WCI Austin Landfill, LLC.

2020 Coal Combustion Residuals Annual Monitoring Report

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

January 29, 2021

2020 Coal Combustion Residuals Annual Monitoring Report

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

Prepared for:
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Date:
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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: 01/29/2021 License Number: 25086

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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	2020 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 *2020 Combustion Coal Residuals Annual Monitoring Report* (Report) was prepared to summarize the results of the 2020 groundwater monitoring events and associated analysis for Appendix III (detection monitoring) and Appendix IV (assessment monitoring), per 40 Code of Federal Regulations (CFR) §§ 257.90 – 257.98, at the SKB Lansing Landfill. The SKB Lansing Landfill operates under Minnesota Pollution Control Agency (MPCA) Site Permit Number SW-514-001. The SKB Lansing Landfill is located at 52563 243rd Street in Austin, Mower County, Minnesota (**Figure 1**).

Two groundwater sampling events were conducted at the SKB Lansing Landfill in the spring and fall of 2020. Groundwater samples were analyzed for parameters included in Appendix III (detection monitoring) and Appendix IV (assessment monitoring). Analytical results from the groundwater monitoring events were compared and evaluated to Background Threshold Values (BTVs) and Groundwater Protection Standards (GPS) established for the SKB Lansing Landfill.

1.1 Scope of Work

The following scope of work was conducted for the 2020 CCR groundwater monitoring events:

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

2 Site Background

2.1 Site Location and Description

The 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. 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 8 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:

<u>Gauging and Sampling</u>

- 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.

<u>Gauging Only</u>

- 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 evaluation, a total of 2 groundwater monitoring events were conducted in 2020 on the following dates:

- April 1-2, 2020
- October 15-16, 2020

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 2020 sampling events were analyzed for parameters specified in Appendix III (spring and fall) and Appendix IV (spring (full analyte list) and fall (analytes detected in spring event)) per §§ 257.93 – 257.95 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 Methods 903.0 and 904.0.

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 1 and October 15, 2020 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 2020 sampling results to the BTVs are summarized below.

Appendix III Analytes - Result Summary of BTV Exceedances

Boron (BTV =1.1 mg/l)

- Downgradient monitoring well
  - MW-2R (3.2 mg/l) (4/20/2020) – Exceedance confirmed. Statistically significant
  - MW-2R (2.4 mg/l) (10/15/2020) – Exceedance confirmed. Statistically significant
  - MW-4 – Had exceedance in the fall 2019 but sampling results in the spring 2020 (0.39 mg/l) indicate not statistically significant.

Sulfate as SO_4 (BTV = 359 mg/l)

- Downgradient monitoring well
  - MW-4 (146 mg/l) (4/2/2020) – Had exceedance in the fall of 2019 but sampling results in the spring 2020 (146 mg/l) indicate not statistically significant.

Appendix IV Analytes - Result Summary of BTV Exceedances

Arsenic (BTV = 0.015 mg/l)

- Downgradient monitoring well
  - MW-3 (0.0221 mg/l) (10/16/2020) – Exceedance not confirmed. Confirmation sampling scheduled for spring of 2021.

Cobalt (BTV = 0.0062 mg/l)

- Downgradient monitoring well
  - MW-3 (0.0.0069 mg/l) (4/5/2020) – Exceedance but sampling results in the fall of 2020 indicate not statistically significant.

6 Statistical Evaluation Data

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

The background dataset was determined for each well using analytical results ranging from spring 2017 to the most recent sampling event in October of 2020.

Statistical evaluation of the 2017 - 2020 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 5**. The statistical evaluation data is included in **Appendix C**.

6.1 Statistically Significant Increase Determination

The detected concentrations for the first and second half 2020 sampling event with the respective USL are listed below. Compliance is determined by comparing the current concentration to the calculated USL. Boron concentrations at monitoring well MW-2R were confirmed as SSI.

Comparison of 2020 Confirmed COC Concentrations to USLs

Monitoring Well	Analyte	First Half 2020 Conc (mg/l unless noted)	USL Conc (mg/l unless noted)	Second Half 2020 Conc (mg/l unless noted)	USL Notes
MW-2R	Boron	**3.2**	1.1	**2.4**	Exceedance confirmed
MW-3	Arsenic	0.0043	0.015	**0.0221**	Exceedance not confirmed. Confirmation sampling scheduled for spring 2021
MW-3	Cobalt	**0.0069**	0.0062	0.0036	Exceedance but not statistically significant

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

For the sampling events conducted in 2020, Cobalt (0.0069 mg/l) was detected above the GPS at MW-3 during the spring 2020 sampling event (**Table 7**). However, sampling results in the fall 2020 (0.0036 mg/l) indicate that it was not statistically significant. Arsenic (0.0221 mg/l) was detected above the GPS in the fall 2020 (**Table 7**). Sampling will be conducted in the spring 2021 to determine if it is statistically significant.

8 Report Summary and Conclusions

Per 40 CFR §§ 40.257.93 – 257.95, 2 monitoring events (spring and fall) were conducted in 2020 at the SKB Lansing Landfill. Groundwater samples were collected from the monitoring network's 8 monitoring wells (MW-1, MW-1RD, MW-2R, MW-2RD, MW-3, MW-3R, MW-3RD, and MW-4) located at the SKB Lansing Landfill during the 2020 monitoring events. Groundwater samples

were analyzed for parameters specified in Appendix III (detection monitoring) and Appendix IV (assessment monitoring).

The groundwater data collected in the 2017 – 2020 sampling events were statistically tested following the concepts outlined in this report to form a background data set. Interwell USLs were developed for Appendix III and Appendix IV in 8 monitoring wells. Upper and lower threshold values were developed for pH using USL and box plot statistics. The resulting USLs were compared to the current concentrations for each COC and well pair.

The following analytes were reported above the calculated BTVs in 2020:

Appendix III Analytes

- Boron groundwater concentrations were detected above the BTV at downgradient monitoring well MW-2R during the spring and fall 2020 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 exceedance from the spring 2020 sampling event indicate it was 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 2019 sampling event. Subsequent confirmation sampling during the spring 2020 determined this exceedance was not statistically significant.

Appendix IV Analytes

- A Arsenic groundwater concentration was detected above the BTV at downgradient monitoring well MW-4 during the fall 2020 sampling event. Confirmation sampling will be conducted in the spring 2021 to determine if statistically significant.

- A Cobalt groundwater concentration was detected above the BTV at downgradient monitoring well MW-3 in the spring 2020 sampling event. Subsequent confirmation sampling during the fall 2020 determined this exceedance was not statistically significant.

Groundwater concentrations from the 2020 monitoring events were compared to established GPS values. Cobalt was detected above the GPS value in the spring 2020, but was determined not to be statistically significant following the fall 2020 sampling event. Arsenic was detected above the GPS value in the fall 2020. Subsequent sampling in the spring 2021 will determined if statistically significant.

Groundwater elevation information from the monitoring data indicates a southwesterly groundwater flow direction beneath the landfill.

9 Recommendations

CCR groundwater monitoring events will be conducted in 2021 by the following schedule:

Spring 2021

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).

Summer 2021

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 2021 event).

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

A 2021 Annual Monitoring Report will be prepared and include sampling results from the 2021 CCR groundwater monitoring events and an evaluation of the analytical results as they pertained to BTV and GPS values.

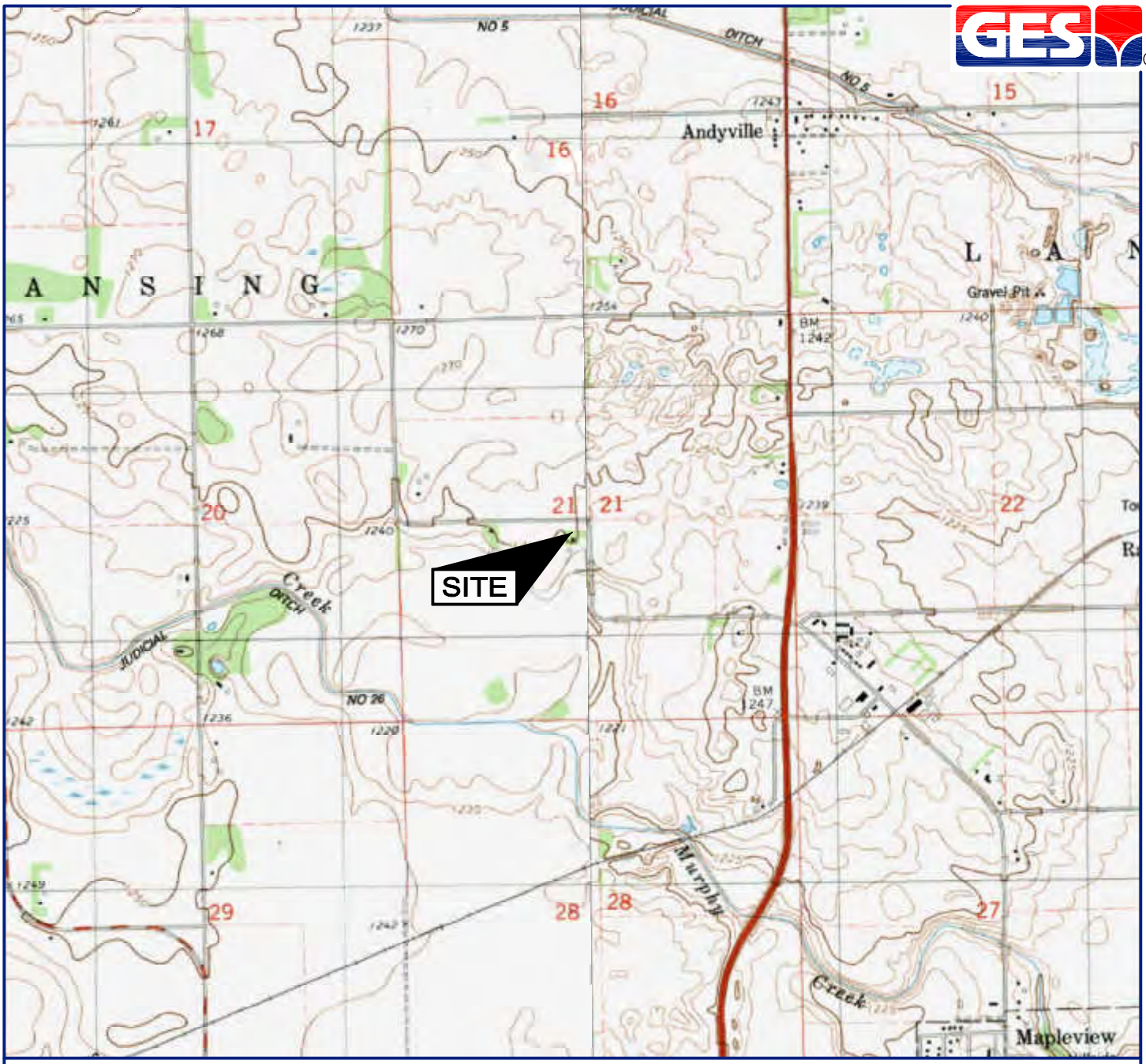
References

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



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

QUADRANGLE LOCATION

DRAFTED BY: W.G.S. (N.J.)	SITE LOCATION MAP
CHECKED BY: JFS	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

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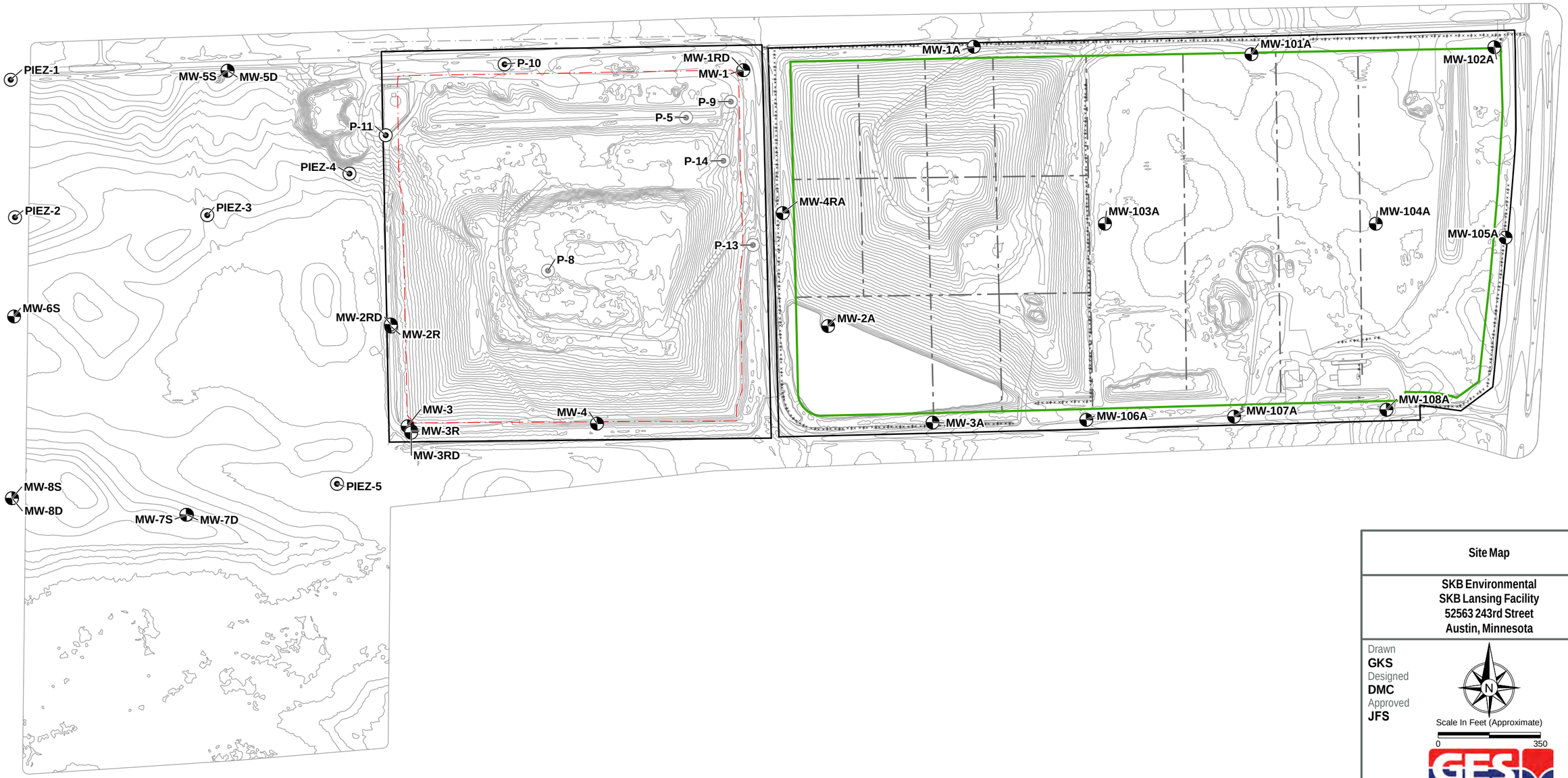


