Variance Detected					5.0000E-9	Percent Non-Detects					98.47%
517	Mean Detected					2.5000E-4	SD Detected					7.0711E-5
518	Mean of Detected Logged Data					-8.314	SD of Detected Logged Data					0.287
519												
520	**Warning: Data set has only 2 Detected Values.**											

521	This is not enough to compute meaningful or reliable statistics and estimates.											
522												
523												
524	**Critical Values for Background Threshold Values (BTVs)**											
525						Tolerance Factor K (For UTL)	1.885			d2max (for USL)	3.299		
526												
527	**Nonparametric Distribution Free Background Statistics**											
528	**Data do not follow a Discernible Distribution (0.05)**											
529												
530	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
531						Order of Statistic, r	128			95% UTL with95% Coverage	2.0000E-4	
532						Approx, f used to compute achieved CC	1.684			Approximate Actual Confidence Coefficient achieved by UTL	0.898	
533						Approximate Sample Size needed to achieve specified CC	153			95% UPL	2.0000E-4	
534						95% USL	3.0000E-4			95% KM Chebyshev UPL	2.3885E-4	
535												
536	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
537	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
538	and consists of observations collected from clean unimpacted locations.											
539	The use of USL tends to provide a balance between false positives and false negatives provided the data											
540	represents a background data set and when many onsite observations need to be compared with the BTV.											
541												
542	**Molybdenum**											
543												
544	**General Statistics**											
545						Total Number of Observations	120			Number of Missing Observations	23	
546						Number of Distinct Observations	43					
547						Number of Detects	92			Number of Non-Detects	28	
548						Number of Distinct Detects	41			Number of Distinct Non-Detects	3	
549						Minimum Detect	0.0011			Minimum Non-Detect	0.001	
550						Maximum Detect	0.0075			Maximum Non-Detect	0.01	
551						Variance Detected	2.0209E-6			Percent Non-Detects	23.33%	
552						Mean Detected	0.00311			SD Detected	0.00142	
553						Mean of Detected Logged Data	-5.869			SD of Detected Logged Data	0.438	
554												
555	**Critical Values for Background Threshold Values (BTVs)**											
556						Tolerance Factor K (For UTL)	1.897			d2max (for USL)	3.271	
557												
558	**Normal GOF Test on Detects Only**											
559						Shapiro Wilk Test Statistic	0.898			**Normal GOF Test on Detected Observations Only**		
560						5% Shapiro Wilk P Value	3.1165E-8			Data Not Normal at 5% Significance Level		
561						Lilliefors Test Statistic	0.133			**Lilliefors GOF Test**		
562						5% Lilliefors Critical Value	0.0926			Data Not Normal at 5% Significance Level		
563	**Data Not Normal at 5% Significance Level**											
564												
565	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
566						KM Mean	0.00277			KM SD	0.00148	
567						95% UTL95% Coverage	0.00558			95% KM UPL (t)	0.00523	
568						90% KM Percentile (z)	0.00467			95% KM Percentile (z)	0.00521	
569						99% KM Percentile (z)	0.00621			95% KM USL	0.00761	
570												
571	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
572						Mean	0.00284			SD	0.00163	

	A	B	C	D	E	F	G	H	I	J	K	L
573				95% UTL95% Coverage		0.00594					95% UPL (t)	0.00556
574				90% Percentile (z)		0.00493					95% Percentile (z)	0.00553
575				99% Percentile (z)		0.00664					95% USL	0.00818
576	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
577												
578	**Gamma GOF Tests on Detected Observations Only**											
579				A-D Test Statistic		0.732	**Anderson-Darling GOF Test**					
580				5% A-D Critical Value		0.754	Detected data appear Gamma Distributed at 5% Significance Level					
581				K-S Test Statistic		0.076	**Kolmogorov-Smirnov GOF**					
582				5% K-S Critical Value		0.0934	Detected data appear Gamma Distributed at 5% Significance Level					
583	**Detected data appear Gamma Distributed at 5% Significance Level**											
584												
585	**Gamma Statistics on Detected Data Only**											
586				k hat (MLE)		5.394	k star (bias corrected MLE)					5.226
587				Theta hat (MLE)		5.7650E-4	Theta star (bias corrected MLE)					5.9511E-4
588				nu hat (MLE)		992.5	nu star (bias corrected)					961.5
589				MLE Mean (bias corrected)		0.00311						
590				MLE Sd (bias corrected)		0.00136	95% Percentile of Chisquare (2kstar)					18.93
591												
592	**Gamma ROS Statistics using Imputed Non-Detects**											
593	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
594	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
595	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
596	This is especially true when the sample size is small.											
597	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
598				Minimum		0.0011	Mean					0.00472
599				Maximum		0.01	Median					0.00345
600				SD		0.00318	CV					0.674
601				k hat (MLE)		2.453	k star (bias corrected MLE)					2.398
602				Theta hat (MLE)		0.00192	Theta star (bias corrected MLE)					0.00197
603				nu hat (MLE)		588.8	nu star (bias corrected)					575.4
604				MLE Mean (bias corrected)		0.00472	MLE Sd (bias corrected)					0.00305
605				95% Percentile of Chisquare (2kstar)		10.75	90% Percentile					0.0088
606				95% Percentile		0.0106	99% Percentile					0.0145
607	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
608	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
609					WH	HW					WH	HW
610			95% Approx. Gamma UTL with 95% Coverage		0.0118	0.0121	95% Approx. Gamma UPL				0.0106	0.0107
611				95% Gamma USL	0.0213	0.0231						
612												
613	**Estimates of Gamma Parameters using KM Estimates**											
614				Mean (KM)		0.00277	SD (KM)					0.00148
615				Variance (KM)		2.1909E-6	SE of Mean (KM)					1.4116E-4
616				k hat (KM)		3.504	k star (KM)					3.422
617				nu hat (KM)		841	nu star (KM)					821.3
618				theta hat (KM)		7.9069E-4	theta star (KM)					8.0965E-4
619				80% gamma percentile (KM)		0.00389	90% gamma percentile (KM)					0.00478
620				95% gamma percentile (KM)		0.0056	99% gamma percentile (KM)					0.00738
621												
622	**The following statistics are computed using gamma distribution and KM estimates**											
623	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
624					WH	HW					WH	HW

625	95% Approx. Gamma UTL with 95% Coverage				0.00601	0.00612	95% Approx. Gamma UPL				0.00548	0.00554
626	95% KM Gamma Percentile				0.00543	0.0055	95% Gamma USL				0.00992	0.0105
627												
628	**Lognormal GOF Test on Detected Observations Only**											
629	Shapiro Wilk Approximate Test Statistic					0.971	**Shapiro Wilk GOF Test**					
630	5% Shapiro Wilk P Value					0.182	Detected Data appear Lognormal at 5% Significance Level					
631	Lilliefors Test Statistic					0.0679	**Lilliefors GOF Test**					
632	5% Lilliefors Critical Value					0.0926	Detected Data appear Lognormal at 5% Significance Level					
633	**Detected Data appear Lognormal at 5% Significance Level**											
634												
635	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
636	Mean in Original Scale					0.00276	Mean in Log Scale					-6.026
637	SD in Original Scale					0.00146	SD in Log Scale					0.527
638	95% UTL95% Coverage					0.00656	95% BCA UTL95% Coverage					0.00653
639	95% Bootstrap (%) UTL95% Coverage					0.00653	95% UPL (t)					0.0058
640	90% Percentile (z)					0.00474	95% Percentile (z)					0.00574
641	99% Percentile (z)					0.00822	95% USL					0.0135
642												
643	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
644	KM Mean of Logged Data					-6.026	95% KM UTL (Lognormal)95% Coverage					0.00659
645	KM SD of Logged Data					0.529	95% KM UPL (Lognormal)					0.00583
646	95% KM Percentile Lognormal (z)					0.00577	95% KM USL (Lognormal)					0.0136
647												
648	**Background DL/2 Statistics Assuming Lognormal Distribution**											
649	Mean in Original Scale					0.00284	Mean in Log Scale					-6.062
650	SD in Original Scale					0.00163	SD in Log Scale					0.688
651	95% UTL95% Coverage					0.0086	95% UPL (t)					0.00733
652	90% Percentile (z)					0.00563	95% Percentile (z)					0.00723
653	99% Percentile (z)					0.0116	95% USL					0.0221
654	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
655												
656	**Nonparametric Distribution Free Background Statistics**											
657	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
658												
659	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
660	Order of Statistic, r					117	95% UTL with95% Coverage					0.01
661	Approx, f used to compute achieved CC					1.539	Approximate Actual Confidence Coefficient achieved by UTL					0.856
662	Approximate Sample Size needed to achieve specified CC					153	95% UPL					0.01
663	95% USL					0.01	95% KM Chebyshev UPL					0.00925
664												
665	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
666	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
667	and consists of observations collected from clean unimpacted locations.											
668	The use of USL tends to provide a balance between false positives and false negatives provided the data											
669	represents a background data set and when many onsite observations need to be compared with the BTV.											
670												
671	**Selenium**											
672												
673	**General Statistics**											
674	Total Number of Observations					123	Number of Missing Observations					18
675	Number of Distinct Observations					14						
676	Number of Detects					16	Number of Non-Detects					107

	A	B	C	D	E	F	G	H	I	J	K	L
677					Number of Distinct Detects	11				Number of Distinct Non-Detects		3
678					Minimum Detect	0.0011				Minimum Non-Detect		0.001
679					Maximum Detect	0.034				Maximum Non-Detect		0.025
680					Variance Detected	1.7977E-4				Percent Non-Detects		86.99%
681					Mean Detected	0.0113				SD Detected		0.0134
682					Mean of Detected Logged Data	-5.363				SD of Detected Logged Data		1.444
683												
684					**Critical Values for Background Threshold Values (BTVs)**							
685					Tolerance Factor K (For UTL)	1.893				d2max (for USL)		3.279
686												
687					**Normal GOF Test on Detects Only**							
688					Shapiro Wilk Test Statistic	0.729			**Shapiro Wilk GOF Test**			
689					5% Shapiro Wilk Critical Value	0.887			Data Not Normal at 5% Significance Level			
690					Lilliefors Test Statistic	0.29			**Lilliefors GOF Test**			
691					5% Lilliefors Critical Value	0.213			Data Not Normal at 5% Significance Level			
692					**Data Not Normal at 5% Significance Level**							
693												
694					**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**							
695					KM Mean	0.00237				KM SD		0.00584
696					95% UTL95% Coverage	0.0134				95% KM UPL (t)		0.0121
697					90% KM Percentile (z)	0.00985				95% KM Percentile (z)		0.012
698					99% KM Percentile (z)	0.016				95% KM USL		0.0215
699												
700					**DL/2 Substitution Background Statistics Assuming Normal Distribution**							
701					Mean	0.00317				SD		0.00637
702					95% UTL95% Coverage	0.0152				95% UPL (t)		0.0138
703					90% Percentile (z)	0.0113				95% Percentile (z)		0.0137
704					99% Percentile (z)	0.018				95% USL		0.0241
705					**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**							
706												
707					**Gamma GOF Tests on Detected Observations Only**							
708					A-D Test Statistic	1.354			**Anderson-Darling GOF Test**			
709					5% A-D Critical Value	0.78			Data Not Gamma Distributed at 5% Significance Level			
710					K-S Test Statistic	0.251			**Kolmogorov-Smirnov GOF**			
711					5% K-S Critical Value	0.224			Data Not Gamma Distributed at 5% Significance Level			
712					**Data Not Gamma Distributed at 5% Significance Level**							
713												
714					**Gamma Statistics on Detected Data Only**							
715					k hat (MLE)	0.688				k star (bias corrected MLE)		0.601
716					Theta hat (MLE)	0.0164				Theta star (bias corrected MLE)		0.0188
717					nu hat (MLE)	22.03				nu star (bias corrected)		19.23
718					MLE Mean (bias corrected)	0.0113						
719					MLE Sd (bias corrected)	0.0146				95% Percentile of Chisquare (2kstar)		4.323
720												
721					**Gamma ROS Statistics using Imputed Non-Detects**							
722					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
723					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
724					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
725					This is especially true when the sample size is small.							
726					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
727					Minimum	0.0011				Mean		0.0102
728					Maximum	0.034				Median		0.01

