WCI Austin Landfill, LLC.

2019 Coal Combustion Residuals Annual Monitoring Report

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

January 31, 2020

2019 Coal Combustion Residuals Annual Monitoring Report

SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota
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:
3502092

Date:
January 31, 2020

James F. Simonet, P.G.
Senior Project Hydrogeologist

Bonnie Janowiak, Ph. D.
Project Chemist

Brian Deering
Senior Project Manager

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: 01/31/2020 License Number: 25086

Table of Contents

Figures

Tables

Appendices

Acronyms

BTV	Background Threshold Values
CCR	Coal Combustion Residuals (CCR)
CFR	Code of Federal Regulations
COC	Chemicals of Concern
Eurofins TA	Eurofins Test America, 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	2018 Coal Combustion Residuals Annual Monitoring Report
SAP	Sampling Analysis Plan
SSI	statistically significant increase
US EPA	United States Environmental Protection Agency
USL	Upper Simultaneous Limit

1 Introduction

The *2019 Combustion Coal Residuals Annual Monitoring Report* (Report) was prepared to summarize the results of the 2019 groundwater monitoring events and associated analysis for Appendix III (detection monitoring) and Appendix IV (assessment monitoring) to Part 257 at the SKB Lansing Landfill. The SKB Lansing Landfill operates under Minnesota Pollution Control Agency (MPCA) Site Permit Number SW-514. The SKB Lansing Landfill is located at 52563 243rd Street in Austin, Mower County, Minnesota (**Figure 1**).

Per the CFR 40.257.90 – 257.98, 3 groundwater sampling events were conducted at the SKB Lansing Landfill in the spring and fall of 2019. Analytical results from the groundwater monitoring events are compared and evaluated to Background Threshold Values (BTVs) established for the SKB Lansing Landfill. Fall 2018 sampling results indicated a Boron concentration exceeding the BTV at MW-2R, which was determine to be a statistical significant increase (SSI). Thus, Appendix IV (assessment monitoring) analytes were included in the spring and fall 2019 sampling events.

1.1 Scope of Work

The following scope of work was conducted for the 2019 CCR groundwater monitoring events:

- Conduct 3 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 WCI Austin Landfill permit (Permit SW-542), was combined with the SKB Lansing Landfill permit (Permit SW-514). The combined permit will be identified as SW-514-001. At the time the previous permit application was submitted in 2011 for the SW-542 facility, it was listed as Vonco IV, and owned/operated by Veit Companies. In July 2014, WCI Austin Landfill, LLC, purchased the Vonco IV Landfill. SKB (Austin) Environmental, LLC (the owner of the SKB Lansing Landfill) and WCI Austin Landfill, LLC merged on August 31, 2017, with the surviving owner entity being WCI Austin Landfill, LLC. The facility name and permit number will become SKB Lansing Landfill, SW-514-001, for both properties and disposal areas.

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 3 miles east of the site.

3 Monitoring Network Systems and Sampling Schedule

The groundwater monitoring network at SKB Lansing Landfill for the CCR sampling was designed based on the analysis of local and regional hydrologic conditions. Currently, the groundwater monitoring network system consists of eight monitoring wells (one set monitors the shallow till layer and one set monitors a deeper sand layer) and five piezometers (see **Figure 2**). Located in the future expansion area are 7 monitoring wells and 5 piezometers that are currently used for groundwater elevation only as noted below. The monitoring wells used as data collection points that have been divided into 2 groups for the purpose of this report:

Gauging and Sampling

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

Gauging Only

- Downgradient Monitoring Points. The downgradient monitoring points consist of monitoring wells downgradient of the compliance boundary and include MW-5S, MW-5D, MW-6S, MW-7S, MW-7D, MW-8S and MW-8D.
- Piezometer Monitoring Points. The piezometer monitoring points consist of shallow monitoring points used to collect groundwater elevations only across the site and include PIEZ-1, PIEZ-2, PIEZ-3, PIEZ-4, and PIEZ-5.
- Upgradient/Sidegradient Monitoring Points. Upgradient/sidegradient monitoring points 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 background evaluation, a total of 3 groundwater monitoring events were conducted in 2019 on the following dates:

- April 18-19, 2019
- October 28-29, 2019 and December 20, 2019 (Radium 226/228)

4 Groundwater Sampling Methodology

For 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 well dedicated, pneumatic low-flow bladder pump, each well was purged and field stabilization parameters including temperature, pH, and specific conductance were measured.

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 Amherst, New York.

Groundwater samples obtained during the 2019 sampling events were analyzed for parameters specified in Appendix III (detection monitoring) and Appendix IV (assessment monitoring) to Part 257 and are noted below:

Appendix III

General Chemistry

- Chloride (Method 300.0)
- Fluoride (Method 300.0)
- Sulfate as SO_4 (Method 300.0)
- pH (Standard Method 4500 H+ B)
- Total Dissolved Solids (Standard Method 2540C)

Metals

- Boron (Method 6010D)
- Calcium (Method 6010D)

Appendix IV

Metals

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium

- Chromium
- Cobalt
- Lead
- Lithium
- Mercury
- Molybdenum
- Radium 226
- Radium 228
- Selenium
- Thallium

General Chemistry

- Fluoride (Method 300.0)

The above metals were analyzed by Methods 6010D, 6020B, and 7470A. Radium was analyzed by Method 903.0 and 904.0. Please note Radium 226/228 was inadvertently not sampled due to missing sample bottles during the October 28-29, 2019 sampling event. Therefore, Radium 226/228 samples were collected on December 20, 2019.

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 groundwater monitoring events are presented in **Table 1**. Groundwater contours maps were generated for the April 18 and October 28, 2019 gauging events. Water table contours based on the shallow well data indicate that the shallow groundwater flows to the southwest (**Figures 3** and **5**). Six monitoring wells monitor a deeper water-bearing unit beneath the site. Based on the deeper well data, potentiometric surface contours indicate a southwest flow direction (**Figures 4** and **6**). The groundwater flow directions are consistent with historical flow direction.

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 **Tables 2** and **3**. 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 2019 sampling results to the BTVs are summarized below.

<u>Appendix III Analytes - Result Summary of BTV Exceedances</u>

Boron (BTV = 0.51 mg/l)

- Downgradient monitoring well
  - MW-2R (2.4 mg/l) (4/19/2019) – Exceedance confirmed. Statistically significant
  - MW-2R (2.7 mg/l) (10/29/2019) – Exceedance confirmed. Statistically significant
  - MW-3 (0.87 mg/l) (4/19/2019) – Exceedance not confirmed. Confirmation sampling conducted in fall of 2019.
  - MW-3 (0.92 mg/l) (10/29/2019) – Exceedance confirmed. Statistically significant
  - MW-4 (0.61 mg/l) (10/29/2019) – Exceedance not confirmed. Confirmation sampling scheduled for spring of 2020.

Chloride (BTV = 97.2 mg/l)

- Downgradient monitoring well
  - MW-2R (120 mg/l) (4/19/2019) – Exceedance but sampling results in the fall of 2019 indicate not statistically significant.
  - MW-3 (100 mg/l) (4/19/2019) – Exceedance but sampling results in the fall of 2019 indicate not statistically significant.

Sulfate as SO_4 (BTV = 171 mg/l)

- Downgradient monitoring well
  - MW-4 (304 mg/l) (10/29/2019) – Exceedance not confirmed. Confirmation sampling scheduled for spring of 2020.

Appendix IV Analytes - Result Summary of BTV Exceedances

Chromium (BTV = 0.0048 mg/l)

- Upgradient monitoring well
  - MW-1 (0.0066 mg/l) (4/18/2019) - Exceedance but sampling results in the fall of 2019 indicate not statistically significant.

6 Statistical Evaluation Data

This groundwater statistical evaluation for landfill monitoring is conducted in accordance with CFR 40.257.93(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 events in December of 2019.

Statistical evaluation of the 2017 - 2019 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). 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 6**. The statistical evaluation data is included in **Appendix C**.

6.1 SSI Determination

The detected concentrations for the first and second half 2019 sampling event with the respective USL are listed below. Compliance is determined by comparing the current concentration to the calculated USL. Boron concentrations in monitoring wells MW-2R and MW-3 were confirmed as SSI.

Comparison of 2019 Confirmed COC Concentrations to USLs

Monitoring Well	Analyte	First Half 2019 Conc (mg/l unless noted)	USL Conc (mg/l unless noted)	Second Half 2019 Conc (mg/l unless noted)	USL Notes
MW-1	Chromium	**0.0066**	0.0048	ND	Exceedance but not statistically significant
MW-2R	Boron	**2.4**	0.51	**2.7**	Exceedance confirmed
MW-2R	Chloride	**120**	97.2	96.7	Exceedance but not statistically significant
MW-3	Boron	**0.87**	0.51	**0.92**	Confirmed SSI
MW-3	Chloride	**100**	97.2	59.4	Exceedance but not statistically significant
MW-4	Boron	0.30	0.51	**0.61**	Exceedance not confirmed. Confirmation sampling scheduled for spring 2020
MW-4	Sulfate as SO_4	120	171	**304**	Exceedance not confirmed. Confirmation sampling scheduled for spring 2020

Notes:
Conc – Concentration
KM – Kaplan Meier method for non-detect substitution
Bolded concentration exceeds the respective USL.
ND – Not Detected

7 Groundwater Protection Standards

Per CFR 40.257.95, Groundwater Protection Standards (GPS) were established for each constituent in Appendix IV detected in the groundwater. GPS were established United States Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) 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 levels are shown in **Table 6**.

For the sampling events conducted in 2019, no constituent in Appendix IV was detected at a statistical significant level above established GPS levels for the site (**Table 7**).

8 Conclusions

The groundwater data collected in the 2017 – 2019 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 (detection monitoring) analytes to include Chloride, Fluoride, Sulfate as SO_4, Total Dissolved Solids, Boron, Calcium and in 8 monitoring wells (MW-1, MW-1RD, MW-2R, MW-2RD, MW-3, MW-3R, MW-3RD, and MW-4). 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. Confirmation sampling detected concentrations of Boron in the second half (fall) of 2018 above the respective USL. Boron in monitoring well MW-2R was determined to be a confirmed SSI. Thus, constituents in Appendix IV (assessment monitoring) were analyzed during the spring of 2019 event. Additionally, detected Appendix IV constituents from the spring 2019 event were then analyzed during the fall of 2019 event.

Interwell USLs were developed for the 8 monitoring wells for Appendix IV (assessment monitoring) analytes noted below. The resulting USLs were compared to the current concentrations for each COC and well pair.

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Selenium
- Thallium
- Radium 226/228

Compliance is determined by comparing the currently detected concentrations to the calculated USL. Boron (MW-2R and MW-3) concentrations were detected above the USL and determined to be statistically significant. Chloride (MW-2R and MW-3) and Chromium (MW-1) were detected above respective USLs but confirmation sampling determine the concentrations were not statistical significant. Boron (MW-4) and Sulfate as SO_4 (MW-4) were detected above respective USLs. Resampling is required to determine if the exceedances are statistically significant.

Fall 2018 Fluoride concentrations in monitoring wells MW-1RD (0.30 mg/L) and MW-3 (0.33 mg/l) exceeded the calculated 2019 USL of 0.26 mg/l. Spring 2019 groundwater sampling results indicated Fluoride concentrations at MW-1RD and MW-3 were below the calculated USL value. Thus, the Fluoride fall 2018 concentrations were determined not to be statistically significant.

GPS were established after obtaining Appendix IV sampling data in 2019. For the sampling events conducted in 2019, no constituent in Appendix IV were detected above established GPS values for the site.

9 Report Summary

Per the CFR 40.257.90 – 257.98, 3 monitoring events were conducted at the SKB Lansing Landfill in 2019. Groundwater samples were collected from the monitoring network's eight monitoring wells located at the SKB Lansing Landfill during the monitoring events. Groundwater samples were analyzed for parameters indicated in Appendix III (detection monitoring) during the spring and fall 2019 events. Because Boron was determined to be a SSI in the fall of 2018, Appendix IV analytes were included in the spring 2019 sampling event. Additionally, detected constituents in Appendix IV (assessment monitoring) from the spring 2019 event were also sampled during the fall 2019 event. Groundwater elevation information from the monitoring data indicates a southwesterly groundwater flow beneath the landfill.

The following analytes were reported above the calculated BTVs in 2019:

Appendix III Analytes

- Boron groundwater concentrations were detected above the BTV at a downgradient monitoring wells MW-2R and MW-3 during the spring and fall 2019 sampling events. These concentrations were confirmed exceedances.

- A Boron groundwater concentration was detected above the BTV at a downgradient monitoring wells MW-4 during the fall 2019 sampling event. Subsequent confirmation of the concentration must occur for the exceedance to be considered statistically significant.

- Chloride groundwater concentrations were detected above the BTV at downgradient monitoring wells MW-2R and MW-3 during the spring 2019 sampling event. Subsequent confirmation sampling in the fall of 2019 indicate the exceedances were not considered statistically significant.

- A Sulfate as SO_4 groundwater concentration was detected above the BTV at downgradient monitoring well at MW-4 during the fall 2018 sampling event. A subsequent confirmation of the concentration must occur for the exceedance to be considered statistically significant.

- Fluoride groundwater concentrations were detected above the BTV at both an upgradient monitoring well (MW-1RD) and downgradient monitoring well (MW-3) during the fall 2018 sampling event. Subsequent confirmation sampling during the spring 2019 determined these exceedances were not statistically significant.

Appendix IV Analytes

- A Chromium groundwater concentration was detected above the BTV at upgradient monitoring well MW-1 during the spring 2019 sampling event. Subsequent confirmation sampling during the fall 2019 determined the exceedance was not statistically significant.

Groundwater concentrations from the 2019 monitoring events were compared to established GPS values. No constituents in Appendix IV were detected at a statistical significant level above established GPS values for the site.

10 Recommendations

CCR groundwater monitoring events will be conducted in 2020 by the following schedule:

Spring 2020

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).

Fall 2020

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 2020 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 (CFR 40.257.93(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 value.

A 2020 Annual Monitoring Report will be prepared and include sampling results from the 2020 CCR groundwater monitoring events and an evaluation of the analytical results as they pertained to BTV and GPS values.

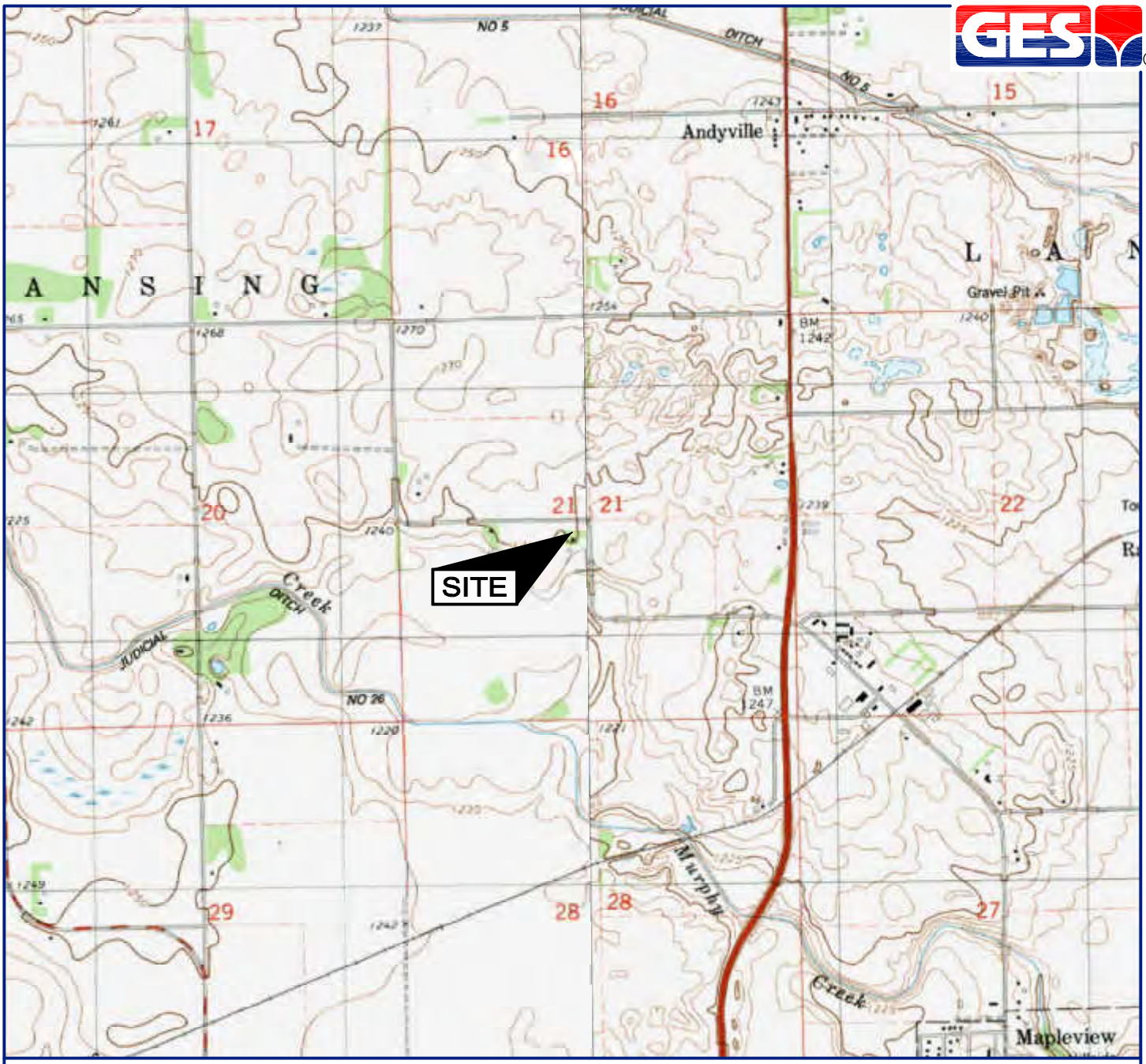
References

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.

United States Geological Survey, 1975. *Water Resources of The Cedar River Watershed, Southeastern Minnesota.*

Figures



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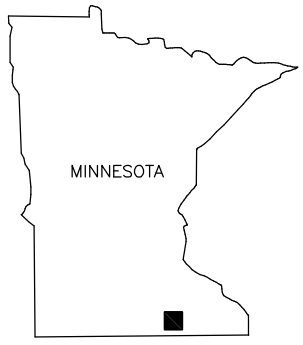
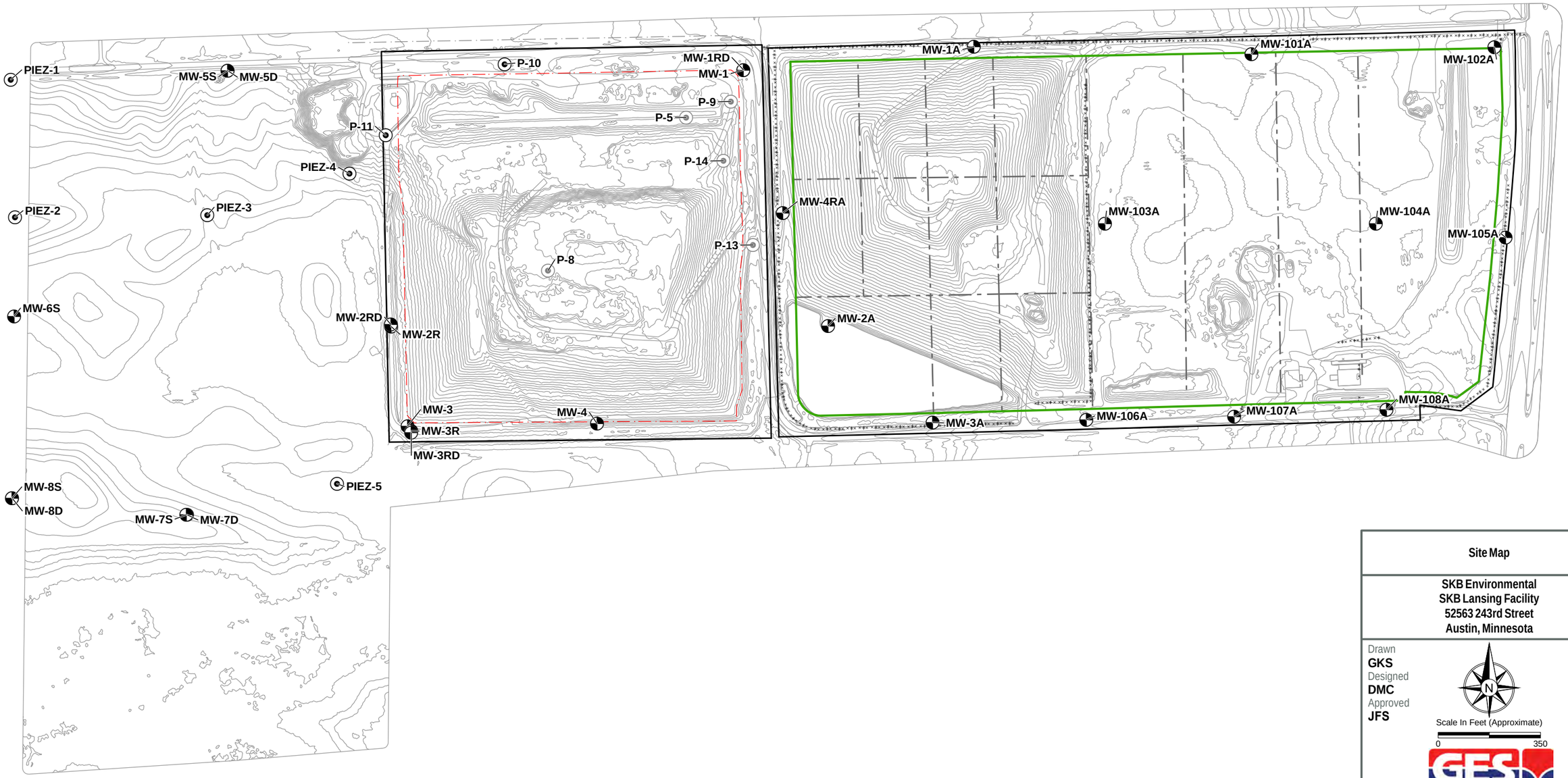
AUSTIN EAST, MINNESOTA
CONTOUR INTERVAL = 5'



QUADRANGLE LOCATION

DRAFTED BY: W.G.S. (N.J.)	SITE LOCATION MAP
CHECKED BY: JFS	SKB ENVIRONMENTAL SKB LANSING FACILITY 52563 243rd STREET AUSTIN, MINNESOTA
REVIEWED BY: JFS	Groundwater & Environmental Services, Inc. 1285 CORPORATE CENTER DRIVE, SUITE 120, EAGAN, MN 55121
NORTH	SCALE IN FEET: 0 — 2000 / DATE: 1-6-14 / FIGURE: 1

M:\Graphics\3500-Minnesota\SKB Environmental\Austin-Lansing facility\Austin SLM.dwg, Layout1, WShea



Legend

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

Site Map

SKB Environmental
SKB Lansing Facility
52563 243rd Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **JFS**

Date **1/9/20**
Figure **2**

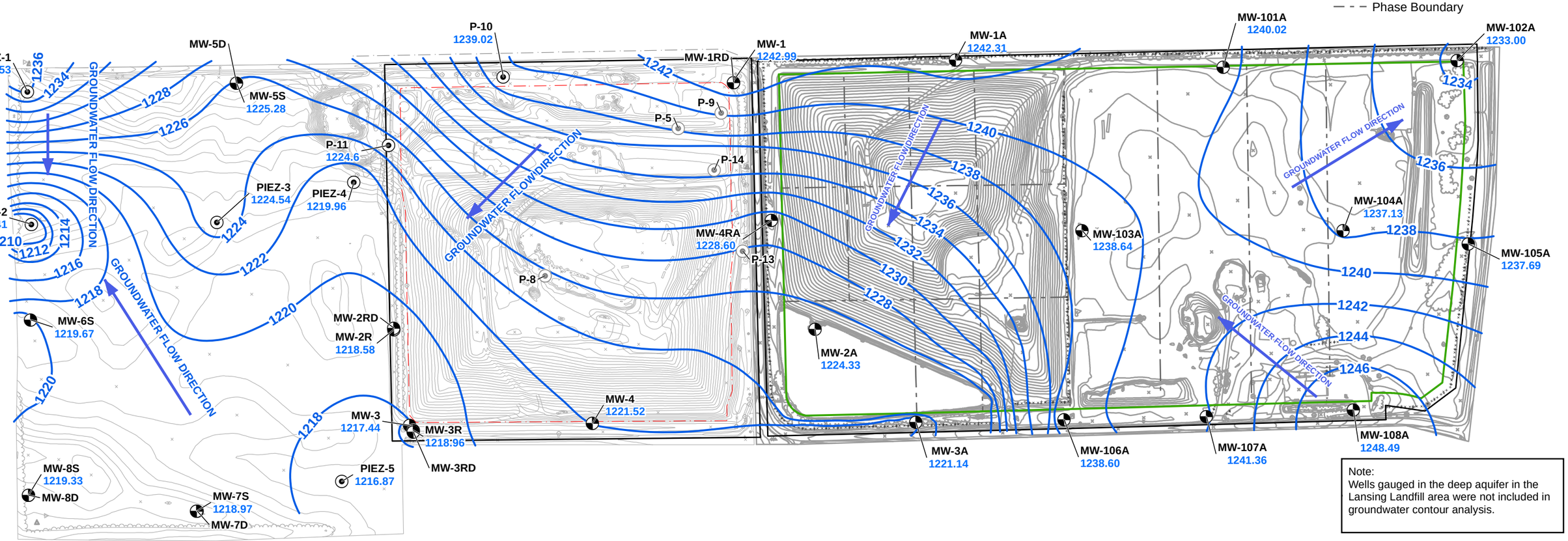
N

Scale In Feet (Approximate)

0 350

GES
Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Combined Austin Landfills\GIS\SKB_Combined_Austin_Landfills_SM.mxd - Scale 1:4,200 - 1/9/2020 11:43:26 AM - GStewart - NAD 1983 StatePlane Minnesota South FIPS 2203 Feet



Legend

- Monitoring Well
- Piezometer
- Destroyed Piezometer
- Groundwater Elevation Contour (ft)
- Approximate Limit of Waste
- Right of Way
- Compliance Boundary
- Property Boundary
- Fence
- Phase Boundary

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

Water Table Contour Map
April 18, 2019

SKB Environmental
SKB Lansing Facility
52563 243rd Street
Austin, Minnesota

Drawn
AMW
Designed
AMW
Approved
DMC

Date
6/18/19
Figure
3

Scale In Feet (Approximate)
0 350

Groundwater & Environmental Services, Inc.

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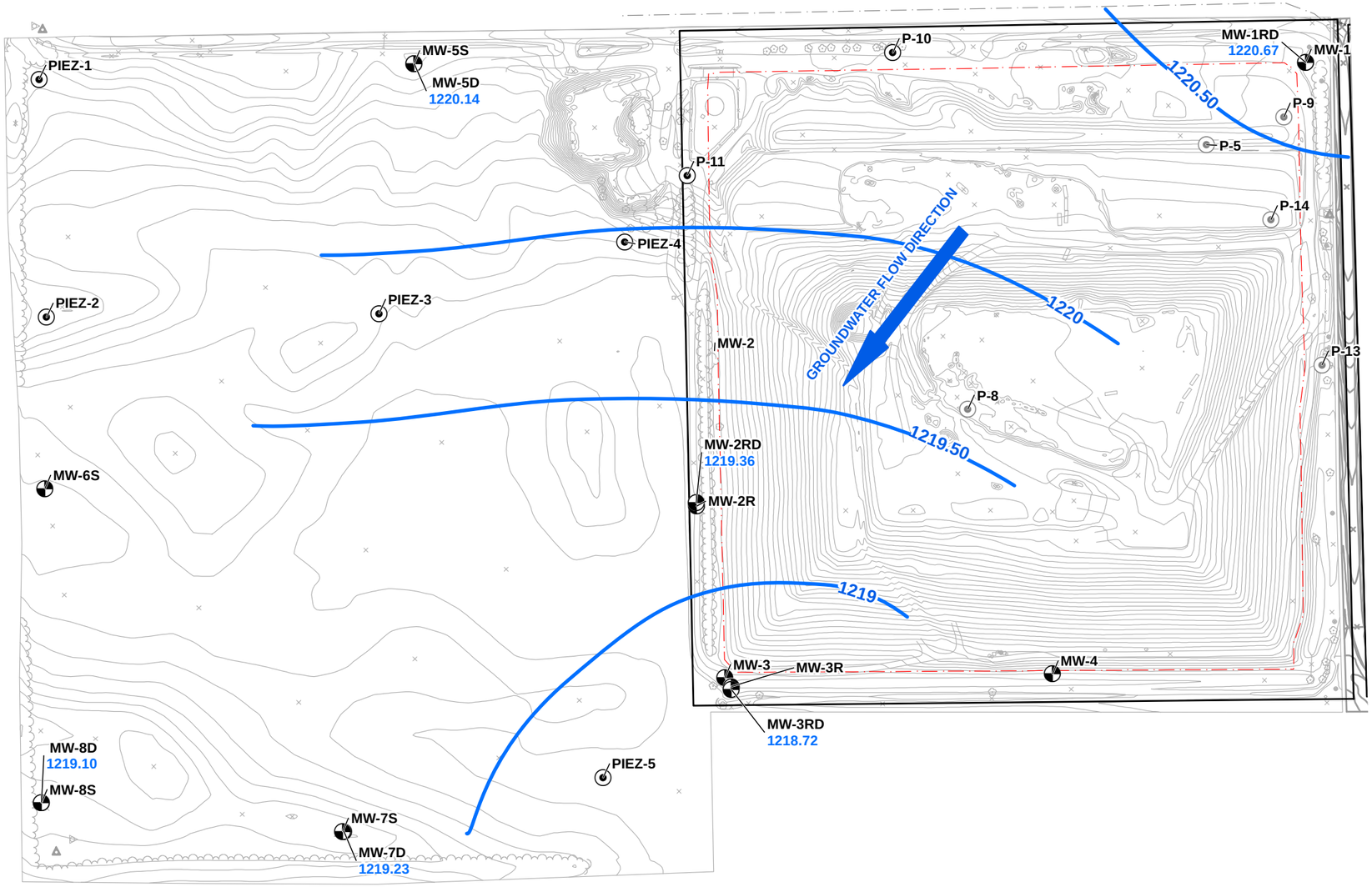

LEGEND

- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- PROPERTY BOUNDARY
- RIGHT OF WAY
- APPROXIMATE LIMITS OF WASTE
- FENCE
- 1216.73 MEASURED GROUNDWATER ELEVATION (ft MSL)
- MONITORING WELL
- PIEZOMETER
- DESTROYED PIEZOMETER

Potentiometic Surface Contour Map
April 18, 2019

SKB Environmental
SKB Lansing Facility
52563 243rd Street
Austin, Minnesota

Drawn **AMW**
Designed **AMW**
Approved **DMC**

Date **6/18/19**
Figure **4**

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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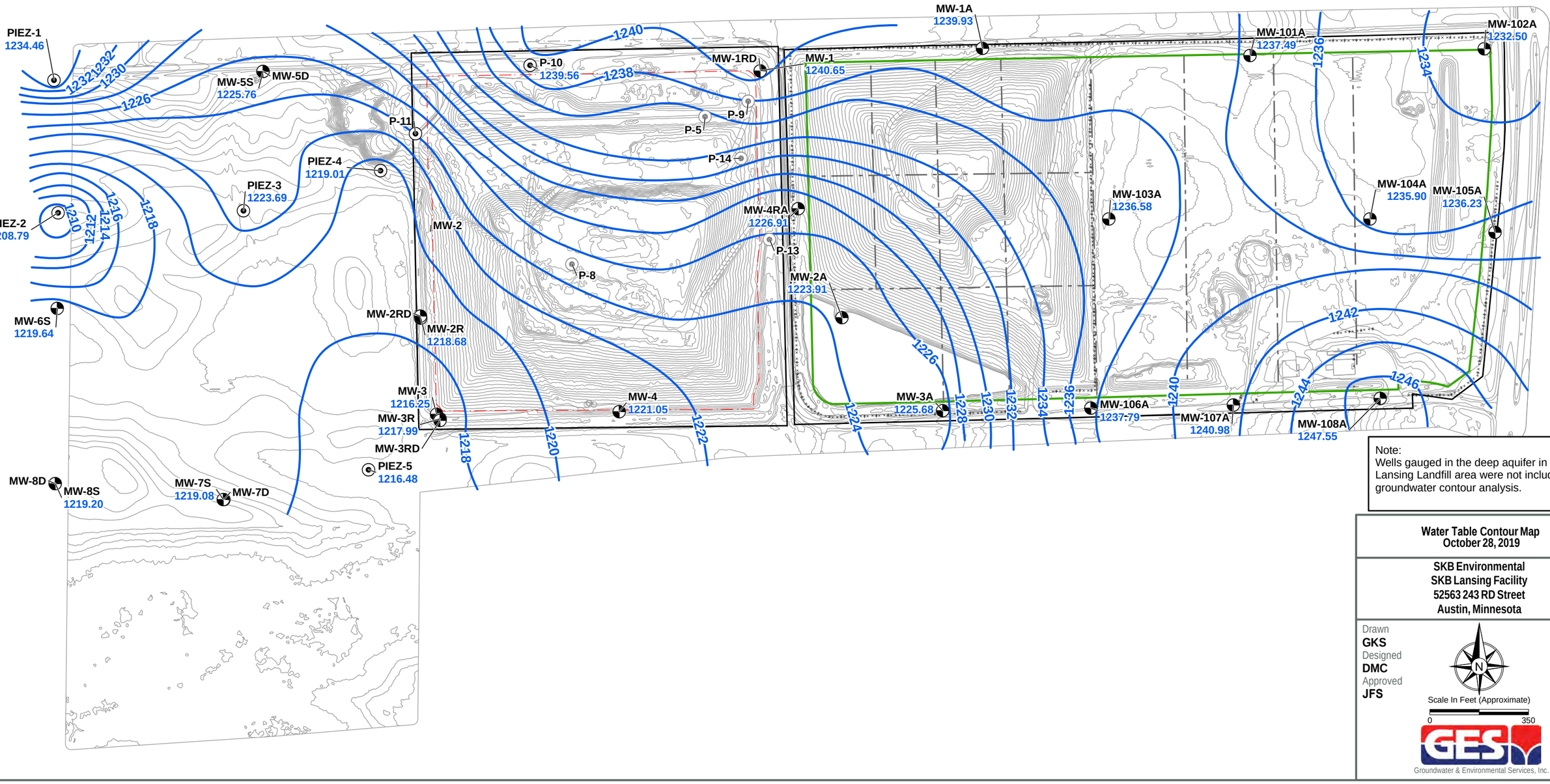

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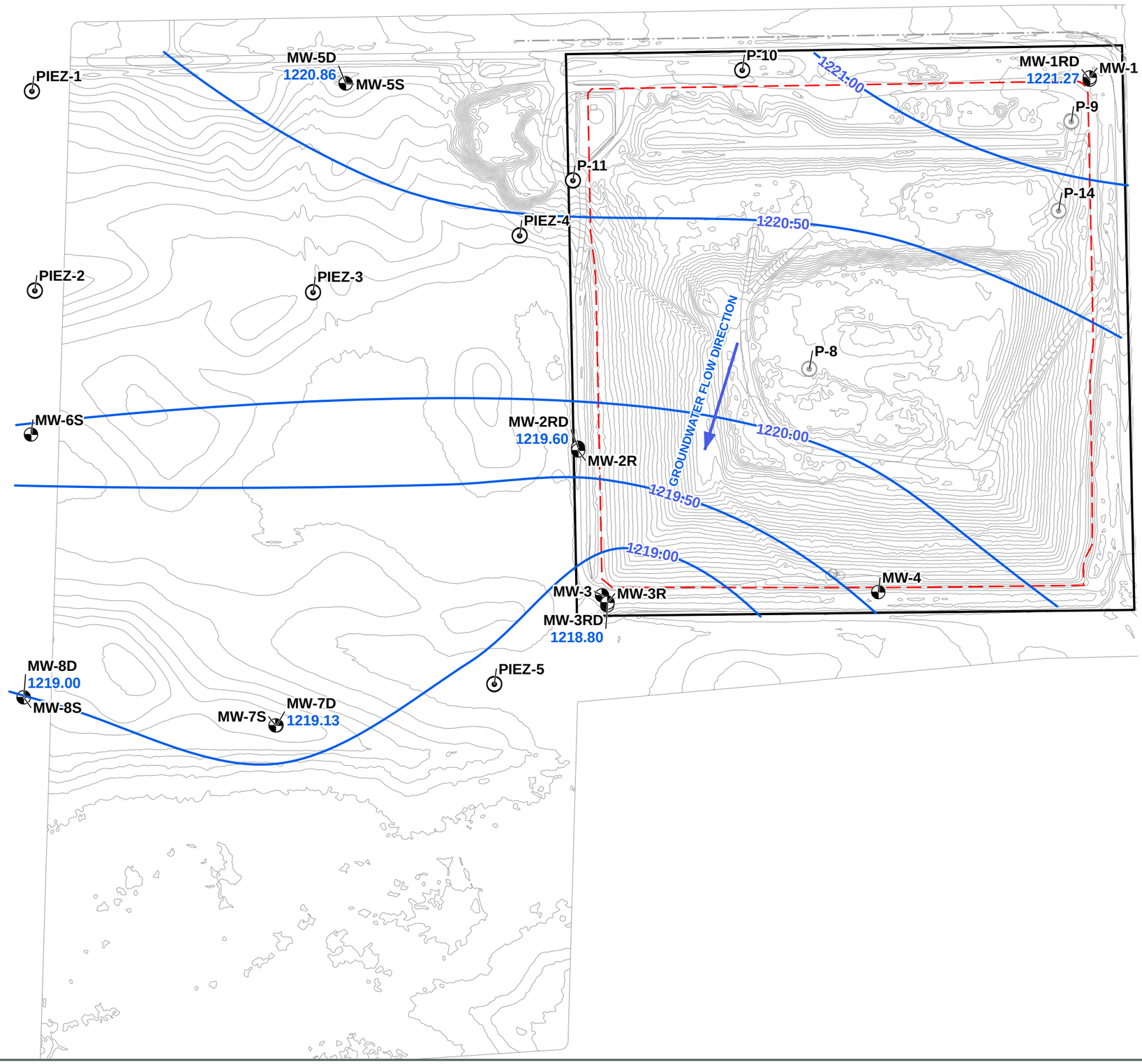

LEGEND

- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- PROPERTY BOUNDARY
- RIGHT OF WAY
- APPROXIMATE LIMITS OF WASTE
- FENCE
- 1216.09 MEASURED GROUNDWATER ELEVATION (ft MSL)
- MONITORING WELL
- PIEZOMETER
- DESTROYED PIEZOMETER