Legend

- 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**

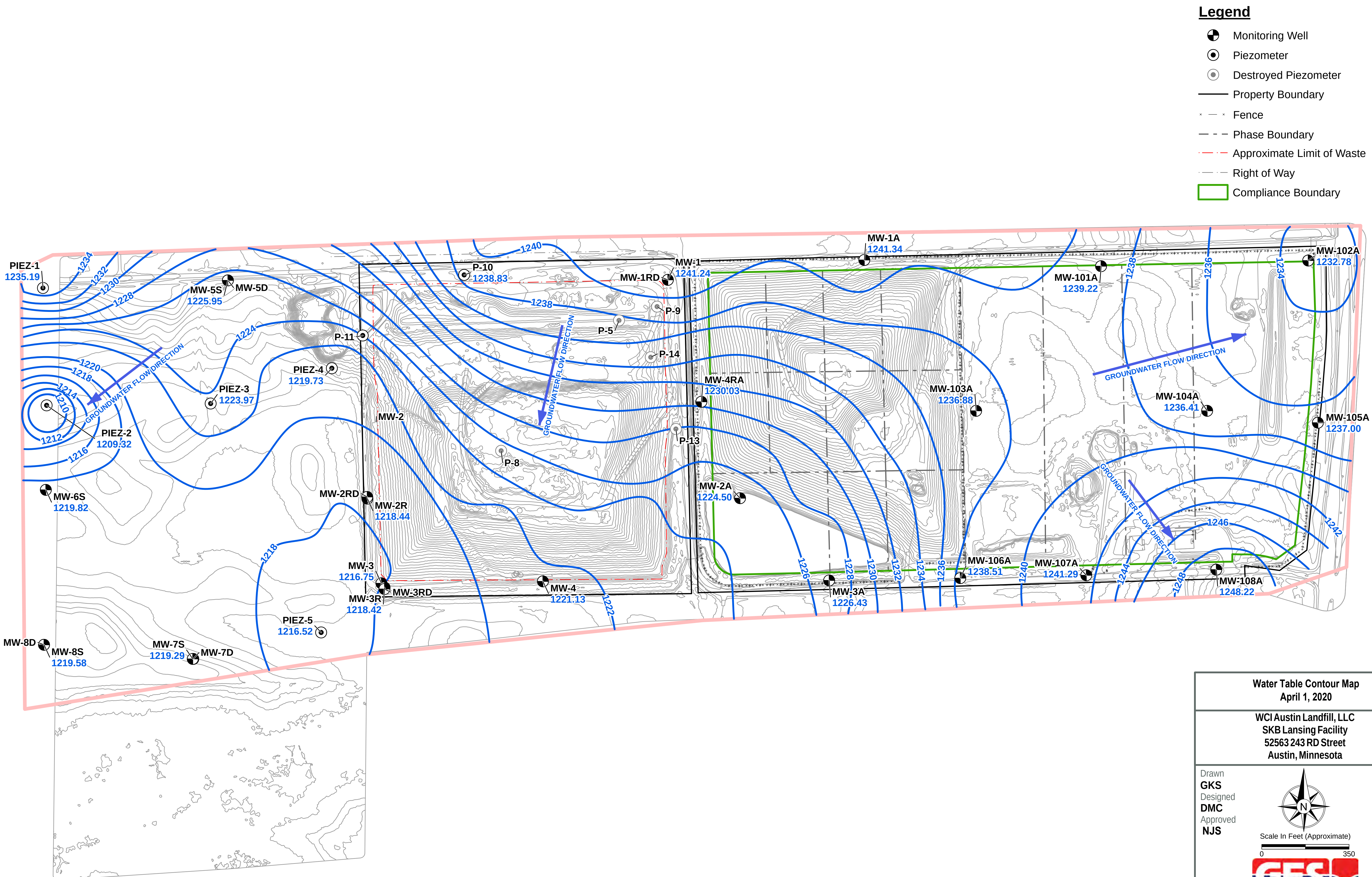
N

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



Water Table Contour Map
April 1, 2020

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

Drawn GKS
Designed DMC
Approved NJS
Date 1/11/21
Figure 3

GES
Groundwater & Environmental Services, Inc.

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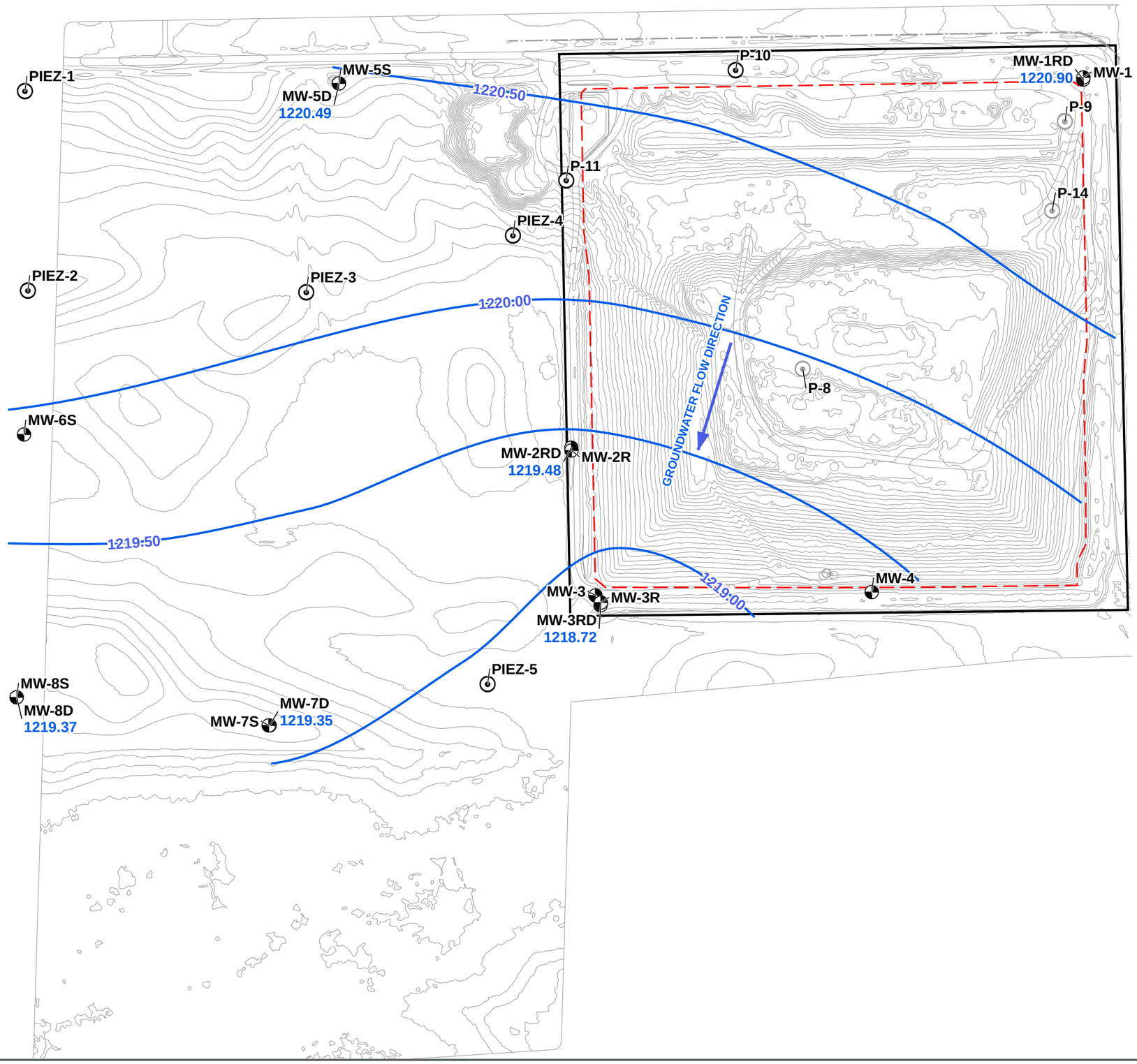


LEGEND

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

Potentiometric Surface Contour Map
April 1, 2020

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

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

Date **5/8/20**
Figure **4**

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Lansing Facility\GIS\Lansing_GWE_Pot_Surface.mxd - Scale 1:3,000 - 5/8/2020 9:31:12 AM - GStewart - GES

Legend

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

PIEZ-1 1229.83
MW-5S 1217.43
MW-5D
P-10 1234.28
MW-1 1237.19
MW-1RD
MW-1A 1234.18
MW-101A 1232.18
MW-102A 1229.87
P-11 1222.08
P-9
P-5
PIEZ-2 1203.89
PIEZ-3 1221.53
PIEZ-4 1215.25
P-14
MW-103A 1233.83
MW-104A 1231.72
MW-105A 1230.75
MW-4RA 1219.62
P-13
P-8
MW-6S 1215.49
MW-2RD
MW-2R 1216.38
MW-2A 1222.62
MW-106A 1233.7
MW-3 1213.1
MW-4 1217.06
MW-3RD
MW-3R 1215.16
MW-3A 1222.87
MW-107A 1237.14
MW-108A 1240.13
PIEZ-5 1214.54
MW-8D
MW-8S 1215.11
MW-7S 1215.22
MW-7D

GROUNDWATER FLOW DIRECTION

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

Water Table Contour Map
October 15, 2020

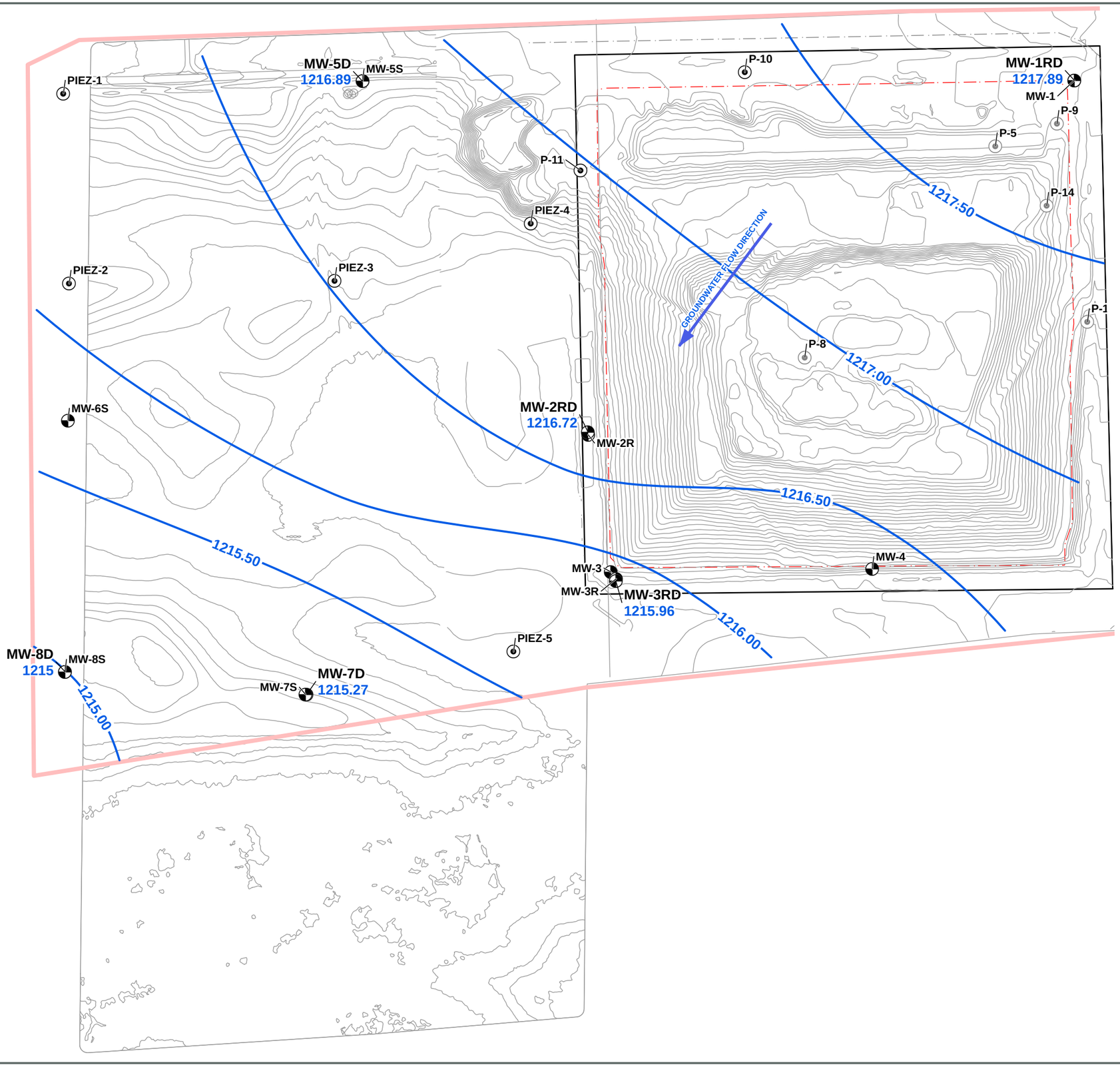
WCI Austin Landfill, LLC
SKB Lansing Landfill
52563 243 RD Street
Austin, Minnesota

Drawn **GKS**
Designed **DMC**
Approved **NJS**
Date **1/25/21**
Figure **5**

Scale In Feet (Approximate)
0 350

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Lansing Facility\GIS\SKB_Combined_Austin_Landfills_WaterTable.mxd - Scale 1:4,200 - 1/25/2021 9:31:38 AM - GStewart - NAD 1983 StatePlane Minnesota South FIPS 2203 Feet



Legend

- Groundwater Elevation Isocontour (ft MSL)
- Property Boundary
- Right of Way
- Approximate Limit of Waste
- Fence
- Monitoring Well
- Piezometer
- Destroyed Piezometer
- 1217.89 Measured Groundwater Elevation (ft MSL)

Potentiometric Surface Contour Map
Deep Zone - October 15, 2020

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

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

Date **1/25/21**
Figure **6**

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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Tables

2020 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
04/01/2020	1241.24	1220.90	1218.44	1219.48	1216.75	1218.42	1218.72	1221.13
10/15/2020	1237.19	1217.89	1216.38	1216.72	1213.10	1215.16	1215.96	1217.06