	A	B	C	D	E	F	G	H	I	J	K	L
729					SD	0.00472					CV	0.464
730					k hat (MLE)	4.495					k star (bias corrected MLE)	4.391
731					Theta hat (MLE)	0.00226					Theta star (bias corrected MLE)	0.00232
732					nu hat (MLE)	1106					nu star (bias corrected)	1080
733					MLE Mean (bias corrected)	0.0102					MLE Sd (bias corrected)	0.00485
734				95% Percentile of Chisquare (2kstar)		16.61					90% Percentile	0.0167
735					95% Percentile	0.0192					99% Percentile	0.0247
736	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
737	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
738					WH	HW					WH	HW
739	95% Approx. Gamma UTL with 95% Coverage				0.0208	0.0217	95% Approx. Gamma UPL				0.0191	0.0198
740				95% Gamma USL	0.0333	0.0364						
741												
742	**Estimates of Gamma Parameters using KM Estimates**											
743					Mean (KM)	0.00237					SD (KM)	0.00584
744					Variance (KM)	3.4092E-5					SE of Mean (KM)	5.4582E-4
745					k hat (KM)	0.165					k star (KM)	0.166
746					nu hat (KM)	40.58					nu star (KM)	40.92
747					theta hat (KM)	0.0144					theta star (KM)	0.0143
748					80% gamma percentile (KM)	0.00279					90% gamma percentile (KM)	0.00711
749					95% gamma percentile (KM)	0.0128					99% gamma percentile (KM)	0.0289
750												
751	**The following statistics are computed using gamma distribution and KM estimates**											
752	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
753					WH	HW					WH	HW
754	95% Approx. Gamma UTL with 95% Coverage				0.00735	0.00667	95% Approx. Gamma UPL				0.00627	0.00567
755				95% KM Gamma Percentile	0.00619	0.00559				95% Gamma USL	0.0165	0.0158
756												
757	**Lognormal GOF Test on Detected Observations Only**											
758					Shapiro Wilk Test Statistic	0.807	**Shapiro Wilk GOF Test**					
759					5% Shapiro Wilk Critical Value	0.887	Data Not Lognormal at 5% Significance Level					
760					Lilliefors Test Statistic	0.25	**Lilliefors GOF Test**					
761					5% Lilliefors Critical Value	0.213	Data Not Lognormal at 5% Significance Level					
762	**Data Not Lognormal at 5% Significance Level**											
763												
764	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
765					Mean in Original Scale	0.00158	Mean in Log Scale					-10.21
766					SD in Original Scale	0.00603	SD in Log Scale					2.984
767					95% UTL95% Coverage	0.0105	95% BCA UTL95% Coverage					0.03
768				95% Bootstrap (%) UTL95% Coverage		0.03	95% UPL (t)					0.00529
769					90% Percentile (z)	0.00169	95% Percentile (z)					0.00499
770					99% Percentile (z)	0.0382	95% USL					0.655
771												
772	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
773					KM Mean of Logged Data	-6.694	95% KM UTL (Lognormal)95% Coverage					0.00494
774					KM SD of Logged Data	0.731	95% KM UPL (Lognormal)					0.00418
775				95% KM Percentile Lognormal (z)		0.00412	95% KM USL (Lognormal)					0.0136
776												
777	**Background DL/2 Statistics Assuming Lognormal Distribution**											
778					Mean in Original Scale	0.00317	Mean in Log Scale					-6.708
779					SD in Original Scale	0.00637	SD in Log Scale					1.194
780					95% UTL95% Coverage	0.0117	95% UPL (t)					0.00891

781					90% Percentile (z)	0.00564					95% Percentile (z)	0.0087
782					99% Percentile (z)	0.0196					95% USL	0.0612
783	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
784												
785	**Nonparametric Distribution Free Background Statistics**											
786	**Data do not follow a Discernible Distribution (0.05)**											
787												
788	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
789					Order of Statistic, r	120					95% UTL with95% Coverage	0.03
790					Approx, f used to compute achieved CC	1.579					Approximate Actual Confidence Coefficient achieved by UTL	0.868
791					Approximate Sample Size needed to achieve specified CC	153					95% UPL	0.025
792					95% USL	0.034					95% KM Chebyshev UPL	0.0279
793												
794	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
795	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
796	and consists of observations collected from clean unimpacted locations.											
797	The use of USL tends to provide a balance between false positives and false negatives provided the data											
798	represents a background data set and when many onsite observations need to be compared with the BTV.											
799												
800	**Thallium**											
801												
802	**General Statistics**											
803					Total Number of Observations	114					Number of Missing Observations	27
804					Number of Distinct Observations	10						
805					Number of Detects	8					Number of Non-Detects	106
806					Number of Distinct Detects	7					Number of Distinct Non-Detects	3
807					Minimum Detect	5.6000E-5					Minimum Non-Detect	2.0000E-4
808					Maximum Detect	0.0035					Maximum Non-Detect	0.02
809					Variance Detected	2.2595E-6					Percent Non-Detects	92.98%
810					Mean Detected	0.00198					SD Detected	0.0015
811					Mean of Detected Logged Data	-6.975					SD of Detected Logged Data	1.781
812												
813	**Critical Values for Background Threshold Values (BTVs)**											
814					Tolerance Factor K (For UTL)	1.904					d2max (for USL)	3.254
815												
816	**Normal GOF Test on Detects Only**											
817					Shapiro Wilk Test Statistic	0.844					**Shapiro Wilk GOF Test**	
818					5% Shapiro Wilk Critical Value	0.818					Detected Data appear Normal at 5% Significance Level	
819					Lilliefors Test Statistic	0.208					**Lilliefors GOF Test**	
820					5% Lilliefors Critical Value	0.283					Detected Data appear Normal at 5% Significance Level	
821	**Detected Data appear Normal at 5% Significance Level**											
822												
823	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
824					KM Mean	2.0189E-4					KM SD	6.3747E-4
825					95% UTL95% Coverage	0.00142					95% KM UPL (t)	0.00126
826					90% KM Percentile (z)	0.00102					95% KM Percentile (z)	0.00125
827					99% KM Percentile (z)	0.00168					95% KM USL	0.00228
828												
829	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
830					Mean	0.00102					SD	0.00255
831					95% UTL95% Coverage	0.00588					95% UPL (t)	0.00527
832					90% Percentile (z)	0.00429					95% Percentile (z)	0.00522

833				99% Percentile (z)	0.00696					95% USL	0.00932	
834	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
835												
836	**Gamma GOF Tests on Detected Observations Only**											
837				A-D Test Statistic	0.842	**Anderson-Darling GOF Test**						
838				5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level						
839				K-S Test Statistic	0.258	**Kolmogorov-Smirnov GOF**						
840				5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level						
841	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
842												
843	**Gamma Statistics on Detected Data Only**											
844				k hat (MLE)	0.793	k star (bias corrected MLE)	0.579					
845				Theta hat (MLE)	0.00249	Theta star (bias corrected MLE)	0.00341					
846				nu hat (MLE)	12.69	nu star (bias corrected)	9.268					
847				MLE Mean (bias corrected)	0.00198							
848				MLE Sd (bias corrected)	0.0026	95% Percentile of Chisquare (2kstar)	4.222					
849												
850	**Gamma ROS Statistics using Imputed Non-Detects**											
851	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
852	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
853	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
854	This is especially true when the sample size is small.											
855	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
856				Minimum	5.6000E-5	Mean	0.00944					
857				Maximum	0.01	Median	0.01					
858				SD	0.00209	CV	0.222					
859				k hat (MLE)	4.775	k star (bias corrected MLE)	4.655					
860				Theta hat (MLE)	0.00198	Theta star (bias corrected MLE)	0.00203					
861				nu hat (MLE)	1089	nu star (bias corrected)	1061					
862				MLE Mean (bias corrected)	0.00944	MLE Sd (bias corrected)	0.00437					
863				95% Percentile of Chisquare (2kstar)	17.35	90% Percentile	0.0153					
864				95% Percentile	0.0176	99% Percentile	0.0225					
865	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
866	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
867					WH	HW				WH	HW	
868				95% Approx. Gamma UTL with 95% Coverage	0.0184	0.0203	95% Approx. Gamma UPL			0.017	0.0184	
869				95% Gamma USL	0.028	0.0332						
870												
871	**Estimates of Gamma Parameters using KM Estimates**											
872				Mean (KM)	2.0189E-4	SD (KM)	6.3747E-4					
873				Variance (KM)	4.0636E-7	SE of Mean (KM)	6.6195E-5					
874				k hat (KM)	0.1	k star (KM)	0.104					
875				nu hat (KM)	22.87	nu star (KM)	23.6					
876				theta hat (KM)	0.00201	theta star (KM)	0.00195					
877				80% gamma percentile (KM)	1.4711E-4	90% gamma percentile (KM)	5.4481E-4					
878				95% gamma percentile (KM)	0.00117	99% gamma percentile (KM)	0.00315					
879												
880	**The following statistics are computed using gamma distribution and KM estimates**											
881	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
882					WH	HW				WH	HW	
883				95% Approx. Gamma UTL with 95% Coverage	6.6689E-4	5.7986E-4	95% Approx. Gamma UPL			5.5005E-4	4.7451E-4	
884				95% KM Gamma Percentile	5.4053E-4	4.6603E-4	95% Gamma USL			0.00165	0.00154	