Potentiometric Surface Contour Map
Deep Zone - October 28, 2019

SKB Environmental
SKB Lansing Facility
52563 243 RD Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **JFS**

Date **1/9/20**
Figure **6**

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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Tables

2019 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
04/18/2019	1242.99	1220.67	1218.58	1219.36	1217.44	1218.96	1218.72	1221.52
10/28/2019	1240.65	1221.27	1218.68	1219.60	1216.25	1217.99	1218.80	1221.05
12/20/2019	1239.84	1220.34	1218.13	1218.78	1215.77	1217.64	1217.90	1221.32

Date	MW-5D	MW-5S	MW-6S	MW-7D	MW-7S	MW-8D	MW-8S	PIEZ-1
04/18/2019	1220.14	1225.28	1219.67	1219.23	1218.97	1219.10	1219.33	1235.53
10/28/2019	1220.86	1225.76	1219.64	1219.13	1219.08	1219.00	1219.20	1234.46
12/20/2019	--	--	--	--	--	--	--	--

Date	PIEZ-2	PIEZ-3	PIEZ-4	PIEZ-5	MW-1A	MW-2A	MW-3A	MW-4RA
04/18/2019	1209.41	1224.54	1219.96	1216.87	1242.31	1224.33	1221.14	1228.60
10/28/2019	1208.79	1223.69	1219.01	1216.48	1239.93	1223.91	1225.68	1226.91
12/20/2019	--	--	--	--	--	--	--	--

Date	MW-101A	MW-102A	MW-103A	MW-104A	MW-105A	MW-106A	MW-107A	MW-108A
04/18/2019	1240.02	1233.00	1238.64	1237.13	1237.69	1238.60	1241.36	1248.49
10/28/2019	1237.49	1232.50	1236.58	1235.90	1236.23	1237.79	1240.98	1247.55
12/20/2019	--	--	--	--	--	--	--	--

2019 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Units	CAS #
MW-1	04/18/2019	Boron	0.020	mg/l	7440-42-8
MW-1	10/29/2019	Boron	0.053	mg/l	7440-42-8
MW-1	04/18/2019	Calcium	123	mg/l	7440-70-2
MW-1	10/29/2019	Calcium	136	mg/l	7440-70-2
MW-1	04/18/2019	Chloride	87	mg/l	16887-00-6
MW-1	10/29/2019	Chloride	63.6	mg/l	16887-00-6
MW-1	04/18/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-1	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-1	04/18/2019	pH	7.4	pH UNITS	PH
MW-1	10/29/2019	pH	7.3	pH UNITS	PH
MW-1	04/18/2019	Sulfate as SO4	85	mg/l	14808-79-8
MW-1	10/29/2019	Sulfate as SO4	125	mg/l	14808-79-8
MW-1	04/18/2019	Total Dissolved Solids	530	mg/l	TDS
MW-1	10/29/2019	Total Dissolved Solids	605	mg/l	TDS
MW-1RD	04/19/2019	Boron	0.012	mg/l	7440-42-8
MW-1RD	10/29/2019	Boron	< 0.020	mg/l	7440-42-8
MW-1RD	04/19/2019	Calcium	79.3	mg/l	7440-70-2
MW-1RD	10/29/2019	Calcium	80.2	mg/l	7440-70-2
MW-1RD	04/19/2019	Chloride	22	mg/l	16887-00-6
MW-1RD	10/29/2019	Chloride	22.2	mg/l	16887-00-6
MW-1RD	04/19/2019	Fluoride	0.17	mg/l	16984-48-8
MW-1RD	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-1RD	04/19/2019	pH	7.5	pH UNITS	PH
MW-1RD	10/29/2019	pH	7.7	pH UNITS	PH
MW-1RD	04/19/2019	Sulfate as SO4	48	mg/l	14808-79-8
MW-1RD	10/29/2019	Sulfate as SO4	67.1	mg/l	14808-79-8
MW-1RD	04/19/2019	Total Dissolved Solids	340	mg/l	TDS
MW-1RD	10/29/2019	Total Dissolved Solids	373	mg/l	TDS
MW-2R	04/19/2019	Boron	**2.4**	mg/l	7440-42-8
MW-2R	10/29/2019	Boron	**2.7**	mg/l	7440-42-8
MW-2R	04/19/2019	Calcium	227	mg/l	7440-70-2
MW-2R	10/29/2019	Calcium	226	mg/l	7440-70-2
MW-2R	04/19/2019	Chloride	**120**	mg/l	16887-00-6
MW-2R	10/29/2019	Chloride	96.7	mg/l	16887-00-6
MW-2R	04/19/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-2R	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-2R	04/19/2019	pH	6.8	pH UNITS	PH
MW-2R	10/29/2019	pH	7.1	pH UNITS	PH
MW-2R	04/19/2019	Sulfate as SO4	130	mg/l	14808-79-8
MW-2R	10/29/2019	Sulfate as SO4	67.3	mg/l	14808-79-8
MW-2R	04/19/2019	Total Dissolved Solids	1100	mg/l	TDS
MW-2R	10/29/2019	Total Dissolved Solids	1010	mg/l	TDS
MW-2RD	04/19/2019	Boron	0.077	mg/l	7440-42-8
MW-2RD	10/29/2019	Boron	0.094	mg/l	7440-42-8
MW-2RD	04/19/2019	Calcium	141	mg/l	7440-70-2
MW-2RD	10/29/2019	Calcium	138	mg/l	7440-70-2
MW-2RD	04/19/2019	Chloride	38	mg/l	16887-00-6
MW-2RD	10/29/2019	Chloride	35.3	mg/l	16887-00-6
MW-2RD	04/19/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-2RD	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-2RD	04/19/2019	pH	7.3	pH UNITS	PH
MW-2RD	10/29/2019	pH	7.6	pH UNITS	PH
MW-2RD	04/19/2019	Sulfate as SO4	81	mg/l	14808-79-8
MW-2RD	10/29/2019	Sulfate as SO4	108	mg/l	14808-79-8
MW-2RD	04/19/2019	Total Dissolved Solids	580	mg/l	TDS
MW-2RD	10/29/2019	Total Dissolved Solids	570	mg/l	TDS

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Units	CAS #
MW-3	04/19/2019	Boron	**0.87**	mg/l	7440-42-8
MW-3	10/29/2019	Boron	**0.92**	mg/l	7440-42-8
MW-3	04/19/2019	Calcium	194	mg/l	7440-70-2
MW-3	10/29/2019	Calcium	186	mg/l	7440-70-2
MW-3	04/19/2019	Chloride	**100**	mg/l	16887-00-6
MW-3	10/29/2019	Chloride	59.4	mg/l	16887-00-6
MW-3	04/19/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-3	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-3	04/19/2019	pH	7.0	pH UNITS	PH
MW-3	10/29/2019	pH	6.8	pH UNITS	PH
MW-3	04/19/2019	Sulfate as SO4	21	mg/l	14808-79-8
MW-3	10/29/2019	Sulfate as SO4	< 2.0	mg/l	14808-79-8
MW-3	04/19/2019	Total Dissolved Solids	780	mg/l	TDS
MW-3	10/29/2019	Total Dissolved Solids	823	mg/l	TDS
MW-3R	04/19/2019	Boron	0.054	mg/l	7440-42-8
MW-3R	10/29/2019	Boron	0.083	mg/l	7440-42-8
MW-3R	04/19/2019	Calcium	218	mg/l	7440-70-2
MW-3R	10/29/2019	Calcium	223	mg/l	7440-70-2
MW-3R	04/19/2019	Chloride	27	mg/l	16887-00-6
MW-3R	10/29/2019	Chloride	23.5	mg/l	16887-00-6
MW-3R	04/19/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-3R	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-3R	04/19/2019	pH	6.8	pH UNITS	PH
MW-3R	10/29/2019	pH	6.7	pH UNITS	PH
MW-3R	04/19/2019	Sulfate as SO4	30	mg/l	14808-79-8
MW-3R	10/29/2019	Sulfate as SO4	< 2.0	mg/l	14808-79-8
MW-3R	04/19/2019	Total Dissolved Solids	780	mg/l	TDS
MW-3R	10/29/2019	Total Dissolved Solids	853	mg/l	TDS
MW-3RD	04/19/2019	Boron	0.034	mg/l	7440-42-8
MW-3RD	10/29/2019	Boron	0.033	mg/l	7440-42-8
MW-3RD	04/19/2019	Calcium	128	mg/l	7440-70-2
MW-3RD	10/29/2019	Calcium	126	mg/l	7440-70-2
MW-3RD	04/19/2019	Chloride	30	mg/l	16887-00-6
MW-3RD	10/29/2019	Chloride	27.9	mg/l	16887-00-6
MW-3RD	04/19/2019	Fluoride	0.17	mg/l	16984-48-8
MW-3RD	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-3RD	04/19/2019	pH	7.2	pH UNITS	PH
MW-3RD	10/29/2019	pH	7.5	pH UNITS	PH
MW-3RD	04/19/2019	Sulfate as SO4	100	mg/l	14808-79-8
MW-3RD	10/29/2019	Sulfate as SO4	128	mg/l	14808-79-8
MW-3RD	04/19/2019	Total Dissolved Solids	540	mg/l	TDS
MW-3RD	10/29/2019	Total Dissolved Solids	543	mg/l	TDS
MW-4	04/19/2019	Boron	0.30	mg/l	7440-42-8
MW-4	10/29/2019	Boron	**0.61**	mg/l	7440-42-8
MW-4	04/19/2019	Calcium	134	mg/l	7440-70-2
MW-4	10/29/2019	Calcium	204	mg/l	7440-70-2
MW-4	04/19/2019	Chloride	12	mg/l	16887-00-6
MW-4	10/29/2019	Chloride	15.7	mg/l	16887-00-6
MW-4	04/19/2019	Fluoride	0.13	mg/l	16984-48-8
MW-4	10/29/2019	Fluoride	< 0.25	mg/l	16984-48-8
MW-4	04/19/2019	pH	7.0	pH UNITS	PH
MW-4	10/29/2019	pH	6.9	pH UNITS	PH
MW-4	04/19/2019	Sulfate as SO4	120	mg/l	14808-79-8
MW-4	10/29/2019	Sulfate as SO4	**304**	mg/l	14808-79-8
MW-4	04/19/2019	Total Dissolved Solids	590	mg/l	TDS
MW-4	10/29/2019	Total Dissolved Solids	914	mg/l	TDS

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

2019 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Units	CAS #
MW-1	04/18/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-1	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-1	04/18/2019	Arsenic	1.2	ug/l	7440-38-2
MW-1	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-1	04/18/2019	Barium	0.14	mg/l	7440-39-3
MW-1	10/29/2019	Barium	0.14	mg/l	7440-39-3
MW-1	04/18/2019	Beryllium	0.16	ug/l	7440-41-7
MW-1	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-1	04/18/2019	Cadmium	0.20	ug/l	7440-43-9
MW-1	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-1	04/18/2019	Chromium	**0.0066**	mg/l	7440-47-3
MW-1	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-1	04/18/2019	Cobalt	1.6	ug/l	7440-48-4
MW-1	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-1	04/18/2019	Lead	< 0.010	mg/l	7439-92-1
MW-1	04/18/2019	Lithium	0.022	mg/l	7439-93-2
MW-1	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-1	04/18/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-1	04/18/2019	Molybdenum	< 1.0	ug/l	7439-98-7
MW-1	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-1	4/18/2019	Radium 226	< 0.156	pci/l	13982-63-3
MW-1	12/20/2019	Radium 226	0.148	pci/l	13982-63-3
MW-1	04/18/2019	Radium 228	< 0.700	pci/l	15262-20-1
MW-1	12/20/2019	Radium 228	< 0.465	pci/l	15262-20-1
MW-1	04/18/2019	Radium 226/228	< 0.700	pci/l	--
MW-1	12/20/2019	Radium 226/228	0.148	pci/l	--
MW-1	04/18/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-1	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-1	04/18/2019	Thallium	0.056	ug/l	7440-28-0
MW-1	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-1RD	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-1RD	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-1RD	04/19/2019	Arsenic	< 1.0	ug/l	7440-38-2
MW-1RD	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-1RD	04/19/2019	Barium	0.17	mg/l	7440-39-3
MW-1RD	10/29/2019	Barium	0.16	mg/l	7440-39-3
MW-1RD	04/19/2019	Beryllium	0.041	ug/l	7440-41-7
MW-1RD	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-1RD	04/19/2019	Cadmium	< 0.50	ug/l	7440-43-9
MW-1RD	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-1RD	04/19/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-1RD	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-1RD	04/19/2019	Cobalt	0.64	ug/l	7440-48-4
MW-1RD	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-1RD	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-1RD	04/19/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-1RD	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-1RD	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-1RD	04/19/2019	Molybdenum	3.1	ug/l	7439-98-7
MW-1RD	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-1RD	04/19/2019	Radium 226	0.303	pci/l	13982-63-3
MW-1RD	12/20/2019	Radium 226	0.254	pci/l	13982-63-3
MW-1RD	04/19/2019	Radium 228	0.684	pci/l	15262-20-1
MW-1RD	12/20/2019	Radium 228	0.510	pci/l	15262-20-1
MW-1RD	04/19/2019	Radium 226/228	0.987	pci/l	--

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Units	CAS #
MW-1RD	12/20/2019	Radium 226/228	0.764	pci/l	--
MW-1RD	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-1RD	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-1RD	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-1RD	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-2R	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-2R	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-2R	04/19/2019	Arsenic	1.5	ug/l	7440-38-2
MW-2R	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-2R	04/19/2019	Barium	0.27	mg/l	7440-39-3
MW-2R	10/29/2019	Barium	0.27	mg/l	7440-39-3
MW-2R	04/19/2019	Beryllium	< 0.70	ug/l	7440-41-7
MW-2R	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-2R	04/19/2019	Cadmium	0.20	ug/l	7440-43-9
MW-2R	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-2R	04/19/2019	Chromium	0.0018	mg/l	7440-47-3
MW-2R	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-2R	04/19/2019	Cobalt	2.3	ug/l	7440-48-4
MW-2R	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-2R	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-2R	04/19/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-2R	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-2R	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-2R	04/19/2019	Molybdenum	2.4	ug/l	7439-98-7
MW-2R	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-2R	04/19/2019	Radium 226	0.364	pci/l	13982-63-3
MW-2R	12/20/2019	Radium 226	< 0.167	pci/l	13982-63-3
MW-2R	04/19/2019	Radium 228	0.892	pci/l	15262-20-1
MW-2R	12/20/2019	Radium 228	0.635	pci/l	15262-20-1
MW-2R	04/19/2019	Radium 226/228	1.256	pci/l	--
MW-2R	12/20/2019	Radium 226/228	0.635	pci/l	--
MW-2R	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-2R	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-2R	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-2R	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-2RD	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-2RD	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-2RD	04/19/2019	Arsenic	2.2	ug/l	7440-38-2
MW-2RD	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-2RD	04/19/2019	Barium	0.19	mg/l	7440-39-3
MW-2RD	10/29/2019	Barium	0.19	mg/l	7440-39-3
MW-2RD	04/19/2019	Beryllium	< 0.70	ug/l	7440-41-7
MW-2RD	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-2RD	04/19/2019	Cadmium	< 0.50	ug/l	7440-43-9
MW-2RD	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-2RD	04/19/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-2RD	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-2RD	04/19/2019	Cobalt	2.5	ug/l	7440-48-4
MW-2RD	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-2RD	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-2RD	04/19/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-2RD	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-2RD	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-2RD	04/19/2019	Molybdenum	2.2	ug/l	7439-98-7
MW-2RD	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Units	CAS #
MW-2RD	04/19/2019	Radium 226	0.450	pci/l	13982-63-3
MW-2RD	12/20/2019	Radium 226	0.392	pci/l	13982-63-3
MW-2RD	04/19/2019	Radium 228	< 0.552	pci/l	15262-20-1
MW-2RD	12/20/2019	Radium 228	< 0.453	pci/l	15262-20-1
MW-2RD	04/19/2019	Radium 226/228	0.450	pci/l	--
MW-2RD	12/20/2019	Radium 226/228	0.392	pci/l	--
MW-2RD	04/19/2019	Selenium	2.2	ug/l	7782-49-2
MW-2RD	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-2RD	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-2RD	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-3	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-3	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-3	04/19/2019	Arsenic	2.5	ug/l	7440-38-2
MW-3	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-3	04/19/2019	Barium	0.25	mg/l	7440-39-3
MW-3	10/29/2019	Barium	0.29	mg/l	7440-39-3
MW-3	04/19/2019	Beryllium	< 0.70	ug/l	7440-41-7
MW-3	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-3	04/19/2019	Cadmium	0.18	ug/l	7440-43-9
MW-3	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-3	04/19/2019	Chromium	0.0013	mg/l	7440-47-3
MW-3	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-3	04/19/2019	Cobalt	5.4	ug/l	7440-48-4
MW-3	10/29/2019	Cobalt	0.0055	mg/l	7440-48-4
MW-3	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-3	04/19/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-3	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-3	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-3	04/19/2019	Molybdenum	4.3	ug/l	7439-98-7
MW-3	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-3	04/19/2019	Radium 226	0.243	pci/l	13982-63-3
MW-3	12/20/2019	Radium 226	0.329	pci/l	13982-63-3
MW-3	04/19/2019	Radium 228	0.971	pci/l	15262-20-1
MW-3	12/20/2019	Radium 228	0.559	pci/l	15262-20-1
MW-3	04/19/2019	Radium 226/228	1.214	pci/l	--
MW-3	12/20/2019	Radium 226/228	0.888	pci/l	--
MW-3	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-3	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-3	04/19/2019	Thallium	0.058	ug/l	7440-28-0
MW-3	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-3R	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-3R	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-3R	04/19/2019	Arsenic	2.1	ug/l	7440-38-2
MW-3R	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-3R	04/19/2019	Barium	0.60	mg/l	7440-39-3
MW-3R	10/29/2019	Barium	0.60	mg/l	7440-39-3
MW-3R	04/19/2019	Beryllium	< 0.70	ug/l	7440-41-7
MW-3R	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-3R	04/19/2019	Cadmium	< 0.50	ug/l	7440-43-9
MW-3R	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-3R	04/19/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-3R	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-3R	04/19/2019	Cobalt	0.36	ug/l	7440-48-4
MW-3R	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-3R	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-3R	04/19/2019	Lithium	0.016	mg/l	7439-93-2

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Units	CAS #
MW-3R	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-3R	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-3R	04/19/2019	Molybdenum	1.2	ug/l	7439-98-7
MW-3R	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-3R	04/19/2019	Radium 226	0.518	pci/l	13982-63-3
MW-3R	12/20/2019	Radium 226	0.494	pci/l	13982-63-3
MW-3R	04/19/2019	Radium 228	0.822	pci/l	15262-20-1
MW-3R	12/20/2019	Radium 228	1.88	pci/l	15262-20-1
MW-3R	04/19/2019	Radium 226/228	1.34	pci/l	--
MW-3R	12/20/2019	Radium 226/228	2.374	pci/l	--
MW-3R	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-3R	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-3R	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-3R	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-3RD	04/19/2019	Antimony	< 1.0	ug/l	7440-36-0
MW-3RD	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-3RD	04/19/2019	Arsenic	3.6	ug/l	7440-38-2
MW-3RD	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-3RD	04/19/2019	Barium	0.23	mg/l	7440-39-3
MW-3RD	10/29/2019	Barium	0.21	mg/l	7440-39-3
MW-3RD	04/19/2019	Beryllium	0.090	ug/l	7440-41-7
MW-3RD	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-3RD	04/19/2019	Cadmium	< 0.50	ug/l	7440-43-9
MW-3RD	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-3RD	04/19/2019	Chromium	0.0018	mg/l	7440-47-3
MW-3RD	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-3RD	04/19/2019	Cobalt	0.57	ug/l	7440-48-4
MW-3RD	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-3RD	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-3RD	04/19/2019	Lithium	0.011	mg/l	7439-93-2
MW-3RD	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-3RD	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-3RD	04/19/2019	Molybdenum	4.0	ug/l	7439-98-7
MW-3RD	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-3RD	04/19/2019	Radium 226	0.546	pci/l	13982-63-3
MW-3RD	12/20/2019	Radium 226	0.658	pci/l	13982-63-3
MW-3RD	04/19/2019	Radium 228	0.944	pci/l	15262-20-1
MW-3RD	12/20/2019	Radium 228	0.810	pci/l	15262-20-1
MW-3RD	04/19/2019	Radium 226/228	1.49	pci/l	--
MW-3RD	12/20/2019	Radium 226/228	1.468	pci/l	--
MW-3RD	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-3RD	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-3RD	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-3RD	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0
MW-4	04/19/2019	Antimony	0.36	ug/l	7440-36-0
MW-4	10/29/2019	Antimony	< 0.020	mg/l	7440-36-0
MW-4	04/19/2019	Arsenic	0.86	ug/l	7440-38-2
MW-4	10/29/2019	Arsenic	< 0.015	mg/l	7440-38-2
MW-4	04/19/2019	Barium	0.15	mg/l	7440-39-3
MW-4	10/29/2019	Barium	0.24	mg/l	7440-39-3
MW-4	04/19/2019	Beryllium	< 0.70	ug/l	7440-41-7
MW-4	10/29/2019	Beryllium	< 0.0020	mg/l	7440-41-7
MW-4	04/19/2019	Cadmium	0.32	ug/l	7440-43-9
MW-4	10/29/2019	Cadmium	< 0.0020	mg/l	7440-43-9
MW-4	04/19/2019	Chromium	< 0.0040	mg/l	7440-47-3

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Units	CAS #
MW-4	10/29/2019	Chromium	< 0.0040	mg/l	7440-47-3
MW-4	04/19/2019	Cobalt	0.57	ug/l	7440-48-4
MW-4	10/29/2019	Cobalt	< 0.0040	mg/l	7440-48-4
MW-4	04/19/2019	Lead	< 0.010	mg/l	7439-92-1
MW-4	04/19/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-4	10/29/2019	Lithium	< 0.030	mg/l	7439-93-2
MW-4	04/19/2019	Mercury	< 0.20	ug/l	7439-97-6
MW-4	04/19/2019	Molybdenum	1.6	ug/l	7439-98-7
MW-4	10/29/2019	Molybdenum	< 0.010	mg/l	7439-98-7
MW-4	04/19/2019	Radium 226	0.201	pci/l	13982-63-3
MW-4	12/20/2019	Radium 226	0.290	pci/l	13982-63-3
MW-4	04/19/2019	Radium 228	< 0.569	pci/l	15262-20-1
MW-4	12/20/2019	Radium 228	0.767	pci/l	15262-20-1
MW-4	04/19/2019	Radium 226/228	0.201	pci/l	--
MW-4	12/20/2019	Radium 226/228	1.057	pci/l	--
MW-4	04/19/2019	Selenium	< 1.0	ug/l	7782-49-2
MW-4	10/29/2019	Selenium	< 0.025	mg/l	7782-49-2
MW-4	04/19/2019	Thallium	< 0.20	ug/l	7440-28-0
MW-4	10/29/2019	Thallium	< 0.020	mg/l	7440-28-0

Results in milligrams per liter (mg/l), micrograms per liter (ug/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	Field pH pH	Field Specific Conductivity umhos/cm	Field Temp deg c
MW-1	4/18/2019	1000	7.31	948	4.91
MW-1	4/18/2019	1000	6.60	979	4.52
MW-1	4/18/2019	1000	6.58	1060	3.70
MW-1	4/18/2019	1000	6.64	1080	3.89
MW-1	10/29/2019	1000	7.27	1060	11.21
MW-1	10/29/2019		7.11	1060	12.28
MW-1	10/29/2019	1000	7.08	1060	12.46
MW-1	10/29/2019	1000	7.08	1050	12.59
MW-1	12/20/2019	1000	7.26	1000	7.88
MW-1	12/20/2019	1000	7.17	1000	7.87
MW-1	12/20/2019	1000	7.11	1000	7.86
MW-1	12/20/2019	1000	7.11	1000	7.85
MW-1RD	4/18/2019	1000	6.69	679	8.38
MW-1RD	4/18/2019	1000	6.70	679	8.36
MW-1RD	4/18/2019	1000	6.75	679	8.39
MW-1RD	4/18/2019	1000	6.76	679	8.40
MW-1RD	10/29/2019	1000	7.48	320	9.19
MW-1RD	10/29/2019	1000	7.59	451	9.19
MW-1RD	10/29/2019	1000	7.62	584	9.19
MW-1RD	10/29/2019	1000	7.60	604	9.19
MW-1RD	12/20/2019	1000	7.89	622	7.86
MW-1RD	12/20/2019	1000	7.87	622	7.81
MW-1RD	12/20/2019	1000	7.88	623	7.80
MW-1RD	12/20/2019	1000	7.88	623	7.80
MW-2R	4/18/2019	1000	6.86	1850	5.32
MW-2R	4/18/2019	1000	6.54	1720	4.50
MW-2R	4/18/2019	1000	6.22	1900	5.20
MW-2R	4/18/2019	1000	6.15	1910	5.28
MW-2R	10/29/2019	1000	7.27	1490	13.22
MW-2R	10/29/2019	1000	7.00	1460	13.48
MW-2R	10/29/2019	1000	6.91	1540	13.35
MW-2R	10/29/2019	1000	6.89	1560	13.33
MW-2R	12/20/2019	1000	7.28	1500	8.33
MW-2R	12/20/2019	1000	7.02	1500	8.36
MW-2R	12/20/2019	1000	6.97	1500	8.37
MW-2R	12/20/2019	1000	6.95	1500	8.39
MW-2RD	4/18/2019	1000	6.34	1100	8.85
MW-2RD	4/18/2019	1000	6.47	1120	9.06
MW-2RD	4/18/2019	1000	6.59	1130	9.11
MW-2RD	4/18/2019	1000	6.62	1130	9.10
MW-2RD	10/29/2019	1000	7.56	711	10.45
MW-2RD	10/29/2019	1000	7.36	869	10.42
MW-2RD	10/29/2019	1000	7.28	1000	10.28
MW-2RD	10/29/2019	1000	7.27	962	10.33
MW-2RD	12/20/2019	1000	7.42	884	9.77
MW-2RD	12/20/2019	1000	7.31	884	9.78
MW-2RD	12/20/2019	1000	7.25	884	9.80
MW-2RD	12/20/2019	1000	7.26	885	9.81
MW-3	4/18/2019	1000	7.02	1330	6.81

Table 4

Well Stabilization Data

Well ID	Sample Date	Purge Rate ml/min	Field pH pH	Field Specific Conductivity umhos/cm	Field Temp deg c
MW-3	4/18/2019	1000	6.55	1390	4.40
MW-3	4/18/2019	1000	6.42	1480	4.43
MW-3	4/18/2019	1000	6.24	1510	4.42
MW-3	10/29/2019	1000	6.92	1320	12.52
MW-3	10/29/2019	1000	6.92	1330	12.52
MW-3	10/29/2019	1000	6.91	1290	12.49
MW-3	10/29/2019	1000	6.91	1290	12.49
MW-3	12/20/2019	1000	7.97	1200	8.47
MW-3	12/20/2019	1000	7.96	1240	8.46
MW-3	12/20/2019	1000	7.95	1240	8.46
MW-3	12/20/2019	1000	7.95	1240	8.46
MW-3R	4/18/2019	1000	6.14	1470	7.83
MW-3R	4/18/2019	1000	6.14	1470	7.83
MW-3R	4/18/2019	1000	6.14	1470	7.83
MW-3R	4/18/2019	1000	6.14	1470	7.83
MW-3R	10/29/2019	1000	7.21	1330	9.91
MW-3R	10/29/2019	1000	6.93	1360	10.37
MW-3R	10/29/2019	1000	6.84	1380	10.18
MW-3R	10/29/2019	1000	6.83	1390	10.15
MW-3R	12/20/2019	1000	8.16	1250	9.28
MW-3R	12/20/2019	1000	8.15	1250	9.27
MW-3R	12/20/2019	1000	8.15	1250	9.27
MW-3R	12/20/2019	1000	8.14	1250	9.27
MW-3RD	4/18/2019	1000	6.54	1050	8.62
MW-3RD	4/18/2019	1000	6.56	1050	8.69
MW-3RD	4/18/2019	1000	6.45	1050	8.69
MW-3RD	4/18/2019	1000	6.45	1050	8.70
MW-3RD	4/18/2019	1000	6.47	1050	8.73
MW-3RD	10/29/2019	1000	7.28	917	9.42
MW-3RD	10/29/2019	1000	7.29	919	9.40
MW-3RD	10/29/2019	1000	7.29	921	9.39
MW-3RD	10/29/2019	1000	7.28	920	9.39
MW-3RD	12/20/2019	1000	8.16	854	8.75
MW-3RD	12/20/2019	1000	8.15	854	8.77
MW-3RD	12/20/2019	1000	8.15	854	8.77
MW-3RD	12/20/2019	1000	8.15	854	8.77
MW-4	4/18/2019	1000	6.66	58	6.25
MW-4	4/18/2019	1000	6.47	42	4.84
MW-4	4/18/2019	1000	6.35	60	4.50
MW-4	4/18/2019	1000	6.40	50	4.44
MW-4	10/29/2019	1000	7.27	1320	11.54
MW-4	10/29/2019	1000	7.10	1340	12.24
MW-4	10/29/2019	1000	7.09	1330	12.32
MW-4	10/29/2019	1000	7.07	1300	12.36
MW-4	12/20/2019	1000	7.95	1230	7.62
MW-4	12/20/2019	1000	7.94	1230	7.73
MW-4	12/20/2019	1000	7.93	1230	7.78
MW-4	12/20/2019	1000	7.92	1230	7.81

Table 5

Background Threshold Values

Appendix III to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Boron	0.51	mg/l	7440-42-8
Calcium	271	mg/l	7440-70-2
Chloride	97.2	mg/l	16887-00-6
Fluoride	0.33	mg/l	15984-48-8
pH	lower 6.6 higher 7.8	pH UNITS	PH
Sulfate as SO4	171	mg/l	14808-79-8
Total Dissolved Solids	1170	mg/l	TDS

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Antimony	20	ug/l	7440-36-0
Arsenic	15	ug/l	7440-38-2
Barium	0.61	mg/l	7440-39-3
Beryllium	2.0	ug/l	7440-41-7
Cadmium	2.0	ug/l	7440-43-9
Chromium	0.0048	mg/l	7440-47-3
Cobalt	6.2	ug/l	7440-48-4
Lead	0.015	mg/l	7439-92-1
Lithium	0.01	mg/l	7439-93-2
Mercury	0.0002	mg/l	7439-97-6
Molybdenum	10	ug/l	7439-98-7
Radium 226	0.947	pci/l	13982-63-3
Radium 228	1.898	pci/l	15262-20-1
Radium 226/228	2.845	pci/l	EDF-206
Selenium	25	ug/l	7782-49-2
Thallium	0.2	ug/l	7440-28-0

Table 6

2019 Groundwater Protection Standards

Appendix III to Part 257

Parameter	Background Threshold Value (BTV)	EPA Maximum Contaminate Level (MCL)	Groundwater Protection Standard (GPS)	Units	CAS #
Boron	0.51	--	0.51	mg/l	7440-42-8
Calcium	271	--	271	mg/l	7440-70-2
Chloride	97.2	250	250	mg/l	16887-00-6
Fluoride	0.33	4	4	mg/l	15984-48-8
pH	lower 6.6 higher 7.8	--	7.8	pH UNITS	PH
Sulfate as SO4	171	250	250	mg/l	14808-79-8
Total Dissolved Solids	1170	500	1170	mg/l	TDS

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	EPA Maximum Contaminate Level (MCL)	Groundwater Protection Standard (GPS)	Units	CAS #
Antimony	20	6	20	ug/l	7440-36-0
Arsenic	15	10	15	ug/l	7440-38-2
Barium	0.61	2	2	mg/l	7440-39-3
Beryllium	2.0	4	4	ug/l	7440-41-7
Cadmium	2.0	5	5	ug/l	7440-43-9
Chromium	0.0048	0.1	0.1	mg/l	7440-47-3
Cobalt	6.2	6	6.2	ug/l	7440-48-4
Lead	0.015	0.015	0.015	mg/l	7439-92-1
Lithium	0.01	0.040	0.040	mg/l	7439-93-2
Mercury	0.0002	0.002	0.002	mg/l	7439-97-6
Molybdenum	10	100	100	ug/l	7439-98-7
Radium 226	0.947	--	--	pci/l	13982-63-3
Radium 228	1.898	--	--	pci/l	15262-20-1
Radium 226/228	2.845	5	5	pci/l	EDF-206
Selenium	25	50	50	ug/l	7782-49-2
Thallium	0.2	2	2	ug/l	7440-28-0

Results in milligrams per liter (mg/l), micrograms per liter (ug/l), or pecocuries per liter (pci/l)

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1	04/18/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-1	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-1	04/18/2019	Arsenic	1.2	15	ug/l	7440-38-2
MW-1	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-1	04/18/2019	Barium	0.14	2	mg/l	7440-39-3
MW-1	10/29/2019	Barium	0.14	2	mg/l	7440-39-3
MW-1	04/18/2019	Beryllium	0.16	4	ug/l	7440-41-7
MW-1	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-1	04/18/2019	Cadmium	0.20	5	ug/l	7440-43-9
MW-1	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-1	04/18/2019	Chromium	0.0066	0.1	mg/l	7440-47-3
MW-1	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-1	04/18/2019	Cobalt	1.6	6.2	ug/l	7440-48-4
MW-1	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-1	04/18/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-1	04/18/2019	Lithium	0.022	0.040	mg/l	7439-93-2
MW-1	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-1	04/18/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-1	04/18/2019	MOLYBDENUM	< 1.0	100	ug/l	7439-98-7
MW-1	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-1	04/18/2019	Radium 226	< 0.156	--	pci/l	13982-63-3
MW-1	12/20/2019	Radium 226	0.148	--	pci/l	13982-63-3
MW-1	04/18/2019	Radium 228	< 0.700	--	pci/l	15262-20-1
MW-1	12/20/2019	Radium 228	< 0.465	--	pci/l	15262-20-1
MW-1	04/18/2019	Radium 226/228	< 0.700	5	pci/l	--
MW-1	12/20/2019	Radium 226/228	0.148	5	pci/l	--
MW-1	04/18/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-1	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-1	04/18/2019	Thallium	0.056	2	ug/l	7440-28-0
MW-1	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-1RD	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-1RD	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-1RD	04/19/2019	Arsenic	< 1.0	15	ug/l	7440-38-2
MW-1RD	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-1RD	04/19/2019	Barium	0.17	2	mg/l	7440-39-3
MW-1RD	10/29/2019	Barium	0.16	2	mg/l	7440-39-3
MW-1RD	04/19/2019	Beryllium	0.041	4	ug/l	7440-41-7
MW-1RD	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-1RD	04/19/2019	Cadmium	< 0.50	5	ug/l	7440-43-9
MW-1RD	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-1RD	04/19/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-1RD	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1RD	04/19/2019	Cobalt	0.64	6.2	ug/l	7440-48-4
MW-1RD	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-1RD	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-1RD	04/19/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-1RD	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-1RD	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-1RD	04/19/2019	MOLYBDENUM	3.1	100	ug/l	7439-98-7
MW-1RD	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-1RD	04/19/2019	Radium 226	0.303	--	pci/l	13982-63-3
MW-1RD	12/20/2019	Radium 226	0.254	--	pci/l	13982-63-3
MW-1RD	04/19/2019	Radium 228	0.684	--	pci/l	15262-20-1
MW-1RD	12/20/2019	Radium 228	0.510	--	pci/l	15262-20-1
MW-1RD	4/19/2019	Radium 226/228	0.987	5	pci/l	--
MW-1RD	12/20/2019	Radium 226/228	0.764	5	pci/l	--
MW-1RD	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-1RD	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-1RD	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-1RD	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-2R	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-2R	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-2R	04/19/2019	Arsenic	1.5	15	ug/l	7440-38-2
MW-2R	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-2R	04/19/2019	Barium	0.27	2	mg/l	7440-39-3
MW-2R	10/29/2019	Barium	0.27	2	mg/l	7440-39-3
MW-2R	04/19/2019	Beryllium	< 0.70	4	ug/l	7440-41-7
MW-2R	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-2R	04/19/2019	Cadmium	0.20	5	ug/l	7440-43-9
MW-2R	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-2R	04/19/2019	Chromium	0.0018	0.1	mg/l	7440-47-3
MW-2R	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-2R	04/19/2019	Cobalt	2.3	6.2	ug/l	7440-48-4
MW-2R	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-2R	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-2R	04/19/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-2R	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-2R	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-2R	04/19/2019	MOLYBDENUM	2.4	100	ug/l	7439-98-7
MW-2R	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-2R	04/19/2019	Radium 226	0.364	--	pci/l	13982-63-3
MW-2R	12/20/2019	Radium 226	< 0.167	--	pci/l	13982-63-3
MW-2R	04/19/2019	Radium 228	0.892	--	pci/l	15262-20-1
MW-2R	12/20/2019	Radium 228	0.635	--	pci/l	15262-20-1

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-2R	4/19/2019	Radium 226/228	1.256	5	pci/l	--
MW-2R	12/20/2019	Radium 226/228	0.635	5	pci/l	--
MW-2R	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-2R	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-2R	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-2R	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-2RD	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-2RD	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-2RD	04/19/2019	Arsenic	2.2	15	ug/l	7440-38-2
MW-2RD	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-2RD	04/19/2019	Barium	0.19	2	mg/l	7440-39-3
MW-2RD	10/29/2019	Barium	0.19	2	mg/l	7440-39-3
MW-2RD	04/19/2019	Beryllium	< 0.70	4	ug/l	7440-41-7
MW-2RD	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-2RD	04/19/2019	Cadmium	< 0.50	5	ug/l	7440-43-9
MW-2RD	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-2RD	04/19/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-2RD	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-2RD	04/19/2019	Cobalt	2.5	6.2	ug/l	7440-48-4
MW-2RD	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-2RD	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-2RD	04/19/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-2RD	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-2RD	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-2RD	04/19/2019	MOLYBDENUM	2.2	100	ug/l	7439-98-7
MW-2RD	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-2RD	04/19/2019	Radium 226	0.450	--	pci/l	13982-63-3
MW-2RD	12/20/2019	Radium 226	0.392	--	pci/l	13982-63-3
MW-2RD	04/19/2019	Radium 228	< 0.552	--	pci/l	15262-20-1
MW-2RD	12/20/2019	Radium 228	< 0.453	--	pci/l	15262-20-1
MW-2RD	4/19/2019	Radium 226/228	0.450	5	pci/l	--
MW-2RD	12/20/2019	Radium 226/228	0.392	5	pci/l	--
MW-2RD	04/19/2019	Selenium	2.2	50	ug/l	7782-49-2
MW-2RD	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-2RD	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-2RD	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-3	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-3	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-3	04/19/2019	Arsenic	2.5	15	ug/l	7440-38-2
MW-3	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-3	04/19/2019	Barium	0.25	2	mg/l	7440-39-3
MW-3	10/29/2019	Barium	0.29	2	mg/l	7440-39-3