Date	MW-5D	MW-5S	MW-6S	MW-7D	MW-7S	MW-8D	MW-8S	PIEZ-1
04/01/2020	1220.49	1225.95	1219.82	1219.35	1219.29	1219.37	1219.58	1235.19
10/15/2020	1216.89	1217.43	1215.49	1215.27	1215.22	1215.00	1215.11	1229.83

Date	PIEZ-2	PIEZ-3	PIEZ-4	PIEZ-5	MW-1A	MW-2A	MW-3A	MW-4RA
04/01/2020	1209.32	1223.97	1219.73	1216.52	1241.34	1224.50	1226.43	1230.03
10/15/2020	1203.89	1221.53	1215.25	1214.54	1234.18	1222.62	1222.87	1219.62

Date	MW-101A	MW-102A	MW-103A	MW-104A	MW-105A	MW-106A	MW-107A	MW-108A
04/01/2020	1239.22	1232.78	1236.88	1236.41	1237.00	1238.51	1241.29	1248.22
10/15/2020	1232.18	1229.87	1233.83	1231.72	1230.75	1233.70	1237.14	1240.13

2020 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1	04/02/2020	Boron	0.034	1.1	mg/l	7440-42-8
MW-1	10/15/2020	Boron	0.046	1.1	mg/l	7440-42-8
MW-1	04/02/2020	Calcium	129	263.1	mg/l	7440-70-2
MW-1	10/15/2020	Calcium	127	263.1	mg/l	7440-70-2
MW-1	04/02/2020	Chloride	56.5	125	mg/l	16887-00-6
MW-1	10/15/2020	Chloride	94.5	125	mg/l	16887-00-6
MW-1	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-1	10/15/2020	Fluoride	0.12	0.33	mg/l	16984-48-8
MW-1	04/02/2020	pH	7.2	6.4 < 7.7	pH UNITS	PH
MW-1	10/15/2020	pH	6.7	6.4 < 7.7	pH UNITS	PH
MW-1	04/02/2020	Sulfate as SO4	95.6	359	mg/l	14808-79-8
MW-1	10/15/2020	Sulfate as SO4	55.9	359	mg/l	14808-79-8
MW-1	04/02/2020	Total Dissolved Solids	523	1501	mg/l	TDS
MW-1	10/15/2020	Total Dissolved Solids	454	1501	mg/l	TDS
MW-1RD	04/02/2020	Boron	< 0.020	1.1	mg/l	7440-42-8
MW-1RD	10/15/2020	Boron	0.031	1.1	mg/l	7440-42-8
MW-1RD	04/02/2020	Calcium	56.7	263.1	mg/l	7440-70-2
MW-1RD	10/15/2020	Calcium	81.7	263.1	mg/l	7440-70-2
MW-1RD	04/02/2020	Chloride	21.3	125	mg/l	16887-00-6
MW-1RD	10/15/2020	Chloride	24.0	125	mg/l	16887-00-6
MW-1RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-1RD	10/15/2020	Fluoride	0.19	0.33	mg/l	16984-48-8
MW-1RD	04/02/2020	pH	7.6	6.4 < 7.7	pH UNITS	PH
MW-1RD	10/15/2020	pH	7.1	6.4 < 7.7	pH UNITS	PH
MW-1RD	04/02/2020	Sulfate as SO4	49.7	359	mg/l	14808-79-8
MW-1RD	10/15/2020	Sulfate as SO4	50.5	359	mg/l	14808-79-8
MW-1RD	04/02/2020	Total Dissolved Solids	345	1501	mg/l	TDS
MW-1RD	10/15/2020	Total Dissolved Solids	428	1501	mg/l	TDS
MW-2R	04/02/2020	Boron	**3.2**	1.1	mg/l	7440-42-8
MW-2R	10/15/2020	Boron	**2.4**	1.1	mg/l	7440-42-8
MW-2R	04/02/2020	Calcium	227	263.1	mg/l	7440-70-2
MW-2R	10/15/2020	Calcium	221	263.1	mg/l	7440-70-2
MW-2R	04/02/2020	Chloride	101	125	mg/l	16887-00-6
MW-2R	10/15/2020	Chloride	105	125	mg/l	16887-00-6
MW-2R	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2R	10/15/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2R	04/02/2020	pH	7.3	6.4 < 7.7	pH UNITS	PH
MW-2R	10/15/2020	pH	6.5	6.4 < 7.7	pH UNITS	PH
MW-2R	04/02/2020	Sulfate as SO4	142	359	mg/l	14808-79-8
MW-2R	10/15/2020	Sulfate as SO4	137	359	mg/l	14808-79-8
MW-2R	04/02/2020	Total Dissolved Solids	1050	1501	mg/l	TDS
MW-2R	10/15/2020	Total Dissolved Solids	1010	1501	mg/l	TDS
MW-2RD	04/02/2020	Boron	0.071	1.1	mg/l	7440-42-8
MW-2RD	10/16/2020	Boron	0.079	1.1	mg/l	7440-42-8
MW-2RD	04/02/2020	Calcium	139	263.1	mg/l	7440-70-2
MW-2RD	10/16/2020	Calcium	138	263.1	mg/l	7440-70-2
MW-2RD	04/02/2020	Chloride	35.1	125	mg/l	16887-00-6
MW-2RD	10/16/2020	Chloride	36.4	125	mg/l	16887-00-6
MW-2RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2RD	10/16/2020	Fluoride	0.19	0.33	mg/l	16984-48-8
MW-2RD	04/02/2020	pH	7.3	6.4 < 7.7	pH UNITS	PH
MW-2RD	10/16/2020	pH	6.9	6.4 < 7.7	pH UNITS	PH
MW-2RD	04/02/2020	Sulfate as SO4	79.0	359	mg/l	14808-79-8
MW-2RD	10/16/2020	Sulfate as SO4	72.6	359	mg/l	14808-79-8
MW-2RD	04/02/2020	Total Dissolved Solids	563	1501	mg/l	TDS
MW-2RD	10/16/2020	Total Dissolved Solids	710	1501	mg/l	TDS
MW-3	04/02/2020	Boron	0.70	1.1	mg/l	7440-42-8

Table 2

Groundwater Analytical Data
Appendix III

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-3	10/16/2020	Boron	0.23	1.1	mg/l	7440-42-8
MW-3	04/02/2020	Calcium	197	263.1	mg/l	7440-70-2
MW-3	10/16/2020	Calcium	233	263.1	mg/l	7440-70-2
MW-3	04/02/2020	Chloride	67.6	125	mg/l	16887-00-6
MW-3	10/16/2020	Chloride	24.9	125	mg/l	16887-00-6
MW-3	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3	10/16/2020	Fluoride	0.099	0.33	mg/l	16984-48-8
MW-3	04/02/2020	pH	7.0	6.4 < 7.7	pH UNITS	PH
MW-3	10/16/2020	pH	6.5	6.4 < 7.7	pH UNITS	PH
MW-3	04/02/2020	Sulfate as SO4	17.9	359	mg/l	14808-79-8
MW-3	10/16/2020	Sulfate as SO4	10	359	mg/l	14808-79-8
MW-3	04/02/2020	Total Dissolved Solids	802	1501	mg/l	TDS
MW-3	10/16/2020	Total Dissolved Solids	1020	1501	mg/l	TDS
MW-3R	04/02/2020	Boron	0.054	1.1	mg/l	7440-42-8
MW-3R	10/16/2020	Boron	0.060	1.1	mg/l	7440-42-8
MW-3R	04/02/2020	Calcium	226	263.1	mg/l	7440-70-2
MW-3R	10/16/2020	Calcium	213	263.1	mg/l	7440-70-2
MW-3R	04/02/2020	Chloride	19.8	125	mg/l	16887-00-6
MW-3R	10/16/2020	Chloride	18.4	125	mg/l	16887-00-6
MW-3R	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3R	10/16/2020	Fluoride	0.055	0.33	mg/l	16984-48-8
MW-3R	04/02/2020	pH	7.0	6.4 < 7.7	pH UNITS	PH
MW-3R	10/16/2020	pH	6.5	6.4 < 7.7	pH UNITS	PH
MW-3R	04/02/2020	Sulfate as SO4	< 10.0	359	mg/l	14808-79-8
MW-3R	10/16/2020	Sulfate as SO4	4.4	359	mg/l	14808-79-8
MW-3R	04/02/2020	Total Dissolved Solids	782	1501	mg/l	TDS
MW-3R	10/16/2020	Total Dissolved Solids	724	1501	mg/l	TDS
MW-3RD	04/02/2020	Boron	0.037	1.1	mg/l	7440-42-8
MW-3RD	10/16/2020	Boron	0.032	1.1	mg/l	7440-42-8
MW-3RD	04/02/2020	Calcium	127	263.1	mg/l	7440-70-2
MW-3RD	10/16/2020	Calcium	120	263.1	mg/l	7440-70-2
MW-3RD	04/02/2020	Chloride	26.0	125	mg/l	16887-00-6
MW-3RD	10/16/2020	Chloride	27.1	125	mg/l	16887-00-6
MW-3RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3RD	10/16/2020	Fluoride	0.18	0.33	mg/l	16984-48-8
MW-3RD	04/02/2020	pH	7.4	6.4 < 7.7	pH UNITS	PH
MW-3RD	10/16/2020	pH	6.9	6.4 < 7.7	pH UNITS	PH
MW-3RD	04/02/2020	Sulfate as SO4	93.4	359	mg/l	14808-79-8
MW-3RD	10/16/2020	Sulfate as SO4	82.8	359	mg/l	14808-79-8
MW-3RD	04/02/2020	Total Dissolved Solids	552	1501	mg/l	TDS
MW-3RD	10/16/2020	Total Dissolved Solids	625	1501	mg/l	TDS
MW-4	04/02/2020	Boron	0.39	1.1	mg/l	7440-42-8
MW-4	10/16/2020	Boron	0.51	1.1	mg/l	7440-42-8
MW-4	04/02/2020	Calcium	172	263.1	mg/l	7440-70-2
MW-4	10/16/2020	Calcium	181	263.1	mg/l	7440-70-2
MW-4	04/02/2020	Chloride	12.9	125	mg/l	16887-00-6
MW-4	10/16/2020	Chloride	13.8	125	mg/l	16887-00-6
MW-4	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-4	10/16/2020	Fluoride	0.16	0.33	mg/l	16984-48-8
MW-4	04/02/2020	pH	7.3	6.4 < 7.7	pH UNITS	PH
MW-4	10/16/2020	pH	6.8	6.4 < 7.7	pH UNITS	PH
MW-4	04/02/2020	Sulfate as SO4	146	359	mg/l	14808-79-8
MW-4	10/16/2020	Sulfate as SO4	156	359	mg/l	14808-79-8
MW-4	04/02/2020	Total Dissolved Solids	708	1501	mg/l	TDS
MW-4	10/16/2020	Total Dissolved Solids	819	1501	mg/l	TDS

Results in milligrams per liter (mg/l)

Bold = Indicates concentration above Background Threshold Value

2020 CCR Annual Monitoring Report
SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-1	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1	10/15/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1	04/02/2020	Barium	0.13	0.604	mg/l	7440-39-3
MW-1	10/15/2020	Barium	0.12	0.604	mg/l	7440-39-3
MW-1	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-1	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-1	10/15/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-1	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-1	04/02/2020	Cobalt	0.00058	0.0062	mg/l	7440-48-4
MW-1	10/15/2020	Cobalt	< 0.00030	0.0062	mg/l	7440-48-4
MW-1	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-1	10/15/2020	Fluoride	0.12	0.33	mg/l	16984-48-8
MW-1	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-1	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-1	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-1	04/02/2020	Molybdenum	< 0.001	0.0083	mg/l	7439-98-7
MW-1	10/15/2020	Molybdenum	< 0.001	0.0083	mg/l	7439-98-7
MW-1	04/02/2020	Radium (226)	< 0.0861	2.082	pci/l	13982-63-3
MW-1	10/15/2020	Radium (226)	0.149	2.082	pci/l	13982-63-3
MW-1	04/02/2020	Radium 228	< 0.451	2.318	pci/l	15262-20-1
MW-1	10/15/2020	Radium 228	< 0.638	2.318	pci/l	15262-20-1
MW-1	04/02/2020	Radium 226/228	< 0.451	4.4	pci/l	425
MW-1	10/15/2020	Radium 226/228	0.149	4.4	pci/l	425
MW-1	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-1	10/15/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-1	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-1RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-1RD	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1RD	10/15/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1RD	04/02/2020	Barium	0.11	0.604	mg/l	7440-39-3
MW-1RD	10/15/2020	Barium	0.16	0.604	mg/l	7440-39-3
MW-1RD	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-1RD	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-1RD	10/15/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-1RD	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-1RD	04/02/2020	Cobalt	0.00094	0.0062	mg/l	7440-48-4
MW-1RD	10/15/2020	Cobalt	0.00099	0.0062	mg/l	7440-48-4
MW-1RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-1RD	10/15/2020	Fluoride	0.19	0.33	mg/l	16984-48-8
MW-1RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-1RD	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-1RD	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-1RD	04/02/2020	Molybdenum	0.0034	0.0083	mg/l	7439-98-7
MW-1RD	10/15/2020	Molybdenum	0.0031	0.0083	mg/l	7439-98-7
MW-1RD	04/02/2020	Radium (226)	0.353	2.082	pci/l	13982-63-3
MW-1RD	10/15/2020	Radium (226)	0.396	2.082	pci/l	13982-63-3
MW-1RD	04/02/2020	Radium 228	0.916	2.318	pci/l	15262-20-1
MW-1RD	10/15/2020	Radium 228	< 0.523	2.318	pci/l	15262-20-1
MW-1RD	04/02/2020	Radium 226/228	1.269	4.4	pci/l	425
MW-1RD	10/15/2020	Radium 226/228	0.396	4.4	pci/l	425
MW-1RD	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-1RD	10/15/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-1RD	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-2R	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-2R	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-2R	10/15/2020	Arsenic	0.0032	0.015	mg/l	7440-38-2
MW-2R	04/02/2020	Barium	0.23	0.604	mg/l	7440-39-3
MW-2R	10/15/2020	Barium	0.29	0.604	mg/l	7440-39-3
MW-2R	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-2R	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-2R	10/15/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-2R	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-2R	04/02/2020	Cobalt	0.0016	0.0062	mg/l	7440-48-4
MW-2R	10/15/2020	Cobalt	0.0016	0.0062	mg/l	7440-48-4
MW-2R	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2R	10/15/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2R	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-2R	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-2R	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-2R	04/02/2020	Molybdenum	0.0024	0.0083	mg/l	7439-98-7
MW-2R	10/15/2020	Molybdenum	0.0019	0.0083	mg/l	7439-98-7
MW-2R	04/02/2020	Radium (226)	0.317	2.082	pci/l	13982-63-3
MW-2R	10/15/2020	Radium (226)	0.351	2.082	pci/l	13982-63-3
MW-2R	04/02/2020	Radium 228	< 0.725	2.318	pci/l	15262-20-1
MW-2R	10/15/2020	Radium 228	1.41	2.318	pci/l	15262-20-1
MW-2R	04/02/2020	Radium 226/228	0.317	4.4	pci/l	425
MW-2R	10/15/2020	Radium 226/228	1.761	4.4	pci/l	425
MW-2R	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-2R	10/15/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-2R	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-2RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-2RD	04/02/2020	Arsenic	0.0021	0.015	mg/l	7440-38-2
MW-2RD	10/16/2020	Arsenic	0.0021	0.015	mg/l	7440-38-2
MW-2RD	04/02/2020	Barium	0.19	0.604	mg/l	7440-39-3
MW-2RD	10/16/2020	Barium	0.19	0.604	mg/l	7440-39-3
MW-2RD	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-2RD	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-2RD	10/16/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-2RD	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-2RD	04/02/2020	Cobalt	0.0028	0.0062	mg/l	7440-48-4
MW-2RD	10/16/2020	Cobalt	0.0027	0.0062	mg/l	7440-48-4
MW-2RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-2RD	10/16/2020	Fluoride	0.19	0.33	mg/l	16984-48-8
MW-2RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-2RD	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-2RD	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-2RD	04/02/2020	Molybdenum	0.0026	0.0083	mg/l	7439-98-7
MW-2RD	10/16/2020	Molybdenum	0.0024	0.0083	mg/l	7439-98-7
MW-2RD	04/02/2020	Radium (226)	0.488	2.082	pci/l	13982-63-3
MW-2RD	10/16/2020	Radium (226)	0.457	2.082	pci/l	13982-63-3
MW-2RD	04/02/2020	Radium 228	0.798	2.318	pci/l	15262-20-1
MW-2RD	10/16/2020	Radium 228	0.672	2.318	pci/l	15262-20-1
MW-2RD	04/02/2020	Radium 226/228	1.286	4.4	pci/l	425
MW-2RD	10/16/2020	Radium 226/228	1.129	4.4	pci/l	425
MW-2RD	04/02/2020	Selenium	0.0056	0.025	mg/l	7782-49-2