	A	B	C	D	E	F	G	H	I	J	K	L
885												
886	**Lognormal GOF Test on Detected Observations Only**											
887					Shapiro Wilk Test Statistic	0.734	**Shapiro Wilk GOF Test**					
888					5% Shapiro Wilk Critical Value	0.818	Data Not Lognormal at 5% Significance Level					
889					Lilliefors Test Statistic	0.286	**Lilliefors GOF Test**					
890					5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level					
891	**Data Not Lognormal at 5% Significance Level**											
892												
893	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
894					Mean in Original Scale	2.7974E-4			Mean in Log Scale	-9.472		
895					SD in Original Scale	6.2970E-4			SD in Log Scale	1.625		
896					95% UTL95% Coverage	0.0017			95% BCA UTL95% Coverage	0.00301		
897					95% Bootstrap (%) UTL95% Coverage	0.00301			95% UPL (t)	0.00115		
898					90% Percentile (z)	6.1717E-4			95% Percentile (z)	0.00111		
899					99% Percentile (z)	0.00337			95% USL	0.0152		
900												
901	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
902					KM Mean of Logged Data	-9.561			95% KM UTL (Lognormal)95% Coverage	3.6842E-4		
903					KM SD of Logged Data	0.869			95% KM UPL (Lognormal)	2.9950E-4		
904					95% KM Percentile Lognormal (z)	2.9411E-4			95% KM USL (Lognormal)	0.00119		
905												
906	**Background DL/2 Statistics Assuming Lognormal Distribution**											
907					Mean in Original Scale	0.00102			Mean in Log Scale	-8.335		
908					SD in Original Scale	0.00255			SD in Log Scale	1.386		
909					95% UTL95% Coverage	0.00336			95% UPL (t)	0.00241		
910					90% Percentile (z)	0.00142			95% Percentile (z)	0.00234		
911					99% Percentile (z)	0.00603			95% USL	0.0218		
912	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
913												
914	**Nonparametric Distribution Free Background Statistics**											
915	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
916												
917	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
918					Order of Statistic, r	111			95% UTL with95% Coverage	0.02		
919					Approx, f used to compute achieved CC	1.461			Approximate Actual Confidence Coefficient achieved by UTL	0.827		
920					Approximate Sample Size needed to achieve specified CC	153			95% UPL	0.02		
921					95% USL	0.02			95% KM Chebyshev UPL	0.00299		
922												
923	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
924	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
925	and consists of observations collected from clean unimpacted locations.											
926	The use of USL tends to provide a balance between false positives and false negatives provided the data											
927	represents a background data set and when many onsite observations need to be compared with the BTV.											
928												
929	**Calcium**											
930												
931	**General Statistics**											
932					Total Number of Observations	128			Number of Distinct Observations	85		
933									Number of Missing Observations	13		
934					Minimum	56.7			First Quartile	123		
935					Second Largest	259			Median	151		
936					Maximum	287			Third Quartile	204.3		

937					Mean	158.5					SD	53.27
938					Coefficient of Variation	0.336					Skewness	0.0528
939					Mean of logged Data	5.003					SD of logged Data	0.369
940												
941	**Critical Values for Background Threshold Values (BTVs)**											
942					Tolerance Factor K (For UTL)	1.888					d2max (for USL)	3.292
943												
944	**Normal GOF Test**											
945					Shapiro Wilk Test Statistic	0.944	**Normal GOF Test**					
946					5% Shapiro Wilk P Value	5.9537E-5	Data Not Normal at 5% Significance Level					
947					Lilliefors Test Statistic	0.121	**Lilliefors GOF Test**					
948					5% Lilliefors Critical Value	0.0787	Data Not Normal at 5% Significance Level					
949	**Data Not Normal at 5% Significance Level**											
950												
951	**Background Statistics Assuming Normal Distribution**											
952				95% UTL with	95% Coverage	259.1					90% Percentile (z)	226.7
953					95% UPL (t)	247.1					95% Percentile (z)	246.1
954					95% USL	333.8					99% Percentile (z)	282.4
955												
956	**Gamma GOF Test**											
957					A-D Test Statistic	2.152	**Anderson-Darling Gamma GOF Test**					
958					5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level					
959					K-S Test Statistic	0.0988	**Kolmogorov-Smirnov Gamma GOF Test**					
960					5% K-S Critical Value	0.0822	Data Not Gamma Distributed at 5% Significance Level					
961	**Data Not Gamma Distributed at 5% Significance Level**											
962												
963	**Gamma Statistics**											
964					k hat (MLE)	8.105					k star (bias corrected MLE)	7.92
965					Theta hat (MLE)	19.55					Theta star (bias corrected MLE)	20.01
966					nu hat (MLE)	2075					nu star (bias corrected)	2028
967					MLE Mean (bias corrected)	158.5					MLE Sd (bias corrected)	56.31
968												
969	**Background Statistics Assuming Gamma Distribution**											
970					95% Wilson Hilferty (WH) Approx. Gamma UPL	261.7					90% Percentile	233.6
971					95% Hawkins Wixley (HW) Approx. Gamma UPL	264.5					95% Percentile	261
972				95% WH Approx. Gamma UTL with	95% Coverage	279.7					99% Percentile	317.9
973				95% HW Approx. Gamma UTL with	95% Coverage	283.7						
974					95% WH USL	410.7					95% HW USL	427.7
975												
976	**Lognormal GOF Test**											
977					Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk Lognormal GOF Test**					
978					5% Shapiro Wilk P Value	7.4702E-8	Data Not Lognormal at 5% Significance Level					
979					Lilliefors Test Statistic	0.108	**Lilliefors Lognormal GOF Test**					
980					5% Lilliefors Critical Value	0.0787	Data Not Lognormal at 5% Significance Level					
981	**Data Not Lognormal at 5% Significance Level**											
982												
983	**Background Statistics assuming Lognormal Distribution**											
984				95% UTL with	95% Coverage	298.8					90% Percentile (z)	238.9
985					95% UPL (t)	275					95% Percentile (z)	273.2
986					95% USL	501.9					99% Percentile (z)	351.3
987												
988	**Nonparametric Distribution Free Background Statistics**											

989	**Data do not follow a Discernible Distribution (0.05)**											
990												
991	**Nonparametric Upper Limits for Background Threshold Values**											
992					Order of Statistic, r	125			95% UTL with 95% Coverage		252	
993					Approx, f used to compute achieved CC	1.645			Approximate Actual Confidence Coefficient achieved by UTL		0.887	
994									Approximate Sample Size needed to achieve specified CC		153	
995					95% Percentile Bootstrap UTL with 95% Coverage	249.9			95% BCA Bootstrap UTL with 95% Coverage		252	
996					95% UPL	241.6			90% Percentile		226	
997					90% Chebyshev UPL	318.9			95% Percentile		240.3	
998					95% Chebyshev UPL	391.6			99% Percentile		257.1	
999					95% USL	287						
1000												
1001	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1002	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1003	and consists of observations collected from clean unimpacted locations.											
1004	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1005	represents a background data set and when many onsite observations need to be compared with the BTV.											
1006												
1007	**Chloride**											
1008												
1009	**General Statistics**											
1010					Total Number of Observations	132			Number of Distinct Observations		79	
1011									Number of Missing Observations		9	
1012					Minimum	5.7			First Quartile		24	
1013					Second Largest	120			Median		29	
1014					Maximum	120			Third Quartile		43.25	
1015					Mean	39.96			SD		25.77	
1016					Coefficient of Variation	0.645			Skewness		1.585	
1017					Mean of logged Data	3.521			SD of logged Data		0.564	
1018												
1019	**Critical Values for Background Threshold Values (BTVs)**											
1020					Tolerance Factor K (For UTL)	1.884			d2max (for USL)		3.302	
1021												
1022	**Normal GOF Test**											
1023					Shapiro Wilk Test Statistic	0.786			**Normal GOF Test**			
1024					5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
1025					Lilliefors Test Statistic	0.22			**Lilliefors GOF Test**			
1026					5% Lilliefors Critical Value	0.0775			Data Not Normal at 5% Significance Level			
1027	**Data Not Normal at 5% Significance Level**											
1028												
1029	**Background Statistics Assuming Normal Distribution**											
1030					95% UTL with 95% Coverage	88.51			90% Percentile (z)		72.99	
1031					95% UPL (t)	82.82			95% Percentile (z)		82.35	
1032					95% USL	125.1			99% Percentile (z)		99.92	
1033												
1034	**Gamma GOF Test**											
1035					A-D Test Statistic	5.023			**Anderson-Darling Gamma GOF Test**			
1036					5% A-D Critical Value	0.759			Data Not Gamma Distributed at 5% Significance Level			
1037					K-S Test Statistic	0.172			**Kolmogorov-Smirnov Gamma GOF Test**			
1038					5% K-S Critical Value	0.0817			Data Not Gamma Distributed at 5% Significance Level			
1039	**Data Not Gamma Distributed at 5% Significance Level**											
1040												

1041	**Gamma Statistics**											
1042					k hat (MLE)	3.157			k star (bias corrected MLE)			3.091
1043					Theta hat (MLE)	12.66			Theta star (bias corrected MLE)			12.93
1044					nu hat (MLE)	833.6			nu star (bias corrected)			816
1045					MLE Mean (bias corrected)	39.96			MLE Sd (bias corrected)			22.73
1046												
1047	**Background Statistics Assuming Gamma Distribution**											
1048				95% Wilson Hilferty (WH) Approx. Gamma UPL		82.93			90% Percentile			70.43
1049				95% Hawkins Wixley (HW) Approx. Gamma UPL		83.44			95% Percentile			83.15
1050				95% WH Approx. Gamma UTL with 95% Coverage		91.31			99% Percentile			110.7
1051				95% HW Approx. Gamma UTL with 95% Coverage		92.39						
1052					95% WH USL	158.7			95% HW USL			168
1053												
1054	**Lognormal GOF Test**											
1055					Shapiro Wilk Test Statistic	0.937			**Shapiro Wilk Lognormal GOF Test**			
1056					5% Shapiro Wilk P Value	2.8221E-6			Data Not Lognormal at 5% Significance Level			
1057					Lilliefors Test Statistic	0.137			**Lilliefors Lognormal GOF Test**			
1058					5% Lilliefors Critical Value	0.0775			Data Not Lognormal at 5% Significance Level			
1059	**Data Not Lognormal at 5% Significance Level**											
1060												
1061	**Background Statistics assuming Lognormal Distribution**											
1062					95% UTL with 95% Coverage	97.87			90% Percentile (z)			69.68
1063					95% UPL (t)	86.4			95% Percentile (z)			85.52
1064					95% USL	217.7			99% Percentile (z)			125.6
1065												
1066	**Nonparametric Distribution Free Background Statistics**											
1067	**Data do not follow a Discernible Distribution (0.05)**											
1068												
1069	**Nonparametric Upper Limits for Background Threshold Values**											
1070					Order of Statistic, r	129			95% UTL with 95% Coverage			110
1071					Approx, f used to compute achieved CC	1.697			Approximate Actual Confidence Coefficient achieved by UTL			0.901
1072									Approximate Sample Size needed to achieve specified CC			153
1073				95% Percentile Bootstrap UTL with 95% Coverage		110			95% BCA Bootstrap UTL with 95% Coverage			110
1074					95% UPL	101.7			90% Percentile			78
1075					90% Chebyshev UPL	117.6			95% Percentile			95.99
1076					95% Chebyshev UPL	152.7			99% Percentile			120
1077					95% USL	120						
1078												
1079	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1080	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1081	and consists of observations collected from clean unimpacted locations.											
1082	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1083	represents a background data set and when many onsite observations need to be compared with the BTV.											
1084												
1085	**Fluoride**											
1086												
1087	**General Statistics**											
1088					Total Number of Observations	108			Number of Missing Observations			18
1089					Number of Distinct Observations	17						
1090					Number of Detects	30			Number of Non-Detects			78
1091					Number of Distinct Detects	16			Number of Distinct Non-Detects			3
1092					Minimum Detect	0.087			Minimum Non-Detect			0.2