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3	04/19/2019	Beryllium	< 0.70	4	ug/l	7440-41-7
MW-3	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-3	04/19/2019	Cadmium	0.18	5	ug/l	7440-43-9
MW-3	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-3	04/19/2019	Chromium	0.0013	0.1	mg/l	7440-47-3
MW-3	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3	04/19/2019	Cobalt	5.4	6.2	ug/l	7440-48-4
MW-3	10/29/2019	Cobalt	0.0055	0.0062	mg/l	7440-48-4
MW-3	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-3	04/19/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-3	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-3	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-3	04/19/2019	MOLYBDENUM	4.3	100	ug/l	7439-98-7
MW-3	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-3	04/19/2019	Radium 226	0.243	--	pci/l	13982-63-3
MW-3	12/20/2019	Radium 226	0.329	--	pci/l	13982-63-3
MW-3	04/19/2019	Radium 228	0.971	--	pci/l	15262-20-1
MW-3	12/20/2019	Radium 228	0.559	--	pci/l	15262-20-1
MW-3	4/19/2019	Radium 226/228	1.214	5	pci/l	--
MW-3	12/20/2019	Radium 226/228	0.888	5	pci/l	--
MW-3	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-3	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-3	04/19/2019	Thallium	0.058	2	ug/l	7440-28-0
MW-3	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-3R	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-3R	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-3R	04/19/2019	Arsenic	2.1	15	ug/l	7440-38-2
MW-3R	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-3R	04/19/2019	Barium	0.60	2	mg/l	7440-39-3
MW-3R	10/29/2019	Barium	0.60	2	mg/l	7440-39-3
MW-3R	04/19/2019	Beryllium	< 0.70	4	ug/l	7440-41-7
MW-3R	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-3R	04/19/2019	Cadmium	< 0.50	5	ug/l	7440-43-9
MW-3R	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-3R	04/19/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3R	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3R	04/19/2019	Cobalt	0.36	6.2	ug/l	7440-48-4
MW-3R	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-3R	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-3R	04/19/2019	Lithium	0.016	0.040	mg/l	7439-93-2
MW-3R	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-3R	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3R	04/19/2019	MOLYBDENUM	1.2	100	ug/l	7439-98-7
MW-3R	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-3R	04/19/2019	Radium 226	0.518	--	pci/l	13982-63-3
MW-3R	12/20/2019	Radium 226	0.494	--	pci/l	13982-63-3
MW-3R	04/19/2019	Radium 228	0.822	--	pci/l	15262-20-1
MW-3R	12/20/2019	Radium 228	1.88	--	pci/l	15262-20-1
MW-3R	4/19/2019	Radium 226/228	1.34	5	pci/l	--
MW-3R	12/20/2019	Radium 226/228	2.374	5	pci/l	--
MW-3R	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-3R	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-3R	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-3R	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0
MW-3RD	04/19/2019	Antimony	< 1.0	20	ug/l	7440-36-0
MW-3RD	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-3RD	04/19/2019	Arsenic	3.6	15	ug/l	7440-38-2
MW-3RD	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-3RD	04/19/2019	Barium	0.23	2	mg/l	7440-39-3
MW-3RD	10/29/2019	Barium	0.21	2	mg/l	7440-39-3
MW-3RD	04/19/2019	Beryllium	0.090	4	ug/l	7440-41-7
MW-3RD	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-3RD	04/19/2019	Cadmium	< 0.50	5	ug/l	7440-43-9
MW-3RD	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-3RD	04/19/2019	Chromium	0.0018	0.1	mg/l	7440-47-3
MW-3RD	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3RD	04/19/2019	Cobalt	0.57	6.2	ug/l	7440-48-4
MW-3RD	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-3RD	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-3RD	04/19/2019	Lithium	0.011	0.040	mg/l	7439-93-2
MW-3RD	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-3RD	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-3RD	04/19/2019	MOLYBDENUM	4.0	100	ug/l	7439-98-7
MW-3RD	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-3RD	04/19/2019	Radium 226	0.546	--	pci/l	13982-63-3
MW-3RD	12/20/2019	Radium 226	0.658	--	pci/l	13982-63-3
MW-3RD	04/19/2019	Radium 228	0.944	--	pci/l	15262-20-1
MW-3RD	12/20/2019	Radium 228	0.810	--	pci/l	15262-20-1
MW-3RD	4/19/2019	Radium 226/228	1.49	5	pci/l	--
MW-3RD	12/20/2019	Radium 226/228	1.468	5	pci/l	--
MW-3RD	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-3RD	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-3RD	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-3RD	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-4	04/19/2019	Antimony	0.36	20	ug/l	7440-36-0
MW-4	10/29/2019	Antimony	< 0.020	0.020	mg/l	7440-36-0
MW-4	04/19/2019	Arsenic	0.86	15	ug/l	7440-38-2
MW-4	10/29/2019	Arsenic	< 0.015	0.015	mg/l	7440-38-2
MW-4	04/19/2019	Barium	0.15	2	mg/l	7440-39-3
MW-4	10/29/2019	Barium	0.24	2	mg/l	7440-39-3
MW-4	04/19/2019	Beryllium	< 0.70	4	ug/l	7440-41-7
MW-4	10/29/2019	Beryllium	< 0.0020	0.004	mg/l	7440-41-7
MW-4	04/19/2019	Cadmium	0.32	5	ug/l	7440-43-9
MW-4	10/29/2019	Cadmium	< 0.0020	0.005	mg/l	7440-43-9
MW-4	04/19/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-4	10/29/2019	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-4	04/19/2019	Cobalt	0.57	6.2	ug/l	7440-48-4
MW-4	10/29/2019	Cobalt	< 0.0040	0.0062	mg/l	7440-48-4
MW-4	04/19/2019	Lead	< 0.010	0.015	mg/l	7439-92-1
MW-4	04/19/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-4	10/29/2019	Lithium	< 0.030	0.040	mg/l	7439-93-2
MW-4	04/19/2019	Mercury	< 0.20	2	ug/l	7439-97-6
MW-4	04/19/2019	MOLYBDENUM	1.6	100	ug/l	7439-98-7
MW-4	10/29/2019	MOLYBDENUM	< 0.010	0.1	mg/l	7439-98-7
MW-4	04/19/2019	Radium 226	0.201	--	pci/l	13982-63-3
MW-4	12/20/2019	Radium 226	0.290	--	pci/l	13982-63-3
MW-4	04/19/2019	Radium 228	< 0.569	--	pci/l	15262-20-1
MW-4	12/20/2019	Radium 228	0.767	--	pci/l	15262-20-1
MW-4	4/19/2019	Radium 226/228	0.201	5	pci/l	--
MW-4	12/20/2019	Radium 226/228	1.057	5	pci/l	--
MW-4	04/19/2019	Selenium	< 1.0	50	ug/l	7782-49-2
MW-4	10/29/2019	Selenium	< 0.025	0.050	mg/l	7782-49-2
MW-4	04/19/2019	Thallium	< 0.20	2	ug/l	7440-28-0
MW-4	10/29/2019	Thallium	< 0.020	0.002	mg/l	7440-28-0

Results in milligrams per liter (mg/l) or micrograms per liter (ug/l)
Bold = Indicates concentration above Groundwater Protection Standard

Appendix A – Field Data Sheets

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/18/19
Well ID: MW-1

Tubing Diameter (ID): 2 inches
Depth to Water: ~~2.56~~ 1.85 ft, TOC
Depth to Bottom of Well: 25.6 ft, TOC
Feet of Water in Well: 23.75 ft
Volume of Water in Well: 3.9 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u mhos)	Temperature (°F) C	Purge Rate (L/min)
1	1.85	7.31	948	4.91	1
5	1.95	6.80	979	4.82	1
10	2.25	6.58	1,060	3.70	1
15	2.50	6.64	1,080	3.89	1

Purge Start Time: 15:45 Purge End Time: 16:05 Total Volume Purged: 12.0 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: R. S.

Weather Conditions: 52 °F, cloudy, 10–15 mph N

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Pre-cleaned Bladder Pump
Date: 4/18/15
Well ID: MW-1RD

Tubing Diameter (ID): 2 inches
Depth to Water: 24.85 ft, TOC
Depth to Bottom of Well: 75.5 ft, TOC
Feet of Water in Well: 50.65 ft
Volume of Water in Well: 8.3 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	24.85	6.69	679	8.38	1
15	24.87	6.70	679	8.36	1
30	24.89	6.75	679	8.39	1
45	24.89	6.76	679	8.40	1

Purge Start Time: 15:45 Purge End Time: 16:35 Total Volume Purged: 25.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel

Weather Conditions: 52 F, cloudy, 10 – 15 mph N

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: MW-212D

Tubing Diameter (ID): 2 inches
Depth to Water: 7.01 ft, TOC
Depth to Bottom of Well: 35 ft, TOC
Feet of Water in Well: 27.99 ft
Volume of Water in Well: 4.6 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.01	6.54	1,100	8.95	1
10	7.14	6.47	1,120	9.06	1
20	7.32	6.54	1,130	9.11	1
30	7.35	6.62	1,130	9.10	1

Purge Start Time: 7:20 Purge End Time: 7:55 Total Volume Purged: 140 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: M. Schlegel

Weather Conditions: 39°F, sunny, 5-10 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 7.65 ft, TOC
Depth to Bottom of Well: 18.35 ft, TOC
Feet of Water in Well: 10.7 ft
Volume of Water in Well: 1.7 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / whp)	Temperature (°F) °C	Purge Rate (L/min)
1	7.65	6.96	1,850	5.32	1
5	9.27	6.54	1,720	4.50	1
10	13.48	6.22	1,900	5.20	1
15	16.75	6.15	1,910	5.28	1

Purge Start Time: 7:20 Purge End Time: 7:40 Total Volume Purged: 2.5 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlegel

Weather Conditions: 39°F, sunny, 5-10 mph N

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: MW-3

Tubing Diameter (ID): 2 inches
Depth to Water: 5.71 ft, TOC
Depth to Bottom of Well: 19.7 ft, TOC
Feet of Water in Well: 13.99 ft
Volume of Water in Well: 2.3 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	5.71	7.02	1,310	8.81	1
10	5.89	6.55	1,390	4.40	1
20	6.02	6.42	1,480	4.43	1
30	6.02	6.24	1,510	4.42	1

Purge Start Time: 8:50 Purge End Time: 9:25 Total Volume Purged: 7.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 46°F, sunny, ~~cloudy~~ 5–10 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Delonsing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: MW-32

Tubing Diameter (ID): 2 inches
Depth to Water: 6.23 ft, TOC
Depth to Bottom of Well: 27.5 ft, TOC
Feet of Water in Well: 21.27 ft
Volume of Water in Well: 3.5 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (U mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.23	6.14	1,470	7.83	1
5	6.48	6.14	1,470	7.83	1
10	6.57	6.14	1,470	7.83	1
15	6.57	6.14	1,470	7.83	1

Purge Start Time: 8:50 Purge End Time: 9:10 Total Volume Purged: 10.5 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlegel

Weather Conditions: 46 °F, sunny, 5 - 10 mph N

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: MW-3RD

Tubing Diameter (ID): 2 inches
Depth to Water: 6.29 ft, TOC
Depth to Bottom of Well: 46.25 ft, TOC
Feet of Water in Well: 39.96 ft
Volume of Water in Well: 6.5 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.29	6.54	1,050	8.62	1
5	6.37	6.56	1,050	8.69	1
10	6.41	6.45	1,050	8.69	1
15	6.41	6.45	1,050	8.70	1
20	6.41	6.47	1,050	8.72	1

Purge Start Time: 9:40 Purge End Time: 10:85 Total Volume Purged: 200 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: M. Schlegel
Weather Conditions: 52°F, sunny, 5–10 mph N
Comments:

DUPLICATE COLLECTED

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lam Stg
Project Number:
Sampling Device: Dedicated Bladder Pump
Date: 4/19/19
Well ID: pmw-4

Tubing Diameter (ID): 2 inches
Depth to Water: 4.45 ft, TOC
Depth to Bottom of Well: 18.3 ft, TOC
Feet of Water in Well: 13.85 ft
Volume of Water in Well: 2.3 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / uhos)	Temperature (°F)	Purge Rate (L/min)
1	4.45	6.66	58	6.25	1
10	4.55	6.47	47	4.84	1
20	4.59	6.35	60	4.50	1
30	4.59	6.40	50	4.44	1

Purge Start Time: 11:15 Purge End Time: 11:50 Total Volume Purged: 7.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Sulaged

Weather Conditions: 55°F, sunny, 5-10 mph N

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing	Tubing Diameter (ID):	2	inches
Project Number:	3502063	Depth to Water:	4.19	ft, TOC
Sampling Device:	Dedicated Bladder Pump	Depth to Bottom of Well:	25.6	ft, TOC
Date:	10/29/19	Feet of Water in Well:	21.41	ft
Well ID:	MW-1	Volume of Water in Well:	3.5	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	4.19	7.27	1,060	11.21	1
10	4.20	7.11	1,060	12.28	1
20	4.25	7.08	1,060	12.46	1
30	4.25	7.08	1,050	12.59	1

Purge Start Time: 8:00 Purge End Time: 8:35 Total Volume Purged: 10.5 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: M. Schlagel

Weather Conditions: 27°F, mostly cloudy, 0-5 mph NW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing Basement
Project Number: 307063
Sampling Device: Dedicated Bladder Pump
Date: 10/29/19
Well ID: MW-1RD

Tubing Diameter (ID): 2 inches
Depth to Water: 24.25 ft, TOC
Depth to Bottom of Well: 75.5 ft, TOC
Feet of Water in Well: 51.25 ft
Volume of Water in Well: 8.4 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	24.25	7.48	320	9.19	1
15	24.30	7.59	451	9.19	1
30	24.30	7.62	584	9.14	1
40	24.30	7.60	604	9.19	1

Purge Start Time: 8:00 Purge End Time: 8:40 Total Volume Purged: 25.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel

Weather Conditions: 27°F, mostly cloudy, 0-5 mph NW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB ~~Rivermont~~ Lansing
Project Number: 302063
Sampling Device: Dedicated Bladder Pump
Date: 10/29/19
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 7.55 ft, TOC
Depth to Bottom of Well: 18.35 ft, TOC
Feet of Water in Well: 10.8 ft
Volume of Water in Well: 1.7 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.55	7.27	1,490	13.22	1
5	10.52	7.00	1,460	13.48	1
10	13.17	6.91	1,540	13.35	1
15	15.45	6.89	1,560	13.33	1

Purge Start Time: 9:10 Purge End Time: 9:30 Total Volume Purged: 2.5 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel

Weather Conditions: 28°F, mostly sunny, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	3502063		Depth to Water:	6.77	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	35	ft, TOC
Date:	10/25/19		Feet of Water in Well:	28.23	ft
Well ID:	MW-2RD		Volume of Water in Well:	4.6	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mho)	Temperature (°F) °C	Purge Rate (L/min)
1	6.77	7.56	711	10.45	1
5	6.80	7.36	869	10.42	1
10	6.85	7.28	1,000	10.28	1
15	6.85	7.27	962	10.33	1

Purge Start Time: 9:40 Purge End Time: 10:00 Total Volume Purged: 14.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 30°F, mostly cloudy, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	3502063		Depth to Water:	7.30	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	27.5	ft, TOC
Date:	10/29/19		Feet of Water in Well:	20.3	ft
Well ID:	MW-3R		Volume of Water in Well:	3.3	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.20	7.21	1,330	9.91	1
5	7.25	6.93	1,360	10.37	1
10	7.25	6.84	1,380	10.18	1
15	7.25	6.83	1,390	10.15	1

Purge Start Time: 10:30 Purge End Time: 10:50 Total Volume Purged: 10.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 36°F, mostly sunny, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing	Tubing Diameter (ID):	2	inches
Project Number:	3502063	Depth to Water:	~~7.7~~ 6.90	ft, TOC
Sampling Device:	Dedicated Bladder Pump	Depth to Bottom of Well:	19.7	ft, TOC
Date:	10/29/19	Feet of Water in Well:	12.80	ft
Well ID:	~~MW-1~~ MW-3	Volume of Water in Well:	2.1	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F)	Purge Rate (L/min)
1	6.90	6.92	1,320	12.52	1
10	7.00	6.92	1,330	12.52	1
20	7.00	6.91	1,290	12.49	1
30	7.00	6.91	1,290	12.49	1

Purge Start Time: 10:30 Purge End Time: 11:00 Total Volume Purged: 6.3 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 36°F, mostly sunny, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	3502063		Depth to Water:	6.21	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	46.25	ft, TOC
Date:	10/29/19		Feet of Water in Well:	40.04	ft
Well ID:	MW-3RD		Volume of Water in Well:	6.5	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.21	7.28	917	9.42	1
10	6.25	7.29	919	9.40	1
20	6.25	7.29	921	9.39	1
30	6.25	7.28	920	9.39	1

Purge Start Time: 11:00 Purge End Time: 11:35 Total Volume Purged: 20.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel

Weather Conditions: 37°F, sunny, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SCB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	3502063		Depth to Water:	4.92	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	18.3	ft, TOC
Date:	10/29/19		Feet of Water in Well:	13.38	ft
Well ID:	MW-4		Volume of Water in Well:	2.2	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mic)	Temperature (°F) °C	Purge Rate (L/min)
1	4.92	7.27	1,320	11.54	1
10	5.00	7.10	1,340	12.24	1
20	5.00	7.09	1,330	12.32	1
30	5.00	7.07	1,300	12.36	1

Purge Start Time: 12:30 Purge End Time: 13:00 Total Volume Purged: 6.6 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlagel

Weather Conditions: 41°F, sunny, 5-10 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502063
Sampling Device: Dedicated Bladder Pump
Date: 12/20/19
Well ID: MW-1

Tubing Diameter (ID): 2 inches
Depth to Water: 5.00 ft, TOC
Depth to Bottom of Well: 25.6 ft, TOC
Feet of Water in Well: 20.6 ft
Volume of Water in Well: 3-3.4 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / µmhos)	Temperature (°F) °C	Purge Rate (L/min)
1	5.00	7.26	1000	7.88	1
3	5.02	7.17	1000	7.87	1
6	5.02	7.11	1000	7.88	1
9	5.02	7.11	1000	7.95	1

Purge Start Time: 10:00 Purge End Time: ~~10:05~~ 10:10 Total Volume Purged: 3.5 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: M. Schlagel

Weather Conditions: 32°F, cloudy, 10 – 15 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502063
Sampling Device: Dedicated Bladder Pump
Date: 12/20/19
Well ID: MW-1RD

Tubing Diameter (ID): 2 inches
Depth to Water: 25.18 ft, TOC
Depth to Bottom of Well: 75.5 ft, TOC
Feet of Water in Well: 50.32 ft
Volume of Water in Well: 8.2 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	25.18	7.89	622	7.86	1
5	25.16	7.97	622	7.81	1
10	25.16	7.85	623	7.80	1
15	25.16	7.88	623	7.80	1

Purge Start Time: 10:00 Purge End Time: 10:15 Total Volume Purged: 8.5 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel
Weather Conditions: 32°F, cloudy, 10 -15 mph S
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3507063
Sampling Device: Dedicated Bladder Pump
Date: 12/20/19
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 8.10 ft, TOC
Depth to Bottom of Well: 18.35 ft, TOC
Feet of Water in Well: 10.25 ft
Volume of Water in Well: 1.67 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	8.73	7.28	1,500	8.35	1
3	10.76	7.02	1,500	8.36	1
6	12.78	6.97	1,500	8.37	1
9	16.97	6.95	1,500	8.39	1

Purge Start Time: 10:30 Purge End Time: 10:40 Total Volume Purged: 1.75 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: M. Schlagel

Weather Conditions: 32°F, cloudy, 10 – 18 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 35020C3
Sampling Device: Dedicated
Date: 12/20/19
Well ID: MW-2RD

Tubing Diameter (ID): 2 inches
Depth to Water: 7.59 ft, TOC
Depth to Bottom of Well: 35 ft, TOC
Feet of Water in Well: 27.41 ft
Volume of Water in Well: 4.47 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.59	7.42	894	9.77	1
5	7.57	7.31	894	9.78	1
10	7.57	7.25	894	9.80	1
15	7.57	7.26	895	9.81	1

Purge Start Time: 10:30 Purge End Time: 10:45 Total Volume Purged: 5.0 gal
Approximate Purge Rate: 1 L/ min. Purged/Sampled by: N. Schlagel
Weather Conditions: 32°F, cloudy, 10 - 15 mph S
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing	Tubing Diameter (ID):	2	inches
Project Number:	350 2063	Depth to Water:	7.55	ft, TOC
Sampling Device:	Dedicated Bladder Pump	Depth to Bottom of Well:	27.5	ft, TOC
Date:	12/20/19	Feet of Water in Well:	19.95	ft
Well ID:	MW-3R	Volume of Water in Well:	3.25	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.55	8.16	1,250	9.28	1
3	7.57	8.15	1,250	9.27	1
6	7.57	8.15	1,250	9.27	1
9	7.57	8.14	1,250	9.27	1

Purge Start Time: 10:55 Purge End Time: 11:05 Total Volume Purged: 3.5 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlidgell

Weather Conditions: 32°F cloudy, 10 – 15 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350203
Sampling Device: Dedicated Bladder Pump
Date: 12/20/19
Well ID: MW-3

Tubing Diameter (ID): 2 inches
Depth to Water: 7.38 ft, TOC
Depth to Bottom of Well: 19.7 ft, TOC
Feet of Water in Well: 12.32 ft
Volume of Water in Well: 2.0 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.38	7.97	1,200	8.47	1
5	7.40	7.96	1,240	8.46	1
10	7.40	7.95	1,240	8.46	1
15	7.40	7.95	1,240	8.46	1

Purge Start Time: 10:55 Purge End Time: 11:10 Total Volume Purged: 2.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 32°F, cloudy, 10 – 15 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	350263		Depth to Water:	7.11	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	46.25	ft, TOC
Date:	12/20/14		Feet of Water in Well:	39.14	ft
Well ID:	MW-3RD		Volume of Water in Well:	6.38	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.11	8.16	854	8.75	1
3	7.13	8.15	854	8.77	1
6	7.13	8.15	854	8.77	1
9	7.13	8.15	854	8.77	1

Purge Start Time: 11:05 Purge End Time: 11:15 Total Volume Purged: 7.0 gal

Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel

Weather Conditions: 32 °F, cloudy, 10–15 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Lansing		Tubing Diameter (ID):	2	inches
Project Number:	350 20 63		Depth to Water:	4.65	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	18.3	ft, TOC
Date:	12/20/19		Feet of Water in Well:	13.65	ft
Well ID:	MW-4		Volume of Water in Well:	2.22	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	4.65	7.95	1,230	7.62	1
3	4.67	7.94	1,230	7.73	1
6	4.67	7.93	1,230	7.78	1
9	4.67	7.92	1,230	7.81	1

Purge Start Time: 11:35 Purge End Time: 11:45 Total Volume Purged: 25 gal

Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlagel

Weather Conditions: 32 °F, cloudy, 10 - 15 mph S

Comments:

Appendix B – Laboratory Analytical Reports

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

Laboratory Job ID: 480-152313-1
Client Project/Site: SKB Lansing - CCR Groundwater
Sampling Event: CCR Groundwater
Revision: 1

For:
Waste Connections, Inc.
13425 Courthouse Blvd
Rosemount, Minnesota 55068

Attn: Nathaniel Beinemann

Authorized for release by:
7/24/2019 11:21:30 AM
Julianna DuHart, Project Management Assistant I
julianna.duhart@testamericainc.com

Designee for

Ryan VanDette, Project Manager II
(716)504-9830
ryan.vandette@testamericainc.com

Table of Contents

Definitions/Glossary

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

Job ID: 480-152313-1

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Job ID: 480-152313-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-152313-1

Receipt
The samples were received on 4/20/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1° C.

Receipt Exceptions
This report has been revised to include the Rad data.

HPLC/IC
Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-1 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8) and DUPLICATE (480-152313-9). 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.

RAD
Method(s) PrecSep-21: Radium 226 Prep Batch 160-431033: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10) and EQUIP BLANK (480-152313-11). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep_0: Radium 228 Prep Batch 160-431038: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10) and EQUIP BLANK (480-152313-11). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) 904.0, 9320: Radium-228 Prep Batch 160-431038 Any 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 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10), EQUIP BLANK (480-152313-11), (LCS 160-431038/1-A), (LCSD 160-431038/2-A) and (MB 160-431038/23-A)

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-431033 Any 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 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10), EQUIP BLANK (480-152313-11), (LCS 160-431033/1-A), (LCSD 160-431033/2-A) and (MB 160-431033/23-A)

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

Metals
Method(s) 6020B: The Low Level Initial Calibration Verification, (ICVL 480-472126/7) associated with batch 480-472126, contained Total Antimony above the upper quality control limit. The associated samples were either below the reporting limit for the affected analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples MW-1 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10) and EQUIP BLANK (480-152313-11) was not performed.

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

Job ID: 480-152313-1 (Continued)

Laboratory: Eurofins TestAmerica, Buffalo (Continued)

General Chemistry
Method(s) SM 2540C: The following sample was received outside of holding time: MW-1 (480-152313-1).

Method(s) 9040C, SM 4500 H+ B: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following samples has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: MW-1 (480-152313-1), MW-3 (480-152313-2), MW-1RD (480-152313-3), MW-2RD (480-152313-4), MW-2R (480-152313-5), MW-3RD (480-152313-6), MW-3R (480-152313-7), MW-4 (480-152313-8), DUPLICATE (480-152313-9), FIELD BLANK (480-152313-10) and EQUIP BLANK (480-152313-11).

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

Detection Summary

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

Job ID: 480-152313-1

Client Sample ID: MW-1 — Lab Sample ID: 480-152313-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.14		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.020	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	123		0.50	0.10	mg/L	1		6010D	Total/NA
Chromium	0.0066		0.0040	0.0010	mg/L	1		6010D	Total/NA
Lithium	0.022	J	0.030	0.010	mg/L	1		6010D	Total/NA
Arsenic	1.2		1.0	0.27	ug/L	1		6020B	Total/NA
Beryllium	0.16	J	0.70	0.030	ug/L	1		6020B	Total/NA
Cadmium	0.20	J	0.50	0.071	ug/L	1		6020B	Total/NA
Cobalt	1.6		0.30	0.040	ug/L	1		6020B	Total/NA
Thallium	0.056	J	0.20	0.019	ug/L	1		6020B	Total/NA
Chloride	87		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	85		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	530	H	24	24	mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 480-152313-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.25		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.87	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	194		0.50	0.10	mg/L	1		6010D	Total/NA
Chromium	0.0013	J	0.0040	0.0010	mg/L	1		6010D	Total/NA
Arsenic	2.5		1.0	0.27	ug/L	1		6020B	Total/NA
Cadmium	0.18	J	0.50	0.071	ug/L	1		6020B	Total/NA
Cobalt	5.4		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	4.3		1.0	0.087	ug/L	1		6020B	Total/NA
Thallium	0.058	J	0.20	0.019	ug/L	1		6020B	Total/NA
Chloride	100		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	21		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	780		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.3	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD — Lab Sample ID: 480-152313-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.17		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.012	J B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	79.3		0.50	0.10	mg/L	1		6010D	Total/NA
Beryllium	0.041	J	0.70	0.030	ug/L	1		6020B	Total/NA
Cobalt	0.64		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	3.1		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	22		2.5	1.4	mg/L	5		300.0	Total/NA
Fluoride	0.17	J	0.25	0.13	mg/L	5		300.0	Total/NA
Sulfate	48		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	340		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.3	HF	0.001	0.001	Degrees C	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 - CCR Groundwater

Job ID: 480-152313-1

Client Sample ID: MW-2RD — Lab Sample ID: 480-152313-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.19		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.077	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	141		0.50	0.10	mg/L	1		6010D	Total/NA
Arsenic	2.2		1.0	0.27	ug/L	1		6020B	Total/NA
Cobalt	2.5		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	2.2		1.0	0.087	ug/L	1		6020B	Total/NA
Selenium	2.2		1.0	0.44	ug/L	1		6020B	Total/NA
Chloride	38		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	81		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	580		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.3	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R — Lab Sample ID: 480-152313-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.27		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	2.4	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	227		0.50	0.10	mg/L	1		6010D	Total/NA
Chromium	0.0018	J	0.0040	0.0010	mg/L	1		6010D	Total/NA
Arsenic	1.5		1.0	0.27	ug/L	1		6020B	Total/NA
Cadmium	0.20	J	0.50	0.071	ug/L	1		6020B	Total/NA
Cobalt	2.3		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	2.4		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	120		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	130		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	1100		48	48	mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.3	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD — Lab Sample ID: 480-152313-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.23		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.034	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	128		0.50	0.10	mg/L	1		6010D	Total/NA
Chromium	0.0018	J	0.0040	0.0010	mg/L	1		6010D	Total/NA
Lithium	0.011	J	0.030	0.010	mg/L	1		6010D	Total/NA
Arsenic	3.6		1.0	0.27	ug/L	1		6020B	Total/NA
Beryllium	0.090	J	0.70	0.030	ug/L	1		6020B	Total/NA
Cobalt	0.57		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	4.0		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	30		2.5	1.4	mg/L	5		300.0	Total/NA
Fluoride	0.17	J	0.25	0.13	mg/L	5		300.0	Total/NA
Sulfate	100		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	540		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	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 - CCR Groundwater

Job ID: 480-152313-1

Client Sample ID: MW-3R — Lab Sample ID: 480-152313-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.60		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.054	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	218		0.50	0.10	mg/L	1		6010D	Total/NA
Lithium	0.016	J	0.030	0.010	mg/L	1		6010D	Total/NA
Arsenic	2.1		1.0	0.27	ug/L	1		6020B	Total/NA
Cobalt	0.36		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	1.2		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	27		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	30		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	780		24	24	mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 480-152313-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.15		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.30	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	134		0.50	0.10	mg/L	1		6010D	Total/NA
Antimony	0.36	J ^	1.0	0.35	ug/L	1		6020B	Total/NA
Arsenic	0.86	J	1.0	0.27	ug/L	1		6020B	Total/NA
Cadmium	0.32	J	0.50	0.071	ug/L	1		6020B	Total/NA
Cobalt	0.57		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	1.6		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	12		2.5	1.4	mg/L	5		300.0	Total/NA
Fluoride	0.13	J	0.25	0.13	mg/L	5		300.0	Total/NA
Sulfate	120		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	590		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUPLICATE — Lab Sample ID: 480-152313-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.23		0.0020	0.00070	mg/L	1		6010D	Total/NA
Boron	0.032	B	0.020	0.0040	mg/L	1		6010D	Total/NA
Calcium	131		0.50	0.10	mg/L	1		6010D	Total/NA
Chromium	0.0022	J	0.0040	0.0010	mg/L	1		6010D	Total/NA
Lithium	0.011	J	0.030	0.010	mg/L	1		6010D	Total/NA
Arsenic	3.5		1.0	0.27	ug/L	1		6020B	Total/NA
Beryllium	0.077	J	0.70	0.030	ug/L	1		6020B	Total/NA
Cobalt	0.57		0.30	0.040	ug/L	1		6020B	Total/NA
Molybdenum	4.3		1.0	0.087	ug/L	1		6020B	Total/NA
Chloride	30		2.5	1.4	mg/L	5		300.0	Total/NA
Fluoride	0.17	J	0.25	0.13	mg/L	5		300.0	Total/NA
Sulfate	100		10	1.7	mg/L	5		300.0	Total/NA
Total Dissolved Solids	550		24	24	mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	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 - CCR Groundwater

Job ID: 480-152313-1

Client Sample ID: FIELD BLANK — Lab Sample ID: 480-152313-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.4	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: EQUIP BLANK — Lab Sample ID: 480-152313-11

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.6	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Temperature	21.6	HF	0.001	0.001	Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1

Date Collected: 04/18/19 16:05
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-1

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.14**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:03	1
Boron	**0.020**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:03	1
Calcium	**123**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:03	1
Chromium	**0.0066**		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:03	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:03	1
Lithium	**0.022**	**J**	0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:03	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 14:47	1
Arsenic	**1.2**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 11:55	1
Beryllium	**0.16**	**J**	0.70	0.030	ug/L		04/30/19 08:42	05/02/19 11:55	1
Cadmium	**0.20**	**J**	0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:12	1
Cobalt	**1.6**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 11:55	1
Molybdenum	ND		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 11:55	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 11:55	1
Thallium	**0.056**	**J**	0.20	0.019	ug/L		04/30/19 08:42	05/02/19 11:55	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 14:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**87**		2.5	1.4	mg/L			04/25/19 19:05	5
Fluoride	ND		0.25	0.13	mg/L			04/25/19 19:05	5
Sulfate	**85**		10	1.7	mg/L			04/25/19 19:05	5
Total Dissolved Solids	**530**	**H**	24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.4**	**HF**	0.1	0.1	SU			05/12/19 15:21	1
Temperature	**21.4**	**HF**	0.001	0.001	Degrees C			05/12/19 15:21	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0729	U	0.0938	0.0940	1.00	0.156	pCi/L	06/06/19 08:14	07/17/19 06:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.8*		*40 - 110*	*06/06/19 08:14*	*07/17/19 06:23*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.366	U	0.425	0.426	1.00	0.700	pCi/L	06/06/19 09:13	07/02/19 15:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.8*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:44*	*1*
Y Carrier	*53.5*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:44*	*1*

Client Sample ID: MW-3

Date Collected: 04/19/19 09:20
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-2

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.25**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:07	1
Boron	**0.87**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:07	1
Calcium	**194**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:07	1
Chromium	**0.0013**	**J**	0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:07	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:07	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:07	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 14:50	1
Arsenic	**2.5**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:04	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:04	1
Cadmium	**0.18**	**J**	0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:21	1
Cobalt	**5.4**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:04	1
Molybdenum	**4.3**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:04	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:04	1
Thallium	**0.058**	**J**	0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 14:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**100**		2.5	1.4	mg/L			04/25/19 19:19	5
Fluoride	ND		0.25	0.13	mg/L			04/25/19 19:19	5
Sulfate	**21**		10	1.7	mg/L			04/25/19 19:19	5
Total Dissolved Solids	**780**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1	0.1	SU			05/12/19 15:23	1
Temperature	**21.3**	**HF**	0.001	0.001	Degrees C			05/12/19 15:23	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.243**		0.0949	0.0974	1.00	0.0899	pCi/L	06/06/19 08:14	07/17/19 06:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.2*		*40 - 110*	*06/06/19 08:14*	*07/17/19 06:23*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.971**		0.365	0.376	1.00	0.489	pCi/L	06/06/19 09:13	07/02/19 15:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.2*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*
Y Carrier	*68.8*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*

Client Sample ID: MW-1RD

Date Collected: 04/19/19 16:35
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-3

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.17**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:10	1
Boron	**0.012**	**J B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:10	1
Calcium	**79.3**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:10	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:10	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:10	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:10	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 14:59	1
Arsenic	ND		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:06	1
Beryllium	**0.041**	**J**	0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:06	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:24	1
Cobalt	**0.64**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:06	1
Molybdenum	**3.1**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:06	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:06	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:06	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 14:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**22**		2.5	1.4	mg/L			04/25/19 19:34	5
Fluoride	**0.17**	**J**	0.25	0.13	mg/L			04/25/19 19:34	5
Sulfate	**48**		10	1.7	mg/L			04/25/19 19:34	5
Total Dissolved Solids	**340**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1	0.1	SU			05/12/19 15:26	1
Temperature	**21.3**	**HF**	0.001	0.001	Degrees C			05/12/19 15:26	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.303**		0.113	0.117	1.00	0.126	pCi/L	06/06/19 08:14	07/17/19 06:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*40 - 110*	*06/06/19 08:14*	*07/17/19 06:23*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.684**		0.440	0.444	1.00	0.674	pCi/L	06/06/19 09:13	07/02/19 15:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*
Y Carrier	*54.6*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*

Client Sample ID: MW-2RD

Date Collected: 04/19/19 07:55
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-4

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.19**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:14	1
Boron	**0.077**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:14	1
Calcium	**141**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:14	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:14	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:14	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:14	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:01	1
Arsenic	**2.2**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:09	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:09	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:26	1
Cobalt	**2.5**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:09	1
Molybdenum	**2.2**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:09	1
Selenium	**2.2**		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:09	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**38**		2.5	1.4	mg/L			04/25/19 19:49	5
Fluoride	ND		0.25	0.13	mg/L			04/25/19 19:49	5
Sulfate	**81**		10	1.7	mg/L			04/25/19 19:49	5
Total Dissolved Solids	**580**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1	0.1	SU			05/12/19 15:28	1
Temperature	**21.3**	**HF**	0.001	0.001	Degrees C			05/12/19 15:28	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.450**		0.122	0.129	1.00	0.106	pCi/L	06/06/19 08:14	07/22/19 05:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.9*		*40 - 110*	*06/06/19 08:14*	*07/22/19 05:59*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.428	U	0.348	0.350	1.00	0.552	pCi/L	06/06/19 09:13	07/02/19 15:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.9*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*
Y Carrier	*70.3*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*

Client Sample ID: MW-2R

Date Collected: 04/19/19 07:40
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-5

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.27**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:18	1
Boron	**2.4**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:18	1
Calcium	**227**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:18	1
Chromium	**0.0018**	**J**	0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:18	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:18	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:18	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:03	1
Arsenic	**1.5**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:11	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:11	1
Cadmium	**0.20**	**J**	0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:28	1
Cobalt	**2.3**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:11	1
Molybdenum	**2.4**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:11	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:11	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:11	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**120**		2.5	1.4	mg/L			04/25/19 20:03	5
Fluoride	ND		0.25	0.13	mg/L			04/25/19 20:03	5
Sulfate	**130**		10	1.7	mg/L			04/25/19 20:03	5
Total Dissolved Solids	**1100**		48	48	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1	0.1	SU			05/12/19 15:30	1
Temperature	**21.3**	**HF**	0.001	0.001	Degrees C			05/12/19 15:30	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.364**		0.115	0.119	1.00	0.111	pCi/L	06/06/19 08:14	07/22/19 05:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.6*		*40 - 110*	*06/06/19 08:14*	*07/22/19 05:59*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.892**		0.372	0.381	1.00	0.519	pCi/L	06/06/19 09:13	07/02/19 15:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.6*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*
Y Carrier	*68.8*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*

Client Sample ID: MW-3RD

Date Collected: 04/19/19 10:05
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-6