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-2RD	10/16/2020	Selenium	0.009	0.025	mg/l	7782-49-2
MW-2RD	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-3	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3	04/02/2020	Arsenic	0.0043	0.015	mg/l	7440-38-2
MW-3	10/16/2020	Arsenic	**0.0221**	0.015	mg/l	7440-38-2
MW-3	04/02/2020	Barium	0.27	0.604	mg/l	7440-39-3
MW-3	10/16/2020	Barium	0.39	0.604	mg/l	7440-39-3
MW-3	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-3	04/02/2020	Cadmium	0.00056	0.002	mg/l	7440-43-9
MW-3	10/16/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-3	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-3	04/02/2020	Cobalt	**0.0069**	0.0062	mg/l	7440-48-4
MW-3	10/16/2020	Cobalt	0.0036	0.0062	mg/l	7440-48-4
MW-3	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3	10/16/2020	Fluoride	0.099	0.33	mg/l	16984-48-8
MW-3	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-3	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-3	04/02/2020	Molybdenum	0.0071	0.0083	mg/l	7439-98-7
MW-3	10/16/2020	Molybdenum	0.0071	0.0083	mg/l	7439-98-7
MW-3	04/02/2020	Radium (226)	0.378	2.082	pci/l	13982-63-3
MW-3	10/16/2020	Radium (226)	0.585	2.082	pci/l	13982-63-3
MW-3	04/02/2020	Radium 228	0.958	2.318	pci/l	15262-20-1
MW-3	10/16/2020	Radium 228	1.11	2.318	pci/l	15262-20-1
MW-3	04/02/2020	Radium 226/228	1.336	4.4	pci/l	425
MW-3	10/16/2020	Radium 226/228	1.695	4.4	pci/l	425
MW-3	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3	10/16/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-3R	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3R	04/02/2020	Arsenic	0.0025	0.015	mg/l	7440-38-2
MW-3R	10/16/2020	Arsenic	0.0025	0.015	mg/l	7440-38-2
MW-3R	04/02/2020	Barium	0.59	0.604	mg/l	7440-39-3
MW-3R	10/16/2020	Barium	0.56	0.604	mg/l	7440-39-3
MW-3R	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-3R	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-3R	10/16/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-3R	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-3R	04/02/2020	Cobalt	0.00043	0.0062	mg/l	7440-48-4
MW-3R	10/16/2020	Cobalt	0.00056	0.0062	mg/l	7440-48-4
MW-3R	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3R	10/16/2020	Fluoride	0.055	0.33	mg/l	16984-48-8
MW-3R	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3R	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-3R	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-3R	04/02/2020	Molybdenum	0.0016	0.0083	mg/l	7439-98-7
MW-3R	10/16/2020	Molybdenum	0.0012	0.0083	mg/l	7439-98-7
MW-3R	04/02/2020	Radium (226)	0.553	2.082	pci/l	13982-63-3
MW-3R	10/16/2020	Radium (226)	0.393	2.082	pci/l	13982-63-3
MW-3R	04/02/2020	Radium 228	1.07	2.318	pci/l	15262-20-1
MW-3R	10/16/2020	Radium 228	< 0.871	2.318	pci/l	15262-20-1
MW-3R	04/02/2020	Radium 226/228	1.623	4.4	pci/l	425
MW-3R	10/16/2020	Radium 226/228	0.393	4.4	pci/l	425

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-3R	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3R	10/16/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3R	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-3RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3RD	04/02/2020	Arsenic	0.0038	0.015	mg/l	7440-38-2
MW-3RD	10/16/2020	Arsenic	0.0037	0.015	mg/l	7440-38-2
MW-3RD	04/02/2020	Barium	0.22	0.604	mg/l	7440-39-3
MW-3RD	10/16/2020	Barium	0.21	0.604	mg/l	7440-39-3
MW-3RD	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-3RD	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-3RD	10/16/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-3RD	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-3RD	04/02/2020	Cobalt	0.00035	0.0062	mg/l	7440-48-4
MW-3RD	10/16/2020	Cobalt	0.00032	0.0062	mg/l	7440-48-4
MW-3RD	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-3RD	10/16/2020	Fluoride	0.18	0.33	mg/l	16984-48-8
MW-3RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3RD	04/02/2020	Lithium	< 0.030	0.03	mg/l	7439-93-2
MW-3RD	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-3RD	04/02/2020	Molybdenum	0.0045	0.0083	mg/l	7439-98-7
MW-3RD	10/16/2020	Molybdenum	0.0043	0.0083	mg/l	7439-98-7
MW-3RD	04/02/2020	Radium (226)	0.610	2.082	pci/l	13982-63-3
MW-3RD	10/16/2020	Radium (226)	0.738	2.082	pci/l	13982-63-3
MW-3RD	04/02/2020	Radium 228	0.697	2.318	pci/l	15262-20-1
MW-3RD	10/16/2020	Radium 228	< 0.452	2.318	pci/l	15262-20-1
MW-3RD	04/02/2020	Radium 226/228	1.307	4.4	pci/l	425
MW-3RD	10/16/2020	Radium 226/228	0.738	4.4	pci/l	425
MW-3RD	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3RD	10/16/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-3RD	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0
MW-4	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-4	04/02/2020	Arsenic	0.0012	0.015	mg/l	7440-38-2
MW-4	10/16/2020	Arsenic	0.0014	0.015	mg/l	7440-38-2
MW-4	04/02/2020	Barium	0.19	0.604	mg/l	7440-39-3
MW-4	10/16/2020	Barium	0.21	0.604	mg/l	7440-39-3
MW-4	04/02/2020	Beryllium	< 0.0007	0.002	mg/l	7440-41-7
MW-4	04/02/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-4	10/16/2020	Cadmium	< 0.0005	0.002	mg/l	7440-43-9
MW-4	04/02/2020	Chromium	< 0.0040	0.0048	mg/l	7440-47-3
MW-4	04/02/2020	Cobalt	0.0012	0.0062	mg/l	7440-48-4
MW-4	10/16/2020	Cobalt	0.0012	0.0062	mg/l	7440-48-4
MW-4	04/02/2020	Fluoride	< 0.25	0.33	mg/l	16984-48-8
MW-4	10/16/2020	Fluoride	0.16	0.33	mg/l	16984-48-8
MW-4	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-4	04/02/2020	Lithium	< 0.000030	0.03	mg/l	7439-93-2
MW-4	04/02/2020	Mercury	< 0.00020	0.0002	mg/l	7439-97-6
MW-4	04/02/2020	Molybdenum	0.0021	0.0083	mg/l	7439-98-7
MW-4	10/16/2020	Molybdenum	0.0030	0.0083	mg/l	7439-98-7
MW-4	04/02/2020	Radium (226)	0.175	2.082	pci/l	13982-63-3
MW-4	10/16/2020	Radium (226)	0.323	2.082	pci/l	13982-63-3
MW-4	04/02/2020	Radium 228	0.571	2.318	pci/l	15262-20-1
MW-4	10/16/2020	Radium 228	0.561	2.318	pci/l	15262-20-1
MW-4	04/02/2020	Radium 226/228	0.746	4.4	pci/l	425

Table 3

Groundwater Analytical Data
Appendix IV

Location	Date	Parameter	Result	Background Threshold Value (BTV)	Units	CAS #
MW-4	10/16/2020	Radium 226/228	0.884	4.4	pci/l	425
MW-4	04/02/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-4	10/16/2020	Selenium	< 0.001	0.025	mg/l	7782-49-2
MW-4	04/02/2020	Thallium	< 0.00020	0.02	mg/l	7440-28-0

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

Table 4

Well Stabilization Data

Well ID	Sample Date	Purge Rate ml/min	Field pH pH	Field Specific Conductivity umhos/cm	Field Temp deg c
MW-1	4/2/2020	1000	6.47	935	5.87
MW-1	4/2/2020	1000	6.46	939	5.84
MW-1	4/2/2020	1000	6.22	946	5.95
MW-1	4/2/2020	1000	6.21	946	5.94
MW-1	10/15/2020	1000	8.57	1070	11.29
MW-1	10/15/2020	1000	8.49	1120	11.94
MW-1	10/15/2020	1000	8.55	1120	12.00
MW-1	10/15/2020	1000	8.55	1120	11.99
MW-1RD	4/2/2020	1000	7.00	613	9.31
MW-1RD	4/2/2020	1000	6.92	614	9.32
MW-1RD	4/2/2020	1000	6.95	614	9.30
MW-1RD	4/2/2020	1000	6.90	614	9.31
MW-1RD	10/15/2020	1000	8.86	624	8.95
MW-1RD	10/15/2020	1000	8.80	650	8.51
MW-1RD	10/15/2020	1000	8.70	651	8.50
MW-1RD	10/15/2020	1000	8.74	651	8.50
MW-2R	4/2/2020	1000	6.92	1870	5.17
MW-2R	4/2/2020	1000	6.63	1910	5.26
MW-2R	4/2/2020	1000	6.42	1900	5.27
MW-2R	4/2/2020	1000	6.21	1900	5.28
MW-2R	10/15/2020	1000	7.96	1130	12.6
MW-2R	10/15/2020	1000	8.1	1590	13.00
MW-2R	10/15/2020	1000	8.08	1630	13.04
MW-2R	10/15/2020	1000	8.07	1670	13.01
MW-2RD	4/2/2020	1000	7.47	761	9.64
MW-2RD	4/2/2020	1000	7.14	897	9.87
MW-2RD	4/2/2020	1000	6.97	974	9.97
MW-2RD	4/2/2020	1000	6.28	989	10.01
MW-2RD	10/16/2020	1000	8.97	816	8.46
MW-2RD	10/16/2020	1000	8.92	962	9.27
MW-2RD	10/16/2020	1000	8.77	1060	9.26
MW-2RD	10/16/2020	1000	8.78	1080	9.26
MW-3	4/2/2020	1000	6.53	1410	6.34
MW-3	4/2/2020	1000	6.44	1390	6.44
MW-3	4/2/2020	1000	6.28	1370	6.35
MW-3	4/2/2020	1000	6.14	1360	6.31
MW-3	10/16/2020	1000	8.08	1570	10.46
MW-3	10/16/2020	1000	8.09	1570	10.38
MW-3	10/16/2020	1000	8.09	1570	10.38
MW-3	10/16/2020	1000	8.08	1560	10.37
MW-3R	4/2/2020	1000	6.00	1240	8.66
MW-3R	4/2/2020	1000	7.06	1360	8.56
MW-3R	4/2/2020	1000	7.10	1400	8.78
MW-3R	4/2/2020	1000	7.30	1410	8.91
MW-3R	10/16/2020	1000	8.21	1410	9.33
MW-3R	10/16/2020	1000	8.09	1450	9.2
MW-3R	10/16/2020	1000	8.12	1470	9.16

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-3R	10/16/2020	1000	8.12	1470	9.17
MW-3RD	4/2/2020	1000	7.70	895	9.57
MW-3RD	4/2/2020	1000	7.67	896	9.57
MW-3RD	4/2/2020	1000	7.65	896	9.57
MW-3RD	4/2/2020	1000	7.65	896	9.57
MW-3RD	10/16/2020	1000	8.29	992	8.57
MW-3RD	10/16/2020	1000	8.35	995	8.58
MW-3RD	10/16/2020	1000	8.42	997	8.57
MW-3RD	10/16/2020	1000	8.46	1000	8.58
MW-4	4/2/2020	1000	7.18	1130	6.80
MW-4	4/2/2020	1000	7.18	1130	6.80
MW-4	4/2/2020	1000	7.18	1130	6.79
MW-4	4/2/2020	1000	7.19	1130	6.78
MW-4	10/15/2020	1000	8.92	984	8.28
MW-4	10/15/2020	1000	8.79	968	8.85
MW-4	10/15/2020	1000	8.79	968	8.81
MW-4	10/15/2020	1000	8.76	972	8.77

Table 5

Background Threshold Values

Appendix III to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Boron	1.1	mg/l	7440-42-8
Calcium	263.1	mg/l	7440-70-2
Chloride	125	mg/l	16887-00-6
Fluoride	0.33	mg/l	15984-48-8
pH	lower 6.4 higher 7.7	pH UNITS	PH
Sulfate as SO4	359	mg/l	14808-79-8
Total Dissolved Solids	1501	mg/l	TDS