	A	B	C	D	E	F	G	H	I	J	K	L
1093					Maximum Detect	0.33				Maximum Non-Detect		0.5
1094					Variance Detected	0.00331				Percent Non-Detects		72.22%
1095					Mean Detected	0.215				SD Detected		0.0575
1096					Mean of Detected Logged Data	-1.576				SD of Detected Logged Data		0.309
1097												
1098					**Critical Values for Background Threshold Values (BTVs)**							
1099					Tolerance Factor K (For UTL)	1.912				d2max (for USL)		3.236
1100												
1101					**Normal GOF Test on Detects Only**							
1102					Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk GOF Test**					
1103					5% Shapiro Wilk Critical Value	0.927	Detected Data appear Normal at 5% Significance Level					
1104					Lilliefors Test Statistic	0.0999	**Lilliefors GOF Test**					
1105					5% Lilliefors Critical Value	0.159	Detected Data appear Normal at 5% Significance Level					
1106					**Detected Data appear Normal at 5% Significance Level**							
1107												
1108					**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**							
1109					KM Mean	0.19				KM SD		0.0499
1110					95% UTL95% Coverage	0.286				95% KM UPL (t)		0.273
1111					90% KM Percentile (z)	0.254				95% KM Percentile (z)		0.272
1112					99% KM Percentile (z)	0.306				95% KM USL		0.352
1113												
1114					**DL/2 Substitution Background Statistics Assuming Normal Distribution**							
1115					Mean	0.162				SD		0.0583
1116					95% UTL95% Coverage	0.274				95% UPL (t)		0.26
1117					90% Percentile (z)	0.237				95% Percentile (z)		0.258
1118					99% Percentile (z)	0.298				95% USL		0.351
1119					**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**							
1120												
1121					**Gamma GOF Tests on Detected Observations Only**							
1122					A-D Test Statistic	0.589	**Anderson-Darling GOF Test**					
1123					5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level					
1124					K-S Test Statistic	0.128	**Kolmogorov-Smirnov GOF**					
1125					5% K-S Critical Value	0.16	Detected data appear Gamma Distributed at 5% Significance Level					
1126					**Detected data appear Gamma Distributed at 5% Significance Level**							
1127												
1128					**Gamma Statistics on Detected Data Only**							
1129					k hat (MLE)	12.25				k star (bias corrected MLE)		11.05
1130					Theta hat (MLE)	0.0176				Theta star (bias corrected MLE)		0.0195
1131					nu hat (MLE)	735.3				nu star (bias corrected)		663.1
1132					MLE Mean (bias corrected)	0.215						
1133					MLE Sd (bias corrected)	0.0648				95% Percentile of Chisquare (2kstar)		34.05
1134												
1135					**Gamma ROS Statistics using Imputed Non-Detects**							
1136					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1137					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1138					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1139					This is especially true when the sample size is small.							
1140					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1141					Minimum	0.087				Mean		0.189
1142					Maximum	0.33				Median		0.186
1143					SD	0.046				CV		0.244
1144					k hat (MLE)	16.59				k star (bias corrected MLE)		16.14

1145					Theta hat (MLE)	0.0114				Theta star (bias corrected MLE)		0.0117
1146					nu hat (MLE)	3584				nu star (bias corrected)		3485
1147					MLE Mean (bias corrected)	0.189				MLE Sd (bias corrected)		0.0469
1148					95% Percentile of Chisquare (2kstar)	46.52				90% Percentile		0.251
1149					95% Percentile	0.272				99% Percentile		0.315
1150	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1151	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1152					WH	HW				WH	HW	
1153	95% Approx. Gamma UTL with 95% Coverage				0.287	0.289	95% Approx. Gamma UPL			0.272	0.274	
1154	95% Gamma USL				0.377	0.384						
1155												
1156	**Estimates of Gamma Parameters using KM Estimates**											
1157					Mean (KM)	0.19	SD (KM)				0.0499	
1158					Variance (KM)	0.00249	SE of Mean (KM)				0.00912	
1159					k hat (KM)	14.56	k star (KM)				14.17	
1160					nu hat (KM)	3146	nu star (KM)				3060	
1161					theta hat (KM)	0.0131	theta star (KM)				0.0134	
1162					80% gamma percentile (KM)	0.231	90% gamma percentile (KM)				0.257	
1163					95% gamma percentile (KM)	0.28	99% gamma percentile (KM)				0.327	
1164												
1165	**The following statistics are computed using gamma distribution and KM estimates**											
1166	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1167					WH	HW				WH	HW	
1168	95% Approx. Gamma UTL with 95% Coverage				0.305	0.308	95% Approx. Gamma UPL			0.287	0.29	
1169	95% KM Gamma Percentile				0.286	0.288	95% Gamma USL			0.412	0.424	
1170												
1171	**Lognormal GOF Test on Detected Observations Only**											
1172					Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**					
1173					5% Shapiro Wilk Critical Value	0.927	Data Not Lognormal at 5% Significance Level					
1174					Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**					
1175					5% Lilliefors Critical Value	0.159	Detected Data appear Lognormal at 5% Significance Level					
1176	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
1177												
1178	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1179					Mean in Original Scale	0.186	Mean in Log Scale				-1.714	
1180					SD in Original Scale	0.0469	SD in Log Scale				0.258	
1181					95% UTL95% Coverage	0.295	95% BCA UTL95% Coverage				0.28	
1182					95% Bootstrap (%) UTL95% Coverage	0.28	95% UPL (t)				0.277	
1183					90% Percentile (z)	0.251	95% Percentile (z)				0.276	
1184					99% Percentile (z)	0.329	95% USL				0.416	
1185												
1186	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1187					KM Mean of Logged Data	-1.699	95% KM UTL (Lognormal)95% Coverage				0.322	
1188					KM SD of Logged Data	0.296	95% KM UPL (Lognormal)				0.299	
1189					95% KM Percentile Lognormal (z)	0.297	95% KM USL (Lognormal)				0.476	
1190												
1191	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1192					Mean in Original Scale	0.162	Mean in Log Scale				-1.873	
1193					SD in Original Scale	0.0583	SD in Log Scale				0.323	
1194					95% UTL95% Coverage	0.285	95% UPL (t)				0.263	
1195					90% Percentile (z)	0.232	95% Percentile (z)				0.261	
1196					99% Percentile (z)	0.326	95% USL				0.437	

1197	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1198												
1199	**Nonparametric Distribution Free Background Statistics**											
1200	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1201												
1202	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1203					Order of Statistic, r	106				95% UTL with95% Coverage	0.5	
1204					Approx, f used to compute achieved CC	1.86				Approximate Actual Confidence Coefficient achieved by UTL	0.911	
1205					Approximate Sample Size needed to achieve specified CC	124				95% UPL	0.5	
1206					95% USL	0.5				95% KM Chebyshev UPL	0.409	
1207												
1208	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1209	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1210	and consists of observations collected from clean unimpacted locations.											
1211	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1212	represents a background data set and when many onsite observations need to be compared with the BTV.											
1213												
1214	**Lithium**											
1215												
1216	**General Statistics**											
1217					Total Number of Observations	122				Number of Missing Observations	17	
1218					Number of Distinct Observations	15						
1219					Number of Detects	25				Number of Non-Detects	97	
1220					Number of Distinct Detects	13				Number of Distinct Non-Detects	2	
1221					Minimum Detect	0.011				Minimum Non-Detect	0.01	
1222					Maximum Detect	0.041				Maximum Non-Detect	0.03	
1223					Variance Detected	5.8460E-5				Percent Non-Detects	79.51%	
1224					Mean Detected	0.0173				SD Detected	0.00765	
1225					Mean of Detected Logged Data	-4.124				SD of Detected Logged Data	0.34	
1226												
1227	**Critical Values for Background Threshold Values (BTVs)**											
1228					Tolerance Factor K (For UTL)	1.894				d2max (for USL)	3.276	
1229												
1230	**Normal GOF Test on Detects Only**											
1231					Shapiro Wilk Test Statistic	0.679				**Shapiro Wilk GOF Test**		
1232					5% Shapiro Wilk Critical Value	0.918				Data Not Normal at 5% Significance Level		
1233					Lilliefors Test Statistic	0.241				**Lilliefors GOF Test**		
1234					5% Lilliefors Critical Value	0.173				Data Not Normal at 5% Significance Level		
1235	**Data Not Normal at 5% Significance Level**											
1236												
1237	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
1238					KM Mean	0.0138				KM SD	0.00495	
1239					95% UTL95% Coverage	0.0232				95% KM UPL (t)	0.022	
1240					90% KM Percentile (z)	0.0201				95% KM Percentile (z)	0.0219	
1241					99% KM Percentile (z)	0.0253				95% KM USL	0.03	
1242												
1243	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
1244					Mean	0.0144				SD	0.0048	
1245					95% UTL95% Coverage	0.0235				95% UPL (t)	0.0224	
1246					90% Percentile (z)	0.0206				95% Percentile (z)	0.0223	
1247					99% Percentile (z)	0.0256				95% USL	0.0301	
1248	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											