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.23		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:21	1
Boron	0.034	B	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:21	1
Calcium	128		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:21	1
Chromium	0.0018	J	0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:21	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:21	1
Lithium	0.011	J	0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:21	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:06	1
Arsenic	3.6		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:13	1
Beryllium	0.090	J	0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:13	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:30	1
Cobalt	0.57		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:13	1
Molybdenum	4.0		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:13	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:13	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:13	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30		2.5	1.4	mg/L			04/25/19 20:18	5
Fluoride	0.17	J	0.25	0.13	mg/L			04/25/19 20:18	5
Sulfate	100		10	1.7	mg/L			04/25/19 20:18	5
Total Dissolved Solids	540		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			05/12/19 15:33	1
Temperature	21.4	HF	0.001	0.001	Degrees C			05/12/19 15:33	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.546		0.132	0.141	1.00	0.0978	pCi/L	06/06/19 08:14	07/22/19 05:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*40 - 110*	*06/06/19 08:14*	*07/22/19 05:59*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.944		0.412	0.421	1.00	0.598	pCi/L	06/06/19 09:13	07/02/19 15:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*
Y Carrier	*74.0*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:45*	*1*

Client Sample ID: MW-3R

Date Collected: 04/19/19 09:10
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-7

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.60**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:36	1
Boron	**0.054**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:36	1
Calcium	**218**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:36	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:36	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:36	1
Lithium	**0.016**	**J**	0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:36	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:08	1
Arsenic	**2.1**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:15	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:15	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:33	1
Cobalt	**0.36**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:15	1
Molybdenum	**1.2**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:15	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:15	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:15	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**		2.5	1.4	mg/L			04/25/19 20:32	5
Fluoride	ND		0.25	0.13	mg/L			04/25/19 20:32	5
Sulfate	**30**		10	1.7	mg/L			04/25/19 20:32	5
Total Dissolved Solids	**780**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1	0.1	SU			05/12/19 15:36	1
Temperature	**21.4**	**HF**	0.001	0.001	Degrees C			05/12/19 15:36	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.518**		0.127	0.136	1.00	0.0908	pCi/L	06/06/19 08:14	07/22/19 05:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*40 - 110*	*06/06/19 08:14*	*07/22/19 05:59*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.822**		0.384	0.392	1.00	0.562	pCi/L	06/06/19 09:13	07/02/19 15:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:42*	*1*
Y Carrier	*72.1*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:42*	*1*

Client Sample ID: MW-4

Date Collected: 04/19/19 11:50
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-8

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.15**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:40	1
Boron	**0.30**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:40	1
Calcium	**134**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:40	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:40	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:40	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:40	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.36**	**J ^**	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:10	1
Arsenic	**0.86**	**J**	1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:18	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:18	1
Cadmium	**0.32**	**J**	0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:35	1
Cobalt	**0.57**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:18	1
Molybdenum	**1.6**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:18	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:18	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:18	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**12**		2.5	1.4	mg/L			04/25/19 20:47	5
Fluoride	**0.13**	**J**	0.25	0.13	mg/L			04/25/19 20:47	5
Sulfate	**120**		10	1.7	mg/L			04/25/19 20:47	5
Total Dissolved Solids	**590**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1	0.1	SU			05/12/19 15:38	1
Temperature	**21.4**	**HF**	0.001	0.001	Degrees C			05/12/19 15:38	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.201**		0.0975	0.0991	1.00	0.120	pCi/L	06/06/19 08:14	07/22/19 06:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.4*		*40 - 110*	*06/06/19 08:14*	*07/22/19 06:40*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.559	U	0.370	0.373	1.00	0.569	pCi/L	06/06/19 09:13	07/02/19 15:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.4*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:42*	*1*
Y Carrier	*72.5*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:42*	*1*

Client Sample ID: DUPLICATE

Date Collected: 04/19/19 00:00
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-9

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.23**		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:44	1
Boron	**0.032**	**B**	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:44	1
Calcium	**131**		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:44	1
Chromium	**0.0022**	**J**	0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:44	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:44	1
Lithium	**0.011**	**J**	0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:44	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:12	1
Arsenic	**3.5**		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:20	1
Beryllium	**0.077**	**J**	0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:20	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:37	1
Cobalt	**0.57**		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:20	1
Molybdenum	**4.3**		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:20	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:20	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:20	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**30**		2.5	1.4	mg/L			04/25/19 21:02	5
Fluoride	**0.17**	**J**	0.25	0.13	mg/L			04/25/19 21:02	5
Sulfate	**100**		10	1.7	mg/L			04/25/19 21:02	5
Total Dissolved Solids	**550**		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.4**	**HF**	0.1	0.1	SU			05/12/19 15:44	1
Temperature	**21.4**	**HF**	0.001	0.001	Degrees C			05/12/19 15:44	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.612**		0.142	0.152	1.00	0.103	pCi/L	06/06/19 08:14	07/22/19 06:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.1*		*40 - 110*	*06/06/19 08:14*	*07/22/19 06:41*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.12**		0.424	0.437	1.00	0.594	pCi/L	06/06/19 09:13	07/02/19 15:49	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.1*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*
Y Carrier	*75.5*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*

Client Sample ID: FIELD BLANK

Date Collected: 04/19/19 12:50
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-10

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:47	1
Boron	ND		0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:47	1
Calcium	ND		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:47	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:47	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:47	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:47	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:15	1
Arsenic	ND		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:22	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:22	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:39	1
Cobalt	ND		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:22	1
Molybdenum	ND		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:22	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:22	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:22	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/25/19 22:29	1
Fluoride	ND		0.050	0.026	mg/L			04/25/19 22:29	1
Sulfate	ND		2.0	0.35	mg/L			04/25/19 22:29	1
Total Dissolved Solids	ND		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.7**	**HF**	0.1	0.1	SU			05/12/19 15:46	1
Temperature	**21.4**	**HF**	0.001	0.001	Degrees C			05/12/19 15:46	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0278	U	0.0436	0.0436	1.00	0.105	pCi/L	06/06/19 08:14	07/22/19 08:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*40 - 110*	*06/06/19 08:14*	*07/22/19 08:38*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.133	U	0.287	0.288	1.00	0.532	pCi/L	06/06/19 09:13	07/02/19 15:49	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*
Y Carrier	*80.4*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*

Client Sample ID: EQUIP BLANK

Date Collected: 04/19/19 13:00
Date Received: 04/20/19 09:30

Lab Sample ID: 480-152313-11

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 18:51	1
Boron	ND		0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 18:51	1
Calcium	ND		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 18:51	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 18:51	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 18:51	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 18:51	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 15:17	1
Arsenic	ND		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 12:24	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 12:24	1
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:42	1
Cobalt	ND		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 12:24	1
Molybdenum	ND		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 12:24	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 12:24	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 12:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 15:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/25/19 22:44	1
Fluoride	ND		0.050	0.026	mg/L			04/25/19 22:44	1
Sulfate	ND		2.0	0.35	mg/L			04/25/19 22:44	1
Total Dissolved Solids	ND		24	24	mg/L			04/26/19 13:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.6**	**HF**	0.1	0.1	SU			05/12/19 15:48	1
Temperature	**21.6**	**HF**	0.001	0.001	Degrees C			05/12/19 15:48	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0547	U	0.0653	0.0655	1.00	0.107	pCi/L	06/06/19 08:14	07/22/19 08:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.3*		*40 - 110*	*06/06/19 08:14*	*07/22/19 08:38*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.403	U	0.329	0.331	1.00	0.632	pCi/L	06/06/19 09:13	07/02/19 15:49	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.3*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*
Y Carrier	*77.4*		*40 - 110*	*06/06/19 09:13*	*07/02/19 15:49*	*1*

Tracer/Carrier Summary

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

Job ID: 480-152313-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
480-152313-1	MW-1	82.8
480-152313-2	MW-3	84.2
480-152313-3	MW-1RD	87.0
480-152313-4	MW-2RD	85.9
480-152313-5	MW-2R	85.6
480-152313-6	MW-3RD	83.3
480-152313-7	MW-3R	83.3
480-152313-8	MW-4	75.4
480-152313-9	DUPLICATE	79.1
480-152313-10	FIELD BLANK	86.4
480-152313-11	EQUIP BLANK	89.3
LCS 160-431033/1-A	Lab Control Sample	95.5
LCSD 160-431033/2-A	Lab Control Sample Dup	86.7
MB 160-431033/23-A	Method Blank	101

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
480-152313-1	MW-1	82.8	53.5
480-152313-2	MW-3	84.2	68.8
480-152313-3	MW-1RD	87.0	54.6
480-152313-4	MW-2RD	85.9	70.3
480-152313-5	MW-2R	85.6	68.8
480-152313-6	MW-3RD	83.3	74.0
480-152313-7	MW-3R	83.3	72.1
480-152313-8	MW-4	75.4	72.5
480-152313-9	DUPLICATE	79.1	75.5
480-152313-10	FIELD BLANK	86.4	80.4
480-152313-11	EQUIP BLANK	89.3	77.4
LCS 160-431038/1-A	Lab Control Sample	95.5	70.7
LCSD 160-431038/2-A	Lab Control Sample Dup	86.7	70.7
MB 160-431038/23-A	Method Blank	101	71.8

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 480-470921/1-A
Matrix: Water
Analysis Batch: 472702

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 470921

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020	0.00070	mg/L		05/03/19 07:33	05/13/19 16:45	1
Boron	0.00405	J	0.020	0.0040	mg/L		05/03/19 07:33	05/13/19 16:45	1
Calcium	ND		0.50	0.10	mg/L		05/03/19 07:33	05/13/19 16:45	1
Chromium	ND		0.0040	0.0010	mg/L		05/03/19 07:33	05/13/19 16:45	1
Lead	ND		0.010	0.0030	mg/L		05/03/19 07:33	05/13/19 16:45	1
Lithium	ND		0.030	0.010	mg/L		05/03/19 07:33	05/13/19 16:45	1

Lab Sample ID: LCS 480-470921/2-A
Matrix: Water
Analysis Batch: 472702

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 470921

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.200	0.206		mg/L		103	80 - 120
Boron	0.200	0.199		mg/L		100	80 - 120
Calcium	10.0	9.55		mg/L		96	80 - 120
Chromium	0.200	0.198		mg/L		99	80 - 120
Lead	0.200	0.185		mg/L		92	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 480-470327/1-A
Matrix: Water
Analysis Batch: 470952

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 470327

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.27	ug/L		04/30/19 08:42	05/02/19 11:21	1
Beryllium	ND		0.70	0.030	ug/L		04/30/19 08:42	05/02/19 11:21	1
Cobalt	ND		0.30	0.040	ug/L		04/30/19 08:42	05/02/19 11:21	1
Molybdenum	ND		1.0	0.087	ug/L		04/30/19 08:42	05/02/19 11:21	1
Selenium	ND		1.0	0.44	ug/L		04/30/19 08:42	05/02/19 11:21	1
Thallium	ND		0.20	0.019	ug/L		04/30/19 08:42	05/02/19 11:21	1

Lab Sample ID: MB 480-470327/1-A
Matrix: Water
Analysis Batch: 471508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 470327

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.50	0.071	ug/L		04/30/19 08:42	05/06/19 19:07	1

Lab Sample ID: MB 480-470327/1-A
Matrix: Water
Analysis Batch: 472126

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 470327

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^	1.0	0.35	ug/L		04/30/19 08:42	05/09/19 14:34	1

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

Lab Sample ID: LCS 480-470327/2-A
Matrix: Water
Analysis Batch: 470952

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 470327

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	20.0	18.85		ug/L		94	80 - 120
Beryllium	20.0	20.37		ug/L		102	80 - 120
Cobalt	20.0	19.19		ug/L		96	80 - 120
Molybdenum	20.0	20.05		ug/L		100	80 - 120
Selenium	20.0	19.33		ug/L		97	80 - 120
Thallium	20.0	20.15		ug/L		101	80 - 120

Lab Sample ID: LCS 480-470327/2-A
Matrix: Water
Analysis Batch: 471508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 470327

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	20.0	19.82		ug/L		99	80 - 120

Lab Sample ID: LCS 480-470327/2-A
Matrix: Water
Analysis Batch: 472126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 470327

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	20.0	21.57	^	ug/L		108	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 480-469944/1-A
Matrix: Water
Analysis Batch: 470031

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 469944

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.12	ug/L		04/26/19 11:31	04/26/19 14:35	1

Lab Sample ID: LCS 480-469944/2-A
Matrix: Water
Analysis Batch: 470031

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 469944

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	6.67	6.52		ug/L		98	80 - 120

Lab Sample ID: 480-152313-3 MS
Matrix: Water
Analysis Batch: 470031

Client Sample ID: MW-1RD
Prep Type: Total/NA
Prep Batch: 469944

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		6.67	6.87		ug/L		103	80 - 120

Lab Sample ID: 480-152313-3 MSD
Matrix: Water
Analysis Batch: 470031

Client Sample ID: MW-1RD
Prep Type: Total/NA
Prep Batch: 469944

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		6.67	6.88		ug/L		103	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-469819/28
Matrix: Water
Analysis Batch: 469819

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/25/19 22:15	1
Fluoride	ND		0.050	0.026	mg/L			04/25/19 22:15	1
Sulfate	ND		2.0	0.35	mg/L			04/25/19 22:15	1

Lab Sample ID: MB 480-469819/4
Matrix: Water
Analysis Batch: 469819

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/25/19 16:24	1
Fluoride	ND		0.050	0.026	mg/L			04/25/19 16:24	1
Sulfate	ND		2.0	0.35	mg/L			04/25/19 16:24	1

Lab Sample ID: LCS 480-469819/27
Matrix: Water
Analysis Batch: 469819

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.0		mg/L		102	90 - 110
Fluoride	5.00	4.77		mg/L		95	90 - 110
Sulfate	50.0	48.1		mg/L		96	90 - 110

Lab Sample ID: LCS 480-469819/3
Matrix: Water
Analysis Batch: 469819

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.4		mg/L		101	90 - 110
Fluoride	5.00	4.74		mg/L		95	90 - 110
Sulfate	50.0	47.9		mg/L		96	90 - 110

Lab Sample ID: 480-152313-9 MS
Matrix: Water
Analysis Batch: 469819

Client Sample ID: DUPLICATE
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	30		250	291		mg/L		104	81 - 120
Fluoride	0.17	J	25.0	24.7		mg/L		98	82 - 120
Sulfate	100		250	348		mg/L		99	80 - 120

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

Lab Sample ID: MB 310-237382/1
Matrix: Water
Analysis Batch: 237382

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	ND		24	24	mg/L			04/26/19 13:39	1

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

Lab Sample ID: LCS 310-237382/2
Matrix: Water
Analysis Batch: 237382

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	990		mg/L		99	90 - 110		

Lab Sample ID: 480-152313-10 DU
Matrix: Water
Analysis Batch: 237382

Client Sample ID: FIELD BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	ND			ND		mg/L				NC	24

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-472502/1
Matrix: Water
Analysis Batch: 472502

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	99 - 101		

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-431033/23-A
Matrix: Water
Analysis Batch: 435762

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431033

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01530	U	0.0479	0.0479	1.00	0.0915	pCi/L	06/06/19 08:14	07/22/19 10:36	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*06/06/19 08:14*	*07/22/19 10:36*	*1*

Lab Sample ID: LCS 160-431033/1-A
Matrix: Water
Analysis Batch: 435081

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431033

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	9.865		1.03	1.00	0.101	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.5*		*40 - 110*

Lab Sample ID: LCSD 160-431033/2-A
Matrix: Water
Analysis Batch: 435081

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 431033

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.4	11.90		1.24	1.00	0.126	pCi/L	105	75 - 125	0.90	1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCSD 160-431033/2-A
Matrix: Water
Analysis Batch: 435081

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 431033

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	86.7		40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-431038/23-A
Matrix: Water
Analysis Batch: 433445

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431038

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4491	U	0.303	0.305	1.00	0.469	pCi/L	06/06/19 09:13	07/02/19 15:51	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	06/06/19 09:13	07/02/19 15:51	1
Y Carrier	71.8		40 - 110	06/06/19 09:13	07/02/19 15:51	1

Lab Sample ID: LCS 160-431038/1-A
Matrix: Water
Analysis Batch: 433407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431038

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.06	9.372		1.16	1.00	0.519	pCi/L	103	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	95.5		40 - 110
Y Carrier	70.7		40 - 110

Lab Sample ID: LCSD 160-431038/2-A
Matrix: Water
Analysis Batch: 433407

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 431038

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.06	10.21		1.25	1.00	0.541	pCi/L	113	75 - 125	0.35	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	86.7		40 - 110
Y Carrier	70.7		40 - 110

QC Association Summary

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

Job ID: 480-152313-1

Metals

Prep Batch: 469944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	7470A	
480-152313-2	MW-3	Total/NA	Water	7470A	
480-152313-3	MW-1RD	Total/NA	Water	7470A	
480-152313-4	MW-2RD	Total/NA	Water	7470A	
480-152313-5	MW-2R	Total/NA	Water	7470A	
480-152313-6	MW-3RD	Total/NA	Water	7470A	
480-152313-7	MW-3R	Total/NA	Water	7470A	
480-152313-8	MW-4	Total/NA	Water	7470A	
480-152313-9	DUPLICATE	Total/NA	Water	7470A	
480-152313-10	FIELD BLANK	Total/NA	Water	7470A	
480-152313-11	EQUIP BLANK	Total/NA	Water	7470A	
MB 480-469944/1-A	Method Blank	Total/NA	Water	7470A	
LCS 480-469944/2-A	Lab Control Sample	Total/NA	Water	7470A	
480-152313-3 MS	MW-1RD	Total/NA	Water	7470A	
480-152313-3 MSD	MW-1RD	Total/NA	Water	7470A	

Analysis Batch: 470031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	7470A	469944
480-152313-2	MW-3	Total/NA	Water	7470A	469944
480-152313-3	MW-1RD	Total/NA	Water	7470A	469944
480-152313-4	MW-2RD	Total/NA	Water	7470A	469944
480-152313-5	MW-2R	Total/NA	Water	7470A	469944
480-152313-6	MW-3RD	Total/NA	Water	7470A	469944
480-152313-7	MW-3R	Total/NA	Water	7470A	469944
480-152313-8	MW-4	Total/NA	Water	7470A	469944
480-152313-9	DUPLICATE	Total/NA	Water	7470A	469944
480-152313-10	FIELD BLANK	Total/NA	Water	7470A	469944
480-152313-11	EQUIP BLANK	Total/NA	Water	7470A	469944
MB 480-469944/1-A	Method Blank	Total/NA	Water	7470A	469944
LCS 480-469944/2-A	Lab Control Sample	Total/NA	Water	7470A	469944
480-152313-3 MS	MW-1RD	Total/NA	Water	7470A	469944
480-152313-3 MSD	MW-1RD	Total/NA	Water	7470A	469944

Prep Batch: 470327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	3020A	
480-152313-2	MW-3	Total/NA	Water	3020A	
480-152313-3	MW-1RD	Total/NA	Water	3020A	
480-152313-4	MW-2RD	Total/NA	Water	3020A	
480-152313-5	MW-2R	Total/NA	Water	3020A	
480-152313-6	MW-3RD	Total/NA	Water	3020A	
480-152313-7	MW-3R	Total/NA	Water	3020A	
480-152313-8	MW-4	Total/NA	Water	3020A	
480-152313-9	DUPLICATE	Total/NA	Water	3020A	
480-152313-10	FIELD BLANK	Total/NA	Water	3020A	
480-152313-11	EQUIP BLANK	Total/NA	Water	3020A	
MB 480-470327/1-A	Method Blank	Total/NA	Water	3020A	
LCS 480-470327/2-A	Lab Control Sample	Total/NA	Water	3020A	

Metals

Prep Batch: 470921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	3005A	
480-152313-2	MW-3	Total/NA	Water	3005A	
480-152313-3	MW-1RD	Total/NA	Water	3005A	
480-152313-4	MW-2RD	Total/NA	Water	3005A	
480-152313-5	MW-2R	Total/NA	Water	3005A	
480-152313-6	MW-3RD	Total/NA	Water	3005A	
480-152313-7	MW-3R	Total/NA	Water	3005A	
480-152313-8	MW-4	Total/NA	Water	3005A	
480-152313-9	DUPLICATE	Total/NA	Water	3005A	
480-152313-10	FIELD BLANK	Total/NA	Water	3005A	
480-152313-11	EQUIP BLANK	Total/NA	Water	3005A	
MB 480-470921/1-A	Method Blank	Total/NA	Water	3005A	
LCS 480-470921/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 470952

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	6020B	470327
480-152313-2	MW-3	Total/NA	Water	6020B	470327
480-152313-3	MW-1RD	Total/NA	Water	6020B	470327
480-152313-4	MW-2RD	Total/NA	Water	6020B	470327
480-152313-5	MW-2R	Total/NA	Water	6020B	470327
480-152313-6	MW-3RD	Total/NA	Water	6020B	470327
480-152313-7	MW-3R	Total/NA	Water	6020B	470327
480-152313-8	MW-4	Total/NA	Water	6020B	470327
480-152313-9	DUPLICATE	Total/NA	Water	6020B	470327
480-152313-10	FIELD BLANK	Total/NA	Water	6020B	470327
480-152313-11	EQUIP BLANK	Total/NA	Water	6020B	470327
MB 480-470327/1-A	Method Blank	Total/NA	Water	6020B	470327
LCS 480-470327/2-A	Lab Control Sample	Total/NA	Water	6020B	470327

Analysis Batch: 471508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	6020B	470327
480-152313-2	MW-3	Total/NA	Water	6020B	470327
480-152313-3	MW-1RD	Total/NA	Water	6020B	470327
480-152313-4	MW-2RD	Total/NA	Water	6020B	470327
480-152313-5	MW-2R	Total/NA	Water	6020B	470327
480-152313-6	MW-3RD	Total/NA	Water	6020B	470327
480-152313-7	MW-3R	Total/NA	Water	6020B	470327
480-152313-8	MW-4	Total/NA	Water	6020B	470327
480-152313-9	DUPLICATE	Total/NA	Water	6020B	470327
480-152313-10	FIELD BLANK	Total/NA	Water	6020B	470327
480-152313-11	EQUIP BLANK	Total/NA	Water	6020B	470327
MB 480-470327/1-A	Method Blank	Total/NA	Water	6020B	470327
LCS 480-470327/2-A	Lab Control Sample	Total/NA	Water	6020B	470327

Analysis Batch: 472126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	6020B	470327
480-152313-2	MW-3	Total/NA	Water	6020B	470327
480-152313-3	MW-1RD	Total/NA	Water	6020B	470327

Metals (Continued)

Analysis Batch: 472126 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-4	MW-2RD	Total/NA	Water	6020B	470327
480-152313-5	MW-2R	Total/NA	Water	6020B	470327
480-152313-6	MW-3RD	Total/NA	Water	6020B	470327
480-152313-7	MW-3R	Total/NA	Water	6020B	470327
480-152313-8	MW-4	Total/NA	Water	6020B	470327
480-152313-9	DUPLICATE	Total/NA	Water	6020B	470327
480-152313-10	FIELD BLANK	Total/NA	Water	6020B	470327
480-152313-11	EQUIP BLANK	Total/NA	Water	6020B	470327
MB 480-470327/1-A	Method Blank	Total/NA	Water	6020B	470327
LCS 480-470327/2-A	Lab Control Sample	Total/NA	Water	6020B	470327

Analysis Batch: 472702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	6010D	470921
480-152313-2	MW-3	Total/NA	Water	6010D	470921
480-152313-3	MW-1RD	Total/NA	Water	6010D	470921
480-152313-4	MW-2RD	Total/NA	Water	6010D	470921
480-152313-5	MW-2R	Total/NA	Water	6010D	470921
480-152313-6	MW-3RD	Total/NA	Water	6010D	470921
480-152313-7	MW-3R	Total/NA	Water	6010D	470921
480-152313-8	MW-4	Total/NA	Water	6010D	470921
480-152313-9	DUPLICATE	Total/NA	Water	6010D	470921
480-152313-10	FIELD BLANK	Total/NA	Water	6010D	470921
480-152313-11	EQUIP BLANK	Total/NA	Water	6010D	470921
MB 480-470921/1-A	Method Blank	Total/NA	Water	6010D	470921
LCS 480-470921/2-A	Lab Control Sample	Total/NA	Water	6010D	470921

General Chemistry

Analysis Batch: 237382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	SM 2540C	
480-152313-2	MW-3	Total/NA	Water	SM 2540C	
480-152313-3	MW-1RD	Total/NA	Water	SM 2540C	
480-152313-4	MW-2RD	Total/NA	Water	SM 2540C	
480-152313-5	MW-2R	Total/NA	Water	SM 2540C	
480-152313-6	MW-3RD	Total/NA	Water	SM 2540C	
480-152313-7	MW-3R	Total/NA	Water	SM 2540C	
480-152313-8	MW-4	Total/NA	Water	SM 2540C	
480-152313-9	DUPLICATE	Total/NA	Water	SM 2540C	
480-152313-10	FIELD BLANK	Total/NA	Water	SM 2540C	
480-152313-11	EQUIP BLANK	Total/NA	Water	SM 2540C	
MB 310-237382/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-237382/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-152313-10 DU	FIELD BLANK	Total/NA	Water	SM 2540C	

Analysis Batch: 469819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	300.0	
480-152313-2	MW-3	Total/NA	Water	300.0	
480-152313-3	MW-1RD	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 469819 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-4	MW-2RD	Total/NA	Water	300.0	
480-152313-5	MW-2R	Total/NA	Water	300.0	
480-152313-6	MW-3RD	Total/NA	Water	300.0	
480-152313-7	MW-3R	Total/NA	Water	300.0	
480-152313-8	MW-4	Total/NA	Water	300.0	
480-152313-9	DUPLICATE	Total/NA	Water	300.0	
480-152313-10	FIELD BLANK	Total/NA	Water	300.0	
480-152313-11	EQUIP BLANK	Total/NA	Water	300.0	
MB 480-469819/28	Method Blank	Total/NA	Water	300.0	
MB 480-469819/4	Method Blank	Total/NA	Water	300.0	
LCS 480-469819/27	Lab Control Sample	Total/NA	Water	300.0	
LCS 480-469819/3	Lab Control Sample	Total/NA	Water	300.0	
480-152313-9 MS	DUPLICATE	Total/NA	Water	300.0	

Analysis Batch: 472502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	SM 4500 H+ B	
480-152313-2	MW-3	Total/NA	Water	SM 4500 H+ B	
480-152313-3	MW-1RD	Total/NA	Water	SM 4500 H+ B	
480-152313-4	MW-2RD	Total/NA	Water	SM 4500 H+ B	
480-152313-5	MW-2R	Total/NA	Water	SM 4500 H+ B	
480-152313-6	MW-3RD	Total/NA	Water	SM 4500 H+ B	
480-152313-7	MW-3R	Total/NA	Water	SM 4500 H+ B	
480-152313-8	MW-4	Total/NA	Water	SM 4500 H+ B	
480-152313-9	DUPLICATE	Total/NA	Water	SM 4500 H+ B	
480-152313-10	FIELD BLANK	Total/NA	Water	SM 4500 H+ B	
480-152313-11	EQUIP BLANK	Total/NA	Water	SM 4500 H+ B	
LCS 480-472502/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Rad

Prep Batch: 431033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	PrecSep-21	
480-152313-2	MW-3	Total/NA	Water	PrecSep-21	
480-152313-3	MW-1RD	Total/NA	Water	PrecSep-21	
480-152313-4	MW-2RD	Total/NA	Water	PrecSep-21	
480-152313-5	MW-2R	Total/NA	Water	PrecSep-21	
480-152313-6	MW-3RD	Total/NA	Water	PrecSep-21	
480-152313-7	MW-3R	Total/NA	Water	PrecSep-21	
480-152313-8	MW-4	Total/NA	Water	PrecSep-21	
480-152313-9	DUPLICATE	Total/NA	Water	PrecSep-21	
480-152313-10	FIELD BLANK	Total/NA	Water	PrecSep-21	
480-152313-11	EQUIP BLANK	Total/NA	Water	PrecSep-21	
MB 160-431033/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431033/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-431033/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 431038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-1	MW-1	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 431038 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-152313-2	MW-3	Total/NA	Water	PrecSep_0	
480-152313-3	MW-1RD	Total/NA	Water	PrecSep_0	
480-152313-4	MW-2RD	Total/NA	Water	PrecSep_0	
480-152313-5	MW-2R	Total/NA	Water	PrecSep_0	
480-152313-6	MW-3RD	Total/NA	Water	PrecSep_0	
480-152313-7	MW-3R	Total/NA	Water	PrecSep_0	
480-152313-8	MW-4	Total/NA	Water	PrecSep_0	
480-152313-9	DUPLICATE	Total/NA	Water	PrecSep_0	
480-152313-10	FIELD BLANK	Total/NA	Water	PrecSep_0	
480-152313-11	EQUIP BLANK	Total/NA	Water	PrecSep_0	
MB 160-431038/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431038/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-431038/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1
Lab Sample ID: 480-152313-1
Date Collected: 04/18/19 16:05
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:03	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 11:55	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:12	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 14:47	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 14:52	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 19:05	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:21	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435081	07/17/19 06:23	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:44	KLS	TAL SL

Client Sample ID: MW-3
Lab Sample ID: 480-152313-2
Date Collected: 04/19/19 09:20
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:07	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:04	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:21	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 14:50	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 14:53	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 19:19	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:23	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435081	07/17/19 06:23	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:45	KLS	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1RD
Lab Sample ID: 480-152313-3
Date Collected: 04/19/19 16:35
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:10	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:06	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:24	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 14:59	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 14:54	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 19:34	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:26	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435081	07/17/19 06:23	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:45	KLS	TAL SL

Client Sample ID: MW-2RD
Lab Sample ID: 480-152313-4
Date Collected: 04/19/19 07:55
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:14	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:09	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:26	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:01	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:02	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 19:49	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:28	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 05:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:45	KLS	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-2R
Lab Sample ID: 480-152313-5
Date Collected: 04/19/19 07:40
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:18	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:11	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:28	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:03	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:04	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 20:03	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:30	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 05:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:45	KLS	TAL SL

Client Sample ID: MW-3RD
Lab Sample ID: 480-152313-6
Date Collected: 04/19/19 10:05
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:21	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:13	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:30	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:06	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:05	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 20:18	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:33	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 05:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433407	07/02/19 15:45	KLS	TAL SL

Client Sample ID: MW-3R
Lab Sample ID: 480-152313-7
Date Collected: 04/19/19 09:10
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:36	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:15	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:33	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:08	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:06	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 20:32	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:36	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 05:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433408	07/02/19 15:42	CDR	TAL SL

Client Sample ID: MW-4
Lab Sample ID: 480-152313-8
Date Collected: 04/19/19 11:50
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:40	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:18	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:35	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:10	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:07	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 20:47	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:38	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435774	07/22/19 06:40	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433408	07/02/19 15:42	CDR	TAL SL

Client Sample ID: DUPLICATE

Lab Sample ID: 480-152313-9

Date Collected: 04/19/19 00:00

Matrix: Water

Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:44	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:20	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:37	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:12	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:09	BMB	TAL BUF
Total/NA	Analysis	300.0		5	469819	04/25/19 21:02	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:44	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435762	07/22/19 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433445	07/02/19 15:49	KLS	TAL SL

Client Sample ID: FIELD BLANK

Lab Sample ID: 480-152313-10

Date Collected: 04/19/19 12:50

Matrix: Water

Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:47	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:22	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:39	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:15	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:10	BMB	TAL BUF
Total/NA	Analysis	300.0		1	469819	04/25/19 22:29	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:46	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 08:38	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433445	07/02/19 15:49	KLS	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: EQUIP BLANK
Lab Sample ID: 480-152313-11
Date Collected: 04/19/19 13:00
Matrix: Water
Date Received: 04/20/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			470921	05/03/19 07:33	BMB	TAL BUF
Total/NA	Analysis	6010D		1	472702	05/13/19 18:51	LMH	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	470952	05/02/19 12:24	JMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	471508	05/06/19 19:42	KMP	TAL BUF
Total/NA	Prep	3020A			470327	04/30/19 08:42	KMP	TAL BUF
Total/NA	Analysis	6020B		1	472126	05/09/19 15:17	KMP	TAL BUF
Total/NA	Prep	7470A			469944	04/26/19 11:31	BMB	TAL BUF
Total/NA	Analysis	7470A		1	470031	04/26/19 15:11	BMB	TAL BUF
Total/NA	Analysis	300.0		1	469819	04/25/19 22:44	CLA	TAL BUF
Total/NA	Analysis	SM 2540C		1	237382	04/26/19 13:39	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	472502	05/12/19 15:48	KEB	TAL BUF
Total/NA	Prep	PrecSep-21			431033	06/06/19 08:14	EJQ	TAL SL
Total/NA	Analysis	903.0		1	435773	07/22/19 08:38	CDR	TAL SL
Total/NA	Prep	PrecSep_0			431038	06/06/19 09:13	EJQ	TAL SL
Total/NA	Analysis	904.0		1	433445	07/02/19 15:49	KLS	TAL SL

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

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

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

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Laboratory: Eurofins TestAmerica, Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Minnesota	NELAP	5	036-999-337	12-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6010D	3005A	Water	Lithium
SM 4500 H+ B		Water	pH
SM 4500 H+ B		Water	Temperature

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State		IA100001 (OR)	09-29-19
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
Illinois	NELAP		200024	11-29-19
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota	NELAP		019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
Oregon	NELAP		IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-20
Missouri	State Program	7	780	06-30-19 *
Nevada	State Program	9	MO000542018-1	07-31-19 *
New Jersey	NELAP	2	MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19 *
Texas	NELAP	6	T104704193-18-13	07-31-19 *
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19 *
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

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

Method Summary

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

Job ID: 480-152313-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	TAL BUF
6020B	Metals (ICP/MS)	SW846	TAL BUF
7470A	Mercury (CVAA)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL BUF
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
3005A	Preparation, Total Metals	SW846	TAL BUF
3020A	Preparation, Total Metals	SW846	TAL BUF
7470A	Preparation, Mercury	SW846	TAL BUF
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
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.

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600
TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

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

Job ID: 480-152313-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-152313-1	MW-1	Water	04/18/19 16:05	04/20/19 09:30	
480-152313-2	MW-3	Water	04/19/19 09:20	04/20/19 09:30	
480-152313-3	MW-1RD	Water	04/19/19 16:35	04/20/19 09:30	
480-152313-4	MW-2RD	Water	04/19/19 07:55	04/20/19 09:30	
480-152313-5	MW-2R	Water	04/19/19 07:40	04/20/19 09:30	
480-152313-6	MW-3RD	Water	04/19/19 10:05	04/20/19 09:30	
480-152313-7	MW-3R	Water	04/19/19 09:10	04/20/19 09:30	
480-152313-8	MW-4	Water	04/19/19 11:50	04/20/19 09:30	
480-152313-9	DUPLICATE	Water	04/19/19 00:00	04/20/19 09:30	
480-152313-10	FIELD BLANK	Water	04/19/19 12:50	04/20/19 09:30	
480-152313-11	EQUIP BLANK	Water	04/19/19 13:00	04/20/19 09:30	

Quantitation Limit Exceptions Summary

Client: Waste Connections, Inc. Job ID: 480-152313-1
Project/Site: SKB Lansing - CCR Groundwater

The requested project specific reporting limits listed below were less than laboratory standard quantitation limits (PQL) but greater than or equal to the laboratory method detection limits (MDL). It must be noted that results reported below lab standard quantitation limits may result in false positive/false negative values and less accurate quantitation. Routine laboratory procedures do not indicate corrective action for detections below the laboratory's PQL.