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Antimony	0.02	mg/l	7440-36-0
Arsenic	0.015	mg/l	7440-38-2
Barium	0.604	mg/l	7440-39-3
Beryllium	0.002	mg/l	7440-41-7
Cadmium	0.002	mg/l	7440-43-9
Chromium	0.0048	mg/l	7440-47-3
Cobalt	0.0062	mg/l	7440-48-4
Fluoride	0.33	mg/l	15984-48-8
Lead	0.02	mg/l	7439-92-1
Lithium	0.03	mg/l	7439-93-2
Mercury	0.0002	mg/l	7439-97-6
Molybdenum	0.0083	mg/l	7439-98-7
Radium 226	2.082	pci/l	13982-63-3
Radium 228	2.318	pci/l	15262-20-1
Radium 226/228	4.4	pci/l	EDF-206
Selenium	0.025	mg/l	7782-49-2
Thallium	0.02	mg/l	7440-28-0

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

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SKB Lansing Landfill
52563 243rd Street
Austin, Minnesota

Table 6

2020 Groundwater Protection Standards

Appendix IV to Part 257

Parameter	Background Threshold Value (BTV)	EPA Maximum Contaminate Level (MCL)	Groundwater Protection Standard (GPS)	Units	CAS #
Antimony	0.02	0.006	0.02	mg/l	7440-36-0
Arsenic	0.015	0.010	0.015	mg/l	7440-38-2
Barium	0.604	2	2	mg/l	7440-39-3
Beryllium	0.002	0.004	0.004	mg/l	7440-41-7
Cadmium	0.002	0.005	0.005	mg/l	7440-43-9
Chromium	0.0048	0.1	0.1	mg/l	7440-47-3
Cobalt	0.0062	0.006	0.0062	mg/l	7440-48-4
Fluoride	0.33	4	4	mg/l	15984-48-8
Lead	0.02	0.015	0.02	mg/l	7439-92-1
Lithium	0.03	0.04	0.04	mg/l	7439-93-2
Mercury	0.0002	0.002	0.002	mg/l	7439-97-6
Molybdenum	0.0083	0.1	0.1	mg/l	7439-98-7
Radium 226	2.082	--	--	pci/l	13982-63-3
Radium 228	2.318	--	--	pci/l	15262-20-1
Radium 226/228	4.4	5	5	pci/l	EDF-206
Selenium	0.025	0.05	0.05	mg/l	7782-49-2
Thallium	0.02	0.002	0.002	mg/l	7440-28-0

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

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-1	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1	10/15/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1	04/02/2020	Barium	0.13	2	mg/l	7440-39-3
MW-1	10/15/2020	Barium	0.12	2	mg/l	7440-39-3
MW-1	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-1	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-1	10/15/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-1	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-1	04/02/2020	Cobalt	0.00058	0.0062	mg/l	7440-48-4
MW-1	10/15/2020	Cobalt	< 0.00030	0.0062	mg/l	7440-48-4
MW-1	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-1	10/15/2020	Fluoride	0.12	4	mg/l	16984-48-8
MW-1	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-1	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-1	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1	04/02/2020	MOLYBDENUM	< 0.001	0.1	mg/l	7439-98-7
MW-1	10/15/2020	MOLYBDENUM	< 0.001	0.1	mg/l	7439-98-7
MW-1	04/02/2020	Radium (226)	< 0.0861	--	pci/l	13982-63-3
MW-1	10/15/2020	Radium (226)	0.149	--	pci/l	13982-63-3
MW-1	04/02/2020	Radium 228	< 0.451	--	pci/l	15262-20-1
MW-1	10/15/2020	Radium 228	< 0.638	--	pci/l	15262-20-1
MW-1	04/02/2020	Radium 226/228	< 0.451	5	pci/l	425
MW-1	10/15/2020	Radium 226/228	0.149	5	pci/l	425
MW-1	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-1	10/15/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-1	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-1RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-1RD	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1RD	10/15/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-1RD	04/02/2020	Barium	0.11	2	mg/l	7440-39-3
MW-1RD	10/15/2020	Barium	0.16	2	mg/l	7440-39-3
MW-1RD	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-1RD	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-1RD	10/15/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-1RD	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-1RD	04/02/2020	Cobalt	0.00094	0.0062	mg/l	7440-48-4
MW-1RD	10/15/2020	Cobalt	0.00099	0.0062	mg/l	7440-48-4
MW-1RD	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-1RD	10/15/2020	Fluoride	0.19	4	mg/l	16984-48-8
MW-1RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-1RD	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-1RD	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-1RD	04/02/2020	MOLYBDENUM	0.0034	0.1	mg/l	7439-98-7
MW-1RD	10/15/2020	MOLYBDENUM	0.0031	0.1	mg/l	7439-98-7
MW-1RD	04/02/2020	Radium (226)	0.353	--	pci/l	13982-63-3
MW-1RD	10/15/2020	Radium (226)	0.396	--	pci/l	13982-63-3
MW-1RD	04/02/2020	Radium 228	0.916	--	pci/l	15262-20-1
MW-1RD	10/15/2020	Radium 228	< 0.523	--	pci/l	15262-20-1
MW-1RD	04/02/2020	Radium 226/228	1.269	5	pci/l	425
MW-1RD	10/15/2020	Radium 226/228	0.396	5	pci/l	425
MW-1RD	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-1RD	10/15/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-1RD	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-2R	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-2R	04/02/2020	Arsenic	< 0.001	0.015	mg/l	7440-38-2
MW-2R	10/15/2020	Arsenic	0.0032	0.015	mg/l	7440-38-2
MW-2R	04/02/2020	Barium	0.23	2	mg/l	7440-39-3
MW-2R	10/15/2020	Barium	0.29	2	mg/l	7440-39-3
MW-2R	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-2R	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-2R	10/15/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-2R	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-2R	04/02/2020	Cobalt	0.0016	0.0062	mg/l	7440-48-4
MW-2R	10/15/2020	Cobalt	0.0016	0.0062	mg/l	7440-48-4
MW-2R	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-2R	10/15/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-2R	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-2R	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-2R	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2R	04/02/2020	MOLYBDENUM	0.0024	0.1	mg/l	7439-98-7
MW-2R	10/15/2020	MOLYBDENUM	0.0019	0.1	mg/l	7439-98-7
MW-2R	04/02/2020	Radium (226)	0.317	--	pci/l	13982-63-3
MW-2R	10/15/2020	Radium (226)	0.351	--	pci/l	13982-63-3
MW-2R	04/02/2020	Radium 228	< 0.725	--	pci/l	15262-20-1
MW-2R	10/15/2020	Radium 228	1.41	--	pci/l	15262-20-1
MW-2R	04/02/2020	Radium 226/228	0.317	5	pci/l	425
MW-2R	10/15/2020	Radium 226/228	1.761	5	pci/l	425
MW-2R	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-2R	10/15/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-2R	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-2RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-2RD	04/02/2020	Arsenic	0.0021	0.015	mg/l	7440-38-2
MW-2RD	10/16/2020	Arsenic	0.0021	0.015	mg/l	7440-38-2

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-2RD	04/02/2020	Barium	0.19	2	mg/l	7440-39-3
MW-2RD	10/16/2020	Barium	0.19	2	mg/l	7440-39-3
MW-2RD	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-2RD	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-2RD	10/16/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-2RD	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-2RD	04/02/2020	Cobalt	0.0028	0.0062	mg/l	7440-48-4
MW-2RD	10/16/2020	Cobalt	0.0027	0.0062	mg/l	7440-48-4
MW-2RD	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-2RD	10/16/2020	Fluoride	0.19	4	mg/l	16984-48-8
MW-2RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-2RD	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-2RD	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-2RD	04/02/2020	MOLYBDENUM	0.0026	0.1	mg/l	7439-98-7
MW-2RD	10/16/2020	MOLYBDENUM	0.0024	0.1	mg/l	7439-98-7
MW-2RD	04/02/2020	Radium (226)	0.488	--	pci/l	13982-63-3
MW-2RD	10/16/2020	Radium (226)	0.457	--	pci/l	13982-63-3
MW-2RD	04/02/2020	Radium 228	0.798	--	pci/l	15262-20-1
MW-2RD	10/16/2020	Radium 228	0.672	--	pci/l	15262-20-1
MW-2RD	04/02/2020	Radium 226/228	1.286	5	pci/l	425
MW-2RD	10/16/2020	Radium 226/228	1.129	5	pci/l	425
MW-2RD	04/02/2020	Selenium	0.0056	0.05	mg/l	7782-49-2
MW-2RD	10/16/2020	Selenium	0.009	0.05	mg/l	7782-49-2
MW-2RD	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-3	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3	04/02/2020	Arsenic	0.004.3	0.015	mg/l	7440-38-2
MW-3	10/16/2020	Arsenic	**0.0221**	0.015	mg/l	7440-38-2
MW-3	04/02/2020	Barium	0.27	2	mg/l	7440-39-3
MW-3	10/16/2020	Barium	0.39	2	mg/l	7440-39-3
MW-3	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-3	04/02/2020	Cadmium	0.00056	0.005	mg/l	7440-43-9
MW-3	10/16/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-3	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3	04/02/2020	Cobalt	**0.0069**	0.0062	mg/l	7440-48-4
MW-3	10/16/2020	Cobalt	0.0036	0.0062	mg/l	7440-48-4
MW-3	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-3	10/16/2020	Fluoride	0.099	4	mg/l	16984-48-8
MW-3	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-3	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3	04/02/2020	MOLYBDENUM	0.0071	0.1	mg/l	7439-98-7
MW-3	10/16/2020	MOLYBDENUM	0.0071	0.1	mg/l	7439-98-7

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3	04/02/2020	Radium (226)	0.378	--	pci/l	13982-63-3
MW-3	10/16/2020	Radium (226)	0.585	--	pci/l	13982-63-3
MW-3	04/02/2020	Radium 228	0.958	--	pci/l	15262-20-1
MW-3	10/16/2020	Radium 228	1.11	--	pci/l	15262-20-1
MW-3	04/02/2020	Radium 226/228	1.336	5	pci/l	425
MW-3	10/16/2020	Radium 226/228	1.695	5	pci/l	425
MW-3	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3	10/16/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-3R	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3R	04/02/2020	Arsenic	0.0025	0.015	mg/l	7440-38-2
MW-3R	10/16/2020	Arsenic	0.0025	0.015	mg/l	7440-38-2
MW-3R	04/02/2020	Barium	0.59	2	mg/l	7440-39-3
MW-3R	10/16/2020	Barium	0.56	2	mg/l	7440-39-3
MW-3R	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-3R	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-3R	10/16/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-3R	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3R	04/02/2020	Cobalt	0.00043	0.0062	mg/l	7440-48-4
MW-3R	10/16/2020	Cobalt	0.00056	0.0062	mg/l	7440-48-4
MW-3R	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-3R	10/16/2020	Fluoride	0.055	4	mg/l	16984-48-8
MW-3R	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3R	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-3R	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3R	04/02/2020	MOLYBDENUM	0.0016	0.1	mg/l	7439-98-7
MW-3R	10/16/2020	MOLYBDENUM	0.0012	0.1	mg/l	7439-98-7
MW-3R	04/02/2020	Radium (226)	0.553	--	pci/l	13982-63-3
MW-3R	10/16/2020	Radium (226)	0.393	--	pci/l	13982-63-3
MW-3R	04/02/2020	Radium 228	1.07	--	pci/l	15262-20-1
MW-3R	10/16/2020	Radium 228	< 0.871	--	pci/l	15262-20-1
MW-3R	04/02/2020	Radium 226/228	1.623	5	pci/l	425
MW-3R	10/16/2020	Radium 226/228	0.393	5	pci/l	425
MW-3R	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3R	10/16/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3R	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-3RD	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-3RD	04/02/2020	Arsenic	0.0038	0.015	mg/l	7440-38-2
MW-3RD	10/16/2020	Arsenic	0.0037	0.015	mg/l	7440-38-2
MW-3RD	04/02/2020	Barium	0.22	2	mg/l	7440-39-3
MW-3RD	10/16/2020	Barium	0.21	2	mg/l	7440-39-3
MW-3RD	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-3RD	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-3RD	10/16/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-3RD	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-3RD	04/02/2020	Cobalt	0.00035	0.0062	mg/l	7440-48-4
MW-3RD	10/16/2020	Cobalt	0.00032	0.0062	mg/l	7440-48-4
MW-3RD	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-3RD	10/16/2020	Fluoride	0.18	4	mg/l	16984-48-8
MW-3RD	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-3RD	04/02/2020	Lithium	< 0.030	0.04	mg/l	7439-93-2
MW-3RD	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-3RD	04/02/2020	MOLYBDENUM	0.0045	0.1	mg/l	7439-98-7
MW-3RD	10/16/2020	MOLYBDENUM	0.0043	0.1	mg/l	7439-98-7
MW-3RD	04/02/2020	Radium (226)	0.610	--	pci/l	13982-63-3
MW-3RD	10/16/2020	Radium (226)	0.738	--	pci/l	13982-63-3
MW-3RD	04/02/2020	Radium 228	0.697	--	pci/l	15262-20-1
MW-3RD	10/16/2020	Radium 228	< 0.452	--	pci/l	15262-20-1
MW-3RD	04/02/2020	Radium 226/228	1.307	5	pci/l	EDF-206
MW-3RD	10/16/2020	Radium 226/228	0.738	5	pci/l	EDF-206
MW-3RD	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3RD	10/16/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-3RD	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0
MW-4	04/02/2020	Antimony	< 0.001	0.02	mg/l	7440-36-0
MW-4	04/02/2020	Arsenic	0.0012	0.015	mg/l	7440-38-2
MW-4	10/16/2020	Arsenic	0.0014	0.015	mg/l	7440-38-2
MW-4	04/02/2020	Barium	0.19	2	mg/l	7440-39-3
MW-4	10/16/2020	Barium	0.21	2	mg/l	7440-39-3
MW-4	04/02/2020	Beryllium	< 0.0007	0.004	mg/l	7440-41-7
MW-4	04/02/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-4	10/16/2020	Cadmium	< 0.0005	0.005	mg/l	7440-43-9
MW-4	04/02/2020	Chromium	< 0.0040	0.1	mg/l	7440-47-3
MW-4	04/02/2020	Cobalt	0.0012	0.0062	mg/l	7440-48-4
MW-4	10/16/2020	Cobalt	0.0012	0.0062	mg/l	7440-48-4
MW-4	04/02/2020	Fluoride	< 0.25	4	mg/l	16984-48-8
MW-4	10/16/2020	Fluoride	0.16	4	mg/l	16984-48-8
MW-4	04/02/2020	Lead	< 0.010	0.02	mg/l	7439-92-1
MW-4	04/02/2020	Lithium	< 0.000030	0.04	mg/l	7439-93-2
MW-4	04/02/2020	Mercury	< 0.00020	0.002	mg/l	7439-97-6
MW-4	04/02/2020	MOLYBDENUM	0.0021	0.1	mg/l	7439-98-7
MW-4	10/16/2020	MOLYBDENUM	0.0030	0.1	mg/l	7439-98-7
MW-4	04/02/2020	Radium (226)	0.175	--	pci/l	13982-63-3
MW-4	10/16/2020	Radium (226)	0.323	--	pci/l	13982-63-3
MW-4	04/02/2020	Radium 228	0.571	--	pci/l	15262-20-1
MW-4	10/16/2020	Radium 228	0.561	--	pci/l	15262-20-1
MW-4	04/02/2020	Radium 226/228	0.746	5	pci/l	EDF-206
MW-4	10/16/2020	Radium 226/228	0.884	5	pci/l	EDF-206
MW-4	04/02/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2
MW-4	10/16/2020	Selenium	< 0.001	0.05	mg/l	7782-49-2