	A	B	C	D	E	F	G	H	I	J	K	L
1249												
1250	**Gamma GOF Tests on Detected Observations Only**											
1251					A-D Test Statistic	1.629	**Anderson-Darling GOF Test**					
1252					5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level					
1253					K-S Test Statistic	0.205	**Kolmogorov-Smirnov GOF**					
1254					5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level					
1255	**Data Not Gamma Distributed at 5% Significance Level**											
1256												
1257	**Gamma Statistics on Detected Data Only**											
1258					k hat (MLE)	7.814	k star (bias corrected MLE)	6.903				
1259					Theta hat (MLE)	0.00221	Theta star (bias corrected MLE)	0.0025				
1260					nu hat (MLE)	390.7	nu star (bias corrected)	345.1				
1261					MLE Mean (bias corrected)	0.0173						
1262					MLE Sd (bias corrected)	0.00658	95% Percentile of Chisquare (2kstar)	23.43				
1263												
1264	**Gamma ROS Statistics using Imputed Non-Detects**											
1265	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1266	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1267	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1268	This is especially true when the sample size is small.											
1269	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1270					Minimum	0.01	Mean	0.0141				
1271					Maximum	0.041	Median	0.012				
1272					SD	0.00569	CV	0.405				
1273					k hat (MLE)	8.374	k star (bias corrected MLE)	8.173				
1274					Theta hat (MLE)	0.00168	Theta star (bias corrected MLE)	0.00172				
1275					nu hat (MLE)	2043	nu star (bias corrected)	1994				
1276					MLE Mean (bias corrected)	0.0141	MLE Sd (bias corrected)	0.00492				
1277					95% Percentile of Chisquare (2kstar)	26.75	90% Percentile	0.0206				
1278					95% Percentile	0.023	99% Percentile	0.0279				
1279	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1280	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1281					WH	HW				WH	HW	
1282				95% Approx. Gamma UTL with 95% Coverage	0.0246	0.0246	95% Approx. Gamma UPL			0.023	0.023	
1283				95% Gamma USL	0.0357	0.0364						
1284												
1285	**Estimates of Gamma Parameters using KM Estimates**											
1286					Mean (KM)	0.0138	SD (KM)	0.00495				
1287					Variance (KM)	2.4457E-5	SE of Mean (KM)	6.7777E-4				
1288					k hat (KM)	7.794	k star (KM)	7.607				
1289					nu hat (KM)	1902	nu star (KM)	1856				
1290					theta hat (KM)	0.00177	theta star (KM)	0.00181				
1291					80% gamma percentile (KM)	0.0177	90% gamma percentile (KM)	0.0205				
1292					95% gamma percentile (KM)	0.0229	99% gamma percentile (KM)	0.028				
1293												
1294	**The following statistics are computed using gamma distribution and KM estimates**											
1295	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1296					WH	HW				WH	HW	
1297				95% Approx. Gamma UTL with 95% Coverage	0.0227	0.0227	95% Approx. Gamma UPL			0.0214	0.0214	
1298				95% KM Gamma Percentile	0.0213	0.0213	95% Gamma USL			0.0318	0.0322	
1299												
1300	**Lognormal GOF Test on Detected Observations Only**											

1301					Shapiro Wilk Test Statistic	0.837	**Shapiro Wilk GOF Test**					
1302					5% Shapiro Wilk Critical Value	0.918	Data Not Lognormal at 5% Significance Level					
1303					Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**					
1304					5% Lilliefors Critical Value	0.173	Data Not Lognormal at 5% Significance Level					
1305	**Data Not Lognormal at 5% Significance Level**											
1306												
1307	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1308					Mean in Original Scale	0.0133				Mean in Log Scale	-4.413	
1309					SD in Original Scale	0.00605				SD in Log Scale	0.421	
1310					95% UTL95% Coverage	0.0269				95% BCA UTL95% Coverage	0.026	
1311					95% Bootstrap (%) UTL95% Coverage	0.0261				95% UPL (t)	0.0244	
1312					90% Percentile (z)	0.0208				95% Percentile (z)	0.0242	
1313					99% Percentile (z)	0.0323				95% USL	0.0482	
1314												
1315	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1316					KM Mean of Logged Data	-4.33				95% KM UTL (Lognormal)95% Coverage	0.0228	
1317					KM SD of Logged Data	0.289				95% KM UPL (Lognormal)	0.0213	
1318					95% KM Percentile Lognormal (z)	0.0212				95% KM USL (Lognormal)	0.0339	
1319												
1320	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1321					Mean in Original Scale	0.0144				Mean in Log Scale	-4.301	
1322					SD in Original Scale	0.0048				SD in Log Scale	0.379	
1323					95% UTL95% Coverage	0.0278				95% UPL (t)	0.0255	
1324					90% Percentile (z)	0.022				95% Percentile (z)	0.0253	
1325					99% Percentile (z)	0.0327				95% USL	0.0469	
1326	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1327												
1328	**Nonparametric Distribution Free Background Statistics**											
1329	**Data do not follow a Discernible Distribution (0.05)**											
1330												
1331	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1332					Order of Statistic, r	119				95% UTL with95% Coverage	0.03	
1333					Approx, f used to compute achieved CC	1.566				Approximate Actual Confidence Coefficient achieved by UTL	0.864	
1334					Approximate Sample Size needed to achieve specified CC	153				95% UPL	0.03	
1335					95% USL	0.041				95% KM Chebyshev UPL	0.0355	
1336												
1337	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1338	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1339	and consists of observations collected from clean unimpacted locations.											
1340	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1341	represents a background data set and when many onsite observations need to be compared with the BTV.											
1342												
1343	**pH**											
1344												
1345	**General Statistics**											
1346					Total Number of Observations	85				Number of Distinct Observations	13	
1347										Number of Missing Observations	4	
1348					Minimum	6.5				First Quartile	6.9	
1349					Second Largest	7.6				Median	7	
1350					Maximum	7.7				Third Quartile	7.2	
1351					Mean	7.065				SD	0.279	
1352					Coefficient of Variation	0.0395				Skewness	0.058	

1353					Mean of logged Data	1.954				SD of logged Data		0.0396
1354												
1355					**Critical Values for Background Threshold Values (BTVs)**							
1356					Tolerance Factor K (For UTL)	1.95				d2max (for USL)		3.153
1357												
1358					**Normal GOF Test**							
1359					Shapiro Wilk Test Statistic	0.963				**Normal GOF Test**		
1360					5% Shapiro Wilk P Value	0.0686				Data appear Normal at 5% Significance Level		
1361					Lilliefors Test Statistic	0.0975				**Lilliefors GOF Test**		
1362					5% Lilliefors Critical Value	0.0962				Data Not Normal at 5% Significance Level		
1363					**Data appear Approximate Normal at 5% Significance Level**							
1364												
1365					**Background Statistics Assuming Normal Distribution**							
1366					95% UTL with 95% Coverage	7.609				90% Percentile (z)		7.423
1367					95% UPL (t)	7.532				95% Percentile (z)		7.524
1368					95% USL	7.946				99% Percentile (z)		7.715
1369												
1370					**Gamma GOF Test**							
1371					A-D Test Statistic	0.702				**Anderson-Darling Gamma GOF Test**		
1372					5% A-D Critical Value	0.75				Detected data appear Gamma Distributed at 5% Significance Level		
1373					K-S Test Statistic	0.095				**Kolmogorov-Smirnov Gamma GOF Test**		
1374					5% K-S Critical Value	0.0966				Detected data appear Gamma Distributed at 5% Significance Level		
1375					**Detected data appear Gamma Distributed at 5% Significance Level**							
1376												
1377					**Gamma Statistics**							
1378					k hat (MLE)	647.2				k star (bias corrected MLE)		624.4
1379					Theta hat (MLE)	0.0109				Theta star (bias corrected MLE)		0.0113
1380					nu hat (MLE)	110028				nu star (bias corrected)		106146
1381					MLE Mean (bias corrected)	7.065				MLE Sd (bias corrected)		0.283
1382												
1383					**Background Statistics Assuming Gamma Distribution**							
1384					95% Wilson Hilferty (WH) Approx. Gamma UPL	7.539				90% Percentile		7.429
1385					95% Hawkins Wixley (HW) Approx. Gamma UPL	7.539				95% Percentile		7.536
1386					95% WH Approx. Gamma UTL with 95% Coverage	7.62				99% Percentile		7.739
1387					95% HW Approx. Gamma UTL with 95% Coverage	7.621						
1388					95% WH USL	7.979				95% HW USL		7.983
1389												
1390					**Lognormal GOF Test**							
1391					Shapiro Wilk Test Statistic	0.963				**Shapiro Wilk Lognormal GOF Test**		
1392					5% Shapiro Wilk P Value	0.0683				Data appear Lognormal at 5% Significance Level		
1393					Lilliefors Test Statistic	0.098				**Lilliefors Lognormal GOF Test**		
1394					5% Lilliefors Critical Value	0.0962				Data Not Lognormal at 5% Significance Level		
1395					**Data appear Approximate Lognormal at 5% Significance Level**							
1396												
1397					**Background Statistics assuming Lognormal Distribution**							
1398					95% UTL with 95% Coverage	7.625				90% Percentile (z)		7.426
1399					95% UPL (t)	7.542				95% Percentile (z)		7.534
1400					95% USL	7.997				99% Percentile (z)		7.74
1401												
1402					**Nonparametric Distribution Free Background Statistics**							
1403					**Data appear Approximate Normal at 5% Significance Level**							
1404												

	A	B	C	D	E	F	G	H	I	J	K	L
1405	**Nonparametric Upper Limits for Background Threshold Values**											
1406					Order of Statistic, r	83				95% UTL with 95% Coverage		7.6
1407					Approx, f used to compute achieved CC	1.456				Approximate Actual Confidence Coefficient achieved by UTL		0.804
1408										Approximate Sample Size needed to achieve specified CC		124
1409					95% Percentile Bootstrap UTL with 95% Coverage	7.6				95% BCA Bootstrap UTL with 95% Coverage		7.5
1410					95% UPL	7.5				90% Percentile		7.4
1411					90% Chebyshev UPL	7.908				95% Percentile		7.5
1412					95% Chebyshev UPL	8.289				99% Percentile		7.616
1413					95% USL	7.7						
1414												
1415	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1416	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1417	and consists of observations collected from clean unimpacted locations.											
1418	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1419	represents a background data set and when many onsite observations need to be compared with the BTV.											
1420												
1421	**Radium (226)**											
1422												
1423	**General Statistics**											
1424					Total Number of Observations	115				Number of Missing Observations		18
1425					Number of Distinct Observations	99						
1426					Number of Detects	90				Number of Non-Detects		25
1427					Number of Distinct Detects	81				Number of Distinct Non-Detects		20
1428					Minimum Detect	0.101				Minimum Non-Detect		0.0816
1429					Maximum Detect	0.816				Maximum Non-Detect		0.461
1430					Variance Detected	0.0327				Percent Non-Detects		21.74%
1431					Mean Detected	0.456				SD Detected		0.181
1432					Mean of Detected Logged Data	-0.873				SD of Detected Logged Data		0.44
1433												
1434	**Critical Values for Background Threshold Values (BTVs)**											
1435					Tolerance Factor K (For UTL)	1.903				d2max (for USL)		3.257
1436												
1437	**Normal GOF Test on Detects Only**											
1438					Shapiro Wilk Test Statistic	0.946				**Normal GOF Test on Detected Observations Only**		
1439					5% Shapiro Wilk P Value	0.00199				Data Not Normal at 5% Significance Level		
1440					Lilliefors Test Statistic	0.095				**Lilliefors GOF Test**		
1441					5% Lilliefors Critical Value	0.0936				Data Not Normal at 5% Significance Level		
1442	**Data Not Normal at 5% Significance Level**											
1443												
1444	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
1445					KM Mean	0.39				KM SD		0.206
1446					95% UTL95% Coverage	0.782				95% KM UPL (t)		0.733
1447					90% KM Percentile (z)	0.654				95% KM Percentile (z)		0.729
1448					99% KM Percentile (z)	0.869				95% KM USL		1.061
1449												
1450	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
1451					Mean	0.384				SD		0.211
1452					95% UTL95% Coverage	0.787				95% UPL (t)		0.736
1453					90% Percentile (z)	0.655				95% Percentile (z)		0.732
1454					99% Percentile (z)	0.876				95% USL		1.073
1455	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
1456												