Method	Analyte	Matrix	Prep Type	Unit	Client RL	Lab PQL
SM 2540C	Total Dissolved Solids	Water	Total/NA	mg/L	24	30

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Schlyer	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-126537-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6065	E-Mail: ryan.vandette@testamerica		Page: Page 1 of 1
Company: Waste Connections, Inc.				Job #:
Address: 13425 Courthouse Blvd	Due Date Requested:			
City: Rosemount	TAT Requested (days):			
State, Zip: MN, 55068				
Phone:	PO #: Purchase Order Requested			
Email: nathanielb@wcnx.org	WO #: 3064-19-00082			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	Project #: 48013603			
Site: Minnesota	SSOW#:			

480-152313 Chain of Custody

ation Codes:

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)

OH
Acetate
ic Acid
HSO4
OH
nchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA

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)	300.0_28D - Cl/F/SO4	6010D - Metals	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Rad 228	903.0 - Rad 226	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
MW-1	4/19/19	16:05	6	Water			X	X	X	X	X	X		
MW-3	4/19/19	9:25	6	Water			X	X	X	X	X	X		
Duplicate	4/19/19	—	6	Water			X	X	X	X	X	X		
Field Blank	4/19/19	12:50	6	Water			X	X	X	X	X	X		
Equip Blank	4/19/19	13:00	6	Water			X	X	X	X	X	X		
MW-1RD	4/18/19	16:35	6	Water			X	X	X	X	X	X		
MW-2RD	4/19/19	7:55	6	Water			X	X	X	X	X	X		
MW-2R	4/19/19	7:40	6	Water			X	X	X	X	X	X		
MW-3RD	4/19/19	10:05	6	Water			X	X	X	X	X	X		
MW-3R	4/19/19	9:10	6	Water			X	X	X	X	X	X		
MW-4	4/19/19	11:50	6	Water			X	X	X	X	X	X		

TestAmerica Minneapolis SC
213

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:

	Date/Time	Company		Date/Time	Company
Relinquished by:	4/19/19 3:30 pm	GES	Received by:	4/19/19 3:30 pm	TA
Relinquished by:	4/19/19 1700	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	4-20-19 930	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		2.1 #1

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-49126.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: ryan.vandette@testamericainc.com	State of Origin: Minnesota	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Minnesota		Job #: 480-152313-1
Address: 13715 Rider Trail North,	Due Date Requested: 5/1/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: SKB Lansing	Project #: 48013603			
Site: Lansing MN	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 - Client ID (Lab ID)	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)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-1 (480-152313-1)	4/18/19	16:05 Central		Water			X	X	2	
MW-3 (480-152313-2)	4/19/19	09:20 Central		Water			X	X	2	
MW-1RD (480-152313-3)	4/19/19	16:35 Central		Water			X	X	2	
MW-2RD (480-152313-4)	4/19/19	07:55 Central		Water			X	X	2	
MW-2R (480-152313-5)	4/19/19	07:40 Central		Water			X	X	2	
MW-3RD (480-152313-6)	4/19/19	10:05 Central		Water			X	X	2	
MW-3R (480-152313-7)	4/19/19	09:10 Central		Water			X	X	2	
MW-4 (480-152313-8)	4/19/19	11:50 Central		Water			X	X	2	
DUP-1 (480-152313-9)	4/19/19	Central		Water			X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4-23-19 1140	TAB	Michael Fleem	4-24-19 09:15	TA SRL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-49126.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: ryan.vandette@testamericainc.com	State of Origin: Minnesota	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Minnesota		Job #: 480-152313-1
Address: 13715 Rider Trail North,	Due Date Requested: 5/1/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045	PO #:			
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	WO #:			
Email:				
Project Name: SKB Lansing	Project #: 48013603			
Site: Lansing MN	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 - Client ID (Lab ID)	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)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
FIELD BLANK (480-152313-10)	4/19/19	12:50 Central		Water			X	X	2	
Equipment Blank (480-152313-11)	4/19/19	13:00 Central		Water			X	X	2	

480-152313 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 4-23-19 1440	Company: TAO	Received by: Michael Hearn
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:

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

Date/Time: 4-24-19 0715	Company: TAS
Date/Time:	Company:
Date/Time:	Company:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-49126.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: ryan.vandette@testamericainc.com	State of Origin: Minnesota	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Minnesota		Job #: 480-152313-1
Address: 13715 Rider Trail North,	Due Date Requested: 5/1/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: SKB Lansing	Project #: 48013603			
Site: Lansing MN	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 - Client ID (Lab ID)	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)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-1 (480-152313-1)	4/18/19	16:05 Central		Water			X	X	2	
MW-3 (480-152313-2)	4/19/19	09:20 Central		Water			X	X	2	
MW-1RD (480-152313-3)	4/19/19	16:35 Central		Water			X	X	2	
MW-2RD (480-152313-4)	4/19/19	07:55 Central		Water			X	X	2	
MW-2R (480-152313-5)	4/19/19	07:40 Central		Water			X	X	2	
MW-3RD (480-152313-6)	4/19/19	10:05 Central		Water			X	X	2	
MW-3R (480-152313-7)	4/19/19	09:10 Central		Water			X	X	2	
MW-4 (480-152313-8)	4/19/19	11:50 Central		Water			X	X	2	
DUP-1 (480-152313-9)	4/19/19	Central		Water			X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	4-23-19 1440	TAL	Michael Fleem	4-24-19 09:15	TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-49126.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: ryan.vandette@testamericainc.com	State of Origin: Minnesota	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Minnesota		Job #: 480-152313-1
Address: 13715 Rider Trail North,	Due Date Requested: 5/1/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: SKB Lansing	Project #: 48013603			
Site: Lansing MN	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 - Client ID (Lab ID)	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)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
FIELD BLANK (480-152313-10)	4/19/19	12:50 Central		Water			X	X	2	
Equipment Blank (480-152313-11)	4/19/19	13:00 Central		Water			X	X	2	

480-152313 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
[signature]	4-23-19 1440	TAB	[signature]	4-24-19 0915	TA SB
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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-152313 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: TA Buffalo			
City/State: CITY Amherst	STATE NY	Project:	
Receipt Information			
Date/Time Received: DATE 4-26-19	TIME 1025	Received By: LAB	
Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ TA 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 # _____ of _____	
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: 1		Correction Factor (°C): -0.1	
• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 0.9		Corrected Temp (°C): 0.8	
• **Sample Container Temperature**			
Container type(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):	TEMP 1 / TEMP 2	Corrected Temp (°C):	TEMP 1 / TEMP 2
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			

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N-Schaefer	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-126537-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6063	E-Mail: ryan.vandette@testamerica		Page: Page 1 of 1
Company: Waste Connections, Inc.				Job #:
Address: 13425 Courthouse Blvd	Due Date Requested:			
City: Rosemount	TAT Requested (days):			
State, Zip: MN, 55068				
Phone:	PO #: Purchase Order Requested			
Email: nathanielb@wcnx.org	WO #: 3064-19-00082			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	Project #: 48013603			
Site: Minnesota	SSOW#:			

480-152313 Chain of Custody

ation Codes:
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)
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
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)	300.0_28D - Cl/F/SO4	6010D - Metals	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Rad 228	903.0 - Rad 226	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
MW-1	4/18/19	16:05	6	Water			X	X	X	X	X	X		
MW-3	4/17/19	9:25	6	Water			X	X	X	X	X	X		
Duplicate	4/17/19	—	6	Water			X	X	X	X	X	X		
Field Blank	4/17/19	12:50	6	Water			X	X	X	X	X	X		
Equip Blank	4/17/19	13:00	6	Water			X	X	X	X	X	X		
MW-1RD	4/18/19	16:55	6	Water			X	X	X	X	X	X		
MW-2RD	4/19/19	7:35	6	Water			X	X	X	X	X	X		
MW-2R	4/19/19	7:40	6	Water			X	X	X	X	X	X		
MW-3RD	4/19/19	10:05	6	Water			X	X	X	X	X	X		
MW-3R	4/19/19	9:10	6	Water			X	X	X	X	X	X		
MW-4	4/19/19	11:50	6	Water			X	X	X	X	X	X		

TestAmerica Minneapolis SC
213

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]	4/19/19 3:30	GES	[signature]	4/19/19 3:30 pm	TA
2	[signature]	4/19/19 1700				
3	[signature]	4-25-19 1600			4-26-19 930	TAB

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No:

Cooler Temperature(s) °C and Other Remarks: 2.1 #1

Login Sample Receipt Checklist

Client: Waste Connections, Inc. Job Number: 480-152313-1

Login Number: 152313 **List Source: Eurofins TestAmerica, Buffalo**
List Number: 1
Creator: Velickovic, Zoran

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
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 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.	False	04/18-04/19
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-152313-1

Login Number: 152313
List Number: 2
Creator: Bindert, Lindsay A

List Source: Eurofins TestAmerica, Cedar Falls
List Creation: 04/26/19 10:31 AM

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.	N/A	
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: 480-152313-1

Login Number: 152313
List Number: 3
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 04/26/19 03:15 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
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?	N/A	
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").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-152313-1

Login Number: 152313
List Number: 4
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 04/26/19 03:16 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
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?	N/A	
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").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

Laboratory Job ID: 480-161871-1
Client Project/Site: SKB Lansing - CCR Groundwater
Sampling Event: CCR Groundwater
Revision: 2

For:
Waste Connections, Inc.
13425 Courthouse Blvd
Rosemount, Minnesota 55068

Attn: Nathaniel Beinemann

Authorized for release by:
12/3/2019 9:44:53 AM

Ryan VanDette, Project Manager II
(716)504-9830
ryan.vandette@testamericainc.com

Table of Contents

Definitions/Glossary

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

Job ID: 480-161871-1

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Job ID: 480-161871-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-161871-1

Comments
This report has been revised to add Fluoride and Lead.

No additional comments.

Receipt
The samples were received on 10/31/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° C.

HPLC/IC
Method 300.0: The following samples were diluted due to the abundance of non-target analytes: MW-1 (480-161871-1), MW-2R (480-161871-3), MW-2RD (480-161871-4), MW-3RD (480-161871-7), MW-4 (480-161871-8) and DUPLICATE (480-161871-9). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were reported with elevated reporting limits for all analytes: MW-1RD (480-161871-2), MW-3 (480-161871-5) and MW-3R (480-161871-6). The sample was analyzed at a dilution based on screening results.

Method 300.0: The following sample(s) was Logged for method 300 with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-1 (480-161871-1), MW-1RD (480-161871-2), MW-2R (480-161871-3), MW-2RD (480-161871-4), MW-3 (480-161871-5), MW-3R (480-161871-6), MW-3RD (480-161871-7), MW-4 (480-161871-8), DUPLICATE (480-161871-9), FIELD BLANK (480-161871-10) and EQUIPMENT BLANK (480-161871-11).

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

Metals
Methods 6010C, 6010D: The low level continuing calibration verification (CCVL 480-502328/26) recovered above the upper control limit for Total Boron. The samples associated with this CCVL were either less than the reporting limit (RL) for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples MW-1RD (480-161871-2), MW-2R (480-161871-3) and MW-3 (480-161871-5) was not performed.

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

General Chemistry
Methods 9040C, SM 4500 H+ B: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following samples has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: MW-1 (480-161871-1), MW-1RD (480-161871-2), MW-2R (480-161871-3), MW-2RD (480-161871-4), MW-3R (480-161871-6), MW-3RD (480-161871-7), FIELD BLANK (480-161871-10) and EQUIPMENT BLANK (480-161871-11).

Methods 9040C, SM 4500 H+ B: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following samples has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: MW-3 (480-161871-5), MW-4 (480-161871-8) and DUPLICATE (480-161871-9).

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

Detection Summary

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

Job ID: 480-161871-1

Client Sample ID: MW-1 — Lab Sample ID: 480-161871-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.14		0.0020		mg/L	1		6010D	Total/NA
Boron	0.053		0.020		mg/L	1		6010D	Total/NA
Calcium	136		0.50		mg/L	1		6010D	Total/NA
Sulfate	125		10.0		mg/L	5		D516-90, 02	Total/NA
Total Dissolved Solids	605		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	63.6		1.0		mg/L	2		SM 4500 Cl- E	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD — Lab Sample ID: 480-161871-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.16		0.0020		mg/L	1		6010D	Total/NA
Calcium	80.2		0.50		mg/L	1		6010D	Total/NA
Sulfate	67.1		4.0		mg/L	2		D516-90, 02	Total/NA
Total Dissolved Solids	373		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	22.2		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	7.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R — Lab Sample ID: 480-161871-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.27		0.0020		mg/L	1		6010D	Total/NA
Boron	2.7	^	0.020		mg/L	1		6010D	Total/NA
Calcium	226		0.50		mg/L	1		6010D	Total/NA
Sulfate	67.3		6.0		mg/L	3		D516-90, 02	Total/NA
Total Dissolved Solids	1010		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	96.7		1.5		mg/L	3		SM 4500 Cl- E	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.5	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2RD — Lab Sample ID: 480-161871-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.19		0.0020		mg/L	1		6010D	Total/NA
Boron	0.094		0.020		mg/L	1		6010D	Total/NA
Calcium	138		0.50		mg/L	1		6010D	Total/NA
Sulfate	108		6.0		mg/L	3		D516-90, 02	Total/NA
Total Dissolved Solids	570		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	35.3		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	7.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 480-161871-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.29		0.0020		mg/L	1		6010D	Total/NA
Boron	0.92	^	0.020		mg/L	1		6010D	Total/NA
Calcium	186		0.50		mg/L	1		6010D	Total/NA
Cobalt	0.0055		0.0040		mg/L	1		6010D	Total/NA
Total Dissolved Solids	823		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	59.4		1.0		mg/L	2		SM 4500 Cl- E	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Buffalo

Detection Summary

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

Job ID: 480-161871-1

Client Sample ID: MW-3 (Continued) — Lab Sample ID: 480-161871-5

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.7	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3R — Lab Sample ID: 480-161871-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.60		0.0020		mg/L	1		6010D	Total/NA
Boron	0.083		0.020		mg/L	1		6010D	Total/NA
Calcium	223		0.50		mg/L	1		6010D	Total/NA
Total Dissolved Solids	853		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	23.5		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.4	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD — Lab Sample ID: 480-161871-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21		0.0020		mg/L	1		6010D	Total/NA
Boron	0.033		0.020		mg/L	1		6010D	Total/NA
Calcium	126		0.50		mg/L	1		6010D	Total/NA
Sulfate	128		10.0		mg/L	5		D516-90, 02	Total/NA
Total Dissolved Solids	543		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	27.9		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 480-161871-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.24		0.0020		mg/L	1		6010D	Total/NA
Boron	0.61		0.020		mg/L	1		6010D	Total/NA
Calcium	204		0.50		mg/L	1		6010D	Total/NA
Sulfate	304		20.0		mg/L	10		D516-90, 02	Total/NA
Total Dissolved Solids	914		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	15.7		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	6.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.7	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUPLICATE — Lab Sample ID: 480-161871-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21		0.0020		mg/L	1		6010D	Total/NA
Boron	0.032		0.020		mg/L	1		6010D	Total/NA
Calcium	124		0.50		mg/L	1		6010D	Total/NA
Sulfate	127		10.0		mg/L	5		D516-90, 02	Total/NA
Total Dissolved Solids	507		10.0		mg/L	1		SM 2540C	Total/NA
Chloride	28.0		0.50		mg/L	1		SM 4500 Cl- E	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.7	HF	0.001		Degrees C	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 - CCR Groundwater

Job ID: 480-161871-1

Client Sample ID: FIELD BLANK — Lab Sample ID: 480-161871-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: EQUIPMENT BLANK — Lab Sample ID: 480-161871-11

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.1	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

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

Job ID: 480-161871-1

Client Sample ID: MW-1

Date Collected: 10/29/19 08:35
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-1

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:09	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:09	1
Barium	**0.14**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:09	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:09	1
Boron	**0.053**		0.020		mg/L		11/02/19 11:18	11/05/19 14:31	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:09	1
Calcium	**136**		0.50		mg/L		11/02/19 11:18	11/05/19 03:09	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:09	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:09	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:09	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:09	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/05/19 14:31	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:09	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 00:43	5
Sulfate	**125**		10.0		mg/L			11/26/19 01:44	5
Total Dissolved Solids	**605**		10.0		mg/L			11/04/19 10:40	1
Chloride	**63.6**		1.0		mg/L			11/25/19 18:14	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1		SU			11/13/19 16:51	1
Temperature	**17.8**	**HF**	0.001		Degrees C			11/13/19 16:51	1

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

Job ID: 480-161871-1

Client Sample ID: MW-1RD

Date Collected: 10/29/19 08:40
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-2

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:13	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:13	1
Barium	**0.16**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:13	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:13	1
Boron	ND	^	0.020		mg/L		11/02/19 11:18	11/05/19 03:13	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:13	1
Calcium	**80.2**		0.50		mg/L		11/02/19 11:18	11/05/19 03:13	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:13	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:13	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:13	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:13	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:30	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:13	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:13	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 00:57	5
Sulfate	**67.1**		4.0		mg/L			11/26/19 01:23	2
Total Dissolved Solids	**373**		10.0		mg/L			11/04/19 10:40	1
Chloride	**22.2**		0.50		mg/L			11/25/19 18:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.7**	**HF**	0.1		SU			11/13/19 16:58	1
Temperature	**17.9**	**HF**	0.001		Degrees C			11/13/19 16:58	1

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

Job ID: 480-161871-1

Client Sample ID: MW-2R

Date Collected: 10/29/19 09:30
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-3

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:17	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:17	1
Barium	**0.27**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:17	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:17	1
Boron	**2.7**	**^**	0.020		mg/L		11/02/19 11:18	11/05/19 03:17	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:17	1
Calcium	**226**		0.50		mg/L		11/02/19 11:18	11/05/19 03:17	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:17	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:17	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:17	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:17	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:33	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:17	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:17	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 01:12	5
Sulfate	**67.3**		6.0		mg/L			11/26/19 02:03	3
Total Dissolved Solids	**1010**		10.0		mg/L			11/04/19 10:40	1
Chloride	**96.7**		1.5		mg/L			11/25/19 18:14	3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			11/13/19 17:02	1
Temperature	**17.5**	**HF**	0.001		Degrees C			11/13/19 17:02	1

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

Job ID: 480-161871-1

Client Sample ID: MW-2RD

Date Collected: 10/29/19 10:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-4

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:20	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:20	1
Barium	**0.19**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:20	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:20	1
Boron	**0.094**		0.020		mg/L		11/02/19 11:18	11/05/19 14:35	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:20	1
Calcium	**138**		0.50		mg/L		11/02/19 11:18	11/05/19 03:20	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:20	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:20	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:20	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:20	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/05/19 14:35	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:20	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:20	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 01:26	5
Sulfate	**108**		6.0		mg/L			11/26/19 01:23	3
Total Dissolved Solids	**570**		10.0		mg/L			11/04/19 10:39	1
Chloride	**35.3**		0.50		mg/L			11/25/19 18:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.6**	**HF**	0.1		SU			11/13/19 17:06	1
Temperature	**17.6**	**HF**	0.001		Degrees C			11/13/19 17:06	1

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

Job ID: 480-161871-1

Client Sample ID: MW-3

Date Collected: 10/29/19 11:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-5

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:24	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:24	1
Barium	**0.29**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:24	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:24	1
Boron	**0.92**	^	0.020		mg/L		11/02/19 11:18	11/05/19 03:24	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:24	1
Calcium	**186**		0.50		mg/L		11/02/19 11:18	11/05/19 03:24	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:24	1
Cobalt	**0.0055**		0.0040		mg/L		11/02/19 11:18	11/05/19 03:24	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:24	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:24	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:37	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:24	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 01:40	5
Sulfate	ND		2.0		mg/L			11/26/19 01:24	1
Total Dissolved Solids	**823**		10.0		mg/L			11/05/19 10:42	1
Chloride	**59.4**		1.0		mg/L			11/25/19 18:14	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1		SU			11/16/19 00:06	1
Temperature	**19.7**	**HF**	0.001		Degrees C			11/16/19 00:06	1

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

Job ID: 480-161871-1

Client Sample ID: MW-3R

Date Collected: 10/29/19 10:50
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-6

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:39	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:39	1
Barium	**0.60**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:39	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:39	1
Boron	**0.083**		0.020		mg/L		11/02/19 11:18	11/05/19 03:39	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:39	1
Calcium	**223**		0.50		mg/L		11/02/19 11:18	11/05/19 03:39	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:39	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:39	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:39	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:39	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:41	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:39	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:39	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 01:54	5
Sulfate	ND		2.0		mg/L			11/26/19 01:24	1
Total Dissolved Solids	**853**		10.0		mg/L			11/05/19 10:42	1
Chloride	**23.5**		0.50		mg/L			11/25/19 18:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.7**	**HF**	0.1		SU			11/13/19 17:08	1
Temperature	**17.4**	**HF**	0.001		Degrees C			11/13/19 17:08	1

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

Job ID: 480-161871-1

Client Sample ID: MW-3RD

Date Collected: 10/29/19 11:35
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-7

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:43	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:43	1
Barium	**0.21**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:43	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:43	1
Boron	**0.033**		0.020		mg/L		11/02/19 11:18	11/05/19 03:43	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:43	1
Calcium	**126**		0.50		mg/L		11/02/19 11:18	11/05/19 03:43	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:43	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:43	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:43	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:43	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:44	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:43	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:43	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 03:05	5
Sulfate	**128**		10.0		mg/L			11/26/19 02:03	5
Total Dissolved Solids	**543**		10.0		mg/L			11/05/19 10:42	1
Chloride	**27.9**		0.50		mg/L			11/25/19 18:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1		SU			11/13/19 17:12	1
Temperature	**17.9**	**HF**	0.001		Degrees C			11/13/19 17:12	1

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

Job ID: 480-161871-1

Client Sample ID: MW-4

Date Collected: 10/29/19 13:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-8

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:46	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:46	1
Barium	**0.24**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:46	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:46	1
Boron	**0.61**		0.020		mg/L		11/02/19 11:18	11/05/19 03:46	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:46	1
Calcium	**204**		0.50		mg/L		11/02/19 11:18	11/05/19 03:46	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:46	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:46	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:46	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:46	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 17:59	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:46	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:46	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 03:19	5
Sulfate	**304**		20.0		mg/L			11/26/19 01:45	10
Total Dissolved Solids	**914**		10.0		mg/L			11/05/19 10:42	1
Chloride	**15.7**		0.50		mg/L			11/25/19 18:13	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.9**	**HF**	0.1		SU			11/16/19 00:09	1
Temperature	**19.7**	**HF**	0.001		Degrees C			11/16/19 00:09	1

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

Job ID: 480-161871-1

Client Sample ID: DUPLICATE

Date Collected: 10/29/19 00:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-9

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:50	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:50	1
Barium	**0.21**		0.0020		mg/L		11/02/19 11:18	11/05/19 03:50	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:50	1
Boron	**0.032**		0.020		mg/L		11/02/19 11:18	11/05/19 03:50	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:50	1
Calcium	**124**		0.50		mg/L		11/02/19 11:18	11/05/19 03:50	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:50	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:50	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:50	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:50	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 18:03	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:50	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:50	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.25		mg/L			11/28/19 03:33	5
Sulfate	**127**		10.0		mg/L			11/26/19 01:25	5
Total Dissolved Solids	**507**		10.0		mg/L			11/05/19 10:43	1
Chloride	**28.0**		0.50		mg/L			11/25/19 18:13	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			11/16/19 00:11	1
Temperature	**19.7**	**HF**	0.001		Degrees C			11/16/19 00:11	1

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

Job ID: 480-161871-1

Client Sample ID: FIELD BLANK

Lab Sample ID: 480-161871-10

Date Collected: 10/29/19 13:10

Matrix: Water

Date Received: 10/31/19 09:30

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:54	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:54	1
Barium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:54	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:54	1
Boron	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:54	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:54	1
Calcium	ND		0.50		mg/L		11/02/19 11:18	11/05/19 03:54	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:54	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:54	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:54	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:54	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 18:07	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:54	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.050		mg/L			11/28/19 03:47	1
Sulfate	ND		2.0		mg/L			11/26/19 01:26	1
Total Dissolved Solids	ND		10.0		mg/L			11/05/19 10:43	1
Chloride	ND		0.50		mg/L			11/26/19 01:47	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.1**	**HF**	0.1		SU			11/13/19 17:15	1
Temperature	**17.8**	**HF**	0.001		Degrees C			11/13/19 17:15	1

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

Job ID: 480-161871-1

Client Sample ID: EQUIPMENT BLANK

Lab Sample ID: 480-161871-11

Date Collected: 10/29/19 13:20

Matrix: Water

Date Received: 10/31/19 09:30

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:58	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 03:58	1
Barium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:58	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:58	1
Boron	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:58	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 03:58	1
Calcium	ND		0.50		mg/L		11/02/19 11:18	11/05/19 03:58	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:58	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 03:58	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 03:58	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 03:58	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/25/19 18:10	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 03:58	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 03:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND	H	0.050		mg/L			11/28/19 04:02	1
Sulfate	ND		2.0		mg/L			11/26/19 01:45	1
Total Dissolved Solids	ND		10.0		mg/L			11/05/19 10:43	1
Chloride	ND		0.50		mg/L			11/26/19 01:05	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.8**	**HF**	0.1		SU			11/13/19 17:17	1
Temperature	**17.1**	**HF**	0.001		Degrees C			11/13/19 17:17	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 480-501773/1-A
Matrix: Water
Analysis Batch: 502328

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 501773

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.020		mg/L		11/02/19 11:18	11/05/19 02:29	1
Arsenic	ND		0.015		mg/L		11/02/19 11:18	11/05/19 02:29	1
Barium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 02:29	1
Beryllium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 02:29	1
Cadmium	ND		0.0020		mg/L		11/02/19 11:18	11/05/19 02:29	1
Calcium	ND		0.50		mg/L		11/02/19 11:18	11/05/19 02:29	1
Chromium	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 02:29	1
Cobalt	ND		0.0040		mg/L		11/02/19 11:18	11/05/19 02:29	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 02:29	1
Lithium	ND		0.030		mg/L		11/02/19 11:18	11/05/19 02:29	1
Selenium	ND		0.025		mg/L		11/02/19 11:18	11/05/19 02:29	1
Thallium	ND		0.020		mg/L		11/02/19 11:18	11/05/19 02:29	1

Lab Sample ID: MB 480-501773/1-A
Matrix: Water
Analysis Batch: 502567

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 501773

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		11/02/19 11:18	11/05/19 14:06	1
Lead	ND		0.010		mg/L		11/02/19 11:18	11/05/19 14:06	1
Molybdenum	ND		0.010		mg/L		11/02/19 11:18	11/05/19 14:06	1

Lab Sample ID: LCS 480-501773/2-A
Matrix: Water
Analysis Batch: 502328

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 501773

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.200	0.214		mg/L		107	80 - 120
Arsenic	0.200	0.198		mg/L		99	80 - 120
Barium	0.200	0.206		mg/L		103	80 - 120
Beryllium	0.200	0.204		mg/L		102	80 - 120
Cadmium	0.200	0.198		mg/L		99	80 - 120
Calcium	10.0	9.92		mg/L		99	80 - 120
Chromium	0.200	0.200		mg/L		100	80 - 120
Cobalt	0.200	0.188		mg/L		94	80 - 120
Lead	0.200	0.193		mg/L		96	80 - 120
Lithium	0.200	0.201		mg/L		101	80 - 120
Selenium	0.200	0.192		mg/L		96	80 - 120
Thallium	0.200	0.205		mg/L		102	80 - 120

Lab Sample ID: LCS 480-501773/2-A
Matrix: Water
Analysis Batch: 502567

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 501773

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.200	0.200		mg/L		100	80 - 120
Lead	0.200	0.193		mg/L		96	80 - 120
Molybdenum	0.200	0.205		mg/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 480-506901/1-A
Matrix: Water
Analysis Batch: 506955

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 506901

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		11/26/19 15:45	11/26/19 18:37	1

Lab Sample ID: LCS 480-506901/2-A
Matrix: Water
Analysis Batch: 506955

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 506901

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	6.67	6.88		ug/L		103	80 - 120

Lab Sample ID: 480-161871-1 MS
Matrix: Water
Analysis Batch: 506955

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 506901

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		6.67	6.92		ug/L		104	80 - 120

Lab Sample ID: 480-161871-1 MSD
Matrix: Water
Analysis Batch: 506955

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 506901

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		6.67	7.10		ug/L		106	80 - 120	3	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-507136/4
Matrix: Water
Analysis Batch: 507136

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.050		mg/L			11/28/19 00:29	1

Lab Sample ID: LCS 480-507136/3
Matrix: Water
Analysis Batch: 507136

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	5.00	5.45		mg/L		109	90 - 110

Lab Sample ID: 480-161871-6 MS
Matrix: Water
Analysis Batch: 507136

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	ND	H	25.0	27.02		mg/L		108	82 - 120

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-161871-6 MSD
Matrix: Water
Analysis Batch: 507136

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	ND	H	25.0	27.44		mg/L		110	82 - 120	2	15

Lab Sample ID: 480-161871-11 MS
Matrix: Water
Analysis Batch: 507136

Client Sample ID: EQUIPMENT BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	ND	H	5.00	5.57		mg/L		111	82 - 120

Method: D516-90, 02 - Sulfate

Lab Sample ID: MB 480-506719/129
Matrix: Water
Analysis Batch: 506719

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0		mg/L			11/26/19 01:28	1

Lab Sample ID: MB 480-506719/143
Matrix: Water
Analysis Batch: 506719

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0		mg/L			11/26/19 02:02	1

Lab Sample ID: MB 480-506719/94
Matrix: Water
Analysis Batch: 506719

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0		mg/L			11/26/19 00:39	1

Lab Sample ID: LCS 480-506719/130
Matrix: Water
Analysis Batch: 506719

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	30.0	30.45		mg/L		101	90 - 110

Lab Sample ID: LCS 480-506719/144
Matrix: Water
Analysis Batch: 506719

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	30.0	29.97		mg/L		100	90 - 110

Method: D516-90, 02 - Sulfate (Continued)

Lab Sample ID: LCS 480-506719/95
Matrix: Water
Analysis Batch: 506719

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			30.0	28.75		mg/L		96	90 - 110		

Lab Sample ID: 480-161871-10 MS
Matrix: Water
Analysis Batch: 506719

Client Sample ID: FIELD BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	ND		20.0	21.27		mg/L		106	60 - 128		

Lab Sample ID: 480-161871-10 MSD
Matrix: Water
Analysis Batch: 506719

Client Sample ID: FIELD BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	ND		20.0	19.77		mg/L		99	60 - 128	7	20

Lab Sample ID: 480-161871-11 MS
Matrix: Water
Analysis Batch: 506719

Client Sample ID: EQUIPMENT BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	ND		20.0	22.11		mg/L		111	60 - 128		

Lab Sample ID: 480-161871-11 MSD
Matrix: Water
Analysis Batch: 506719

Client Sample ID: EQUIPMENT BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	ND		20.0	18.12		mg/L		91	60 - 128	20	20

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

Lab Sample ID: MB 480-502098/1
Matrix: Water
Analysis Batch: 502098

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	ND		10.0		mg/L			11/04/19 10:39	1

Lab Sample ID: LCS 480-502098/2
Matrix: Water
Analysis Batch: 502098

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			500	520.0		mg/L		104	85 - 115		

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

Lab Sample ID: 480-161871-4 DU
Matrix: Water
Analysis Batch: 502098

Client Sample ID: MW-2RD
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	570			624.0		mg/L				9	10

Lab Sample ID: MB 480-502099/1
Matrix: Water
Analysis Batch: 502099

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	ND		10.0		mg/L			11/04/19 10:40	1

Lab Sample ID: LCS 480-502099/2
Matrix: Water
Analysis Batch: 502099

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			500	480.0		mg/L		96	85 - 115		

Lab Sample ID: 480-161871-2 DU
Matrix: Water
Analysis Batch: 502099

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	373			336.0		mg/L				10	10

Lab Sample ID: MB 480-502362/1
Matrix: Water
Analysis Batch: 502362

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	ND		10.0		mg/L			11/05/19 10:42	1

Lab Sample ID: LCS 480-502362/2
Matrix: Water
Analysis Batch: 502362

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			500	448.0		mg/L		90	85 - 115		

Lab Sample ID: 480-161871-8 DU
Matrix: Water
Analysis Batch: 502362

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	914			899.0		mg/L				2	10

Lab Sample ID: MB 480-502363/1
Matrix: Water
Analysis Batch: 502363

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	ND		10.0		mg/L			11/05/19 10:43	1

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

Lab Sample ID: LCS 480-502363/2
Matrix: Water
Analysis Batch: 502363

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			500	460.0		mg/L		92	85 - 115		

Lab Sample ID: 480-161871-9 DU
Matrix: Water
Analysis Batch: 502363

Client Sample ID: DUPLICATE
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	507			527.0		mg/L				4	10

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 480-506702/252
Matrix: Water
Analysis Batch: 506702

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			11/25/19 17:54	1

Lab Sample ID: MB 480-506702/281
Matrix: Water
Analysis Batch: 506702

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			11/25/19 18:07	1

Lab Sample ID: MB 480-506702/291
Matrix: Water
Analysis Batch: 506702

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			11/25/19 18:10	1

Lab Sample ID: LCS 480-506702/253
Matrix: Water
Analysis Batch: 506702

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			25.0	26.42		mg/L		106	90 - 110		

Lab Sample ID: LCS 480-506702/282
Matrix: Water
Analysis Batch: 506702

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			25.0	26.31		mg/L		105	90 - 110		

Method: SM 4500 Cl- E - Chloride, Total (Continued)

Lab Sample ID: LCS 480-506702/292
Matrix: Water
Analysis Batch: 506702

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	26.04		mg/L		104	90 - 110

Lab Sample ID: MB 480-506717/39
Matrix: Water
Analysis Batch: 506717

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			11/26/19 00:59	1

Lab Sample ID: MB 480-506717/79
Matrix: Water
Analysis Batch: 506717

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			11/26/19 01:47	1

Lab Sample ID: LCS 480-506717/40
Matrix: Water
Analysis Batch: 506717

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	26.53		mg/L		106	90 - 110

Lab Sample ID: LCS 480-506717/80
Matrix: Water
Analysis Batch: 506717

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	27.04		mg/L		108	90 - 110

Lab Sample ID: 480-161871-10 MS
Matrix: Water
Analysis Batch: 506717

Client Sample ID: FIELD BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND		20.0	20.54		mg/L		103	74 - 131

Lab Sample ID: 480-161871-10 MSD
Matrix: Water
Analysis Batch: 506717

Client Sample ID: FIELD BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	ND		20.0	20.57		mg/L		103	74 - 131	0	20

Lab Sample ID: 480-161871-11 MS
Matrix: Water
Analysis Batch: 506717

Client Sample ID: EQUIPMENT BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND		20.0	20.32		mg/L		102	74 - 131

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

Job ID: 480-161871-1

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: 480-161871-11 MSD
Matrix: Water
Analysis Batch: 506717

Client Sample ID: EQUIPMENT BLANK
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	ND		20.0	20.58		mg/L		103	74 - 131	1	20

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-504334/1
Matrix: Water
Analysis Batch: 504334

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	99 - 101		

Lab Sample ID: 480-161871-1 DU
Matrix: Water
Analysis Batch: 504334

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.3	HF		7.4		SU				1	5
Temperature	17.8	HF		18.0		Degrees C				1	10

Lab Sample ID: LCS 480-504921/1
Matrix: Water
Analysis Batch: 504921

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	99 - 101		

Metals

Prep Batch: 501773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	3005A	
480-161871-2	MW-1RD	Total/NA	Water	3005A	
480-161871-3	MW-2R	Total/NA	Water	3005A	
480-161871-4	MW-2RD	Total/NA	Water	3005A	
480-161871-5	MW-3	Total/NA	Water	3005A	
480-161871-6	MW-3R	Total/NA	Water	3005A	
480-161871-7	MW-3RD	Total/NA	Water	3005A	
480-161871-8	MW-4	Total/NA	Water	3005A	
480-161871-9	DUPLICATE	Total/NA	Water	3005A	
480-161871-10	FIELD BLANK	Total/NA	Water	3005A	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	3005A	
MB 480-501773/1-A	Method Blank	Total/NA	Water	3005A	
LCS 480-501773/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 502328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	6010D	501773
480-161871-2	MW-1RD	Total/NA	Water	6010D	501773
480-161871-3	MW-2R	Total/NA	Water	6010D	501773
480-161871-4	MW-2RD	Total/NA	Water	6010D	501773
480-161871-5	MW-3	Total/NA	Water	6010D	501773
480-161871-6	MW-3R	Total/NA	Water	6010D	501773
480-161871-7	MW-3RD	Total/NA	Water	6010D	501773
480-161871-8	MW-4	Total/NA	Water	6010D	501773
480-161871-9	DUPLICATE	Total/NA	Water	6010D	501773
480-161871-10	FIELD BLANK	Total/NA	Water	6010D	501773
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	6010D	501773
MB 480-501773/1-A	Method Blank	Total/NA	Water	6010D	501773
LCS 480-501773/2-A	Lab Control Sample	Total/NA	Water	6010D	501773

Analysis Batch: 502567

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	6010D	501773
480-161871-4	MW-2RD	Total/NA	Water	6010D	501773
MB 480-501773/1-A	Method Blank	Total/NA	Water	6010D	501773
LCS 480-501773/2-A	Lab Control Sample	Total/NA	Water	6010D	501773

Analysis Batch: 506778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-2	MW-1RD	Total/NA	Water	6010D	501773
480-161871-3	MW-2R	Total/NA	Water	6010D	501773
480-161871-5	MW-3	Total/NA	Water	6010D	501773
480-161871-6	MW-3R	Total/NA	Water	6010D	501773
480-161871-7	MW-3RD	Total/NA	Water	6010D	501773
480-161871-8	MW-4	Total/NA	Water	6010D	501773
480-161871-9	DUPLICATE	Total/NA	Water	6010D	501773
480-161871-10	FIELD BLANK	Total/NA	Water	6010D	501773
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	6010D	501773

Metals

Prep Batch: 506901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	7470A	
480-161871-2	MW-1RD	Total/NA	Water	7470A	
480-161871-3	MW-2R	Total/NA	Water	7470A	
480-161871-4	MW-2RD	Total/NA	Water	7470A	
480-161871-5	MW-3	Total/NA	Water	7470A	
480-161871-6	MW-3R	Total/NA	Water	7470A	
480-161871-7	MW-3RD	Total/NA	Water	7470A	
480-161871-8	MW-4	Total/NA	Water	7470A	
480-161871-9	DUPLICATE	Total/NA	Water	7470A	
480-161871-10	FIELD BLANK	Total/NA	Water	7470A	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	7470A	
MB 480-506901/1-A	Method Blank	Total/NA	Water	7470A	
LCS 480-506901/2-A	Lab Control Sample	Total/NA	Water	7470A	
480-161871-1 MS	MW-1	Total/NA	Water	7470A	
480-161871-1 MSD	MW-1	Total/NA	Water	7470A	

Analysis Batch: 506955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	7470A	506901
480-161871-2	MW-1RD	Total/NA	Water	7470A	506901
480-161871-3	MW-2R	Total/NA	Water	7470A	506901
480-161871-4	MW-2RD	Total/NA	Water	7470A	506901
480-161871-5	MW-3	Total/NA	Water	7470A	506901
480-161871-6	MW-3R	Total/NA	Water	7470A	506901
480-161871-7	MW-3RD	Total/NA	Water	7470A	506901
480-161871-8	MW-4	Total/NA	Water	7470A	506901
480-161871-9	DUPLICATE	Total/NA	Water	7470A	506901
480-161871-10	FIELD BLANK	Total/NA	Water	7470A	506901
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	7470A	506901
MB 480-506901/1-A	Method Blank	Total/NA	Water	7470A	506901
LCS 480-506901/2-A	Lab Control Sample	Total/NA	Water	7470A	506901
480-161871-1 MS	MW-1	Total/NA	Water	7470A	506901
480-161871-1 MSD	MW-1	Total/NA	Water	7470A	506901

General Chemistry

Analysis Batch: 502098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-4	MW-2RD	Total/NA	Water	SM 2540C	
MB 480-502098/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-502098/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-161871-4 DU	MW-2RD	Total/NA	Water	SM 2540C	

Analysis Batch: 502099

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	SM 2540C	
480-161871-2	MW-1RD	Total/NA	Water	SM 2540C	
480-161871-3	MW-2R	Total/NA	Water	SM 2540C	
MB 480-502099/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-502099/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-161871-2 DU	MW-1RD	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 502362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-5	MW-3	Total/NA	Water	SM 2540C	
480-161871-6	MW-3R	Total/NA	Water	SM 2540C	
480-161871-7	MW-3RD	Total/NA	Water	SM 2540C	
480-161871-8	MW-4	Total/NA	Water	SM 2540C	
MB 480-502362/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-502362/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-161871-8 DU	MW-4	Total/NA	Water	SM 2540C	

Analysis Batch: 502363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-9	DUPLICATE	Total/NA	Water	SM 2540C	
480-161871-10	FIELD BLANK	Total/NA	Water	SM 2540C	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	SM 2540C	
MB 480-502363/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-502363/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-161871-9 DU	DUPLICATE	Total/NA	Water	SM 2540C	

Analysis Batch: 504334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	SM 4500 H+ B	
480-161871-2	MW-1RD	Total/NA	Water	SM 4500 H+ B	
480-161871-3	MW-2R	Total/NA	Water	SM 4500 H+ B	
480-161871-4	MW-2RD	Total/NA	Water	SM 4500 H+ B	
480-161871-6	MW-3R	Total/NA	Water	SM 4500 H+ B	
480-161871-7	MW-3RD	Total/NA	Water	SM 4500 H+ B	
480-161871-10	FIELD BLANK	Total/NA	Water	SM 4500 H+ B	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	SM 4500 H+ B	
LCS 480-504334/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
480-161871-1 DU	MW-1	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 504921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-5	MW-3	Total/NA	Water	SM 4500 H+ B	
480-161871-8	MW-4	Total/NA	Water	SM 4500 H+ B	
480-161871-9	DUPLICATE	Total/NA	Water	SM 4500 H+ B	
LCS 480-504921/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 506702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	SM 4500 Cl- E	
480-161871-2	MW-1RD	Total/NA	Water	SM 4500 Cl- E	
480-161871-3	MW-2R	Total/NA	Water	SM 4500 Cl- E	
480-161871-4	MW-2RD	Total/NA	Water	SM 4500 Cl- E	
480-161871-5	MW-3	Total/NA	Water	SM 4500 Cl- E	
480-161871-6	MW-3R	Total/NA	Water	SM 4500 Cl- E	
480-161871-7	MW-3RD	Total/NA	Water	SM 4500 Cl- E	
480-161871-8	MW-4	Total/NA	Water	SM 4500 Cl- E	
480-161871-9	DUPLICATE	Total/NA	Water	SM 4500 Cl- E	
MB 480-506702/252	Method Blank	Total/NA	Water	SM 4500 Cl- E	
MB 480-506702/281	Method Blank	Total/NA	Water	SM 4500 Cl- E	
MB 480-506702/291	Method Blank	Total/NA	Water	SM 4500 Cl- E	