Table 7

Groundwater Analytical Data vs Groundwater Protection Standards

Location	Date	Parameter	Result	Groundwater Protection Standard (GPS)	Units	CAS #
MW-4	04/02/2020	Thallium	< 0.00020	0.002	mg/l	7440-28-0

Results in milligrams per liter (mg/l) or picocuries per liter (pci/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: 3502.117
Sampling Device: Mechanical Bladder Pump
Date: 4/2/20
Well ID: MW-1

Tubing Diameter (ID): 2 inches
Depth to Water: 3.60 ft, TOC
Depth to Bottom of Well: 25.6 ft, TOC
Feet of Water in Well: 22.0 ft
Volume of Water in Well: 3 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ /mho)	Temperature (°F) °C	Purge Rate (L/min)
1	3.60	6.47	935	5.97	1
10	3.62	6.46	939	5.94	1
20	3.65	6.22	946	5.95	1
30	3.65	6.21	946	5.94	1

Purge Start Time: 7:00 Purge End Time: 7:35 Total Volume Purged: 4.0 gal

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

Weather Conditions: 46°F, cloudy, 10-15 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350217
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
Well ID: MW-1RD

Tubing Diameter (ID): 2 inches
Depth to Water: 24.62 ft, TOC
Depth to Bottom of Well: 75.5 ft, TOC
Feet of Water in Well: ft
Volume of Water in Well: 8.3 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	24.62	7.00	613	9.31	1
15	24.65	6.92	614	9.32	1
30	24.65	6.93	614	9.30	1
45	24.65	6.90	614	9.31	1

Purge Start Time: 7:00 Purge End Time: 7:55 Total Volume Purged: 9.0 gal

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

Weather Conditions:

Comments: ~40°F, cloudy 10-15 mph SE

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350791
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 7.79 ~~10.35~~ ft, TOC
Depth to Bottom of Well: 18.35 ft, TOC
Feet of Water in Well: 10.56 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	7.79	6.92	1,870	5.17	1
5	10.18	6.63	1,910	5.26	1
10	13.47	6.42	1,900	5.27	1
15	16.52	6.21	1,900	5.28	1

Purge Start Time: 8:05 Purge End Time: 8:25 Total Volume Purged: 2.5 gal

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

Weather Conditions: 48°F, cloudy, 10-15 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350217
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
Well ID: MW-2RD

Tubing Diameter (ID): 2 inches
Depth to Water: 6.89 ft, TOC
Depth to Bottom of Well: 35 ft, TOC
Feet of Water in Well: 28.11 ft
Volume of Water in Well: 4.58 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /u/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	6.89	7.47	761	9.64	1
10	6.92	7.14	897	9.87	1
20	6.92	6.99	974	9.97	1
30	6.92	6.28	989	10.01	1

Purge Start Time: 8:05 Purge End Time: 8:40 Total Volume Purged: 5.0 gal

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

Weather Conditions: 48°F, cloudy. 10-15 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Rosemount		Tubing Diameter (ID):	2	inches
Project Number:	350217		Depth to Water:	6.77	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	27.5	ft, TOC
Date:	4/2/20		Feet of Water in Well:	20.73	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 (µ / µS/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	6.77	6.00	1,240	8.66	1
5	6.80	7.06	1,360	8.56	1
10	6.80	7.10	1,400	8.78	1
15	6.80	7.36	1,410	8.91	1

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

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

Weather Conditions: 50°F, mostly cloudy, 15-20 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Redmond
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
Well ID: MW-3

Tubing Diameter (ID): 2 inches
Depth to Water: 6.40 ft, TOC
Depth to Bottom of Well: 19.7 ft, TOC
Feet of Water in Well: 13.30 ft
Volume of Water in Well: 2.17 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.40	6.33	1,410	6.34	1
5	6.42	6.44	1,390	6.44	1
10	6.45	6.28	1,370	6.35	1
15	6.45	6.14	1,360	6.31	1

Purge Start Time: 10:05 Purge End Time: 10:25 Total Volume Purged: 3.0 gal

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

Weather Conditions: 50°F, mostly cloudy, 15-20 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350217
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
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: ft
Volume of Water in Well: 6.51 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (W / mho)	Temperature (°F) °C	Purge Rate (L/min)
1	6.29	7.70	895	9.57	1
10	6.31	7.67	896	9.57	1
20	6.33	7.65	896	9.57	1
30	6.33	7.65	896	9.57	1

Purge Start Time: 9:40 Purge End Time: 10:15 Total Volume Purged: 7.0 gal

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

Weather Conditions: 50°F, mostly cloudy, 15-20 mph SE

Comments: DUP collected

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350-2117
Sampling Device: Dedicated Bladder Pump
Date: 4/2/20
Well ID: MW-4

Tubing Diameter (ID): 2 inches
Depth to Water: 4.84 ft, TOC
Depth to Bottom of Well: 18.3 ft, TOC
Feet of Water in Well: 13.46 ft
Volume of Water in Well: 2.19 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	4.84	7.19	1,130	6.80	1
10	4.86	7.18	1,130	6.80	1
20	4.86	7.18	1,130	6.79	1
30	4.86	7.19	1,130	6.78	1

Purge Start Time: 12:10 Purge End Time: 12:45 Total Volume Purged: 3.0 gal

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

Weather Conditions: 52°F partly cloudy, 15-20 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 350217
Sampling Device: Peristaltic Bladder Pump
Date: 10/15/20
Well ID: MW-1

Tubing Diameter (ID): 2 inches
Depth to Water: 7.65 ft, TOC
Depth to Bottom of Well: 25.6 ft, TOC
Feet of Water in Well: 17.95 ft
Volume of Water in Well: 2.9 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ /µhos)	Temperature (°F) °C	Purge Rate (L/min)
1	7.65	8.57	1,070	11.29	1
10	7.67	8.49	1,120	11.94	1
20	7.67	8.55	1,120	12.00	1
30	7.67	8.55	1,120	11.99	

Purge Start Time: 12:35 Purge End Time: 13:05 Total Volume Purged: 9.0 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: M. Schlegel
Weather Conditions: 47°F, sunny, 15-20 mph NW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/15/20
Well ID: MW-1RD

Tubing Diameter (ID): 1 inches
Depth to Water: 27.63 ft, TOC
Depth to Bottom of Well: 75.5 ft, TOC
Feet of Water in Well: 47.87 ft
Volume of Water in Well: 7.8 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mS/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	27.63	8.86	624	8.95	1
20	27.65	8.90	650	8.51	1
40	26.63	8.70	651	8.50	1
60	26.65	8.74	651	8.50	1

Purge Start Time: 12:35 Purge End Time: 13:35 Total Volume Purged: 240 gal
Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlegel
Weather Conditions: 47°F, sunny, 15 mph NW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Landfill
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/15
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 9.85 ft, TOC
Depth to Bottom of Well: 18.35 ft, TOC
Feet of Water in Well: 8.5 ft
Volume of Water in Well: 1.4 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	9.85	7.96	1,630	12.60	1
5	13.82	8.10	1,590	13.00	1
10	14.27	8.08	1,630	13.04	1
15	16.28	8.07	1,670	13.01	1

Purge Start Time: 14:20 Purge End Time: 14:40 Total Volume Purged: 2.0 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel
Weather Conditions: 48°F, sunny, 15-20 mph NW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/16/20
Well ID: MW-2R

Tubing Diameter (ID): 2 inches
Depth to Water: 9.65 ft, TOC
Depth to Bottom of Well: 35 ft, TOC
Feet of Water in Well: 25.35 ft
Volume of Water in Well: 4.1 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (W / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	9.65	8.97	916	8.46	1
5	9.67	8.92	962	9.27	1
10	9.67	8.77	1,060	9.26	1
15	9.67	8.78	1,080	9.26	1

Purge Start Time: 7:45 Purge End Time: 9:05 Total Volume Purged: 12.5 gal
Approximate Purge Rate: 1L/min Purged/Sampled by: N. Schlagel
Weather Conditions: 30°F, sunny 0-5 mph SW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/16/20
Well ID: MW-3

Tubing Diameter (ID): 2 inches
Depth to Water: 10.05 ft, TOC
Depth to Bottom of Well: 19.7 ft, TOC
Feet of Water in Well: ft
Volume of Water in Well: 1.6 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	10.05	8.08	1,570	10.46	1
5	10.07	8.09	1,570	10.38	1
10	10.07	8.09	1,570	10.38	1
15	10.07	8.08	1,570	10.37	1

Purge Start Time: 8:30 Purge End Time: 8:55 Total Volume Purged: 5.0 gal
Approximate Purge Rate: 1L/min. Purged/Sampled by: N. Schlagel
Weather Conditions: 35°F, sunny, 5-10 mph SW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/16/20
Well ID: MW-3R

Tubing Diameter (ID): 2 inches
Depth to Water: 10.03 ft, TOC
Depth to Bottom of Well: 27.5 ft, TOC
Feet of Water in Well: 17.47 ft
Volume of Water in Well: 2.85 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	10.03	8.32	1,470	8.56	1
5	10.05	8.21	1,410	9.33	1
10	10.05	8.09	1,450	9.20	1
15	10.05	8.12	1,470	9.16	1

Purge Start Time: 8:30 Purge End Time: 8:50 Total Volume Purged: 9.0 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlegel
Weather Conditions: 32°F, sunny, 0-5 mph SW
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SLCB Lansing
Project Number: 350 2117
Sampling Device: Dedicated Bladder Pump
Date: 10/16/20
Well ID: MW-31D

Tubing Diameter (ID): 2. inches
Depth to Water: 9.05 ft, TOC
Depth to Bottom of Well: 46.25 ft, TOC
Feet of Water in Well: 37.20 ft
Volume of Water in Well: 6.1 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u/mhos)	Temperature (°F)	Purge Rate (L/min)
1	9.05	8.29	992	8.57	1
5	9.07	8.35	995	8.58	1
10	9.07	8.42	997	8.57	1
15	9.07	8.46	1,000	8.85	1

Purge Start Time: 9:10 Purge End Time: 9:30 Total Volume Purged: 18.5 gal

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

Weather Conditions: 40°F, sunny, 5-10 mph SW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lansing
Project Number: 3502117
Sampling Device: Dedicated Bladder Pump
Date: 10/16/20
Well ID: MW-4

Tubing Diameter (ID): 2 inches
Depth to Water: 8.91 ft, TOC
Depth to Bottom of Well: 18.3 ft, TOC
Feet of Water in Well: 9.39 ft
Volume of Water in Well: 1.5 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	8.91	8.25	1,360	10.72	1
5	8.93	8.23	1,290	11.86	1
10	8.93	8.14	1,290	11.85	1
15	8.93	8.13	1,290	11.85	1

Purge Start Time: 11:20 Purge End Time: 11:55 Total Volume Purged: 5.0 gal
Approximate Purge Rate: 1 L/min Purged/Sampled by: M Schlegel
Weather Conditions: 42°F, partly cloudy, 10-15 mph W
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: 480-168155-1
Client Project/Site: SKB Lansing - CCR Groundwater
Sampling Event: CCR Groundwater

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

Attn: Nathaniel Beinemann

Authorized for release by:
4/29/2020 2:25:38 PM
Alexander Gilbert, Project Management Assistant I
alexander.gilbert@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: 480-168155-1

Qualifiers

General Chemistry

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

Rad

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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: 480-168155-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-168155-1

Comments
No additional comments.

Receipt
The samples were received on 4/3/2020 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 3.1º C, 3.6º C and 4.2º C.

HPLC/IC
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW-1 (480-168155-1), MW-2R (480-168155-5) and MW-4 (480-168155-8). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were diluted due to the nature of the sample matrix: MW-3 (480-168155-2), MW-1RD (480-168155-3), MW-2RD (480-168155-4), MW-3RD (480-168155-6), MW-3R (480-168155-7), and DUPLICATE (480-168155-9). 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.

Metals
No analytical or quality issues were noted, other than those described 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 (480-168155-1), MW-3 (480-168155-2), MW-1RD (480-168155-3) and MW-2RD (480-168155-4).

Method 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-2R (480-168155-5), MW-3RD (480-168155-6), MW-3R (480-168155-7), MW-4 (480-168155-8), DUPLICATE (480-168155-9), FIELD BLANK (480-168155-10) and EQUIPMENT BLANK (480-168155-11).

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

Narrative

Job Narrative
480-168155-2

Comments
No additional comments.

Receipt
The samples were received on 4/3/2020 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 3.1º C, 3.6º C and 4.2º C.

RAD
Methods 903.0, 9315: Radium-226 Prep Batch 160-467046: 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 (480-168155-1), MW-3 (480-168155-2), MW-1RD (480-168155-3), MW-2RD (480-168155-4), MW-2R (480-168155-5), MW-3RD (480-168155-6), MW-3R (480-168155-7), MW-4 (480-168155-8), DUPLICATE (480-168155-9), FIELD BLANK (480-168155-10), EQUIPMENT BLANK (480-168155-11), (LCS 160-467046/1-A), (MB 160-467046/21-A), (160-37744-C-1-A) and (160-37744-D-1-B DU)

Methods 904.0, 9320: Ra-228 Prep Batch 160-467063: Any minimum detectable concentration (MDC), critical value (DLC), or Safe

Job ID: 480-168155-1 (Continued)

Laboratory: Eurofins TestAmerica, Buffalo (Continued)

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 (480-168155-1), MW-3 (480-168155-2), MW-1RD (480-168155-3), MW-2RD (480-168155-4), MW-2R (480-168155-5), MW-3RD (480-168155-6), MW-3R (480-168155-7), MW-4 (480-168155-8), DUPLICATE (480-168155-9), FIELD BLANK (480-168155-10), EQUIPMENT BLANK (480-168155-11), (LCS 160-467063/1-A), (MB 160-467063/21-A), (160-37744-C-1-B) and (160-37744-D-1-C DU)

Method PrecSep_0: Radium 228 Prep Batch 160-467063: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-3 (480-168155-2), MW-2R (480-168155-5) and MW-3R (480-168155-7). Sample 480-168155-7 also had suspended solids.