	A	B	C	D	E	F	G	H	I	J	K	L
1457	**Gamma GOF Tests on Detected Observations Only**											
1458					A-D Test Statistic	0.497	**Anderson-Darling GOF Test**					
1459					5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level					
1460					K-S Test Statistic	0.0666	**Kolmogorov-Smirnov GOF**					
1461					5% K-S Critical Value	0.0944	Detected data appear Gamma Distributed at 5% Significance Level					
1462	**Detected data appear Gamma Distributed at 5% Significance Level**											
1463												
1464	**Gamma Statistics on Detected Data Only**											
1465					k hat (MLE)	5.883			k star (bias corrected MLE)			5.694
1466					Theta hat (MLE)	0.0775			Theta star (bias corrected MLE)			0.0801
1467					nu hat (MLE)	1059			nu star (bias corrected)			1025
1468					MLE Mean (bias corrected)	0.456						
1469					MLE Sd (bias corrected)	0.191			95% Percentile of Chisquare (2kstar)			20.2
1470												
1471	**Gamma ROS Statistics using Imputed Non-Detects**											
1472	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1473	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1474	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1475	This is especially true when the sample size is small.											
1476	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1477					Minimum	0.101			Mean			0.398
1478					Maximum	0.816			Median			0.37
1479					SD	0.196			CV			0.491
1480					k hat (MLE)	3.95			k star (bias corrected MLE)			3.852
1481					Theta hat (MLE)	0.101			Theta star (bias corrected MLE)			0.103
1482					nu hat (MLE)	908.4			nu star (bias corrected)			886.1
1483					MLE Mean (bias corrected)	0.398			MLE Sd (bias corrected)			0.203
1484					95% Percentile of Chisquare (2kstar)	15.09			90% Percentile			0.67
1485					95% Percentile	0.78			99% Percentile			1.014
1486	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1487	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1488					WH	HW				WH		HW
1489				95% Approx. Gamma UTL with 95% Coverage	0.86	0.881			95% Approx. Gamma UPL	0.783		0.796
1490				95% Gamma USL	1.401	1.498						
1491												
1492	**Estimates of Gamma Parameters using KM Estimates**											
1493					Mean (KM)	0.39			SD (KM)			0.206
1494					Variance (KM)	0.0424			SE of Mean (KM)			0.0196
1495					k hat (KM)	3.594			k star (KM)			3.506
1496					nu hat (KM)	826.6			nu star (KM)			806.4
1497					theta hat (KM)	0.109			theta star (KM)			0.111
1498					80% gamma percentile (KM)	0.547			90% gamma percentile (KM)			0.67
1499					95% gamma percentile (KM)	0.784			99% gamma percentile (KM)			1.03
1500												
1501	**The following statistics are computed using gamma distribution and KM estimates**											
1502	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1503					WH	HW				WH		HW
1504				95% Approx. Gamma UTL with 95% Coverage	0.923	0.959			95% Approx. Gamma UPL	0.831		0.856
1505				95% KM Gamma Percentile	0.823	0.847			95% Gamma USL	1.583		1.744
1506												
1507	**Lognormal GOF Test on Detected Observations Only**											
1508					Shapiro Wilk Approximate Test Statistic	0.951	**Shapiro Wilk GOF Test**					

	A	B	C	D	E	F	G	H	I	J	K	L
1509					5% Shapiro Wilk P Value	0.00565	Data Not Lognormal at 5% Significance Level					
1510					Lilliefors Test Statistic	0.0664	**Lilliefors GOF Test**					
1511					5% Lilliefors Critical Value	0.0936	Detected Data appear Lognormal at 5% Significance Level					
1512	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
1513												
1514	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1515					Mean in Original Scale	0.4	Mean in Log Scale	-1.04				
1516					SD in Original Scale	0.193	SD in Log Scale	0.512				
1517					95% UTL95% Coverage	0.937	95% BCA UTL95% Coverage	0.776				
1518					95% Bootstrap (%) UTL95% Coverage	0.776	95% UPL (t)	0.829				
1519					90% Percentile (z)	0.681	95% Percentile (z)	0.821				
1520					99% Percentile (z)	1.164	95% USL	1.874				
1521												
1522	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1523					KM Mean of Logged Data	-1.12	95% KM UTL (Lognormal)95% Coverage	1.132				
1524					KM SD of Logged Data	0.654	95% KM UPL (Lognormal)	0.97				
1525					95% KM Percentile Lognormal (z)	0.957	95% KM USL (Lognormal)	2.745				
1526												
1527	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1528					Mean in Original Scale	0.384	Mean in Log Scale	-1.154				
1529					SD in Original Scale	0.211	SD in Log Scale	0.701				
1530					95% UTL95% Coverage	1.196	95% UPL (t)	1.013				
1531					90% Percentile (z)	0.774	95% Percentile (z)	0.999				
1532					99% Percentile (z)	1.61	95% USL	3.09				
1533	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1534												
1535	**Nonparametric Distribution Free Background Statistics**											
1536	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1537												
1538	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1539					Order of Statistic, r	112	95% UTL with95% Coverage	0.774				
1540					Approx, f used to compute achieved CC	1.474	Approximate Actual Confidence Coefficient achieved by UTL	0.832				
1541					Approximate Sample Size needed to achieve specified CC	153	95% UPL	0.76				
1542					95% USL	0.816	95% KM Chebyshev UPL	1.292				
1543												
1544	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1545	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1546	and consists of observations collected from clean unimpacted locations.											
1547	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1548	represents a background data set and when many onsite observations need to be compared with the BTV.											
1549												
1550	**Radium 228**											
1551												
1552	**General Statistics**											
1553					Total Number of Observations	114	Number of Missing Observations	19				
1554					Number of Distinct Observations	101						
1555					Number of Detects	78	Number of Non-Detects	36				
1556					Number of Distinct Detects	73	Number of Distinct Non-Detects	30				
1557					Minimum Detect	0.346	Minimum Non-Detect	0.297				
1558					Maximum Detect	1.58	Maximum Non-Detect	1.08				
1559					Variance Detected	0.073	Percent Non-Detects	31.58%				
1560					Mean Detected	0.781	SD Detected	0.27				

	A	B	C	D	E	F	G	H	I	J	K	L
1561				Mean of Detected Logged Data		-0.304				SD of Detected Logged Data		0.342
1562												
1563						**Critical Values for Background Threshold Values (BTVs)**						
1564				Tolerance Factor K (For UTL)		1.904				d2max (for USL)		3.254
1565												
1566						**Normal GOF Test on Detects Only**						
1567				Shapiro Wilk Test Statistic		0.939	**Normal GOF Test on Detected Observations Only**					
1568				5% Shapiro Wilk P Value		0.00153	Data Not Normal at 5% Significance Level					
1569				Lilliefors Test Statistic		0.107	**Lilliefors GOF Test**					
1570				5% Lilliefors Critical Value		0.1	Data Not Normal at 5% Significance Level					
1571						**Data Not Normal at 5% Significance Level**						
1572												
1573						**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**						
1574				KM Mean		0.668	KM SD					0.286
1575				95% UTL95% Coverage		1.213	95% KM UPL (t)					1.145
1576				90% KM Percentile (z)		1.035	95% KM Percentile (z)					1.139
1577				99% KM Percentile (z)		1.334	95% KM USL					1.599
1578												
1579						**DL/2 Substitution Background Statistics Assuming Normal Distribution**						
1580				Mean		0.627	SD					0.323
1581				95% UTL95% Coverage		1.241	95% UPL (t)					1.164
1582				90% Percentile (z)		1.04	95% Percentile (z)					1.158
1583				99% Percentile (z)		1.378	95% USL					1.677
1584						**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**						
1585												
1586						**Gamma GOF Tests on Detected Observations Only**						
1587				A-D Test Statistic		0.342	**Anderson-Darling GOF Test**					
1588				5% A-D Critical Value		0.751	Detected data appear Gamma Distributed at 5% Significance Level					
1589				K-S Test Statistic		0.0804	**Kolmogorov-Smirnov GOF**					
1590				5% K-S Critical Value		0.101	Detected data appear Gamma Distributed at 5% Significance Level					
1591						**Detected data appear Gamma Distributed at 5% Significance Level**						
1592												
1593						**Gamma Statistics on Detected Data Only**						
1594				k hat (MLE)		8.895	k star (bias corrected MLE)					8.561
1595				Theta hat (MLE)		0.0878	Theta star (bias corrected MLE)					0.0912
1596				nu hat (MLE)		1388	nu star (bias corrected)					1336
1597				MLE Mean (bias corrected)		0.781						
1598				MLE Sd (bias corrected)		0.267	95% Percentile of Chisquare (2kstar)					27.74
1599												
1600						**Gamma ROS Statistics using Imputed Non-Detects**						
1601						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1602						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1603						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1604						This is especially true when the sample size is small.						
1605						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
1606				Minimum		0.162	Mean					0.661
1607				Maximum		1.58	Median					0.599
1608				SD		0.291	CV					0.441
1609				k hat (MLE)		5.451	k star (bias corrected MLE)					5.314
1610				Theta hat (MLE)		0.121	Theta star (bias corrected MLE)					0.124
1611				nu hat (MLE)		1243	nu star (bias corrected)					1212
1612				MLE Mean (bias corrected)		0.661	MLE Sd (bias corrected)					0.287