General Chemistry (Continued)

Analysis Batch: 506702 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-506702/253	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
LCS 480-506702/282	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
LCS 480-506702/292	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 506717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-10	FIELD BLANK	Total/NA	Water	SM 4500 Cl- E	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	SM 4500 Cl- E	
MB 480-506717/39	Method Blank	Total/NA	Water	SM 4500 Cl- E	
MB 480-506717/79	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 480-506717/40	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
LCS 480-506717/80	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
480-161871-10 MS	FIELD BLANK	Total/NA	Water	SM 4500 Cl- E	
480-161871-10 MSD	FIELD BLANK	Total/NA	Water	SM 4500 Cl- E	
480-161871-11 MS	EQUIPMENT BLANK	Total/NA	Water	SM 4500 Cl- E	
480-161871-11 MSD	EQUIPMENT BLANK	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 506719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	D516-90, 02	
480-161871-2	MW-1RD	Total/NA	Water	D516-90, 02	
480-161871-3	MW-2R	Total/NA	Water	D516-90, 02	
480-161871-4	MW-2RD	Total/NA	Water	D516-90, 02	
480-161871-5	MW-3	Total/NA	Water	D516-90, 02	
480-161871-6	MW-3R	Total/NA	Water	D516-90, 02	
480-161871-7	MW-3RD	Total/NA	Water	D516-90, 02	
480-161871-8	MW-4	Total/NA	Water	D516-90, 02	
480-161871-9	DUPLICATE	Total/NA	Water	D516-90, 02	
480-161871-10	FIELD BLANK	Total/NA	Water	D516-90, 02	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	D516-90, 02	
MB 480-506719/129	Method Blank	Total/NA	Water	D516-90, 02	
MB 480-506719/143	Method Blank	Total/NA	Water	D516-90, 02	
MB 480-506719/94	Method Blank	Total/NA	Water	D516-90, 02	
LCS 480-506719/130	Lab Control Sample	Total/NA	Water	D516-90, 02	
LCS 480-506719/144	Lab Control Sample	Total/NA	Water	D516-90, 02	
LCS 480-506719/95	Lab Control Sample	Total/NA	Water	D516-90, 02	
480-161871-10 MS	FIELD BLANK	Total/NA	Water	D516-90, 02	
480-161871-10 MSD	FIELD BLANK	Total/NA	Water	D516-90, 02	
480-161871-11 MS	EQUIPMENT BLANK	Total/NA	Water	D516-90, 02	
480-161871-11 MSD	EQUIPMENT BLANK	Total/NA	Water	D516-90, 02	

Analysis Batch: 507136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-1	MW-1	Total/NA	Water	300.0	
480-161871-2	MW-1RD	Total/NA	Water	300.0	
480-161871-3	MW-2R	Total/NA	Water	300.0	
480-161871-4	MW-2RD	Total/NA	Water	300.0	
480-161871-5	MW-3	Total/NA	Water	300.0	
480-161871-6	MW-3R	Total/NA	Water	300.0	
480-161871-7	MW-3RD	Total/NA	Water	300.0	
480-161871-8	MW-4	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 507136 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-161871-9	DUPLICATE	Total/NA	Water	300.0	
480-161871-10	FIELD BLANK	Total/NA	Water	300.0	
480-161871-11	EQUIPMENT BLANK	Total/NA	Water	300.0	
MB 480-507136/4	Method Blank	Total/NA	Water	300.0	
LCS 480-507136/3	Lab Control Sample	Total/NA	Water	300.0	
480-161871-6 MS	MW-3R	Total/NA	Water	300.0	
480-161871-6 MSD	MW-3R	Total/NA	Water	300.0	
480-161871-11 MS	EQUIPMENT BLANK	Total/NA	Water	300.0	

Lab Chronicle

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

Job ID: 480-161871-1

Client Sample ID: MW-1

Date Collected: 10/29/19 08:35
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:09	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502567	11/05/19 14:31	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:39	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 00:43	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		5	506719	11/26/19 01:44	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502099	11/04/19 10:40	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		2	506702	11/25/19 18:14	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 16:51	DSC	TAL BUF

Client Sample ID: MW-1RD

Date Collected: 10/29/19 08:40
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:13	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:30	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:44	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 00:57	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		2	506719	11/26/19 01:23	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502099	11/04/19 10:40	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:08	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 16:58	DSC	TAL BUF

Client Sample ID: MW-2R

Date Collected: 10/29/19 09:30
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:17	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:33	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:46	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 01:12	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		3	506719	11/26/19 02:03	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502099	11/04/19 10:40	CSS	TAL BUF

Lab Chronicle

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

Job ID: 480-161871-1

Client Sample ID: MW-2R
Date Collected: 10/29/19 09:30
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 Cl- E		3	506702	11/25/19 18:14	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:02	DSC	TAL BUF

Client Sample ID: MW-2RD
Date Collected: 10/29/19 10:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:20	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502567	11/05/19 14:35	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:47	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 01:26	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		3	506719	11/26/19 01:23	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502098	11/04/19 10:39	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:08	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:06	DSC	TAL BUF

Client Sample ID: MW-3
Date Collected: 10/29/19 11:00
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:24	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:37	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:48	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 01:40	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		1	506719	11/26/19 01:24	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502362	11/05/19 10:42	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		2	506702	11/25/19 18:14	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504921	11/16/19 00:06	AEF	TAL BUF

Client Sample ID: MW-3R
Date Collected: 10/29/19 10:50
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:39	LMH	TAL BUF

Lab Chronicle

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

Job ID: 480-161871-1

Client Sample ID: MW-3R

Lab Sample ID: 480-161871-6

Date Collected: 10/29/19 10:50
Matrix: Water
Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:41	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:52	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 01:54	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		1	506719	11/26/19 01:24	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502362	11/05/19 10:42	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:08	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:08	DSC	TAL BUF

Client Sample ID: MW-3RD

Lab Sample ID: 480-161871-7

Date Collected: 10/29/19 11:35
Matrix: Water
Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:43	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:44	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:54	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 03:05	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		5	506719	11/26/19 02:03	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502362	11/05/19 10:42	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:08	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:12	DSC	TAL BUF

Client Sample ID: MW-4

Lab Sample ID: 480-161871-8

Date Collected: 10/29/19 13:00
Matrix: Water
Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:46	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 17:59	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:55	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 03:19	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		10	506719	11/26/19 01:45	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502362	11/05/19 10:42	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:13	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504921	11/16/19 00:09	AEF	TAL BUF

Client Sample ID: DUPLICATE

Lab Sample ID: 480-161871-9

Date Collected: 10/29/19 00:00

Matrix: Water

Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:50	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 18:03	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:56	BMB	TAL BUF
Total/NA	Analysis	300.0		5	507136	11/28/19 03:33	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		5	506719	11/26/19 01:25	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502363	11/05/19 10:43	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506702	11/25/19 18:13	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504921	11/16/19 00:11	AEF	TAL BUF

Client Sample ID: FIELD BLANK

Lab Sample ID: 480-161871-10

Date Collected: 10/29/19 13:10

Matrix: Water

Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:54	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 18:07	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:57	BMB	TAL BUF
Total/NA	Analysis	300.0		1	507136	11/28/19 03:47	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		1	506719	11/26/19 01:26	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502363	11/05/19 10:43	CSS	TAL BUF
Total/NA	Analysis	SM 4500 Cl- E		1	506717	11/26/19 01:47	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:15	DSC	TAL BUF

Client Sample ID: EQUIPMENT BLANK

Lab Sample ID: 480-161871-11

Date Collected: 10/29/19 13:20

Matrix: Water

Date Received: 10/31/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	502328	11/05/19 03:58	LMH	TAL BUF
Total/NA	Prep	3005A			501773	11/02/19 11:18	JLC	TAL BUF
Total/NA	Analysis	6010D		1	506778	11/25/19 18:10	LMH	TAL BUF
Total/NA	Prep	7470A			506901	11/26/19 15:45	BMB	TAL BUF
Total/NA	Analysis	7470A		1	506955	11/26/19 18:59	BMB	TAL BUF
Total/NA	Analysis	300.0		1	507136	11/28/19 04:02	IMZ	TAL BUF
Total/NA	Analysis	D516-90, 02		1	506719	11/26/19 01:45	SRW	TAL BUF
Total/NA	Analysis	SM 2540C		1	502363	11/05/19 10:43	CSS	TAL BUF

Lab Chronicle

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

Job ID: 480-161871-1

Client Sample ID: EQUIPMENT BLANK

Date Collected: 10/29/19 13:20
Date Received: 10/31/19 09:30

Lab Sample ID: 480-161871-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 Cl- E		1	506717	11/26/19 01:05	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	504334	11/13/19 17:17	DSC	TAL BUF

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 480-161871-1
Project/Site: SKB Lansing - CCR Groundwater

Laboratory: Eurofins TestAmerica, Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Minnesota	NELAP	036-999-337	12-31-19 *

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6010D	3005A	Water	Lithium
SM 4500 H+ B		Water	pH
SM 4500 H+ B		Water	Temperature

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

Method Summary

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

Job ID: 480-161871-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	TAL BUF
7470A	Mercury (CVAA)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
D516-90, 02	Sulfate	ASTM	TAL BUF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL BUF
SM 4500 Cl- E	Chloride, Total	SM	TAL BUF
SM 4500 H+ B	pH	SM	TAL BUF
3005A	Preparation, Total Metals	SW846	TAL BUF
7470A	Preparation, Mercury	SW846	TAL BUF

Protocol References:

ASTM = ASTM International

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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.

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

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

Job ID: 480-161871-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-161871-1	MW-1	Water	10/29/19 08:35	10/31/19 09:30	
480-161871-2	MW-1RD	Water	10/29/19 08:40	10/31/19 09:30	
480-161871-3	MW-2R	Water	10/29/19 09:30	10/31/19 09:30	
480-161871-4	MW-2RD	Water	10/29/19 10:00	10/31/19 09:30	
480-161871-5	MW-3	Water	10/29/19 11:00	10/31/19 09:30	
480-161871-6	MW-3R	Water	10/29/19 10:50	10/31/19 09:30	
480-161871-7	MW-3RD	Water	10/29/19 11:35	10/31/19 09:30	
480-161871-8	MW-4	Water	10/29/19 13:00	10/31/19 09:30	
480-161871-9	DUPLICATE	Water	10/29/19 00:00	10/31/19 09:30	
480-161871-10	FIELD BLANK	Water	10/29/19 13:10	10/31/19 09:30	
480-161871-11	EQUIPMENT BLANK	Water	10/29/19 13:20	10/31/19 09:30	

Quantitation Limit Exceptions Summary

Client: Waste Connections, Inc. Job ID: 480-161871-1
Project/Site: SKB Lansing - CCR Groundwater

The requested project specific reporting limits listed below were less than laboratory standard quantitation limits (PQL) but greater than or equal to the laboratory method detection limits (MDL). It must be noted that results reported below lab standard quantitation limits may result in false positive/false negative values and less accurate quantitation. Routine laboratory procedures do not indicate corrective action for detections below the laboratory's PQL.

Method	Analyte	Matrix	Prep Type	Unit	Client RL	Lab PQL
D516-90, 02	Sulfate	Water	Total/NA	mg/L	2.0	5.0
SM 4500 Cl- E	Chloride	Water	Total/NA	mg/L	0.50	1.0

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

TestAmerica Minneapolis SC 213

eurofins | Environment Testing TestAmerica

Client Information	Sampler: N. Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-137219-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6065	E-Mail: ryan.vandette@testamericainc.com		Page: Page 1 of 1
Company: Waste Connections, Inc.				Job #:

Address: 13425 Courthouse Blvd	Due Date Requested:
City: Rosemount	TAT Requested (days): standard
State, Zip: MN, 55068	
Phone:	PO #: Purchase Order Requested 3064-19-00257
Email: nathanielb@wcnx.org	WO #:
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	Project #: 48013603
Site: Minnesota	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, 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)

480-161871 Chain of Custody

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)	300.0_28D - Cl/F/SO4	6010D - B/Ca	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	Total Numi	Special Instructions/Note:
			Preservation Code:				N	D	N	N		
MW-1	10/29/19	8:35	6	Water			X	X	X	X		
MW-3		11:00	6	Water								
Duplicate		—	6	Water								
Field Blank		13:10	6	Water								
Equip Blank		13:20	6	Water								
MW-1RD		8:40	6	Water								
MW-2RD		10:00	6	Water								
MW-2R		9:30	6	Water								
MW-3RD		11:35	6	Water								
MW-3R		10:50	6	Water								
MW-4		13:00	6	Water								

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: 10/30/19 1500	Company: GES	Received by:	Date/Time: 10-30-19 1520	Company: Eurofins
Relinquished by:	Date/Time: 10-30-19 1730	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/31/19 9:30	Company: JWB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks: 2.7 #1

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-161871-1

Login Number: 161871
List Number: 1
Creator: Harper, Marcus D

List Source: Eurofins TestAmerica, Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
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 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.	N/A	
Chlorine Residual checked.	N/A	

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ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-36814-1
Client Project/Site: SKB Lansing - CCR Groundwater

For:
Waste Connections, Inc.
13425 Courthouse Blvd
Rosemount, Minnesota 55068

Attn: Nathaniel Beinemann

Authorized for release by:
1/17/2020 9:22:25 AM

Ryan VanDette, Project Manager II
(716)504-9830
ryan.vandette@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 160-36814-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

Job Narrative
160-36814-1

Comments
No additional comments.

Receipt
The samples were received on 12/21/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0º C.

RAD
Method PrecSep_0: Radium 228 Prep batch 160-455029: Sample 36750-1 was reduced due to heavy brown sediment. Samples 36814-1,2, and 6 were reduced due to yellow discoloration. Sample 36814-7 was reduced due to a cloudy appearance.Sample 36806-1 was reduced due to yellow discoloration. Samples 36804-1 and 36805-1 were reduced due to brown discoloration, a cloudy appearance, and leaf fragments floating in the water: MW-3 (160-36814-2), MW-2R (160-36814-4), MW-3R (160-36814-6) and MW-3RD (160-36814-7). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep batch 160-455027: Sample 36750-1 was reduced due to heavy brown sediment. Samples 36814-1,2, and 6 were reduced due to yellow discoloration. Sample 36814-7 was reduced due to a cloudy appearance.Sample 36806-1 was reduced due to yellow discoloration. Samples 36804-1 and 36805-1 were reduced due to brown discoloration, a cloudy appearance, and leaf fragments floating in the water: MW-3 (160-36814-2), MW-2R (160-36814-4), MW-3R (160-36814-6) and MW-3RD (160-36814-7). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium 228 Prep Batch 160-455029: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (160-36814-1), MW-3 (160-36814-2), MW-1RD (160-36814-3), MW-2R (160-36814-4), MW-2RD (160-36814-5), MW-3R (160-36814-6), MW-3RD (160-36814-7) and MW-4 (160-36814-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-455027: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (160-36814-1), MW-3 (160-36814-2), MW-1RD (160-36814-3), MW-2R (160-36814-4), MW-2RD (160-36814-5), MW-3R (160-36814-6), MW-3RD (160-36814-7) and MW-4 (160-36814-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method 904.0: Radium-228 Prep Batch 160-455029: Any 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 (160-36814-1), MW-3 (160-36814-2), MW-1RD (160-36814-3), MW-2R (160-36814-4), MW-2RD (160-36814-5), MW-3R (160-36814-6), MW-3RD (160-36814-7), MW-4 (160-36814-8), (LCS 160-455029/1-A), (LCSD 160-455029/2-A) and (MB 160-455029/15-A)

Method 903.0: Radium-226 Prep Batch 160-455027: Any 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 (160-36814-1), MW-3 (160-36814-2), MW-1RD (160-36814-3), MW-2R (160-36814-4), MW-2RD (160-36814-5), MW-3R (160-36814-6), MW-3RD (160-36814-7), MW-4 (160-36814-8), (LCS 160-455027/1-A), (LCSD 160-455027/2-A) and (MB 160-455027/15-A)

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

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

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TestAmerica Minneapolis SC

Client Information	Sampler: N-Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-139870-31430.1
Client Contact: Mr. Nicholas Schlagel	Phone: 651-792-6065	E-Mail: ryan.vandette@testamericainc.com		Page: Page 1 of 1
Company: Groundwater & Environmental Services Inc				Job #:
Address: 1285 Corporate Center Dr Suite 120	Due Date Requested:			
City: Eagan	TAT Requested (days): Standard			
State, Zip: MN, 55121-1562				
Phone:	PO #: Purchase Order Requested 3064-19-00303			
Email: NSchlagel@gesonline.com	WO #:			
Project Name: SKB Lansing	Project #: 48013603			
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)	903.0 - Standard Target List: Radium 226	904.0 - Standard Target List: Radium 228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
MW-1	12/20/19	10:10	G	Water			X	X		
MW-3		11:10		Water						
MW-1RD		10:15		Water						
MW-2R		10:40		Water						
MW-2RD		10:45		Water						
MW-3R		11:05		Water						
MW-3RD		11:15		Water						
MW-4		11:45		Water						
~~DUP-1~~				~~Water~~						

160-36814 Chain of Custody

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: 12/24/19	13:30	Company: GES	Received by: Thomas G. Lei	Date/Time: 12-20-19	13:30	Company: EUROFINS
Relinquished by: Thomas G. Lei	Date/Time: 12-20-19	17:00	Company: EUROFINS	Received by:	Date/Time: 12/21/19	5:15	Company: GTATA
Relinquished by:	Date/Time:		Company:	Received by:	Date/Time:		Company:

Custody Seals Intact: ☐ Yes ☐ 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: 160-36814-1

Login Number: 36814
List Number: 1
Creator: Press, Nicholas B

List Source: Eurofins TestAmerica, St. Louis

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
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 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	

Definitions/Glossary

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

Job ID: 160-36814-1

Qualifiers

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Method Summary

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

Job ID: 160-36814-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

Laboratory References:

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

Sample Summary

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

Job ID: 160-36814-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-36814-1	MW-1	Water	12/20/19 10:10	12/21/19 09:15	
160-36814-2	MW-3	Water	12/20/19 11:10	12/21/19 09:15	
160-36814-3	MW-1RD	Water	12/20/19 10:15	12/21/19 09:15	
160-36814-4	MW-2R	Water	12/20/19 10:40	12/21/19 09:15	
160-36814-5	MW-2RD	Water	12/20/19 10:45	12/21/19 09:15	
160-36814-6	MW-3R	Water	12/20/19 11:05	12/21/19 09:15	
160-36814-7	MW-3RD	Water	12/20/19 11:15	12/21/19 09:15	
160-36814-8	MW-4	Water	12/20/19 11:45	12/21/19 09:15	

Detection Summary

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

Job ID: 160-36814-1

Client Sample ID: MW-1 — Lab Sample ID: 160-36814-1

No Detections.

Client Sample ID: MW-3 — Lab Sample ID: 160-36814-2

No Detections.

Client Sample ID: MW-1RD — Lab Sample ID: 160-36814-3

No Detections.

Client Sample ID: MW-2R — Lab Sample ID: 160-36814-4

No Detections.

Client Sample ID: MW-2RD — Lab Sample ID: 160-36814-5

No Detections.

Client Sample ID: MW-3R — Lab Sample ID: 160-36814-6

No Detections.

Client Sample ID: MW-3RD — Lab Sample ID: 160-36814-7

No Detections.

Client Sample ID: MW-4 — Lab Sample ID: 160-36814-8

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1

Lab Sample ID: 160-36814-1
Matrix: Water
Date Collected: 12/20/19 10:10
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.148		0.0991	0.100	1.00	0.141	pCi/L	12/24/19 07:28	01/16/20 12:31	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.5		40 - 110	12/24/19 07:28	01/16/20 12:31	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.296	U	0.287	0.288	1.00	0.465	pCi/L	12/24/19 07:43	01/07/20 18:29	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.5		40 - 110	12/24/19 07:43	01/07/20 18:29	1
Y Carrier	89.6		40 - 110	12/24/19 07:43	01/07/20 18:29	1

Client Sample ID: MW-3

Lab Sample ID: 160-36814-2
Matrix: Water
Date Collected: 12/20/19 11:10
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.329		0.129	0.133	1.00	0.138	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.9		40 - 110	12/24/19 07:28	01/16/20 14:47	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.559		0.360	0.364	1.00	0.556	pCi/L	12/24/19 07:43	01/07/20 18:29	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.9		40 - 110	12/24/19 07:43	01/07/20 18:29	1
Y Carrier	87.2		40 - 110	12/24/19 07:43	01/07/20 18:29	1

Client Sample ID: MW-1RD

Lab Sample ID: 160-36814-3
Matrix: Water
Date Collected: 12/20/19 10:15
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.254		0.0994	0.102	1.00	0.108	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.4		40 - 110	12/24/19 07:28	01/16/20 14:47	1

Client Sample ID: MW-1RD
Lab Sample ID: 160-36814-3
Date Collected: 12/20/19 10:15
Matrix: Water
Date Received: 12/21/19 09:15

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.510		0.257	0.261	1.00	0.372	pCi/L	12/24/19 07:43	01/07/20 18:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.4*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:30*	*1*
Y Carrier	*86.9*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:30*	*1*

Client Sample ID: MW-2R
Lab Sample ID: 160-36814-4
Date Collected: 12/20/19 10:40
Matrix: Water
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.124	U	0.109	0.109	1.00	0.167	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.8*		*40 - 110*	*12/24/19 07:28*	*01/16/20 14:47*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.635		0.349	0.354	1.00	0.520	pCi/L	12/24/19 07:43	01/07/20 18:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.8*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:30*	*1*
Y Carrier	*87.8*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:30*	*1*

Client Sample ID: MW-2RD
Lab Sample ID: 160-36814-5
Date Collected: 12/20/19 10:45
Matrix: Water
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.392		0.120	0.125	1.00	0.116	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.7*		*40 - 110*	*12/24/19 07:28*	*01/16/20 14:47*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.317	U	0.281	0.283	1.00	0.453	pCi/L	12/24/19 07:43	01/07/20 18:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.7*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:30*	*1*

Client Sample ID: MW-2RD
Lab Sample ID: 160-36814-5
Date Collected: 12/20/19 10:45
Matrix: Water
Date Received: 12/21/19 09:15

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Y Carrier	87.8		40 - 110	12/24/19 07:43	01/07/20 18:30	1

Client Sample ID: MW-3R
Lab Sample ID: 160-36814-6
Date Collected: 12/20/19 11:05
Matrix: Water
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.494		0.169	0.174	1.00	0.177	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.6		40 - 110	12/24/19 07:28	01/16/20 14:47	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.88		0.559	0.585	1.00	0.757	pCi/L	12/24/19 07:43	01/07/20 18:34	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.6		40 - 110	12/24/19 07:43	01/07/20 18:34	1
Y Carrier	88.4		40 - 110	12/24/19 07:43	01/07/20 18:34	1

Client Sample ID: MW-3RD
Lab Sample ID: 160-36814-7
Date Collected: 12/20/19 11:15
Matrix: Water
Date Received: 12/21/19 09:15

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.658		0.179	0.189	1.00	0.137	pCi/L	12/24/19 07:28	01/16/20 14:47	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	82.1		40 - 110	12/24/19 07:28	01/16/20 14:47	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.810		0.470	0.476	1.00	0.717	pCi/L	12/24/19 07:43	01/07/20 18:35	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	82.1		40 - 110	12/24/19 07:43	01/07/20 18:35	1
Y Carrier	86.0		40 - 110	12/24/19 07:43	01/07/20 18:35	1

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

Job ID: 160-36814-1

Client Sample ID: MW-4

Date Collected: 12/20/19 11:45
Date Received: 12/21/19 09:15

Lab Sample ID: 160-36814-8

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.290		0.103	0.106	1.00	0.0980	pCi/L	12/24/19 07:28	01/16/20 14:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.4*		*40 - 110*	*12/24/19 07:28*	*01/16/20 14:48*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.767		0.349	0.356	1.00	0.513	pCi/L	12/24/19 07:43	01/07/20 18:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.4*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:35*	*1*
Y Carrier	*85.1*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:35*	*1*

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-455027/15-A
Matrix: Water
Analysis Batch: 456989

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455027

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.01866	U	0.0547	0.0548	1.00	0.120	pCi/L	12/24/19 07:28	01/16/20 14:48	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.9*		*40 - 110*	*12/24/19 07:28*	*01/16/20 14:48*	*1*

Lab Sample ID: LCS 160-455027/1-A
Matrix: Water
Analysis Batch: 456989

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455027

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	9.374		0.989	1.00	0.129	pCi/L	83	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.9*		*40 - 110*

Lab Sample ID: LCSD 160-455027/2-A
Matrix: Water
Analysis Batch: 456989

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455027

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.3	9.682		1.03	1.00	0.104	pCi/L	85	75 - 125	0.15	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*95.1*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-455029/15-A
Matrix: Water
Analysis Batch: 456070

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455029

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1282	U	0.256	0.256	1.00	0.473	pCi/L	12/24/19 07:43	01/07/20 18:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.9*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:35*	*1*
Y Carrier	*87.2*		*40 - 110*	*12/24/19 07:43*	*01/07/20 18:35*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-455029/1-A
Matrix: Water
Analysis Batch: 456071

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455029

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.22	8.995		1.07	1.00	0.415	pCi/L	98	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.9*		*40 - 110*
Y Carrier	*88.7*		*40 - 110*

Lab Sample ID: LCSD 160-455029/2-A
Matrix: Water
Analysis Batch: 456071

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455029

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.22	9.061		1.10	1.00	0.467	pCi/L	98	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*95.1*		*40 - 110*
Y Carrier	*80.1*		*40 - 110*

QC Association Summary

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

Job ID: 160-36814-1

Rad

Prep Batch: 455027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36814-1	MW-1	Total/NA	Water	PrecSep-21	
160-36814-2	MW-3	Total/NA	Water	PrecSep-21	
160-36814-3	MW-1RD	Total/NA	Water	PrecSep-21	
160-36814-4	MW-2R	Total/NA	Water	PrecSep-21	
160-36814-5	MW-2RD	Total/NA	Water	PrecSep-21	
160-36814-6	MW-3R	Total/NA	Water	PrecSep-21	
160-36814-7	MW-3RD	Total/NA	Water	PrecSep-21	
160-36814-8	MW-4	Total/NA	Water	PrecSep-21	
MB 160-455027/15-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-455027/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-455027/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 455029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36814-1	MW-1	Total/NA	Water	PrecSep_0	
160-36814-2	MW-3	Total/NA	Water	PrecSep_0	
160-36814-3	MW-1RD	Total/NA	Water	PrecSep_0	
160-36814-4	MW-2R	Total/NA	Water	PrecSep_0	
160-36814-5	MW-2RD	Total/NA	Water	PrecSep_0	
160-36814-6	MW-3R	Total/NA	Water	PrecSep_0	
160-36814-7	MW-3RD	Total/NA	Water	PrecSep_0	
160-36814-8	MW-4	Total/NA	Water	PrecSep_0	
MB 160-455029/15-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-455029/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-455029/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Tracer/Carrier Summary

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

Job ID: 160-36814-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)
160-36814-1	MW-1	85.5
160-36814-2	MW-3	96.9
160-36814-3	MW-1RD	95.4
160-36814-4	MW-2R	94.8
160-36814-5	MW-2RD	95.7
160-36814-6	MW-3R	84.6
160-36814-7	MW-3RD	82.1
160-36814-8	MW-4	90.4
LCS 160-455027/1-A	Lab Control Sample	96.9
LCSD 160-455027/2-A	Lab Control Sample Dup	95.1
MB 160-455027/15-A	Method Blank	96.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)	Y Carrier (40-110)
160-36814-1	MW-1	85.5	89.6
160-36814-2	MW-3	96.9	87.2
160-36814-3	MW-1RD	95.4	86.9
160-36814-4	MW-2R	94.8	87.8
160-36814-5	MW-2RD	95.7	87.8
160-36814-6	MW-3R	84.6	88.4
160-36814-7	MW-3RD	82.1	86.0
160-36814-8	MW-4	90.4	85.1
LCS 160-455029/1-A	Lab Control Sample	96.9	88.7
LCSD 160-455029/2-A	Lab Control Sample Dup	95.1	80.1
MB 160-455029/15-A	Method Blank	96.9	87.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

Appendix C – Statistical Evaluation Data

1				**Background Statistics for Uncensored Full Data Sets**								
2			**User Selected Options**									
3			Date/Time of Computation	ProUCL 5.11/28/2020 4:12:59 PM								
4			From File	C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Lansing Facility\2019 annual_lansing ProUCLraw.x								
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	**MW-1|Antimony|T^report_result_value**											
12												
13	**General Statistics**											
14						Total Number of Observations	84			Number of Distinct Observations	3		
15						Minimum	3.6000E-4			First Quartile	0.001	
16						Second Largest	0.02			Median	0.001	
17						Maximum	0.02			Third Quartile	0.001	
18						Mean	0.00371			SD	0.00669	
19						Coefficient of Variation	1.805			Skewness	2.078	
20						Mean of logged Data	-6.492			SD of logged Data	1.065	
21												
22						**Critical Values for Background Threshold Values (BTVs)**							
23						Tolerance Factor K (For UTL)	1.952			d2max (for USL)	3.149	
24												
25						**Normal GOF Test**						
26						Shapiro Wilk Test Statistic	0.414			**Normal GOF Test**		
27						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level		
28						Lilliefors Test Statistic	0.514			**Lilliefors GOF Test**		
29						5% Lilliefors Critical Value	0.0968			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	0.0168			90% Percentile (z)	0.0123	
34						95% UPL (t)	0.0149			95% Percentile (z)	0.0147	
35						95% USL	0.0248			99% Percentile (z)	0.0193	
36												
37						**Gamma GOF Test**						
38						A-D Test Statistic	25.19			**Anderson-Darling Gamma GOF Test**		
39						5% A-D Critical Value	0.801			Data Not Gamma Distributed at 5% Significance Level		
40						K-S Test Statistic	0.532			**Kolmogorov-Smirnov Gamma GOF Test**		
41						5% K-S Critical Value	0.102			Data Not Gamma Distributed at 5% Significance Level		
42						**Data Not Gamma Distributed at 5% Significance Level**						
43												
44						**Gamma Statistics**						
45						k hat (MLE)	0.679			k star (bias corrected MLE)	0.662	
46						Theta hat (MLE)	0.00546			Theta star (bias corrected MLE)	0.0056	
47						nu hat (MLE)	114			nu star (bias corrected)	111.3	
48						MLE Mean (bias corrected)	0.00371			MLE Sd (bias corrected)	0.00455	
49												

50	**Background Statistics Assuming Gamma Distribution**											
51	95% Wilson Hilferty (WH) Approx. Gamma UPL					0.0115				90% Percentile		0.00943
52	95% Hawkins Wixley (HW) Approx. Gamma UPL					0.0109				95% Percentile		0.0129
53	95% WH Approx. Gamma UTL with 95% Coverage					0.0142				99% Percentile		0.0211
54	95% HW Approx. Gamma UTL with 95% Coverage					0.0138						
55	95% WH USL					0.0312				95% HW USL		0.0331
56												
57	**Lognormal GOF Test**											
58	Shapiro Wilk Test Statistic					0.447				**Shapiro Wilk Lognormal GOF Test**		
59	5% Shapiro Wilk P Value					0				Data Not Lognormal at 5% Significance Level		
60	Lilliefors Test Statistic					0.509				**Lilliefors Lognormal GOF Test**		
61	5% Lilliefors Critical Value					0.0968				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					0.0121				90% Percentile (z)		0.00594
66	95% UPL (t)					0.00901				95% Percentile (z)		0.00874
67	95% USL					0.0434				99% Percentile (z)		0.0181
68												
69	**Nonparametric Distribution Free Background Statistics**											
70	**Data do not follow a Discernible Distribution (0.05)**											
71												
72	**Nonparametric Upper Limits for Background Threshold Values**											
73	Order of Statistic, r					82				95% UTL with 95% Coverage		0.02
74	Approx, f used to compute achieved CC					1.439				Approximate Actual Confidence Coefficient achieved by UTL		0.797
75										Approximate Sample Size needed to achieve specified CC		124
76	95% Percentile Bootstrap UTL with 95% Coverage					N/A				95% BCA Bootstrap UTL with 95% Coverage		N/A
77	95% UPL					0.02				90% Percentile		0.02
78	90% Chebyshev UPL					0.0239				95% Percentile		0.02
79	95% Chebyshev UPL					0.033				99% Percentile		0.02
80	95% USL					0.02						
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												

88	**MW-1|Arsenic|T^report_result_value**										
89											
90	**General Statistics**										
91						Total Number of Observations	81			Number of Distinct Observations	29	
92						Minimum	8.6000E-4			First Quartile	0.001
93						Second Largest	0.015			Median	0.002
94						Maximum	0.015			Third Quartile	0.0032
95						Mean	0.0035			SD	0.00422
96						Coefficient of Variation	1.206			Skewness	2.241
97						Mean of logged Data	-6.082			SD of logged Data	0.83
98											
99						**Critical Values for Background Threshold Values (BTVs)**						
100						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
101											
102						**Normal GOF Test**					
103						Shapiro Wilk Test Statistic	0.567			**Normal GOF Test**	
104						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level	
105						Lilliefors Test Statistic	0.288			**Lilliefors GOF Test**	
106						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
107						**Data Not Normal at 5% Significance Level**					
108											
109						**Background Statistics Assuming Normal Distribution**					
110						95% UTL with 95% Coverage	0.0118			90% Percentile (z)	0.00892
111						95% UPL (t)	0.0106			95% Percentile (z)	0.0105
112						95% USL	0.0167			99% Percentile (z)	0.0133
113											
114						**Gamma GOF Test**					
115						A-D Test Statistic	6.631			**Anderson-Darling Gamma GOF Test**	
116						5% A-D Critical Value	0.775			Data Not Gamma Distributed at 5% Significance Level	
117						K-S Test Statistic	0.191			**Kolmogorov-Smirnov Gamma GOF Test**	
118						5% K-S Critical Value	0.101			Data Not Gamma Distributed at 5% Significance Level	
119						**Data Not Gamma Distributed at 5% Significance Level**					
120											
121						**Gamma Statistics**					
122						k hat (MLE)	1.309			k star (bias corrected MLE)	1.269
123						Theta hat (MLE)	0.00268			Theta star (bias corrected MLE)	0.00276
124						nu hat (MLE)	212.1			nu star (bias corrected)	205.5
125						MLE Mean (bias corrected)	0.0035			MLE Sd (bias corrected)	0.00311
126											
127						**Background Statistics Assuming Gamma Distribution**					
128						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00939			90% Percentile	0.00761
129						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00929			95% Percentile	0.00966
130						95% WH Approx. Gamma UTL with 95% Coverage	0.0112			99% Percentile	0.0143
131						95% HW Approx. Gamma UTL with 95% Coverage	0.0112				
132						95% WH USL	0.0209			95% HW USL	0.0223
133											
134						**Lognormal GOF Test**					
135						Shapiro Wilk Test Statistic	0.832			**Shapiro Wilk Lognormal GOF Test**	
136						5% Shapiro Wilk P Value	6.680E-13			Data Not Lognormal at 5% Significance Level	
137						Lilliefors Test Statistic	0.148			**Lilliefors Lognormal GOF Test**	

138	5% Lilliefors Critical Value					0.0985	Data Not Lognormal at 5% Significance Level					
139	**Data Not Lognormal at 5% Significance Level**											
140												
141	**Background Statistics assuming Lognormal Distribution**											
142	95% UTL with 95% Coverage					0.0116	90% Percentile (z)					0.00661
143	95% UPL (t)					0.00916	95% Percentile (z)					0.00894
144	95% USL					0.0308	99% Percentile (z)					0.0157
145												
146	**Nonparametric Distribution Free Background Statistics**											
147	**Data do not follow a Discernible Distribution (0.05)**											
148												
149	**Nonparametric Upper Limits for Background Threshold Values**											
150	Order of Statistic, r					79	95% UTL with 95% Coverage					0.015
151	Approx, f used to compute achieved CC					1.386	Approximate Actual Confidence Coefficient achieved by UTL					0.777
152							Approximate Sample Size needed to achieve specified CC					124
153	95% Percentile Bootstrap UTL with 95% Coverage					0.015	95% BCA Bootstrap UTL with 95% Coverage					0.0049
154	95% UPL					0.015	90% Percentile					0.015
155	90% Chebyshev UPL					0.0163	95% Percentile					0.015
156	95% Chebyshev UPL					0.022	99% Percentile					0.015
157	95% USL					0.015						
158												
159	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
160	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
161	and consists of observations collected from clean unimpacted locations.											
162	The use of USL tends to provide a balance between false positives and false negatives provided the data											
163	represents a background data set and when many onsite observations need to be compared with the BTV.											
164												

165	**MW-1|Barium|T^report_result_value**										
166											
167	**General Statistics**										
168					Total Number of Observations	88			Number of Distinct Observations		31
169					Minimum	0.002			First Quartile		0.17
170					Second Largest	0.6			Median		0.21
171					Maximum	0.61			Third Quartile		0.25
172					Mean	0.236			SD		0.14
173					Coefficient of Variation	0.594			Skewness		1.436
174					Mean of logged Data	-1.66			SD of logged Data		0.865
175											
176					**Critical Values for Background Threshold Values (BTVs)**						
177					Tolerance Factor K (For UTL)	1.944			d2max (for USL)		3.165
178											
179					**Normal GOF Test**						
180					Shapiro Wilk Test Statistic	0.796			**Normal GOF Test**		
181					5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level		
182					Lilliefors Test Statistic	0.235			**Lilliefors GOF Test**		
183					5% Lilliefors Critical Value	0.0946			Data Not Normal at 5% Significance Level		
184					**Data Not Normal at 5% Significance Level**						
185											
186					**Background Statistics Assuming Normal Distribution**						
187					95% UTL with 95% Coverage	0.509			90% Percentile (z)		0.416
188					95% UPL (t)	0.471			95% Percentile (z)		0.467
189					95% USL	0.68			99% Percentile (z)		0.563
190											
191					**Gamma GOF Test**						
192					A-D Test Statistic	4.377			**Anderson-Darling Gamma GOF Test**		
193					5% A-D Critical Value	0.762			Data Not Gamma Distributed at 5% Significance Level		
194					K-S Test Statistic	0.203			**Kolmogorov-Smirnov Gamma GOF Test**		
195					5% K-S Critical Value	0.0963			Data Not Gamma Distributed at 5% Significance Level		
196					**Data Not Gamma Distributed at 5% Significance Level**						
197											
198					**Gamma Statistics**						
199					k hat (MLE)	2.457			k star (bias corrected MLE)		2.381
200					Theta hat (MLE)	0.0962			Theta star (bias corrected MLE)		0.0992
201					nu hat (MLE)	432.4			nu star (bias corrected)		419
202					MLE Mean (bias corrected)	0.236			MLE Sd (bias corrected)		0.153
203											