Method PrecSep-21: Radium 226 Prep Batch 160-467046: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-3 (480-168155-2), MW-2R (480-168155-5) and MW-3R (480-168155-7). Sample 480-168155-7 also had suspended solids.

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

Client Sample ID: MW-1

Date Collected: 04/02/20 07:35
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-1

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.13**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:13	1
Boron	**0.034**		0.020		mg/L		04/06/20 07:59	04/06/20 20:13	1
Calcium	**129**		0.50		mg/L		04/06/20 07:59	04/06/20 20:13	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:13	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:13	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:13	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:52	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:52	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 16:52	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 16:52	1
Cobalt	**0.58**		0.30		ug/L		04/06/20 07:42	04/14/20 14:33	1
Molybdenum	ND		1.0		ug/L		04/06/20 07:42	04/09/20 13:34	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:52	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 16:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**56.5**		2.5		mg/L			04/13/20 16:05	5
Fluoride	ND		0.25		mg/L			04/13/20 16:05	5
Sulfate	**95.6**		10.0		mg/L			04/13/20 16:05	5
Total Dissolved Solids	**523**		10.0		mg/L			04/03/20 17:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.2**	**HF**	0.1		SU			04/06/20 13:36	1
Temperature	**15.8**	**HF**	0.001		Degrees C			04/06/20 13:36	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	0.0676	U	0.0594	0.0597	1.00	0.0861	pCi/L	04/07/20 13:48	04/29/20 04:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.7*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:39*	*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	0.225	U	0.273	0.274	1.00	0.451	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.7*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*82.2*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

Client Sample ID: MW-3

Date Collected: 04/02/20 10:25
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-2

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.27**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:17	1
Boron	**0.70**		0.020		mg/L		04/06/20 07:59	04/06/20 20:17	1
Calcium	**197**		0.50		mg/L		04/06/20 07:59	04/06/20 20:17	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:17	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:17	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:17	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:54	1
Arsenic	**4.3**		1.0		ug/L		04/06/20 07:42	04/06/20 16:54	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 16:54	1
Cadmium	**0.56**		0.50		ug/L		04/06/20 07:42	04/06/20 16:54	1
Cobalt	**6.9**		0.30		ug/L		04/06/20 07:42	04/14/20 14:36	1
Molybdenum	**7.1**		1.0		ug/L		04/06/20 07:42	04/09/20 13:36	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:54	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 16:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**67.6**		2.5		mg/L			04/13/20 16:19	5
Fluoride	ND		0.25		mg/L			04/13/20 16:19	5
Sulfate	**17.9**		10.0		mg/L			04/13/20 16:19	5
Total Dissolved Solids	**802**		10.0		mg/L			04/03/20 17:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1		SU			04/06/20 13:39	1
Temperature	**15.6**	**HF**	0.001		Degrees C			04/06/20 13:39	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	**0.378**		0.146	0.150	1.00	0.139	pCi/L	04/07/20 13:48	04/29/20 04:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.0*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:39*	*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	**0.958**		0.499	0.507	1.00	0.745	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.0*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*81.1*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

Client Sample ID: MW-1RD

Date Collected: 04/02/20 07:55
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-3

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.11**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:21	1
Boron	ND		0.020		mg/L		04/06/20 07:59	04/06/20 20:21	1
Calcium	**56.7**		0.50		mg/L		04/06/20 07:59	04/06/20 20:21	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:21	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:21	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:21	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:56	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:56	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 16:56	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 16:56	1
Cobalt	**0.94**		0.30		ug/L		04/06/20 07:42	04/14/20 14:38	1
Molybdenum	**3.4**		1.0		ug/L		04/06/20 07:42	04/09/20 13:39	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:56	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 16:56	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**21.3**		2.5		mg/L			04/13/20 16:33	5
Fluoride	ND		0.25		mg/L			04/13/20 16:33	5
Sulfate	**49.7**		10.0		mg/L			04/13/20 16:33	5
Total Dissolved Solids	**345**		10.0		mg/L			04/03/20 17:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.6**	**HF**	0.1		SU			04/06/20 13:42	1
Temperature	**15.9**	**HF**	0.001		Degrees C			04/06/20 13:42	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	**0.353**		0.124	0.128	1.00	0.133	pCi/L	04/07/20 13:48	04/29/20 04:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:39*	*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	**0.916**		0.349	0.359	1.00	0.488	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*81.9*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

Client Sample ID: MW-2RD

Date Collected: 04/02/20 08:40
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-4

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.19**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:24	1
Boron	**0.071**		0.020		mg/L		04/06/20 07:59	04/06/20 20:24	1
Calcium	**139**		0.50		mg/L		04/06/20 07:59	04/06/20 20:24	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:24	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:24	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:24	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:58	1
Arsenic	**2.1**		1.0		ug/L		04/06/20 07:42	04/06/20 16:58	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 16:58	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 16:58	1
Cobalt	**2.8**		0.30		ug/L		04/06/20 07:42	04/14/20 14:40	1
Molybdenum	**2.6**		1.0		ug/L		04/06/20 07:42	04/09/20 13:41	1
Selenium	**5.6**		1.0		ug/L		04/06/20 07:42	04/06/20 16:58	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 16:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**35.1**		2.5		mg/L			04/13/20 16:47	5
Fluoride	ND		0.25		mg/L			04/13/20 16:47	5
Sulfate	**79.0**		10.0		mg/L			04/13/20 16:47	5
Total Dissolved Solids	**563**		10.0		mg/L			04/03/20 17:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1		SU			04/06/20 13:45	1
Temperature	**16.4**	**HF**	0.001		Degrees C			04/06/20 13:45	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	**0.488**		0.133	0.140	1.00	0.101	pCi/L	04/07/20 13:48	04/29/20 04:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.0*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:40*	*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	**0.798**		0.337	0.345	1.00	0.479	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.0*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

Client Sample ID: MW-2R

Date Collected: 04/02/20 08:25
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-5

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.23**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:28	1
Boron	**3.2**		0.020		mg/L		04/06/20 07:59	04/06/20 20:28	1
Calcium	**227**		0.50		mg/L		04/06/20 07:59	04/06/20 20:28	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:28	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:28	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:28	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:01	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:01	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:01	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:01	1
Cobalt	**1.6**		0.30		ug/L		04/06/20 07:42	04/14/20 14:42	1
Molybdenum	**2.4**		1.0		ug/L		04/06/20 07:42	04/09/20 13:43	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:01	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**101**		2.5		mg/L			04/13/20 17:58	5
Fluoride	ND		0.25		mg/L			04/13/20 17:58	5
Sulfate	**142**		10.0		mg/L			04/13/20 17:58	5
Total Dissolved Solids	**1050**		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1		SU			04/07/20 16:32	1
Temperature	**17.6**	**HF**	0.001		Degrees C			04/07/20 16:32	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	**0.317**		0.155	0.157	1.00	0.196	pCi/L	04/07/20 13:48	04/29/20 04:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:40*	*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	0.120	U	0.418	0.418	1.00	0.725	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*82.6*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

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

Job ID: 480-168155-1

Client Sample ID: MW-3RD

Date Collected: 04/02/20 10:15
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-6

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.22**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:32	1
Boron	**0.037**		0.020		mg/L		04/06/20 07:59	04/06/20 20:32	1
Calcium	**127**		0.50		mg/L		04/06/20 07:59	04/06/20 20:32	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:32	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:32	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:32	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:03	1
Arsenic	**3.8**		1.0		ug/L		04/06/20 07:42	04/06/20 17:03	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:03	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:03	1
Cobalt	**0.35**		0.30		ug/L		04/06/20 07:42	04/14/20 14:45	1
Molybdenum	**4.5**		1.0		ug/L		04/06/20 07:42	04/09/20 13:45	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:03	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.0**		2.5		mg/L			04/13/20 18:12	5
Fluoride	ND		0.25		mg/L			04/13/20 18:12	5
Sulfate	**93.4**		10.0		mg/L			04/13/20 18:12	5
Total Dissolved Solids	**552**		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.4**	**HF**	0.1		SU			04/07/20 16:35	1
Temperature	**17.3**	**HF**	0.001		Degrees C			04/07/20 16:35	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	**0.610**		0.134	0.145	1.00	0.0785	pCi/L	04/07/20 13:48	04/29/20 04:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:41*	*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	**0.697**		0.292	0.299	1.00	0.415	pCi/L	04/07/20 15:34	04/21/20 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:53*	*1*

Client Sample ID: MW-3R

Date Collected: 04/02/20 10:00
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-7

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.59**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:36	1
Boron	**0.054**		0.020		mg/L		04/06/20 07:59	04/06/20 20:36	1
Calcium	**226**		0.50		mg/L		04/06/20 07:59	04/06/20 20:36	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:36	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:36	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:36	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:05	1
Arsenic	**2.5**		1.0		ug/L		04/06/20 07:42	04/06/20 17:05	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:05	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:05	1
Cobalt	**0.43**		0.30		ug/L		04/06/20 07:42	04/14/20 14:47	1
Molybdenum	**1.6**		1.0		ug/L		04/06/20 07:42	04/09/20 13:48	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:05	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:05	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**19.8**		2.5		mg/L			04/13/20 18:26	5
Fluoride	ND		0.25		mg/L			04/13/20 18:26	5
Sulfate	ND		10.0		mg/L			04/13/20 18:26	5
Total Dissolved Solids	**782**		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1		SU			04/07/20 16:38	1
Temperature	**17.1**	**HF**	0.001		Degrees C			04/07/20 16:38	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	**0.553**		0.157	0.165	1.00	0.126	pCi/L	04/07/20 13:48	04/29/20 04:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:41*	*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	**1.07**		0.450	0.460	1.00	0.647	pCi/L	04/07/20 15:34	04/21/20 12:54	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:54*	*1*
Y Carrier	*81.1*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:54*	*1*

Client Sample ID: MW-4

Date Collected: 04/02/20 12:45
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-8

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.19**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:40	1
Boron	**0.39**		0.020		mg/L		04/06/20 07:59	04/06/20 20:40	1
Calcium	**172**		0.50		mg/L		04/06/20 07:59	04/06/20 20:40	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:40	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:40	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:40	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:07	1
Arsenic	**1.2**		1.0		ug/L		04/06/20 07:42	04/06/20 17:07	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:07	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:07	1
Cobalt	**1.2**		0.30		ug/L		04/06/20 07:42	04/14/20 14:56	1
Molybdenum	**2.1**		1.0		ug/L		04/06/20 07:42	04/09/20 13:57	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:07	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:07	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**12.9**		2.5		mg/L			04/13/20 18:40	5
Fluoride	ND		0.25		mg/L			04/13/20 18:40	5
Sulfate	**146**		10.0		mg/L			04/13/20 18:40	5
Total Dissolved Solids	**708**		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1		SU			04/07/20 16:41	1
Temperature	**17.0**	**HF**	0.001		Degrees C			04/07/20 16:41	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	**0.175**		0.0840	0.0855	1.00	0.0940	pCi/L	04/07/20 13:48	04/29/20 04:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.5*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:41*	*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	**0.571**		0.292	0.297	1.00	0.427	pCi/L	04/07/20 15:34	04/21/20 12:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.5*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*
Y Carrier	*71.8*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*

Client Sample ID: DUPLICATE

Date Collected: 04/02/20 00:00
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-9

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.21**		0.0020		mg/L		04/06/20 07:59	04/06/20 20:55	1
Boron	**0.033**		0.020		mg/L		04/06/20 07:59	04/06/20 20:55	1
Calcium	**125**		0.50		mg/L		04/06/20 07:59	04/06/20 20:55	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:55	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:55	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:55	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:10	1
Arsenic	**3.7**		1.0		ug/L		04/06/20 07:42	04/06/20 17:10	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:10	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:10	1
Cobalt	**0.32**		0.30		ug/L		04/06/20 07:42	04/14/20 14:58	1
Molybdenum	**4.4**		1.0		ug/L		04/06/20 07:42	04/09/20 13:59	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:10	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:10	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.4**		2.5		mg/L			04/13/20 18:55	5
Fluoride	ND		0.25		mg/L			04/13/20 18:55	5
Sulfate	**93.9**		10.0		mg/L			04/13/20 18:55	5
Total Dissolved Solids	**495**		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1		SU			04/07/20 16:44	1
Temperature	**16.9**	**HF**	0.001		Degrees C			04/07/20 16:44	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	**0.762**		0.159	0.173	1.00	0.0948	pCi/L	04/07/20 13:48	04/29/20 04:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.6*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:41*	*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	**0.674**		0.303	0.309	1.00	0.423	pCi/L	04/07/20 15:34	04/21/20 12:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.6*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*
Y Carrier	*69.9*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*

Client Sample ID: FIELD BLANK

Date Collected: 04/02/20 12:55
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-10

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020		mg/L		04/06/20 07:59	04/06/20 20:59	1
Boron	ND		0.020		mg/L		04/06/20 07:59	04/06/20 20:59	1
Calcium	ND		0.50		mg/L		04/06/20 07:59	04/06/20 20:59	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 20:59	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 20:59	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 20:59	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:19	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:19	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:19	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:19	1
Cobalt	ND		0.30		ug/L		04/06/20 07:42	04/14/20 15:01	1
Molybdenum	ND		1.0		ug/L		04/06/20 07:42	04/09/20 14:01	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:19	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:19	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			04/14/20 11:40	1
Fluoride	ND		0.050		mg/L			04/14/20 11:40	1
Sulfate	ND		2.0		mg/L			04/14/20 11:40	1
Total Dissolved Solids	ND		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.1**	**HF**	0.1		SU			04/07/20 16:47	1
Temperature	**17.0**	**HF**	0.001		Degrees C			04/07/20 16:47	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	0.0336	U	0.0616	0.0617	1.00	0.110	pCi/L	04/07/20 13:48	04/29/20 04:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.7*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:43*	*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	0.331	U	0.341	0.342	1.00	0.553	pCi/L	04/07/20 15:34	04/21/20 12:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.7*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*
Y Carrier	*61.7*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*