	A	B	C	D	E	F	G	H	I	J	K	L
1613				95% Percentile of Chisquare (2kstar)		19.17					90% Percentile	1.044
1614					95% Percentile	1.191					99% Percentile	1.502
1615	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1616	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1617					WH	HW					WH	HW
1618				95% Approx. Gamma UTL with 95% Coverage	1.298	1.317				95% Approx. Gamma UPL	1.194	1.206
1619				95% Gamma USL	1.997	2.091						
1620												
1621	**Estimates of Gamma Parameters using KM Estimates**											
1622					Mean (KM)	0.668					SD (KM)	0.286
1623					Variance (KM)	0.0819					SE of Mean (KM)	0.0277
1624					k hat (KM)	5.451					k star (KM)	5.314
1625					nu hat (KM)	1243					nu star (KM)	1212
1626					theta hat (KM)	0.123					theta star (KM)	0.126
1627					80% gamma percentile (KM)	0.892					90% gamma percentile (KM)	1.056
1628					95% gamma percentile (KM)	1.205					99% gamma percentile (KM)	1.519
1629												
1630	**The following statistics are computed using gamma distribution and KM estimates**											
1631	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1632					WH	HW					WH	HW
1633				95% Approx. Gamma UTL with 95% Coverage	1.285	1.301				95% Approx. Gamma UPL	1.186	1.195
1634				95% KM Gamma Percentile	1.177	1.186				95% Gamma USL	1.955	2.037
1635												
1636	**Lognormal GOF Test on Detected Observations Only**											
1637					Shapiro Wilk Approximate Test Statistic	0.977	**Shapiro Wilk GOF Test**					
1638					5% Shapiro Wilk P Value	0.45	Detected Data appear Lognormal at 5% Significance Level					
1639					Lilliefors Test Statistic	0.0617	**Lilliefors GOF Test**					
1640					5% Lilliefors Critical Value	0.1	Detected Data appear Lognormal at 5% Significance Level					
1641	**Detected Data appear Lognormal at 5% Significance Level**											
1642												
1643	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1644					Mean in Original Scale	0.671					Mean in Log Scale	-0.477
1645					SD in Original Scale	0.279					SD in Log Scale	0.394
1646					95% UTL95% Coverage	1.313					95% BCA UTL95% Coverage	1.369
1647					95% Bootstrap (%) UTL95% Coverage	1.369					95% UPL (t)	1.196
1648					90% Percentile (z)	1.028					95% Percentile (z)	1.186
1649					99% Percentile (z)	1.551					95% USL	2.234
1650												
1651	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1652					KM Mean of Logged Data	-0.492					95% KM UTL (Lognormal)95% Coverage	1.363
1653					KM SD of Logged Data	0.421					95% KM UPL (Lognormal)	1.233
1654					95% KM Percentile Lognormal (z)	1.222					95% KM USL (Lognormal)	2.407
1655												
1656	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1657					Mean in Original Scale	0.627					Mean in Log Scale	-0.611
1658					SD in Original Scale	0.323					SD in Log Scale	0.558
1659					95% UTL95% Coverage	1.572					95% UPL (t)	1.376
1660					90% Percentile (z)	1.11					95% Percentile (z)	1.36
1661					99% Percentile (z)	1.99					95% USL	3.339
1662	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1663												
1664	**Nonparametric Distribution Free Background Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
1665	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1666												
1667	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1668					Order of Statistic, r	111			95% UTL with95% Coverage			1.32
1669					Approx, f used to compute achieved CC	1.461			Approximate Actual Confidence Coefficient achieved by UTL			0.827
1670					Approximate Sample Size needed to achieve specified CC	153			95% UPL			1.195
1671					95% USL	1.58			95% KM Chebyshev UPL			1.921
1672												
1673	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1674	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1675	and consists of observations collected from clean unimpacted locations.											
1676	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1677	represents a background data set and when many onsite observations need to be compared with the BTV.											
1678												
1679	**Total Dissolved Solids**											
1680												
1681	**General Statistics**											
1682					Total Number of Observations	136			Number of Distinct Observations			120
1683					Minimum	292			First Quartile			517.5
1684					Second Largest	1380			Median			641
1685					Maximum	1380			Third Quartile			842.3
1686					Mean	687.3			SD			247.2
1687					Coefficient of Variation	0.36			Skewness			0.568
1688					Mean of logged Data	6.467			SD of logged Data			0.37
1689												
1690	**Critical Values for Background Threshold Values (BTVs)**											
1691					Tolerance Factor K (For UTL)	1.88			d2max (for USL)			3.311
1692												
1693	**Normal GOF Test**											
1694					Shapiro Wilk Test Statistic	0.946			**Normal GOF Test**			
1695					5% Shapiro Wilk P Value	6.1403E-5			Data Not Normal at 5% Significance Level			
1696					Lilliefors Test Statistic	0.0891			**Lilliefors GOF Test**			
1697					5% Lilliefors Critical Value	0.0763			Data Not Normal at 5% Significance Level			
1698	**Data Not Normal at 5% Significance Level**											
1699												
1700	**Background Statistics Assuming Normal Distribution**											
1701					95% UTL with 95% Coverage	1152			90% Percentile (z)			1004
1702					95% UPL (t)	1098			95% Percentile (z)			1094
1703					95% USL	1506			99% Percentile (z)			1262
1704												
1705	**Gamma GOF Test**											
1706					A-D Test Statistic	0.624			**Anderson-Darling Gamma GOF Test**			
1707					5% A-D Critical Value	0.753			Detected data appear Gamma Distributed at 5% Significance Level			
1708					K-S Test Statistic	0.07			**Kolmogorov-Smirnov Gamma GOF Test**			
1709					5% K-S Critical Value	0.0802			Detected data appear Gamma Distributed at 5% Significance Level			
1710	**Detected data appear Gamma Distributed at 5% Significance Level**											
1711												
1712	**Gamma Statistics**											
1713					k hat (MLE)	7.766			k star (bias corrected MLE)			7.6
1714					Theta hat (MLE)	88.5			Theta star (bias corrected MLE)			90.43
1715					nu hat (MLE)	2112			nu star (bias corrected)			2067
1716					MLE Mean (bias corrected)	687.3			MLE Sd (bias corrected)			249.3

1717												
1718	**Background Statistics Assuming Gamma Distribution**											
1719				95% Wilson Hilferty (WH) Approx. Gamma UPL		1145				90% Percentile	1020	
1720				95% Hawkins Wixley (HW) Approx. Gamma UPL		1154				95% Percentile	1142	
1721				95% WH Approx. Gamma UTL with 95% Coverage		1222				99% Percentile	1396	
1722				95% HW Approx. Gamma UTL with 95% Coverage		1236						
1723				95% WH USL		1820				95% HW USL	1889	
1724												
1725	**Lognormal GOF Test**											
1726				Shapiro Wilk Test Statistic		0.958	**Shapiro Wilk Lognormal GOF Test**					
1727				5% Shapiro Wilk P Value		0.00256	Data Not Lognormal at 5% Significance Level					
1728				Lilliefors Test Statistic		0.0821	**Lilliefors Lognormal GOF Test**					
1729				5% Lilliefors Critical Value		0.0763	Data Not Lognormal at 5% Significance Level					
1730	**Data Not Lognormal at 5% Significance Level**											
1731												
1732	**Background Statistics assuming Lognormal Distribution**											
1733				95% UTL with 95% Coverage		1290				90% Percentile (z)	1034	
1734				95% UPL (t)		1190				95% Percentile (z)	1182	
1735				95% USL		2190				99% Percentile (z)	1521	
1736												
1737	**Nonparametric Distribution Free Background Statistics**											
1738	**Data appear Gamma Distributed at 5% Significance Level**											
1739												
1740	**Nonparametric Upper Limits for Background Threshold Values**											
1741				Order of Statistic, r		133				95% UTL with 95% Coverage	1240	
1742				Approx, f used to compute achieved CC		1.75	Approximate Actual Confidence Coefficient achieved by UTL				0.913	
1743							Approximate Sample Size needed to achieve specified CC				153	
1744				95% Percentile Bootstrap UTL with 95% Coverage		1240				95% BCA Bootstrap UTL with 95% Coverage	1240	
1745				95% UPL		1173				90% Percentile	1025	
1746				90% Chebyshev UPL		1432				95% Percentile	1118	
1747				95% Chebyshev UPL		1769				99% Percentile	1352	
1748				95% USL		1380						
1749												
1750	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1751	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1752	and consists of observations collected from clean unimpacted locations.											
1753	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1754	represents a background data set and when many onsite observations need to be compared with the BTV.											
1755												
1756												
1757	**Boron**											
1758												
1759	**General Statistics**											
1760				Total Number of Observations		135				Number of Missing Observations	3	
1761				Number of Distinct Observations		57						
1762				Number of Detects		91				Number of Non-Detects	44	
1763				Number of Distinct Detects		57				Number of Distinct Non-Detects	2	
1764				Minimum Detect		0.012				Minimum Non-Detect	0.02	
1765				Maximum Detect		4.5				Maximum Non-Detect	0.1	
1766				Variance Detected		0.815				Percent Non-Detects	32.59%	
1767				Mean Detected		0.48				SD Detected	0.903	
1768				Mean of Detected Logged Data		-1.674				SD of Detected Logged Data	1.313	

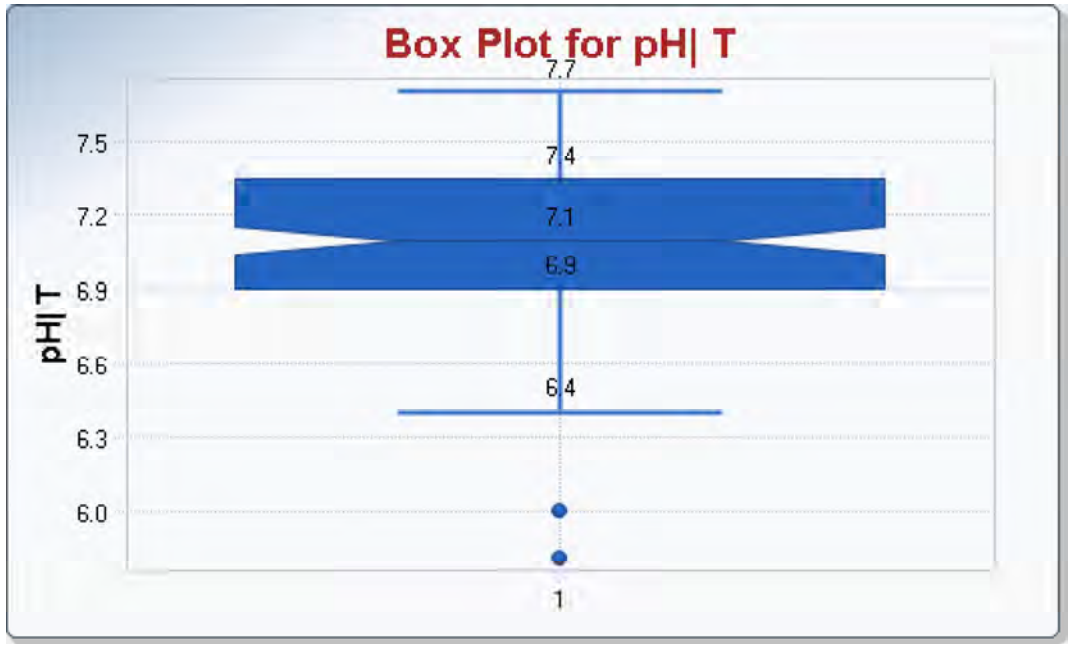
	A	B	C	D	E	F	G	H	I	J	K	L
1769												
1770	**Critical Values for Background Threshold Values (BTVs)**											
1771					Tolerance Factor K (For UTL)	1.881			d2max (for USL)			3.309
1772												
1773	**Normal GOF Test on Detects Only**											
1774					Shapiro Wilk Test Statistic	0.502	**Normal GOF Test on Detected Observations Only**					
1775					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
1776					Lilliefors Test Statistic	0.34	**Lilliefors GOF Test**					
1777					5% Lilliefors Critical Value	0.0931	Data Not Normal at 5% Significance Level					
1778	**Data Not Normal at 5% Significance Level**											
1779												
1780	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
1781					KM Mean	0.333			KM SD			0.767
1782					95% UTL95% Coverage	1.776			95% KM UPL (t)			1.608
1783					90% KM Percentile (z)	1.316			95% KM Percentile (z)			1.595
1784					99% KM Percentile (z)	2.117			95% KM USL			2.871
1785												
1786	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
1787					Mean	0.337			SD			0.768
1788					95% UTL95% Coverage	1.782			95% UPL (t)			1.614
1789					90% Percentile (z)	1.322			95% Percentile (z)			1.601
1790					99% Percentile (z)	2.124			95% USL			2.879
1791	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
1792												
1793	**Gamma GOF Tests on Detected Observations Only**											
1794					A-D Test Statistic	4.538	**Anderson-Darling GOF Test**					
1795					5% A-D Critical Value	0.804	Data Not Gamma Distributed at 5% Significance Level					
1796					K-S Test Statistic	0.203	**Kolmogorov-Smirnov GOF**					
1797					5% K-S Critical Value	0.0981	Data Not Gamma Distributed at 5% Significance Level					
1798	**Data Not Gamma Distributed at 5% Significance Level**											
1799												
1800	**Gamma Statistics on Detected Data Only**											
1801					k hat (MLE)	0.649			k star (bias corrected MLE)			0.635
1802					Theta hat (MLE)	0.74			Theta star (bias corrected MLE)			0.756
1803					nu hat (MLE)	118.1			nu star (bias corrected)			115.6
1804					MLE Mean (bias corrected)	0.48						
1805					MLE Sd (bias corrected)	0.603			95% Percentile of Chisquare (2kstar)			4.478
1806												
1807	**Gamma ROS Statistics using Imputed Non-Detects**											
1808	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1809	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1810	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1811	This is especially true when the sample size is small.											
1812	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1813					Minimum	0.01			Mean			0.327
1814					Maximum	4.5			Median			0.073
1815					SD	0.772			CV			2.361
1816					k hat (MLE)	0.43			k star (bias corrected MLE)			0.426
1817					Theta hat (MLE)	0.76			Theta star (bias corrected MLE)			0.768
1818					nu hat (MLE)	116.2			nu star (bias corrected)			114.9
1819					MLE Mean (bias corrected)	0.327			MLE Sd (bias corrected)			0.501
1820					95% Percentile of Chisquare (2kstar)	3.461			90% Percentile			0.913