	A	B	C	D	E	F	G	H	I	J	K	L
204	**Background Statistics Assuming Gamma Distribution**											
205					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.523				90% Percentile		0.441
206					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.552				95% Percentile		0.531
207					95% WH Approx. Gamma UTL with 95% Coverage	0.592				99% Percentile		0.728
208					95% HW Approx. Gamma UTL with 95% Coverage	0.635						
209					95% WH USL	0.984				95% HW USL		1.128
210												
211	**Lognormal GOF Test**											
212					Shapiro Wilk Test Statistic	0.682	**Shapiro Wilk Lognormal GOF Test**					
213					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
214					Lilliefors Test Statistic	0.262	**Lilliefors Lognormal GOF Test**					
215					5% Lilliefors Critical Value	0.0946	Data Not Lognormal at 5% Significance Level					
216	**Data Not Lognormal at 5% Significance Level**											
217												
218	**Background Statistics assuming Lognormal Distribution**											
219					95% UTL with 95% Coverage	1.022				90% Percentile (z)		0.576
220					95% UPL (t)	0.807				95% Percentile (z)		0.789
221					95% USL	2.938				99% Percentile (z)		1.422
222												
223	**Nonparametric Distribution Free Background Statistics**											
224	**Data do not follow a Discernible Distribution (0.05)**											
225												
226	**Nonparametric Upper Limits for Background Threshold Values**											
227					Order of Statistic, r	86				95% UTL with 95% Coverage		0.6
228					Approx, f used to compute achieved CC	1.509				Approximate Actual Confidence Coefficient achieved by UTL		0.822
229										Approximate Sample Size needed to achieve specified CC		124
230					95% Percentile Bootstrap UTL with 95% Coverage	0.6				95% BCA Bootstrap UTL with 95% Coverage		0.6
231					95% UPL	0.58				90% Percentile		0.54
232					90% Chebyshev UPL	0.66				95% Percentile		0.577
233					95% Chebyshev UPL	0.851				99% Percentile		0.601
234					95% USL	0.61						
235												
236	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
237	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
238	and consists of observations collected from clean unimpacted locations.											
239	The use of USL tends to provide a balance between false positives and false negatives provided the data											
240	represents a background data set and when many onsite observations need to be compared with the BTV.											
241												

242	**MW-1|Beryllium|T^report_result_value**										
243											
244	**General Statistics**										
245						Total Number of Observations	81			Number of Distinct Observations	5	
246						Minimum	4.1000E-5			First Quartile	7.0000E-4
247						Second Largest	0.002			Median	7.0000E-4
248						Maximum	0.002			Third Quartile	7.0000E-4
249						Mean	8.2211E-4			SD	4.3446E-4
250						Coefficient of Variation	0.528			Skewness	2.098
251						Mean of logged Data	-7.226			SD of logged Data	0.55
252											
253						**Critical Values for Background Threshold Values (BTVs)**						
254						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
255											
256						**Normal GOF Test**					
257						Shapiro Wilk Test Statistic	0.474			**Normal GOF Test**	
258						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level	
259						Lilliefors Test Statistic	0.5			**Lilliefors GOF Test**	
260						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
261						**Data Not Normal at 5% Significance Level**					
262											
263						**Background Statistics Assuming Normal Distribution**					
264						95% UTL with 95% Coverage	0.00167			90% Percentile (z)	0.00138
265						95% UPL (t)	0.00155			95% Percentile (z)	0.00154
266						95% USL	0.00218			99% Percentile (z)	0.00183
267											
268						**Gamma GOF Test**					
269						A-D Test Statistic	19.88			**Anderson-Darling Gamma GOF Test**	
270						5% A-D Critical Value	0.756			Data Not Gamma Distributed at 5% Significance Level	
271						K-S Test Statistic	0.451			**Kolmogorov-Smirnov Gamma GOF Test**	
272						5% K-S Critical Value	0.0996			Data Not Gamma Distributed at 5% Significance Level	
273						**Data Not Gamma Distributed at 5% Significance Level**					
274											
275						**Gamma Statistics**					
276						k hat (MLE)	4.234			k star (bias corrected MLE)	4.085
277						Theta hat (MLE)	1.9418E-4			Theta star (bias corrected MLE)	2.0125E-4
278						nu hat (MLE)	685.9			nu star (bias corrected)	661.8
279						MLE Mean (bias corrected)	8.2211E-4			MLE Sd (bias corrected)	4.0675E-4
280											
281						**Background Statistics Assuming Gamma Distribution**					
282						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00158			90% Percentile	0.00137
283						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00161			95% Percentile	0.00158
284						95% WH Approx. Gamma UTL with 95% Coverage	0.00176			99% Percentile	0.00205
285						95% HW Approx. Gamma UTL with 95% Coverage	0.00181				
286						95% WH USL	0.00265			95% HW USL	0.00283
287											

	A	B	C	D	E	F	G	H	I	J	K	L
288	**Lognormal GOF Test**											
289					Shapiro Wilk Test Statistic	0.5	**Shapiro Wilk Lognormal GOF Test**					
290					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
291					Lilliefors Test Statistic	0.435	**Lilliefors Lognormal GOF Test**					
292					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
293	**Data Not Lognormal at 5% Significance Level**											
294												
295	**Background Statistics assuming Lognormal Distribution**											
296				95% UTL with	95% Coverage	0.00214				90% Percentile (z)		0.00147
297					95% UPL (t)	0.00183				95% Percentile (z)		0.0018
298					95% USL	0.00409				99% Percentile (z)		0.00262
299												
300	**Nonparametric Distribution Free Background Statistics**											
301	**Data do not follow a Discernible Distribution (0.05)**											
302												
303	**Nonparametric Upper Limits for Background Threshold Values**											
304					Order of Statistic, r	79				95% UTL with	95% Coverage	0.002
305					Approx, f used to compute achieved CC	1.386				Approximate Actual Confidence Coefficient achieved by UTL		0.777
306										Approximate Sample Size needed to achieve specified CC		124
307			95% Percentile Bootstrap UTL with		95% Coverage	0.002				95% BCA Bootstrap UTL with	95% Coverage	7.0000E-4
308					95% UPL	0.002				90% Percentile		0.002
309					90% Chebyshev UPL	0.00213				95% Percentile		0.002
310					95% Chebyshev UPL	0.00273				99% Percentile		0.002
311					95% USL	0.002						
312												
313	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
314	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
315	and consists of observations collected from clean unimpacted locations.											
316	The use of USL tends to provide a balance between false positives and false negatives provided the data											
317	represents a background data set and when many onsite observations need to be compared with the BTV.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319	**MW-1|Boron|T^report_result_value**											
320												
321	**General Statistics**											
322					Total Number of Observations	92			Number of Distinct Observations			47
323									Number of Missing Observations			7
324					Minimum	0.012			First Quartile			0.0288
325					Second Largest	0.5			Median			0.043
326					Maximum	0.51			Third Quartile			0.193
327					Mean	0.11			SD			0.122
328					Coefficient of Variation	1.107			Skewness			1.387
329					Mean of logged Data	-2.774			SD of logged Data			1.054
330												
331					**Critical Values for Background Threshold Values (BTVs)**							
332					Tolerance Factor K (For UTL)	1.937			d2max (for USL)			3.181
333												
334					**Normal GOF Test**							
335					Shapiro Wilk Test Statistic	0.74			**Normal GOF Test**			
336					5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
337					Lilliefors Test Statistic	0.297			**Lilliefors GOF Test**			
338					5% Lilliefors Critical Value	0.0926			Data Not Normal at 5% Significance Level			
339					**Data Not Normal at 5% Significance Level**							
340												
341					**Background Statistics Assuming Normal Distribution**							
342					95% UTL with 95% Coverage	0.347			90% Percentile (z)			0.267
343					95% UPL (t)	0.314			95% Percentile (z)			0.311
344					95% USL	0.499			99% Percentile (z)			0.395
345												
346					**Gamma GOF Test**							
347					A-D Test Statistic	6.013			**Anderson-Darling Gamma GOF Test**			
348					5% A-D Critical Value	0.783			Data Not Gamma Distributed at 5% Significance Level			
349					K-S Test Statistic	0.235			**Kolmogorov-Smirnov Gamma GOF Test**			
350					5% K-S Critical Value	0.096			Data Not Gamma Distributed at 5% Significance Level			
351					**Data Not Gamma Distributed at 5% Significance Level**							
352												
353					**Gamma Statistics**							
354					k hat (MLE)	1.01			k star (bias corrected MLE)			0.985
355					Theta hat (MLE)	0.109			Theta star (bias corrected MLE)			0.112
356					nu hat (MLE)	185.9			nu star (bias corrected)			181.2
357					MLE Mean (bias corrected)	0.11			MLE Sd (bias corrected)			0.111
358												
359					**Background Statistics Assuming Gamma Distribution**							
360					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.326			90% Percentile			0.255
361					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.332			95% Percentile			0.332
362					95% WH Approx. Gamma UTL with 95% Coverage	0.39			99% Percentile			0.512
363					95% HW Approx. Gamma UTL with 95% Coverage	0.404						
364					95% WH USL	0.8			95% HW USL			0.91
365												

	A	B	C	D	E	F	G	H	I	J	K	L
366	**Lognormal GOF Test**											
367					Shapiro Wilk Test Statistic	0.861	**Shapiro Wilk Lognormal GOF Test**					
368					5% Shapiro Wilk P Value	3.425E-12	Data Not Lognormal at 5% Significance Level					
369					Lilliefors Test Statistic	0.187	**Lilliefors Lognormal GOF Test**					
370					5% Lilliefors Critical Value	0.0926	Data Not Lognormal at 5% Significance Level					
371	**Data Not Lognormal at 5% Significance Level**											
372												
373	**Background Statistics assuming Lognormal Distribution**											
374				95% UTL with	95% Coverage	0.481				90% Percentile (z)		0.241
375					95% UPL (t)	0.363				95% Percentile (z)		0.353
376					95% USL	1.785				99% Percentile (z)		0.725
377												
378	**Nonparametric Distribution Free Background Statistics**											
379	**Data do not follow a Discernible Distribution (0.05)**											
380												
381	**Nonparametric Upper Limits for Background Threshold Values**											
382					Order of Statistic, r	90				95% UTL with	95% Coverage	0.37
383					Approx, f used to compute achieved CC	1.579				Approximate Actual Confidence Coefficient achieved by UTL		0.844
384										Approximate Sample Size needed to achieve specified CC		124
385			95% Percentile Bootstrap UTL with		95% Coverage	0.37				95% BCA Bootstrap UTL with	95% Coverage	0.37
386					95% UPL	0.347				90% Percentile		0.3
387					90% Chebyshev UPL	0.479				95% Percentile		0.335
388					95% Chebyshev UPL	0.646				99% Percentile		0.501
389					95% USL	0.51						
390												
391	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
392	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
393	and consists of observations collected from clean unimpacted locations.											
394	The use of USL tends to provide a balance between false positives and false negatives provided the data											
395	represents a background data set and when many onsite observations need to be compared with the BTV.											
396												

397	**MW-1|Cadmium|T^report_result_value**										
398											
399	**General Statistics**										
400						Total Number of Observations	81			Number of Distinct Observations	11	
401						Minimum	1.8000E-4			First Quartile	5.0000E-4
402						Second Largest	0.002			Median	5.0000E-4
403						Maximum	0.002			Third Quartile	5.0000E-4
404						Mean	6.7407E-4			SD	4.8819E-4
405						Coefficient of Variation	0.724			Skewness	2.276
406						Mean of logged Data	-7.458			SD of logged Data	0.5
407											
408						**Critical Values for Background Threshold Values (BTVs)**						
409						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
410											
411						**Normal GOF Test**					
412						Shapiro Wilk Test Statistic	0.48			**Normal GOF Test**	
413						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level	
414						Lilliefors Test Statistic	0.442			**Lilliefors GOF Test**	
415						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
416						**Data Not Normal at 5% Significance Level**					
417											
418						**Background Statistics Assuming Normal Distribution**					
419						95% UTL with 95% Coverage	0.00163			90% Percentile (z)	0.0013
420						95% UPL (t)	0.00149			95% Percentile (z)	0.00148
421						95% USL	0.00221			99% Percentile (z)	0.00181
422											
423						**Gamma GOF Test**					
424						A-D Test Statistic	18.44			**Anderson-Darling Gamma GOF Test**	
425						5% A-D Critical Value	0.758			Data Not Gamma Distributed at 5% Significance Level	
426						K-S Test Statistic	0.434			**Kolmogorov-Smirnov Gamma GOF Test**	
427						5% K-S Critical Value	0.0998			Data Not Gamma Distributed at 5% Significance Level	
428						**Data Not Gamma Distributed at 5% Significance Level**					
429											
430						**Gamma Statistics**					
431						k hat (MLE)	3.366			k star (bias corrected MLE)	3.25
432						Theta hat (MLE)	2.0025E-4			Theta star (bias corrected MLE)	2.0742E-4
433						nu hat (MLE)	545.3			nu star (bias corrected)	526.5
434						MLE Mean (bias corrected)	6.7407E-4			MLE Sd (bias corrected)	3.7392E-4
435											
436						**Background Statistics Assuming Gamma Distribution**					
437						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00137			90% Percentile	0.00118
438						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00136			95% Percentile	0.00138
439						95% WH Approx. Gamma UTL with 95% Coverage	0.00155			99% Percentile	0.00183
440						95% HW Approx. Gamma UTL with 95% Coverage	0.00154				
441						95% WH USL	0.00243			95% HW USL	0.00249
442											

	A	B	C	D	E	F	G	H	I	J	K	L
443	**Lognormal GOF Test**											
444					Shapiro Wilk Test Statistic	0.596	**Shapiro Wilk Lognormal GOF Test**					
445					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
446					Lilliefors Test Statistic	0.415	**Lilliefors Lognormal GOF Test**					
447					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
448	**Data Not Lognormal at 5% Significance Level**											
449												
450	**Background Statistics assuming Lognormal Distribution**											
451				95% UTL with	95% Coverage	0.00154			90% Percentile (z)			0.0011
452					95% UPL (t)	0.00133			95% Percentile (z)			0.00131
453					95% USL	0.00277			99% Percentile (z)			0.00185
454												
455	**Nonparametric Distribution Free Background Statistics**											
456	**Data do not follow a Discernible Distribution (0.05)**											
457												
458	**Nonparametric Upper Limits for Background Threshold Values**											
459					Order of Statistic, r	79			95% UTL with	95% Coverage		0.002
460					Approx, f used to compute achieved CC	1.386			Approximate Actual Confidence Coefficient achieved by UTL			0.777
461									Approximate Sample Size needed to achieve specified CC			124
462			95% Percentile Bootstrap UTL with	95% Coverage		0.002			95% BCA Bootstrap UTL with	95% Coverage		0.0014
463					95% UPL	0.002				90% Percentile		0.002
464					90% Chebyshev UPL	0.00215				95% Percentile		0.002
465					95% Chebyshev UPL	0.00282				99% Percentile		0.002
466					95% USL	0.002						
467												
468	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
469	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
470	and consists of observations collected from clean unimpacted locations.											
471	The use of USL tends to provide a balance between false positives and false negatives provided the data											
472	represents a background data set and when many onsite observations need to be compared with the BTV.											
473												

474	**MW-1|Calcium|T^report_result_value**										
475											
476	**General Statistics**										
477						Total Number of Observations	98			Number of Distinct Observations	77	
478						Minimum	67.3			First Quartile	121.3
479						Second Largest	265			Median	137.5
480						Maximum	271			Third Quartile	203.8
481						Mean	153.6			SD	56.11
482						Coefficient of Variation	0.365			Skewness	0.101
483						Mean of logged Data	4.96			SD of logged Data	0.4
484											
485						**Critical Values for Background Threshold Values (BTVs)**						
486						Tolerance Factor K (For UTL)	1.927			d2max (for USL)	3.203
487											
488						**Normal GOF Test**					
489						Shapiro Wilk Test Statistic	0.927			**Normal GOF Test**	
490						5% Shapiro Wilk P Value	1.1106E-5			Data Not Normal at 5% Significance Level	
491						Lilliefors Test Statistic	0.119			**Lilliefors GOF Test**	
492						5% Lilliefors Critical Value	0.0897			Data Not Normal at 5% Significance Level	
493						**Data Not Normal at 5% Significance Level**					
494											
495						**Background Statistics Assuming Normal Distribution**					
496						95% UTL with 95% Coverage	261.6			90% Percentile (z)	225.5
497						95% UPL (t)	247.2			95% Percentile (z)	245.8
498						95% USL	333.2			99% Percentile (z)	284.1
499											
500						**Gamma GOF Test**					
501						A-D Test Statistic	1.968			**Anderson-Darling Gamma GOF Test**	
502						5% A-D Critical Value	0.754			Data Not Gamma Distributed at 5% Significance Level	
503						K-S Test Statistic	0.103			**Kolmogorov-Smirnov Gamma GOF Test**	
504						5% K-S Critical Value	0.0905			Data Not Gamma Distributed at 5% Significance Level	
505						**Data Not Gamma Distributed at 5% Significance Level**					
506											
507						**Gamma Statistics**					
508						k hat (MLE)	6.921			k star (bias corrected MLE)	6.716
509						Theta hat (MLE)	22.19			Theta star (bias corrected MLE)	22.86
510						nu hat (MLE)	1357			nu star (bias corrected)	1316
511						MLE Mean (bias corrected)	153.6			MLE Sd (bias corrected)	59.25
512											
513						**Background Statistics Assuming Gamma Distribution**					
514						95% Wilson Hilferty (WH) Approx. Gamma UPL	263.3			90% Percentile	232.7
515						95% Hawkins Wixley (HW) Approx. Gamma UPL	266.3			95% Percentile	262.2
516						95% WH Approx. Gamma UTL with 95% Coverage	285.5			99% Percentile	323.7
517						95% HW Approx. Gamma UTL with 95% Coverage	290.2				
518						95% WH USL	414.4			95% HW USL	432.7
519											

	A	B	C	D	E	F	G	H	I	J	K	L
520	**Lognormal GOF Test**											
521					Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk Lognormal GOF Test**					
522					5% Shapiro Wilk P Value	4.1239E-8	Data Not Lognormal at 5% Significance Level					
523					Lilliefors Test Statistic	0.114	**Lilliefors Lognormal GOF Test**					
524					5% Lilliefors Critical Value	0.0897	Data Not Lognormal at 5% Significance Level					
525	**Data Not Lognormal at 5% Significance Level**											
526												
527	**Background Statistics assuming Lognormal Distribution**											
528				95% UTL with	95% Coverage	308.1				90% Percentile (z)		238.1
529					95% UPL (t)	278				95% Percentile (z)		275.3
530					95% USL	513.2				99% Percentile (z)		361.5
531												
532	**Nonparametric Distribution Free Background Statistics**											
533	**Data do not follow a Discernible Distribution (0.05)**											
534												
535	**Nonparametric Upper Limits for Background Threshold Values**											
536					Order of Statistic, r	96				95% UTL with	95% Coverage	258
537					Approx, f used to compute achieved CC	1.684				Approximate Actual Confidence Coefficient achieved by UTL		0.873
538										Approximate Sample Size needed to achieve specified CC		124
539			95% Percentile Bootstrap UTL with		95% Coverage	258				95% BCA Bootstrap UTL with	95% Coverage	258
540					95% UPL	242.4				90% Percentile		223
541					90% Chebyshev UPL	322.7				95% Percentile		240.3
542					95% Chebyshev UPL	399.4				99% Percentile		265.2
543					95% USL	271						
544												
545	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
546	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
547	and consists of observations collected from clean unimpacted locations.											
548	The use of USL tends to provide a balance between false positives and false negatives provided the data											
549	represents a background data set and when many onsite observations need to be compared with the BTV.											
550												

	A	B	C	D	E	F	G	H	I	J	K	L
551	**MW-1|Chloride|T^report_result_value**											
552												
553	**General Statistics**											
554					Total Number of Observations	168				Number of Distinct Observations		137
555										Number of Missing Observations		10
556					Minimum	0.5				First Quartile		18.28
557					Second Largest	95.7				Median		28.1
558					Maximum	97.2				Third Quartile		35.3
559					Mean	30.62				SD		19.14
560					Coefficient of Variation	0.625				Skewness		1.71
561					Mean of logged Data	3.241				SD of logged Data		0.651
562												
563	**Critical Values for Background Threshold Values (BTVs)**											
564					Tolerance Factor K (For UTL)	1.855				d2max (for USL)		3.379
565												
566	**Normal GOF Test**											
567					Shapiro Wilk Test Statistic	0.823	**Normal GOF Test**					
568					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
569					Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**					
570					5% Lilliefors Critical Value	0.0688	Data Not Normal at 5% Significance Level					
571	**Data Not Normal at 5% Significance Level**											
572												
573	**Background Statistics Assuming Normal Distribution**											
574					95% UTL with 95% Coverage	66.12				90% Percentile (z)		55.15
575					95% UPL (t)	62.37				95% Percentile (z)		62.1
576					95% USL	95.29				99% Percentile (z)		75.15
577												
578	**Gamma GOF Test**											
579					A-D Test Statistic	2.372	**Anderson-Darling Gamma GOF Test**					
580					5% A-D Critical Value	0.76	Data Not Gamma Distributed at 5% Significance Level					
581					K-S Test Statistic	0.107	**Kolmogorov-Smirnov Gamma GOF Test**					
582					5% K-S Critical Value	0.0724	Data Not Gamma Distributed at 5% Significance Level					
583	**Data Not Gamma Distributed at 5% Significance Level**											
584												
585	**Gamma Statistics**											
586					k hat (MLE)	2.929				k star (bias corrected MLE)		2.88
587					Theta hat (MLE)	10.45				Theta star (bias corrected MLE)		10.63
588					nu hat (MLE)	984				nu star (bias corrected)		967.8
589					MLE Mean (bias corrected)	30.62				MLE Sd (bias corrected)		18.04
590												
591	**Background Statistics Assuming Gamma Distribution**											
592					95% Wilson Hilferty (WH) Approx. Gamma UPL	64.62				90% Percentile		54.81
593					95% Hawkins Wixley (HW) Approx. Gamma UPL	66.01				95% Percentile		65.02
594					95% WH Approx. Gamma UTL with 95% Coverage	70.49				99% Percentile		87.2
595					95% HW Approx. Gamma UTL with 95% Coverage	72.5						
596					95% WH USL	128.9				95% HW USL		140.9
597												

	A	B	C	D	E	F	G	H	I	J	K	L
598	**Lognormal GOF Test**											
599					Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk Lognormal GOF Test**					
600					5% Shapiro Wilk P Value	2.449E-12	Data Not Lognormal at 5% Significance Level					
601					Lilliefors Test Statistic	0.111	**Lilliefors Lognormal GOF Test**					
602					5% Lilliefors Critical Value	0.0688	Data Not Lognormal at 5% Significance Level					
603	**Data Not Lognormal at 5% Significance Level**											
604												
605	**Background Statistics assuming Lognormal Distribution**											
606				95% UTL with	95% Coverage	85.56				90% Percentile (z)		58.91
607					95% UPL (t)	75.33				95% Percentile (z)		74.64
608					95% USL	230.9				99% Percentile (z)		116.3
609												
610	**Nonparametric Distribution Free Background Statistics**											
611	**Data do not follow a Discernible Distribution (0.05)**											
612												
613	**Nonparametric Upper Limits for Background Threshold Values**											
614					Order of Statistic, r	164				95% UTL with	95% Coverage	87.8
615					Approx, f used to compute achieved CC	1.726				Approximate Actual Confidence Coefficient achieved by UTL		0.926
616										Approximate Sample Size needed to achieve specified CC		181
617			95% Percentile Bootstrap UTL with		95% Coverage	87.52			95% BCA Bootstrap UTL with		95% Coverage	87
618					95% UPL	82.29				90% Percentile		51.86
619					90% Chebyshev UPL	88.21				95% Percentile		79.43
620					95% Chebyshev UPL	114.3				99% Percentile		94.29
621					95% USL	97.2						
622												
623	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
624	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
625	and consists of observations collected from clean unimpacted locations.											
626	The use of USL tends to provide a balance between false positives and false negatives provided the data											
627	represents a background data set and when many onsite observations need to be compared with the BTV.											
628												

	A	B	C	D	E	F	G	H	I	J	K	L
629	**MW-1|Chromium|T^report_result_value**											
630												
631	**General Statistics**											
632					Total Number of Observations	76				Number of Distinct Observations		2
633										Number of Missing Observations		5
634					Minimum	0.004				First Quartile		0.004
635					Second Largest	0.004				Median		0.004
636					Maximum	0.0048				Third Quartile		0.004
637					Mean	0.00401				SD		9.1766E-5
638					Coefficient of Variation	0.0229				Skewness		8.718
639					Mean of logged Data	-5.519				SD of logged Data		0.0209
640												
641	**Critical Values for Background Threshold Values (BTVs)**											
642					Tolerance Factor K (For UTL)	1.97				d2max (for USL)		3.114
643												
644	**Normal GOF Test**											
645					Shapiro Wilk Test Statistic	0.116	**Normal GOF Test**					
646					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
647					Lilliefors Test Statistic	0.533	**Lilliefors GOF Test**					
648					5% Lilliefors Critical Value	0.102	Data Not Normal at 5% Significance Level					
649	**Data Not Normal at 5% Significance Level**											
650												
651	**Background Statistics Assuming Normal Distribution**											
652					95% UTL with 95% Coverage	0.00419				90% Percentile (z)		0.00413
653					95% UPL (t)	0.00416				95% Percentile (z)		0.00416
654					95% USL	0.0043				99% Percentile (z)		0.00422
655												
656	**Gamma GOF Test**											
657					A-D Test Statistic	1.316E+29	**Anderson-Darling Gamma GOF Test**					
658					5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level					
659					K-S Test Statistic	0.545	**Kolmogorov-Smirnov Gamma GOF Test**					
660					5% K-S Critical Value	0.102	Data Not Gamma Distributed at 5% Significance Level					
661	**Data Not Gamma Distributed at 5% Significance Level**											
662												
663	**Gamma Statistics**											
664					k hat (MLE)	2182				k star (bias corrected MLE)		2096
665					Theta hat (MLE)	1.8379E-6				Theta star (bias corrected MLE)		1.9134E-6
666					nu hat (MLE)	331679				nu star (bias corrected)		318588
667					MLE Mean (bias corrected)	0.00401				MLE Sd (bias corrected)		8.7601E-5
668												
669	**Background Statistics Assuming Gamma Distribution**											
670					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00416				90% Percentile		0.00412
671					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00416				95% Percentile		0.00416
672					95% WH Approx. Gamma UTL with 95% Coverage	0.00418				99% Percentile		0.00422
673					95% HW Approx. Gamma UTL with 95% Coverage	0.00418						
674					95% WH USL	0.00428				95% HW USL		0.00428
675												

	A	B	C	D	E	F	G	H	I	J	K	L
676	**Lognormal GOF Test**											
677					Shapiro Wilk Test Statistic	0.116	**Shapiro Wilk Lognormal GOF Test**					
678					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
679					Lilliefors Test Statistic	0.533	**Lilliefors Lognormal GOF Test**					
680					5% Lilliefors Critical Value	0.102	Data Not Lognormal at 5% Significance Level					
681	**Data Not Lognormal at 5% Significance Level**											
682												
683	**Background Statistics assuming Lognormal Distribution**											
684				95% UTL with	95% Coverage	0.00418				90% Percentile (z)		0.00412
685					95% UPL (t)	0.00415				95% Percentile (z)		0.00415
686					95% USL	0.00428				99% Percentile (z)		0.00421
687												
688	**Nonparametric Distribution Free Background Statistics**											
689	**Data do not follow a Discernible Distribution (0.05)**											
690												
691	**Nonparametric Upper Limits for Background Threshold Values**											
692					Order of Statistic, r	75				95% UTL with	95% Coverage	0.004
693					Approx, f used to compute achieved CC	1.974				Approximate Actual Confidence Coefficient achieved by UTL		0.899
694										Approximate Sample Size needed to achieve specified CC		93
695			95% Percentile Bootstrap UTL with		95% Coverage	N/A			95% BCA Bootstrap UTL with		95% Coverage	N/A
696					95% UPL	0.004				90% Percentile		0.004
697					90% Chebyshev UPL	0.00429				95% Percentile		0.004
698					95% Chebyshev UPL	0.00441				99% Percentile		0.0042
699					95% USL	0.0048						
700												
701	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
702	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
703	and consists of observations collected from clean unimpacted locations.											
704	The use of USL tends to provide a balance between false positives and false negatives provided the data											
705	represents a background data set and when many onsite observations need to be compared with the BTV.											
706												

707	**MW-1|Cobalt|T^report_result_value**										
708											
709	**General Statistics**										
710						Total Number of Observations	81			Number of Distinct Observations	52	
711						Minimum	3.0000E-4			First Quartile	6.2000E-4
712						Second Largest	0.0056			Median	0.0011
713						Maximum	0.0062			Third Quartile	0.0025
714						Mean	0.00188			SD	0.00168
715						Coefficient of Variation	0.892			Skewness	1.08
716						Mean of logged Data	-6.676			SD of logged Data	0.919
717											
718						**Critical Values for Background Threshold Values (BTVs)**						
719						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
720											
721						**Normal GOF Test**					
722						Shapiro Wilk Test Statistic	0.806			**Normal GOF Test**	
723						5% Shapiro Wilk P Value	3.664E-15			Data Not Normal at 5% Significance Level	
724						Lilliefors Test Statistic	0.194			**Lilliefors GOF Test**	
725						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
726						**Data Not Normal at 5% Significance Level**					
727											
728						**Background Statistics Assuming Normal Distribution**					
729						95% UTL with 95% Coverage	0.00517			90% Percentile (z)	0.00403
730						95% UPL (t)	0.00469			95% Percentile (z)	0.00464
731						95% USL	0.00715			99% Percentile (z)	0.00579
732											
733						**Gamma GOF Test**					
734						A-D Test Statistic	2.206			**Anderson-Darling Gamma GOF Test**	
735						5% A-D Critical Value	0.773			Data Not Gamma Distributed at 5% Significance Level	
736						K-S Test Statistic	0.141			**Kolmogorov-Smirnov Gamma GOF Test**	
737						5% K-S Critical Value	0.101			Data Not Gamma Distributed at 5% Significance Level	
738						**Data Not Gamma Distributed at 5% Significance Level**					
739											
740						**Gamma Statistics**					
741						k hat (MLE)	1.39			k star (bias corrected MLE)	1.347
742						Theta hat (MLE)	0.00135			Theta star (bias corrected MLE)	0.0014
743						nu hat (MLE)	225.2			nu star (bias corrected)	218.2
744						MLE Mean (bias corrected)	0.00188			MLE Sd (bias corrected)	0.00162
745											
746						**Background Statistics Assuming Gamma Distribution**					
747						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00508			90% Percentile	0.00403
748						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00521			95% Percentile	0.00508
749						95% WH Approx. Gamma UTL with 95% Coverage	0.00601			99% Percentile	0.00749
750						95% HW Approx. Gamma UTL with 95% Coverage	0.00627				
751						95% WH USL	0.0111			95% HW USL	0.0125
752											

	A	B	C	D	E	F	G	H	I	J	K	L
753	**Lognormal GOF Test**											
754					Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**					
755					5% Shapiro Wilk P Value	2.3836E-5	Data Not Lognormal at 5% Significance Level					
756					Lilliefors Test Statistic	0.118	**Lilliefors Lognormal GOF Test**					
757					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
758	**Data Not Lognormal at 5% Significance Level**											
759												
760	**Background Statistics assuming Lognormal Distribution**											
761				95% UTL with	95% Coverage	0.00763				90% Percentile (z)		0.00409
762					95% UPL (t)	0.00587				95% Percentile (z)		0.00572
763					95% USL	0.0225				99% Percentile (z)		0.0107
764												
765	**Nonparametric Distribution Free Background Statistics**											
766	**Data do not follow a Discernible Distribution (0.05)**											
767												
768	**Nonparametric Upper Limits for Background Threshold Values**											
769					Order of Statistic, r	79				95% UTL with	95% Coverage	0.0055
770					Approx, f used to compute achieved CC	1.386				Approximate Actual Confidence Coefficient achieved by UTL		0.777
771										Approximate Sample Size needed to achieve specified CC		124
772			95% Percentile Bootstrap UTL with		95% Coverage	0.0055				95% BCA Bootstrap UTL with	95% Coverage	0.0055
773					95% UPL	0.0054				90% Percentile		0.0047
774					90% Chebyshev UPL	0.00695				95% Percentile		0.0054
775					95% Chebyshev UPL	0.00924				99% Percentile		0.00572
776					95% USL	0.0062						
777												
778	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
779	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
780	and consists of observations collected from clean unimpacted locations.											
781	The use of USL tends to provide a balance between false positives and false negatives provided the data											
782	represents a background data set and when many onsite observations need to be compared with the BTV.											
783												

	A	B	C	D	E	F	G	H	I	J	K	L
784	**MW-1|Fluoride|T^report_result_value**											
785												
786	**General Statistics**											
787					Total Number of Observations	90				Number of Distinct Observations	13	
788										Number of Missing Observations	8	
789					Minimum	0.14				First Quartile	0.25	
790					Second Largest	0.3				Median	0.25	
791					Maximum	0.33				Third Quartile	0.25	
792					Mean	0.245				SD	0.0247	
793					Coefficient of Variation	0.101				Skewness	-1.862	
794					Mean of logged Data	-1.414				SD of logged Data	0.116	
795												
796					**Critical Values for Background Threshold Values (BTVs)**							
797					Tolerance Factor K (For UTL)	1.94				d2max (for USL)	3.173	
798												
799					**Normal GOF Test**							
800					Shapiro Wilk Test Statistic	0.565				**Normal GOF Test**		
801					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
802					Lilliefors Test Statistic	0.441				**Lilliefors GOF Test**		
803					5% Lilliefors Critical Value	0.0936				Data Not Normal at 5% Significance Level		
804					**Data Not Normal at 5% Significance Level**							
805												
806					**Background Statistics Assuming Normal Distribution**							
807					95% UTL with 95% Coverage	0.293				90% Percentile (z)	0.276	
808					95% UPL (t)	0.286				95% Percentile (z)	0.285	
809					95% USL	0.323				99% Percentile (z)	0.302	
810												
811					**Gamma GOF Test**							
812					A-D Test Statistic	20.34				**Anderson-Darling Gamma GOF Test**		
813					5% A-D Critical Value	0.751				Data Not Gamma Distributed at 5% Significance Level		
814					K-S Test Statistic	0.448				**Kolmogorov-Smirnov Gamma GOF Test**		
815					5% K-S Critical Value	0.0939				Data Not Gamma Distributed at 5% Significance Level		
816					**Data Not Gamma Distributed at 5% Significance Level**							
817												
818					**Gamma Statistics**							
819					k hat (MLE)	83.08				k star (bias corrected MLE)	80.32	
820					Theta hat (MLE)	0.00294				Theta star (bias corrected MLE)	0.00305	
821					nu hat (MLE)	14955				nu star (bias corrected)	14458	
822					MLE Mean (bias corrected)	0.245				MLE Sd (bias corrected)	0.0273	
823												
824					**Background Statistics Assuming Gamma Distribution**							
825					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.291				90% Percentile	0.28	
826					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.292				95% Percentile	0.291	
827					95% WH Approx. Gamma UTL with 95% Coverage	0.3				99% Percentile	0.313	
828					95% HW Approx. Gamma UTL with 95% Coverage	0.301						
829					95% WH USL	0.339				95% HW USL	0.342	
830												

	A	B	C	D	E	F	G	H	I	J	K	L
831	**Lognormal GOF Test**											
832					Shapiro Wilk Test Statistic	0.527	**Shapiro Wilk Lognormal GOF Test**					
833					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
834					Lilliefors Test Statistic	0.45	**Lilliefors Lognormal GOF Test**					
835					5% Lilliefors Critical Value	0.0936	Data Not Lognormal at 5% Significance Level					
836	**Data Not Lognormal at 5% Significance Level**											
837												
838	**Background Statistics assuming Lognormal Distribution**											
839				95% UTL with	95% Coverage	0.305				90% Percentile (z)		0.282
840					95% UPL (t)	0.295				95% Percentile (z)		0.294
841					95% USL	0.351				99% Percentile (z)		0.319
842												
843	**Nonparametric Distribution Free Background Statistics**											
844	**Data do not follow a Discernible Distribution (0.05)**											
845												
846	**Nonparametric Upper Limits for Background Threshold Values**											
847					Order of Statistic, r	88				95% UTL with	95% Coverage	0.27
848					Approx, f used to compute achieved CC	1.544				Approximate Actual Confidence Coefficient achieved by UTL		0.834
849										Approximate Sample Size needed to achieve specified CC		124
850			95% Percentile Bootstrap UTL with		95% Coverage	0.27				95% BCA Bootstrap UTL with	95% Coverage	0.27
851					95% UPL	0.26				90% Percentile		0.25
852					90% Chebyshev UPL	0.319				95% Percentile		0.26
853					95% Chebyshev UPL	0.353				99% Percentile		0.303
854					95% USL	0.33						
855												
856	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
857	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
858	and consists of observations collected from clean unimpacted locations.											
859	The use of USL tends to provide a balance between false positives and false negatives provided the data											
860	represents a background data set and when many onsite observations need to be compared with the BTV.											
861												

862	**MW-1|Lead|T^report_result_value**										
863											
864	**General Statistics**										
865					Total Number of Observations	76			Number of Distinct Observations		4
866					Minimum	0.01			First Quartile		0.01
867					Second Largest	0.012			Median		0.01
868					Maximum	0.015			Third Quartile		0.01
869					Mean	0.0101			SD		6.6014E-4
870					Coefficient of Variation	0.0652			Skewness		6.137
871					Mean of logged Data	-4.594			SD of logged Data		0.0554
872											
873					**Critical Values for Background Threshold Values (BTVs)**						
874					Tolerance Factor K (For UTL)	1.97			d2max (for USL)		3.114
875											
876					**Normal GOF Test**						
877					Shapiro Wilk Test Statistic	0.23			**Normal GOF Test**		
878					5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level		
879					Lilliefors Test Statistic	0.526			**Lilliefors GOF Test**		
880					5% Lilliefors Critical Value	0.102			Data Not Normal at 5% Significance Level		
881					**Data Not Normal at 5% Significance Level**						
882											
883					**Background Statistics Assuming Normal Distribution**						
884					95% UTL with 95% Coverage	0.0114			90% Percentile (z)		0.011
885					95% UPL (t)	0.0112			95% Percentile (z)		0.0112
886					95% USL	0.0122			99% Percentile (z)		0.0117
887											
888					**Gamma GOF Test**						
889					A-D Test Statistic	25.98			**Anderson-Darling Gamma GOF Test**		
890					5% A-D Critical Value	0.749			Data Not Gamma Distributed at 5% Significance Level		
891					K-S Test Statistic	0.529			**Kolmogorov-Smirnov Gamma GOF Test**		
892					5% K-S Critical Value	0.102			Data Not Gamma Distributed at 5% Significance Level		
893					**Data Not Gamma Distributed at 5% Significance Level**						
894											
895					**Gamma Statistics**						
896					k hat (MLE)	296.9			k star (bias corrected MLE)		285.2
897					Theta hat (MLE)	3.4124E-5			Theta star (bias corrected MLE)		3.5525E-5
898					nu hat (MLE)	45129			nu star (bias corrected)		43349
899					MLE Mean (bias corrected)	0.0101			MLE Sd (bias corrected)		5.9994E-4
900											
901					**Background Statistics Assuming Gamma Distribution**						
902					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0111			90% Percentile		0.0109
903					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0111			95% Percentile		0.0111
904					95% WH Approx. Gamma UTL with 95% Coverage	0.0113			99% Percentile		0.0116
905					95% HW Approx. Gamma UTL with 95% Coverage	0.0113					
906					95% WH USL	0.0121			95% HW USL		0.0121
907											

	A	B	C	D	E	F	G	H	I	J	K	L
908	**Lognormal GOF Test**											
909					Shapiro Wilk Test Statistic	0.237	**Shapiro Wilk Lognormal GOF Test**					
910					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
911					Lilliefors Test Statistic	0.529	**Lilliefors Lognormal GOF Test**					
912					5% Lilliefors Critical Value	0.102	Data Not Lognormal at 5% Significance Level					
913	**Data Not Lognormal at 5% Significance Level**											
914												
915	**Background Statistics assuming Lognormal Distribution**											
916					95% UTL with 95% Coverage	0.0113				90% Percentile (z)		0.0109
917					95% UPL (t)	0.0111				95% Percentile (z)		0.0111
918					95% USL	0.012				99% Percentile (z)		0.0115
919												
920	**Nonparametric Distribution Free Background Statistics**											
921	**Data do not follow a Discernible Distribution (0.05)**											
922												
923	**Nonparametric Upper Limits for Background Threshold Values**											
924					Order of Statistic, r	75				95% UTL with 95% Coverage		0.012
925					Approx, f used to compute achieved CC	1.974				Approximate Actual Confidence Coefficient achieved by UTL		0.899
926										Approximate Sample Size needed to achieve specified CC		93
927					95% Percentile Bootstrap UTL with 95% Coverage	0.012				95% BCA Bootstrap UTL with 95% Coverage		0.012
928					95% UPL	0.0112				90% Percentile		0.01
929					90% Chebyshev UPL	0.0121				95% Percentile		0.0103
930					95% Chebyshev UPL	0.013				99% Percentile		0.0128
931					95% USL	0.015						
932												
933	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
934	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
935	and consists of observations collected from clean unimpacted locations.											
936	The use of USL tends to provide a balance between false positives and false negatives provided the data											
937	represents a background data set and when many onsite observations need to be compared with the BTV.											
938												

	A	B	C	D	E	F	G	H	I	J	K	L
939	**MW-1|Lithium|T^report_result_value**											
940												
941	**General Statistics**											
942					Total Number of Observations	78				Number of Distinct Observations		1
943										Number of Missing Observations		3
944					Minimum	0.03				First Quartile		0.03
945					Second Largest	0.03				Median		0.03
946					Maximum	0.03				Third Quartile		0.03
947					Mean	0.03				SD		6.984E-18
948					Coefficient of Variation	2.328E-16				Skewness		1.02
949												
950	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
951	**ProUCL (or any other software) should not be used on such a data set!**											
952	**The data set for variable MW-1|Lithium|T^report_result_value was not processed!**											
953												
954	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
955	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
956												
957												

	A	B	C	D	E	F	G	H	I	J	K	L
958	**MW-1|Mercury|T^report_result_value**											
959												
960	**General Statistics**											
961						Total Number of Observations	81			Number of Distinct Observations	1	
962						Minimum	2.0000E-4			First Quartile	2.0000E-4	
963						Second Largest	2.0000E-4			Median	2.0000E-4	
964						Maximum	2.0000E-4			Third Quartile	2.0000E-4	
965						Mean	2.0000E-4			SD	1.636E-19	
966						Coefficient of Variation	8.182E-16			Skewness	-1.019	
967												
968	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
969	**ProUCL (or any other software) should not be used on such a data set!**											
970	**The data set for variable MW-1|Mercury|T^report_result_value was not processed!**											
971												
972	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
973	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
974												
975												

976	**MW-1|MOLYBDENUM|T^report_result_value**										
977											
978	**General Statistics**										
979						Total Number of Observations	81			Number of Distinct Observations	33	
980						Minimum	0.001			First Quartile	0.0019
981						Second Largest	0.01			Median	0.0026
982						Maximum	0.01			Third Quartile	0.0041
983						Mean	0.00359			SD	0.00275
984						Coefficient of Variation	0.766			Skewness	1.414
985						Mean of logged Data	-5.873			SD of logged Data	0.684
986											
987						**Critical Values for Background Threshold Values (BTVs)**						
988						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
989											
990						**Normal GOF Test**					
991						Shapiro Wilk Test Statistic	0.764			**Normal GOF Test**	
992						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level	
993						Lilliefors Test Statistic	0.225			**Lilliefors GOF Test**	
994						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
995						**Data Not Normal at 5% Significance Level**					
996											
997						**Background Statistics Assuming Normal Distribution**						
998						95% UTL with 95% Coverage	0.00898			90% Percentile (z)	0.00712
999						95% UPL (t)	0.0082			95% Percentile (z)	0.00811
1000						95% USL	0.0122			99% Percentile (z)	0.00999
1001											
1002						**Gamma GOF Test**					
1003						A-D Test Statistic	2.49			**Anderson-Darling Gamma GOF Test**	
1004						5% A-D Critical Value	0.762			Data Not Gamma Distributed at 5% Significance Level	
1005						K-S Test Statistic	0.148			**Kolmogorov-Smirnov Gamma GOF Test**	
1006						5% K-S Critical Value	0.1			Data Not Gamma Distributed at 5% Significance Level	
1007						**Data Not Gamma Distributed at 5% Significance Level**					
1008											
1009						**Gamma Statistics**					
1010						k hat (MLE)	2.205			k star (bias corrected MLE)	2.131
1011						Theta hat (MLE)	0.00163			Theta star (bias corrected MLE)	0.00168
1012						nu hat (MLE)	357.2			nu star (bias corrected)	345.3
1013						MLE Mean (bias corrected)	0.00359			MLE Sd (bias corrected)	0.00246
1014											
1015						**Background Statistics Assuming Gamma Distribution**						
1016						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00835			90% Percentile	0.00688
1017						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00843			95% Percentile	0.00835
1018						95% WH Approx. Gamma UTL with 95% Coverage	0.00962			99% Percentile	0.0116
1019						95% HW Approx. Gamma UTL with 95% Coverage	0.00981				
1020						95% WH USL	0.0163			95% HW USL	0.0174
1021											

	A	B	C	D	E	F	G	H	I	J	K	L
1022	**Lognormal GOF Test**											
1023					Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**					
1024					5% Shapiro Wilk P Value	2.5317E-5	Data Not Lognormal at 5% Significance Level					
1025					Lilliefors Test Statistic	0.0987	**Lilliefors Lognormal GOF Test**					
1026					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
1027	**Data Not Lognormal at 5% Significance Level**											
1028												
1029	**Background Statistics assuming Lognormal Distribution**											
1030					95% UTL with 95% Coverage	0.0108				90% Percentile (z)		0.00677
1031					95% UPL (t)	0.00885				95% Percentile (z)		0.00868
1032					95% USL	0.0241				99% Percentile (z)		0.0138
1033												
1034	**Nonparametric Distribution Free Background Statistics**											
1035	**Data do not follow a Discernible Distribution (0.05)**											
1036												
1037	**Nonparametric Upper Limits for Background Threshold Values**											
1038					Order of Statistic, r	79				95% UTL with 95% Coverage		0.01
1039					Approx, f used to compute achieved CC	1.386				Approximate Actual Confidence Coefficient achieved by UTL		0.777
1040										Approximate Sample Size needed to achieve specified CC		124
1041				95% Percentile Bootstrap UTL with 95% Coverage		0.01				95% BCA Bootstrap UTL with 95% Coverage		0.0083
1042					95% UPL	0.01				90% Percentile		0.01
1043					90% Chebyshev UPL	0.0119				95% Percentile		0.01
1044					95% Chebyshev UPL	0.0157				99% Percentile		0.01
1045					95% USL	0.01						
1046												
1047	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1048	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1049	and consists of observations collected from clean unimpacted locations.											
1050	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1051	represents a background data set and when many onsite observations need to be compared with the BTV.											
1052												

1053	**MW-1|Radium (226)|T^report_result_value**										
1054											
1055	**General Statistics**										
1056					Total Number of Observations	56			Number of Distinct Observations		53
1057					Minimum	0.0816			First Quartile		0.251
1058					Second Largest	0.77			Median		0.362
1059					Maximum	0.881			Third Quartile		0.5
1060					Mean	0.384			SD		0.188
1061					Coefficient of Variation	0.488			Skewness		0.579
1062					Mean of logged Data	-1.09			SD of logged Data		0.552
1063											
1064	**Critical Values for Background Threshold Values (BTVs)**										
1065					Tolerance Factor K (For UTL)	2.032			d2max (for USL)		3.001
1066											
1067	**Normal GOF Test**										
1068					Shapiro Wilk Test Statistic	0.957			**Normal GOF Test**		
1069					5% Shapiro Wilk P Value	0.0935			Data appear Normal at 5% Significance Level		
1070					Lilliefors Test Statistic	0.1			**Lilliefors GOF Test**		
1071					5% Lilliefors Critical Value	0.118			Data appear Normal at 5% Significance Level		
1072	**Data appear Normal at 5% Significance Level**										
1073											
1074	**Background Statistics Assuming Normal Distribution**										
1075					95% UTL with 95% Coverage	0.765			90% Percentile (z)		0.625
1076					95% UPL (t)	0.701			95% Percentile (z)		0.693
1077					95% USL	0.947			99% Percentile (z)		0.82
1078											
1079	**Gamma GOF Test**										
1080					A-D Test Statistic	0.209			**Anderson-Darling Gamma GOF Test**		
1081					5% A-D Critical Value	0.754			Detected data appear Gamma Distributed at 5% Significance Level		
1082					K-S Test Statistic	0.0696			**Kolmogorov-Smirnov Gamma GOF Test**		
1083					5% K-S Critical Value	0.119			Detected data appear Gamma Distributed at 5% Significance Level		
1084	**Detected data appear Gamma Distributed at 5% Significance Level**										
1085											
1086	**Gamma Statistics**										
1087					k hat (MLE)	3.914			k star (bias corrected MLE)		3.716
1088					Theta hat (MLE)	0.0982			Theta star (bias corrected MLE)		0.103
1089					nu hat (MLE)	438.3			nu star (bias corrected)		416.2
1090					MLE Mean (bias corrected)	0.384			MLE Sd (bias corrected)		0.199
1091											
1092	**Background Statistics Assuming Gamma Distribution**										
1093					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.766			90% Percentile		0.651
1094					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.782			95% Percentile		0.76
1095					95% WH Approx. Gamma UTL with 95% Coverage	0.878			99% Percentile		0.992
1096					95% HW Approx. Gamma UTL with 95% Coverage	0.906					
1097					95% WH USL	1.25			95% HW USL		1.332
1098											

	A	B	C	D	E	F	G	H	I	J	K	L
1099	**Lognormal GOF Test**											
1100					Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk Lognormal GOF Test**					
1101					5% Shapiro Wilk P Value	0.0705	Data appear Lognormal at 5% Significance Level					
1102					Lilliefors Test Statistic	0.104	**Lilliefors Lognormal GOF Test**					
1103					5% Lilliefors Critical Value	0.118	Data appear Lognormal at 5% Significance Level					
1104	**Data appear Lognormal at 5% Significance Level**											
1105												
1106	**Background Statistics assuming Lognormal Distribution**											
1107				95% UTL with	95% Coverage	1.032				90% Percentile (z)		0.682
1108					95% UPL (t)	0.854				95% Percentile (z)		0.834
1109					95% USL	1.762				99% Percentile (z)		1.215
1110												
1111	**Nonparametric Distribution Free Background Statistics**											
1112	**Data appear Normal at 5% Significance Level**											
1113												
1114	**Nonparametric Upper Limits for Background Threshold Values**											
1115					Order of Statistic, r	55				95% UTL with	95% Coverage	0.77
1116					Approx, f used to compute achieved CC	1.447				Approximate Actual Confidence Coefficient achieved by UTL		0.777
1117										Approximate Sample Size needed to achieve specified CC		93
1118			95% Percentile Bootstrap UTL with		95% Coverage	0.798			95% BCA Bootstrap UTL with		95% Coverage	0.788
1119					95% UPL	0.759				90% Percentile		0.656
1120					90% Chebyshev UPL	0.952				95% Percentile		0.755
1121					95% Chebyshev UPL	1.209				99% Percentile		0.82
1122					95% USL	0.881						
1123												
1124	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1125	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1126	and consists of observations collected from clean unimpacted locations.											
1127	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1128	represents a background data set and when many onsite observations need to be compared with the BTV.											
1129												

1130	**MW-1|Radium 228|T^report_result_value**											
1131												
1132	**General Statistics**											
1133						Total Number of Observations	56				Number of Distinct Observations	56
1134						Minimum	0.297				First Quartile	0.463
1135						Second Largest	1.75				Median	0.583
1136						Maximum	1.88				Third Quartile	0.813
1137						Mean	0.684				SD	0.333
1138						Coefficient of Variation	0.486				Skewness	1.846
1139						Mean of logged Data	-0.472				SD of logged Data	0.415
1140												
1141						**Critical Values for Background Threshold Values (BTVs)**							
1142						Tolerance Factor K (For UTL)	2.032				d2max (for USL)	3.001
1143												
1144						**Normal GOF Test**						
1145						Shapiro Wilk Test Statistic	0.824				**Normal GOF Test**	
1146						5% Shapiro Wilk P Value	9.9644E-9				Data Not Normal at 5% Significance Level	
1147						Lilliefors Test Statistic	0.147				**Lilliefors GOF Test**	
1148						5% Lilliefors Critical Value	0.118				Data Not Normal at 5% Significance Level	
1149						**Data Not Normal at 5% Significance Level**						
1150												
1151						**Background Statistics Assuming Normal Distribution**						
1152						95% UTL with 95% Coverage	1.36				90% Percentile (z)	1.11
1153						95% UPL (t)	1.245				95% Percentile (z)	1.231
1154						95% USL	1.682				99% Percentile (z)	1.458
1155												
1156						**Gamma GOF Test**						
1157						A-D Test Statistic	0.919				**Anderson-Darling Gamma GOF Test**	
1158						5% A-D Critical Value	0.753				Data Not Gamma Distributed at 5% Significance Level	
1159						K-S Test Statistic	0.102				**Kolmogorov-Smirnov Gamma GOF Test**	
1160						5% K-S Critical Value	0.119				Detected data appear Gamma Distributed at 5% Significance Level	
1161						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**						
1162												
1163						**Gamma Statistics**						
1164						k hat (MLE)	5.602				k star (bias corrected MLE)	5.314
1165						Theta hat (MLE)	0.122				Theta star (bias corrected MLE)	0.129
1166						nu hat (MLE)	627.4				nu star (bias corrected)	595.1
1167						MLE Mean (bias corrected)	0.684				MLE Sd (bias corrected)	0.297
1168												
1169						**Background Statistics Assuming Gamma Distribution**						
1170						95% Wilson Hilferty (WH) Approx. Gamma UPL	1.239				90% Percentile	1.081
1171						95% Hawkins Wixley (HW) Approx. Gamma UPL	1.242				95% Percentile	1.234
1172						95% WH Approx. Gamma UTL with 95% Coverage	1.394				99% Percentile	1.555
1173						95% HW Approx. Gamma UTL with 95% Coverage	1.404					
1174						95% WH USL	1.898				95% HW USL	1.949
1175												

	A	B	C	D	E	F	G	H	I	J	K	L
1176	**Lognormal GOF Test**											
1177					Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk Lognormal GOF Test**					
1178					5% Shapiro Wilk P Value	0.114	Data appear Lognormal at 5% Significance Level					
1179					Lilliefors Test Statistic	0.0779	**Lilliefors Lognormal GOF Test**					
1180					5% Lilliefors Critical Value	0.118	Data appear Lognormal at 5% Significance Level					
1181	**Data appear Lognormal at 5% Significance Level**											
1182												
1183	**Background Statistics assuming Lognormal Distribution**											
1184				95% UTL with	95% Coverage	1.451				90% Percentile (z)		1.062
1185					95% UPL (t)	1.258				95% Percentile (z)		1.235
1186					95% USL	2.169				99% Percentile (z)		1.639
1187												
1188	**Nonparametric Distribution Free Background Statistics**											
1189	**Data appear Approximate Gamma Distribution at 5% Significance Level**											
1190												
1191	**Nonparametric Upper Limits for Background Threshold Values**											
1192					Order of Statistic, r	55				95% UTL with	95% Coverage	1.75
1193					Approx, f used to compute achieved CC	1.447				Approximate Actual Confidence Coefficient achieved by UTL		0.777
1194										Approximate Sample Size needed to achieve specified CC		93
1195			95% Percentile Bootstrap UTL with		95% Coverage	1.783				95% BCA Bootstrap UTL with	95% Coverage	1.783
1196					95% UPL	1.589				90% Percentile		0.99
1197					90% Chebyshev UPL	1.69				95% Percentile		1.38
1198					95% Chebyshev UPL	2.146				99% Percentile		1.809
1199					95% USL	1.88						
1200												
1201	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1202	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1203	and consists of observations collected from clean unimpacted locations.											
1204	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1205	represents a background data set and when many onsite observations need to be compared with the BTV.											
1206												

	A	B	C	D	E	F	G	H	I	J	K	L
1207	**MW-1|Selenium|T^report_result_value**											
1208												
1209	**General Statistics**											
1210					Total Number of Observations	81				Number of Distinct Observations		6
1211					Minimum	0.001				First Quartile		0.001
1212					Second Largest	0.025				Median		0.001
1213					Maximum	0.025				Third Quartile		0.001
1214					Mean	0.0037				SD		0.00758
1215					Coefficient of Variation	2.049				Skewness		2.52
1216					Mean of logged Data	-6.525				SD of logged Data		1.014
1217												
1218					**Critical Values for Background Threshold Values (BTVs)**							
1219					Tolerance Factor K (For UTL)	1.958				d2max (for USL)		3.136
1220												
1221					**Normal GOF Test**							
1222					Shapiro Wilk Test Statistic	0.368				**Normal GOF Test**		
1223					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
1224					Lilliefors Test Statistic	0.501				**Lilliefors GOF Test**		
1225					5% Lilliefors Critical Value	0.0985				Data Not Normal at 5% Significance Level		
1226					**Data Not Normal at 5% Significance Level**							
1227												
1228					**Background Statistics Assuming Normal Distribution**							
1229					95% UTL with 95% Coverage	0.0185				90% Percentile (z)		0.0134
1230					95% UPL (t)	0.0164				95% Percentile (z)		0.0162
1231					95% USL	0.0275				99% Percentile (z)		0.0213
1232												
1233					**Gamma GOF Test**							
1234					A-D Test Statistic	25.45				**Anderson-Darling Gamma GOF Test**		
1235					5% A-D Critical Value	0.803				Data Not Gamma Distributed at 5% Significance Level		
1236					K-S Test Statistic	0.49				**Kolmogorov-Smirnov Gamma GOF Test**		
1237					5% K-S Critical Value	0.104				Data Not Gamma Distributed at 5% Significance Level		
1238					**Data Not Gamma Distributed at 5% Significance Level**							
1239												
1240					**Gamma Statistics**							
1241					k hat (MLE)	0.659				k star (bias corrected MLE)		0.643
1242					Theta hat (MLE)	0.00561				Theta star (bias corrected MLE)		0.00575
1243					nu hat (MLE)	106.7				nu star (bias corrected)		104.1
1244					MLE Mean (bias corrected)	0.0037				MLE Sd (bias corrected)		0.00461
1245												
1246					**Background Statistics Assuming Gamma Distribution**							
1247					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0112				90% Percentile		0.00947
1248					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0104				95% Percentile		0.013
1249					95% WH Approx. Gamma UTL with 95% Coverage	0.014				99% Percentile		0.0214
1250					95% HW Approx. Gamma UTL with 95% Coverage	0.0132						
1251					95% WH USL	0.0305				95% HW USL		0.0313
1252												

	A	B	C	D	E	F	G	H	I	J	K	L
1253	**Lognormal GOF Test**											
1254					Shapiro Wilk Test Statistic	0.397	**Shapiro Wilk Lognormal GOF Test**					
1255					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
1256					Lilliefors Test Statistic	0.437	**Lilliefors Lognormal GOF Test**					
1257					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
1258	**Data Not Lognormal at 5% Significance Level**											
1259												
1260	**Background Statistics assuming Lognormal Distribution**											
1261					95% UTL with 95% Coverage	0.0107				90% Percentile (z)		0.00538
1262					95% UPL (t)	0.00801				95% Percentile (z)		0.00777
1263					95% USL	0.0353				99% Percentile (z)		0.0155
1264												
1265	**Nonparametric Distribution Free Background Statistics**											
1266	**Data do not follow a Discernible Distribution (0.05)**											
1267												
1268	**Nonparametric Upper Limits for Background Threshold Values**											
1269					Order of Statistic, r	79				95% UTL with 95% Coverage		0.025
1270					Approx, f used to compute achieved CC	1.386				Approximate Actual Confidence Coefficient achieved by UTL		0.777
1271										Approximate Sample Size needed to achieve specified CC		124
1272					95% Percentile Bootstrap UTL with 95% Coverage	0.025				95% BCA Bootstrap UTL with 95% Coverage		0.0022
1273					95% UPL	0.025				90% Percentile		0.025
1274					90% Chebyshev UPL	0.0266				95% Percentile		0.025
1275					95% Chebyshev UPL	0.0369				99% Percentile		0.025
1276					95% USL	0.025						
1277												
1278	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1279	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1280	and consists of observations collected from clean unimpacted locations.											
1281	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1282	represents a background data set and when many onsite observations need to be compared with the BTV.											
1283												

1284	**MW-1|Sulfate as SO4|T^report_result_value**										
1285											
1286	**General Statistics**										
1287						Total Number of Observations	169			Number of Distinct Observations	142
1288						Minimum	2			First Quartile	30
1289						Second Largest	167			Median	55.4
1290						Maximum	171			Third Quartile	100
1291						Mean	65.22			SD	42.88
1292						Coefficient of Variation	0.658			Skewness	0.526
1293						Mean of logged Data	3.863			SD of logged Data	0.94
1294											
1295						**Critical Values for Background Threshold Values (BTVs)**					
1296						Tolerance Factor K (For UTL)	1.854			d2max (for USL)	3.38
1297											
1298						**Normal GOF Test**					
1299						Shapiro Wilk Test Statistic	0.927			**Normal GOF Test**	
1300						5% Shapiro Wilk P Value	1.106E-10			Data Not Normal at 5% Significance Level	
1301						Lilliefors Test Statistic	0.118			**Lilliefors GOF Test**	
1302						5% Lilliefors Critical Value	0.0686			Data Not Normal at 5% Significance Level	
1303						**Data Not Normal at 5% Significance Level**					
1304											
1305						**Background Statistics Assuming Normal Distribution**					
1306						95% UTL with 95% Coverage	144.7			90% Percentile (z)	120.2
1307						95% UPL (t)	136.4			95% Percentile (z)	135.8
1308						95% USL	210.2			99% Percentile (z)	165
1309											
1310						**Gamma GOF Test**					
1311						A-D Test Statistic	1.264			**Anderson-Darling Gamma GOF Test**	
1312						5% A-D Critical Value	0.769			Data Not Gamma Distributed at 5% Significance Level	
1313						K-S Test Statistic	0.0757			**Kolmogorov-Smirnov Gamma GOF Test**	
1314						5% K-S Critical Value	0.0728			Data Not Gamma Distributed at 5% Significance Level	
1315						**Data Not Gamma Distributed at 5% Significance Level**					
1316											
1317						**Gamma Statistics**					
1318						k hat (MLE)	1.736			k star (bias corrected MLE)	1.709
1319						Theta hat (MLE)	37.58			Theta star (bias corrected MLE)	38.17
1320						nu hat (MLE)	586.6			nu star (bias corrected)	577.6
1321						MLE Mean (bias corrected)	65.22			MLE Sd (bias corrected)	49.89
1322											
1323						**Background Statistics Assuming Gamma Distribution**					
1324						95% Wilson Hilferty (WH) Approx. Gamma UPL	162.5			90% Percentile	131.7
1325						95% Hawkins Wixley (HW) Approx. Gamma UPL	171.4			95% Percentile	162.7
1326						95% WH Approx. Gamma UTL with 95% Coverage	180.7			99% Percentile	232.2
1327						95% HW Approx. Gamma UTL with 95% Coverage	192.9				
1328						95% WH USL	372.1			95% HW USL	439.2
1329											

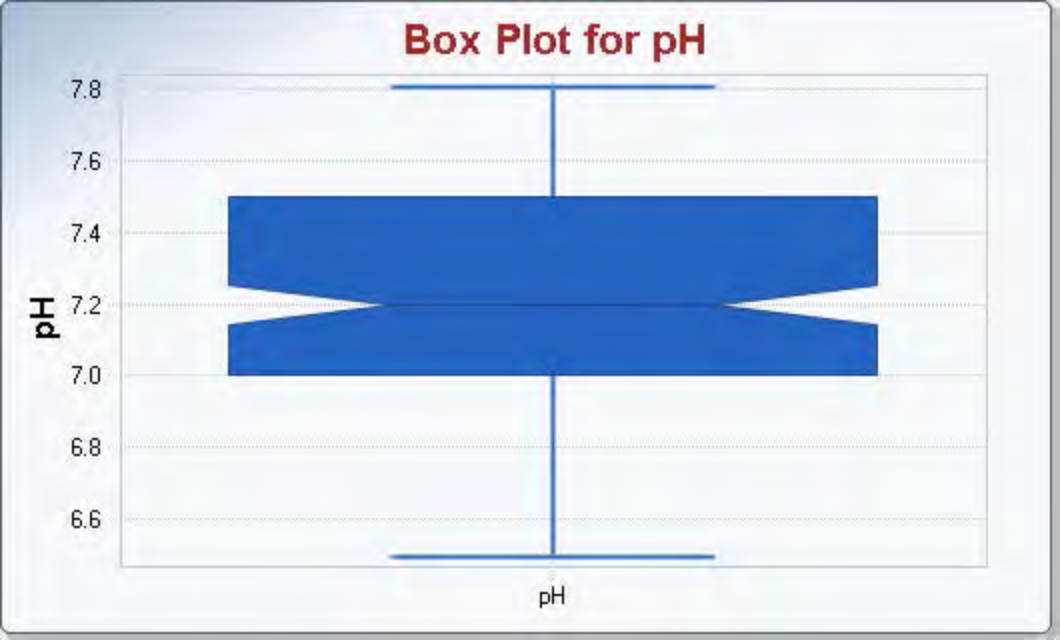
	A	B	C	D	E	F	G	H	I	J	K	L
1330	**Lognormal GOF Test**											
1331					Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk Lognormal GOF Test**					
1332					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
1333					Lilliefors Test Statistic	0.132	**Lilliefors Lognormal GOF Test**					
1334					5% Lilliefors Critical Value	0.0686	Data Not Lognormal at 5% Significance Level					
1335	**Data Not Lognormal at 5% Significance Level**											
1336												
1337	**Background Statistics assuming Lognormal Distribution**											
1338					95% UTL with 95% Coverage	272.1				90% Percentile (z)		158.8
1339					95% UPL (t)	226.5				95% Percentile (z)		223.5
1340					95% USL	1143				99% Percentile (z)		424.3
1341												
1342	**Nonparametric Distribution Free Background Statistics**											
1343	**Data do not follow a Discernible Distribution (0.05)**											
1344												
1345	**Nonparametric Upper Limits for Background Threshold Values**											
1346					Order of Statistic, r	164				95% UTL with 95% Coverage		153
1347					Approx, f used to compute achieved CC	1.439				Approximate Actual Confidence Coefficient achieved by UTL		0.853
1348										Approximate Sample Size needed to achieve specified CC		208
1349					95% Percentile Bootstrap UTL with 95% Coverage	154.2				95% BCA Bootstrap UTL with 95% Coverage		153
1350					95% UPL	142				90% Percentile		125.2
1351					90% Chebyshev UPL	194.2				95% Percentile		140.6
1352					95% Chebyshev UPL	252.7				99% Percentile		167
1353					95% USL	171						
1354												
1355	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1356	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1357	and consists of observations collected from clean unimpacted locations.											
1358	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1359	represents a background data set and when many onsite observations need to be compared with the BTV.											
1360												

1361	**MW-1|Thallium|T^report_result_value**										
1362											
1363	**General Statistics**										
1364						Total Number of Observations	81			Number of Distinct Observations	4
1365						Minimum	5.6000E-5			First Quartile	2.0000E-4
1366						Second Largest	0.02			Median	2.0000E-4
1367						Maximum	0.02			Third Quartile	2.0000E-4
1368						Mean	0.0024			SD	0.00626
1369						Coefficient of Variation	2.613			Skewness	2.522
1370						Mean of logged Data	-8.037			SD of logged Data	1.48
1371											
1372						**Critical Values for Background Threshold Values (BTVs)**					
1373						Tolerance Factor K (For UTL)	1.958			d2max (for USL)	3.136
1374											
1375						**Normal GOF Test**					
1376						Shapiro Wilk Test Statistic	0.363			**Normal GOF Test**	
1377						5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level	
1378						Lilliefors Test Statistic	0.526			**Lilliefors GOF Test**	
1379						5% Lilliefors Critical Value	0.0985			Data Not Normal at 5% Significance Level	
1380						**Data Not Normal at 5% Significance Level**					
1381											
1382						**Background Statistics Assuming Normal Distribution**					
1383						95% UTL with 95% Coverage	0.0147			90% Percentile (z)	0.0104
1384						95% UPL (t)	0.0129			95% Percentile (z)	0.0127
1385						95% USL	0.022			99% Percentile (z)	0.017
1386											
1387						**Gamma GOF Test**					
1388						A-D Test Statistic	25.96			**Anderson-Darling Gamma GOF Test**	
1389						5% A-D Critical Value	0.856			Data Not Gamma Distributed at 5% Significance Level	
1390						K-S Test Statistic	0.556			**Kolmogorov-Smirnov Gamma GOF Test**	
1391						5% K-S Critical Value	0.107			Data Not Gamma Distributed at 5% Significance Level	
1392						**Data Not Gamma Distributed at 5% Significance Level**					
1393											
1394						**Gamma Statistics**					
1395						k hat (MLE)	0.338			k star (bias corrected MLE)	0.333
1396						Theta hat (MLE)	0.0071			Theta star (bias corrected MLE)	0.00719
1397						nu hat (MLE)	54.71			nu star (bias corrected)	54.02
1398						MLE Mean (bias corrected)	0.0024			MLE Sd (bias corrected)	0.00415
1399											
1400						**Background Statistics Assuming Gamma Distribution**					
1401						95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00739			90% Percentile	0.00697
1402						95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00647			95% Percentile	0.0106
1403						95% WH Approx. Gamma UTL with 95% Coverage	0.0098			99% Percentile	0.0199
1404						95% HW Approx. Gamma UTL with 95% Coverage	0.00886				
1405						95% WH USL	0.0253			95% HW USL	0.0264
1406											

	A	B	C	D	E	F	G	H	I	J	K	L
1407	**Lognormal GOF Test**											
1408					Shapiro Wilk Test Statistic	0.415	**Shapiro Wilk Lognormal GOF Test**					
1409					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
1410					Lilliefors Test Statistic	0.516	**Lilliefors Lognormal GOF Test**					
1411					5% Lilliefors Critical Value	0.0985	Data Not Lognormal at 5% Significance Level					
1412	**Data Not Lognormal at 5% Significance Level**											
1413												
1414	**Background Statistics assuming Lognormal Distribution**											
1415					95% UTL with 95% Coverage	0.00587				90% Percentile (z)		0.00216
1416					95% UPL (t)	0.00386				95% Percentile (z)		0.00369
1417					95% USL	0.0336				99% Percentile (z)		0.0101
1418												
1419	**Nonparametric Distribution Free Background Statistics**											
1420	**Data do not follow a Discernible Distribution (0.05)**											
1421												
1422	**Nonparametric Upper Limits for Background Threshold Values**											
1423					Order of Statistic, r	79				95% UTL with 95% Coverage		0.02
1424					Approx, f used to compute achieved CC	1.386				Approximate Actual Confidence Coefficient achieved by UTL		0.777
1425										Approximate Sample Size needed to achieve specified CC		124
1426					95% Percentile Bootstrap UTL with 95% Coverage	0.02				95% BCA Bootstrap UTL with 95% Coverage		2.0000E-4
1427					95% UPL	0.02				90% Percentile		0.02
1428					90% Chebyshev UPL	0.0213				95% Percentile		0.02
1429					95% Chebyshev UPL	0.0299				99% Percentile		0.02
1430					95% USL	0.02						
1431												
1432	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1433	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1434	and consists of observations collected from clean unimpacted locations.											
1435	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1436	represents a background data set and when many onsite observations need to be compared with the BTV.											
1437												

1438	**MW-1|Total Dissolved Solids|T^report_result_value**										
1439											
1440	**General Statistics**										
1441						Total Number of Observations	36			Number of Distinct Observations	33
1442						Minimum	287			First Quartile	355.3
1443						Second Largest	1070			Median	536
1444						Maximum	1170			Third Quartile	632.5
1445						Mean	559.8			SD	229.9
1446						Coefficient of Variation	0.411			Skewness	1.042
1447						Mean of logged Data	6.253			SD of logged Data	0.387
1448											
1449						**Critical Values for Background Threshold Values (BTVs)**					
1450						Tolerance Factor K (For UTL)	2.148			d2max (for USL)	2.824
1451											
1452						**Normal GOF Test**					
1453						Shapiro Wilk Test Statistic	0.885			**Shapiro Wilk GOF Test**	
1454						5% Shapiro Wilk Critical Value	0.935			Data Not Normal at 5% Significance Level	
1455						Lilliefors Test Statistic	0.177			**Lilliefors GOF Test**	
1456						5% Lilliefors Critical Value	0.145			Data Not Normal at 5% Significance Level	
1457						**Data Not Normal at 5% Significance Level**					
1458											
1459						**Background Statistics Assuming Normal Distribution**					
1460						95% UTL with 95% Coverage	1054			90% Percentile (z)	854.4
1461						95% UPL (t)	953.6			95% Percentile (z)	937.9
1462						95% USL	1209			99% Percentile (z)	1095
1463											
1464						**Gamma GOF Test**					
1465						A-D Test Statistic	0.802			**Anderson-Darling Gamma GOF Test**	
1466						5% A-D Critical Value	0.749			Data Not Gamma Distributed at 5% Significance Level	
1467						K-S Test Statistic	0.133			**Kolmogorov-Smirnov Gamma GOF Test**	
1468						5% K-S Critical Value	0.147			Detected data appear Gamma Distributed at 5% Significance Level	
1469						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**					
1470											
1471						**Gamma Statistics**					
1472						k hat (MLE)	6.839			k star (bias corrected MLE)	6.288
1473						Theta hat (MLE)	81.85			Theta star (bias corrected MLE)	89.03
1474						nu hat (MLE)	492.4			nu star (bias corrected)	452.7
1475						MLE Mean (bias corrected)	559.8			MLE Sd (bias corrected)	223.2
1476											
1477						**Background Statistics Assuming Gamma Distribution**					
1478						95% Wilson Hilferty (WH) Approx. Gamma UPL	979.3			90% Percentile	858.1
1479						95% Hawkins Wixley (HW) Approx. Gamma UPL	985			95% Percentile	970.3
1480						95% WH Approx. Gamma UTL with 95% Coverage	1123			99% Percentile	1205
1481						95% HW Approx. Gamma UTL with 95% Coverage	1137				
1482						95% WH USL	1373			95% HW USL	1408
1483											

	A	B	C	D	E	F	G	H	I	J	K	L
1484	**Lognormal GOF Test**											
1485					Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk Lognormal GOF Test**					
1486					5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level					
1487					Lilliefors Test Statistic	0.134	**Lilliefors Lognormal GOF Test**					
1488					5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level					
1489	**Data appear Lognormal at 5% Significance Level**											
1490												
1491	**Background Statistics assuming Lognormal Distribution**											
1492				95% UTL with	95% Coverage	1192				90% Percentile (z)		852.5
1493					95% UPL (t)	1007				95% Percentile (z)		981.1
1494					95% USL	1548				99% Percentile (z)		1277
1495												
1496	**Nonparametric Distribution Free Background Statistics**											
1497	**Data appear Approximate Gamma Distribution at 5% Significance Level**											
1498												
1499	**Nonparametric Upper Limits for Background Threshold Values**											
1500					Order of Statistic, r	36				95% UTL with	95% Coverage	1170
1501					Approx, f used to compute achieved CC	1.895				Approximate Actual Confidence Coefficient achieved by UTL		0.842
1502										Approximate Sample Size needed to achieve specified CC		59
1503			95% Percentile Bootstrap UTL with		95% Coverage	1170				95% BCA Bootstrap UTL with	95% Coverage	1170
1504					95% UPL	1085				90% Percentile		854
1505					90% Chebyshev UPL	1259				95% Percentile		1040
1506					95% Chebyshev UPL	1576				99% Percentile		1135
1507					95% USL	1170						
1508												
1509	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1510	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1511	and consists of observations collected from clean unimpacted locations.											
1512	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1513	represents a background data set and when many onsite observations need to be compared with the BTV.											
1514												


Box Plot for pH
7.8
7.6
7.4
7.2
7.0
6.8
6.6
pH
pH