1821					95% Percentile	1.33					99% Percentile	2.37
1822	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1823	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1824					WH	HW					WH	HW
1825				95% Approx. Gamma UTL with 95% Coverage	1.333	1.36				95% Approx. Gamma UPL	1.094	1.086
1826				95% Gamma USL	3.79	4.613						
1827												
1828	**Estimates of Gamma Parameters using KM Estimates**											
1829					Mean (KM)	0.333					SD (KM)	0.767
1830					Variance (KM)	0.588					SE of Mean (KM)	0.0664
1831					k hat (KM)	0.188					k star (KM)	0.189
1832					nu hat (KM)	50.81					nu star (KM)	51.01
1833					theta hat (KM)	1.768					theta star (KM)	1.761
1834					80% gamma percentile (KM)	0.425					90% gamma percentile (KM)	1.005
1835					95% gamma percentile (KM)	1.74					99% gamma percentile (KM)	3.78
1836												
1837	**The following statistics are computed using gamma distribution and KM estimates**											
1838	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1839					WH	HW					WH	HW
1840				95% Approx. Gamma UTL with 95% Coverage	1.292	1.293				95% Approx. Gamma UPL	1.071	1.048
1841				95% KM Gamma Percentile	1.054	1.029				95% Gamma USL	3.518	4.099
1842												
1843	**Lognormal GOF Test on Detected Observations Only**											
1844					Shapiro Wilk Approximate Test Statistic	0.952	**Shapiro Wilk GOF Test**					
1845					5% Shapiro Wilk P Value	0.00698	Data Not Lognormal at 5% Significance Level					
1846					Lilliefors Test Statistic	0.1	**Lilliefors GOF Test**					
1847					5% Lilliefors Critical Value	0.0931	Data Not Lognormal at 5% Significance Level					
1848	**Data Not Lognormal at 5% Significance Level**											
1849												
1850	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1851					Mean in Original Scale	0.333					Mean in Log Scale	-2.428
1852					SD in Original Scale	0.77					SD in Log Scale	1.635
1853					95% UTL95% Coverage	1.909					95% BCA UTL95% Coverage	3.26
1854					95% Bootstrap (%) UTL95% Coverage	3.29					95% UPL (t)	1.336
1855					90% Percentile (z)	0.717					95% Percentile (z)	1.298
1856					99% Percentile (z)	3.954					95% USL	19.71
1857												
1858	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1859					KM Mean of Logged Data	-2.366					95% KM UTL (Lognormal)95% Coverage	1.599
1860					KM SD of Logged Data	1.508					95% KM UPL (Lognormal)	1.15
1861					95% KM Percentile Lognormal (z)	1.12					95% KM USL (Lognormal)	13.77
1862												
1863	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1864					Mean in Original Scale	0.337					Mean in Log Scale	-2.224
1865					SD in Original Scale	0.768					SD in Log Scale	1.392
1866					95% UTL95% Coverage	1.483					95% UPL (t)	1.094
1867					90% Percentile (z)	0.644					95% Percentile (z)	1.068
1868					99% Percentile (z)	2.757					95% USL	10.83
1869	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1870												
1871	**Nonparametric Distribution Free Background Statistics**											
1872	**Data do not follow a Discernible Distribution (0.05)**											

	A	B	C	D	E	F	G	H	I	J	K	L
1873												
1874	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1875					Order of Statistic, r	132			95% UTL with95% Coverage			3.4
1876					Approx, f used to compute achieved CC	1.737			Approximate Actual Confidence Coefficient achieved by UTL			0.91
1877					Approximate Sample Size needed to achieve specified CC	153			95% UPL			2.16
1878					95% USL	4.5			95% KM Chebyshev UPL			3.689
1879												
1880	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1881	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1882	and consists of observations collected from clean unimpacted locations.											
1883	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1884	represents a background data set and when many onsite observations need to be compared with the BTV.											
1885												

1				**Background Statistics for Uncensored Full Data Sets**								
2			**User Selected Options**									
3			Date/Time of Computation	ProUCL 5.11/18/2024 10:16:12 AM								
4			From File	\\GES.NET\dw05\Minnesota\Projects\SKB Environmental\Lansing Facility\Statistics\2023 CCR Statistical Evalua								
5			Full Precision	OFF								
6			Confidence Coefficient	95%								
7			Coverage	95%								
8			New or Future K Observations	1								
9			Number of Bootstrap Operations	2000								
10												
11	**|Sulfate as SO4|T^**											
12												
13	**General Statistics**											
14						Total Number of Observations	176			Number of Distinct Observations	150		
15						Minimum	1.8			First Quartile	28.98	
16						Second Largest	481			Median	73.1	
17						Maximum	481			Third Quartile	111.5	
18						Mean	90.18			SD	89.33	
19						Coefficient of Variation	0.991			Skewness	2.068	
20						Mean of logged Data	3.979			SD of logged Data	1.184	
21												
22						**Critical Values for Background Threshold Values (BTVs)**							
23						Tolerance Factor K (For UTL)	1.849			d2max (for USL)	3.393	
24												
25						**Normal GOF Test**						
26						Shapiro Wilk Test Statistic	0.791			**Normal GOF Test**		
27						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level		
28						Lilliefors Test Statistic	0.165			**Lilliefors GOF Test**		
29						5% Lilliefors Critical Value	0.0672			Data Not Normal at 5% Significance Level		
30						**Data Not Normal at 5% Significance Level**						
31												
32						**Background Statistics Assuming Normal Distribution**						
33						95% UTL with 95% Coverage	255.4			90% Percentile (z)	204.7	
34						95% UPL (t)	238.3			95% Percentile (z)	237.1	
35						95% USL	393.3			99% Percentile (z)	298	
36												
37						**Gamma GOF Test**						
38						A-D Test Statistic	0.525			**Anderson-Darling Gamma GOF Test**		
39						5% A-D Critical Value	0.781			Detected data appear Gamma Distributed at 5% Significance Level		
40						K-S Test Statistic	0.0591			**Kolmogorov-Smirnov Gamma GOF Test**		
41						5% K-S Critical Value	0.0717			Detected data appear Gamma Distributed at 5% Significance Level		
42						**Detected data appear Gamma Distributed at 5% Significance Level**						
43												
44						**Gamma Statistics**						
45						k hat (MLE)	1.094			k star (bias corrected MLE)	1.079	
46						Theta hat (MLE)	82.46			Theta star (bias corrected MLE)	83.59	
47						nu hat (MLE)	385			nu star (bias corrected)	379.8	
48						MLE Mean (bias corrected)	90.18			MLE Sd (bias corrected)	86.83	
49												
50						**Background Statistics Assuming Gamma Distribution**						
51						95% Wilson Hilferty (WH) Approx. Gamma UPL	257.9			90% Percentile	203.8	
52						95% Hawkins Wixley (HW) Approx. Gamma UPL	272			95% Percentile	263	

53	95% WH Approx. Gamma UTL with 95% Coverage					291.9	99% Percentile					399.8
54	95% HW Approx. Gamma UTL with 95% Coverage					312.5						
55	95% WH USL					681.4	95% HW USL					828.1
56												
57	**Lognormal GOF Test**											
58	Shapiro Wilk Test Statistic					0.93	**Shapiro Wilk Lognormal GOF Test**					
59	5% Shapiro Wilk P Value					1.528E-10	Data Not Lognormal at 5% Significance Level					
60	Lilliefors Test Statistic					0.114	**Lilliefors Lognormal GOF Test**					
61	5% Lilliefors Critical Value					0.0672	Data Not Lognormal at 5% Significance Level					
62	**Data Not Lognormal at 5% Significance Level**											
63												
64	**Background Statistics assuming Lognormal Distribution**											
65	95% UTL with 95% Coverage					478	90% Percentile (z)					244
66	95% UPL (t)					381.2	95% Percentile (z)					375.2
67	95% USL					2975	99% Percentile (z)					841
68												
69	**Nonparametric Distribution Free Background Statistics**											
70	**Data appear Gamma Distributed at 5% Significance Level**											
71												
72	**Nonparametric Upper Limits for Background Threshold Values**											
73	Order of Statistic, r					171	95% UTL with 95% Coverage					310
74	Approx, f used to compute achieved CC					1.5	Approximate Actual Confidence Coefficient achieved by UTL					0.878
75							Approximate Sample Size needed to achieve specified CC					208
76	95% Percentile Bootstrap UTL with 95% Coverage					317.8	95% BCA Bootstrap UTL with 95% Coverage					317.8
77	95% UPL					280.9	90% Percentile					208.5
78	90% Chebyshev UPL					358.9	95% Percentile					270.5
79	95% Chebyshev UPL					480.7	99% Percentile					439
80	95% USL					481						
81												
82	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
83	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
84	and consists of observations collected from clean unimpacted locations.											
85	The use of USL tends to provide a balance between false positives and false negatives provided the data											
86	represents a background data set and when many onsite observations need to be compared with the BTV.											
87												


Box Plot for pH| T
pH| T
7.7
7.5
7.4
7.2
7.1
6.9
6.9
6.6
6.4
6.3
6.0
1