Client Sample ID: EQUIPMENT BLANK

Lab Sample ID: 480-168155-11

Date Collected: 04/02/20 13:00

Matrix: Water

Date Received: 04/03/20 09:30

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020		mg/L		04/06/20 07:59	04/06/20 21:02	1
Boron	ND		0.020		mg/L		04/06/20 07:59	04/06/20 21:02	1
Calcium	ND		0.50		mg/L		04/06/20 07:59	04/06/20 21:02	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 21:02	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 21:02	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 21:02	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:21	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:21	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 17:21	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 17:21	1
Cobalt	ND		0.30		ug/L		04/06/20 07:42	04/14/20 15:03	1
Molybdenum	ND		1.0		ug/L		04/06/20 07:42	04/09/20 14:04	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 17:21	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 17:21	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			04/14/20 11:54	1
Fluoride	ND		0.050		mg/L			04/14/20 11:54	1
Sulfate	ND		2.0		mg/L			04/14/20 11:54	1
Total Dissolved Solids	ND		10.0		mg/L			04/03/20 17:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.0**	**HF**	0.1		SU			04/07/20 16:50	1
Temperature	**17.0**	**HF**	0.001		Degrees C			04/07/20 16:50	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	0.0196	U	0.0520	0.0520	1.00	0.0982	pCi/L	04/07/20 13:48	04/29/20 04:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.6*		*40 - 110*	*04/07/20 13:48*	*04/29/20 04:43*	*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	0.136	U	0.303	0.303	1.00	0.519	pCi/L	04/07/20 15:34	04/21/20 12:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.6*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*
Y Carrier	*75.1*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:48*	*1*

Tracer/Carrier Summary

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

Job ID: 480-168155-1

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)
160-37744-D-1-B DU	Duplicate	100
480-168155-1	MW-1	91.7
480-168155-2	MW-3	78.0
480-168155-3	MW-1RD	89.0
480-168155-4	MW-2RD	85.0
480-168155-5	MW-2R	78.6
480-168155-6	MW-3RD	100
480-168155-7	MW-3R	92.7
480-168155-8	MW-4	94.5
480-168155-9	DUPLICATE	89.6
480-168155-10	FIELD BLANK	77.7
480-168155-11	EQUIPMENT BLANK	89.6
LCS 160-467046/1-A	Lab Control Sample	77.4
MB 160-467046/21-A	Method Blank	86.9

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)
160-37744-D-1-C DU	Duplicate	100	72.1
480-168155-1	MW-1	91.7	82.2
480-168155-2	MW-3	78.0	81.1
480-168155-3	MW-1RD	89.0	81.9
480-168155-4	MW-2RD	85.0	80.0
480-168155-5	MW-2R	78.6	82.6
480-168155-6	MW-3RD	100	80.0
480-168155-7	MW-3R	92.7	81.1
480-168155-8	MW-4	94.5	71.8
480-168155-9	DUPLICATE	89.6	69.9
480-168155-10	FIELD BLANK	77.7	61.7
480-168155-11	EQUIPMENT BLANK	89.6	75.1
LCS 160-467063/1-A	Lab Control Sample	77.4	81.5
MB 160-467063/21-A	Method Blank	86.9	79.3

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 480-524382/1-A
Matrix: Water
Analysis Batch: 524630

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524382

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.0020		mg/L		04/06/20 07:59	04/06/20 19:31	1
Boron	ND		0.020		mg/L		04/06/20 07:59	04/06/20 19:31	1
Calcium	ND		0.50		mg/L		04/06/20 07:59	04/06/20 19:31	1
Chromium	ND		0.0040		mg/L		04/06/20 07:59	04/06/20 19:31	1
Lead	ND		0.010		mg/L		04/06/20 07:59	04/06/20 19:31	1
Lithium	ND		0.030		mg/L		04/06/20 07:59	04/06/20 19:31	1

Lab Sample ID: LCS 480-524382/2-A
Matrix: Water
Analysis Batch: 524630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524382

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.200	0.210		mg/L		105	80 - 120
Boron	0.200	0.203		mg/L		101	80 - 120
Calcium	10.0	10.52		mg/L		105	80 - 120
Chromium	0.200	0.203		mg/L		102	80 - 120
Lead	0.200	0.194		mg/L		97	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 480-524381/1-A
Matrix: Water
Analysis Batch: 524599

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:10	1
Arsenic	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:10	1
Beryllium	ND		0.70		ug/L		04/06/20 07:42	04/06/20 16:10	1
Cadmium	ND		0.50		ug/L		04/06/20 07:42	04/06/20 16:10	1
Selenium	ND		1.0		ug/L		04/06/20 07:42	04/06/20 16:10	1
Thallium	ND		0.20		ug/L		04/06/20 07:42	04/06/20 16:10	1

Lab Sample ID: MB 480-524381/1-A
Matrix: Water
Analysis Batch: 525156

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	ND		1.0		ug/L		04/06/20 07:42	04/09/20 13:30	1

Lab Sample ID: MB 480-524381/1-A
Matrix: Water
Analysis Batch: 525866

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		0.30		ug/L		04/06/20 07:42	04/14/20 14:26	1

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

Lab Sample ID: LCS 480-524381/2-A
Matrix: Water
Analysis Batch: 524599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	20.0	22.03		ug/L		110	80 - 120
Arsenic	20.0	18.83		ug/L		94	80 - 120
Beryllium	20.0	19.65		ug/L		98	80 - 120
Cadmium	20.0	19.94		ug/L		100	80 - 120
Selenium	20.0	19.11		ug/L		96	80 - 120
Thallium	20.0	20.39		ug/L		102	80 - 120

Lab Sample ID: LCS 480-524381/2-A
Matrix: Water
Analysis Batch: 525156

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Molybdenum	20.0	21.52		ug/L		108	80 - 120

Lab Sample ID: LCS 480-524381/2-A
Matrix: Water
Analysis Batch: 525866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	20.0	21.66		ug/L		108	80 - 120

Lab Sample ID: LCSD 480-524381/3-A
Matrix: Water
Analysis Batch: 524599

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 524381

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	20.0	22.14		ug/L		111	80 - 120	1	20
Arsenic	20.0	18.89		ug/L		94	80 - 120	0	20
Beryllium	20.0	19.63		ug/L		98	80 - 120	0	20
Cadmium	20.0	19.82		ug/L		99	80 - 120	1	20
Selenium	20.0	19.18		ug/L		96	80 - 120	0	20
Thallium	20.0	20.61		ug/L		103	80 - 120	1	20

Lab Sample ID: LCSD 480-524381/3-A
Matrix: Water
Analysis Batch: 525866

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 524381

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	20.0	21.39		ug/L		107	80 - 120	1	20
Molybdenum	20.0	21.46		ug/L		107	80 - 120	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 480-524483/1-A
Matrix: Water
Analysis Batch: 524535

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524483

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 15:32	1

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

Lab Sample ID: LCS 480-524483/2-A
Matrix: Water
Analysis Batch: 524535

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	6.67	7.25		ug/L		109	80 - 120

Lab Sample ID: MB 480-524484/1-A
Matrix: Water
Analysis Batch: 524535

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524484

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		04/06/20 12:12	04/06/20 16:13	1

Lab Sample ID: LCS 480-524484/2-A
Matrix: Water
Analysis Batch: 524535

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524484

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	6.67	6.98		ug/L		105	80 - 120

Lab Sample ID: 480-168155-4 MS
Matrix: Water
Analysis Batch: 524535

Client Sample ID: MW-2RD
Prep Type: Total/NA
Prep Batch: 524484

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		6.67	6.68		ug/L		100	80 - 120

Lab Sample ID: 480-168155-4 MSD
Matrix: Water
Analysis Batch: 524535

Client Sample ID: MW-2RD
Prep Type: Total/NA
Prep Batch: 524484

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		6.67	7.12		ug/L		107	80 - 120	6	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-525545/28
Matrix: Water
Analysis Batch: 525545

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			04/13/20 15:22	1
Fluoride	ND		0.050		mg/L			04/13/20 15:22	1
Sulfate	ND		2.0		mg/L			04/13/20 15:22	1

Lab Sample ID: LCS 480-525545/27
Matrix: Water
Analysis Batch: 525545

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	49.30		mg/L		99	90 - 110
Fluoride	5.00	4.95		mg/L		99	90 - 110
Sulfate	50.0	49.45		mg/L		99	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-168155-4 MS
Matrix: Water
Analysis Batch: 525545

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	35.1		250	284.5		mg/L		100	81 - 120
Fluoride	ND		25.0	25.05		mg/L		100	82 - 120
Sulfate	79.0		250	330.2		mg/L		100	80 - 120

Lab Sample ID: 480-168155-4 MSD
Matrix: Water
Analysis Batch: 525545

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	35.1		250	285.7		mg/L		100	81 - 120	0	15
Fluoride	ND		25.0	25.16		mg/L		101	82 - 120	0	15
Sulfate	79.0		250	331.3		mg/L		101	80 - 120	0	15

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

Lab Sample ID: MB 480-524272/1
Matrix: Water
Analysis Batch: 524272

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			04/03/20 17:09	1

Lab Sample ID: LCS 480-524272/2
Matrix: Water
Analysis Batch: 524272

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	504	547.0		mg/L		108	85 - 115

Lab Sample ID: 480-168155-4 DU
Matrix: Water
Analysis Batch: 524272

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	563		575.0		mg/L		2	10

Lab Sample ID: MB 480-524275/1
Matrix: Water
Analysis Batch: 524275

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			04/03/20 17:30	1

Lab Sample ID: LCS 480-524275/2
Matrix: Water
Analysis Batch: 524275

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	504	513.0		mg/L		102	85 - 115

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

Lab Sample ID: 480-168155-5 DU
Matrix: Water
Analysis Batch: 524275

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	1050			986.0		mg/L				6	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-524509/1
Matrix: Water
Analysis Batch: 524509

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: LCS 480-524924/1
Matrix: Water
Analysis Batch: 524924

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		

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-467046/21-A
Matrix: Water
Analysis Batch: 469141

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 467046

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01487	U	0.0712	0.0712	1.00	0.135	pCi/L	04/07/20 13:48	04/29/20 06:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.9*		*40 - 110*	*04/07/20 13:48*	*04/29/20 06:38*	*1*

Lab Sample ID: LCS 160-467046/1-A
Matrix: Water
Analysis Batch: 469141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 467046

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	9.869		1.06	1.00	0.0991	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*77.4*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-467063/21-A
Matrix: Water
Analysis Batch: 468466

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 467063

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1397	U	0.292	0.292	1.00	0.499	pCi/L	04/07/20 15:34	04/21/20 12:50	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.9*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:50*	*1*
Y Carrier	*79.3*		*40 - 110*	*04/07/20 15:34*	*04/21/20 12:50*	*1*

Lab Sample ID: LCS 160-467063/1-A
Matrix: Water
Analysis Batch: 468448

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 467063

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			8.91	10.59		1.29	1.00	0.563	pCi/L	119	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*77.4*		*40 - 110*
Y Carrier	*81.5*		*40 - 110*

Metals

Prep Batch: 524381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	3020A	
480-168155-2	MW-3	Total/NA	Water	3020A	
480-168155-3	MW-1RD	Total/NA	Water	3020A	
480-168155-4	MW-2RD	Total/NA	Water	3020A	
480-168155-5	MW-2R	Total/NA	Water	3020A	
480-168155-6	MW-3RD	Total/NA	Water	3020A	
480-168155-7	MW-3R	Total/NA	Water	3020A	
480-168155-8	MW-4	Total/NA	Water	3020A	
480-168155-9	DUPLICATE	Total/NA	Water	3020A	
480-168155-10	FIELD BLANK	Total/NA	Water	3020A	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	3020A	
MB 480-524381/1-A	Method Blank	Total/NA	Water	3020A	
LCS 480-524381/2-A	Lab Control Sample	Total/NA	Water	3020A	
LCSD 480-524381/3-A	Lab Control Sample Dup	Total/NA	Water	3020A	

Prep Batch: 524382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	3005A	
480-168155-2	MW-3	Total/NA	Water	3005A	
480-168155-3	MW-1RD	Total/NA	Water	3005A	
480-168155-4	MW-2RD	Total/NA	Water	3005A	
480-168155-5	MW-2R	Total/NA	Water	3005A	
480-168155-6	MW-3RD	Total/NA	Water	3005A	
480-168155-7	MW-3R	Total/NA	Water	3005A	
480-168155-8	MW-4	Total/NA	Water	3005A	
480-168155-9	DUPLICATE	Total/NA	Water	3005A	
480-168155-10	FIELD BLANK	Total/NA	Water	3005A	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	3005A	
MB 480-524382/1-A	Method Blank	Total/NA	Water	3005A	
LCS 480-524382/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 524483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	7470A	
480-168155-2	MW-3	Total/NA	Water	7470A	
MB 480-524483/1-A	Method Blank	Total/NA	Water	7470A	
LCS 480-524483/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 524484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-3	MW-1RD	Total/NA	Water	7470A	
480-168155-4	MW-2RD	Total/NA	Water	7470A	
480-168155-5	MW-2R	Total/NA	Water	7470A	
480-168155-6	MW-3RD	Total/NA	Water	7470A	
480-168155-7	MW-3R	Total/NA	Water	7470A	
480-168155-8	MW-4	Total/NA	Water	7470A	
480-168155-9	DUPLICATE	Total/NA	Water	7470A	
480-168155-10	FIELD BLANK	Total/NA	Water	7470A	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	7470A	
MB 480-524484/1-A	Method Blank	Total/NA	Water	7470A	
LCS 480-524484/2-A	Lab Control Sample	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 524484 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-4 MS	MW-2RD	Total/NA	Water	7470A	
480-168155-4 MSD	MW-2RD	Total/NA	Water	7470A	

Analysis Batch: 524535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	7470A	524483
480-168155-2	MW-3	Total/NA	Water	7470A	524483
480-168155-3	MW-1RD	Total/NA	Water	7470A	524484
480-168155-4	MW-2RD	Total/NA	Water	7470A	524484
480-168155-5	MW-2R	Total/NA	Water	7470A	524484
480-168155-6	MW-3RD	Total/NA	Water	7470A	524484
480-168155-7	MW-3R	Total/NA	Water	7470A	524484
480-168155-8	MW-4	Total/NA	Water	7470A	524484
480-168155-9	DUPLICATE	Total/NA	Water	7470A	524484
480-168155-10	FIELD BLANK	Total/NA	Water	7470A	524484
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	7470A	524484
MB 480-524483/1-A	Method Blank	Total/NA	Water	7470A	524483
MB 480-524484/1-A	Method Blank	Total/NA	Water	7470A	524484
LCS 480-524483/2-A	Lab Control Sample	Total/NA	Water	7470A	524483
LCS 480-524484/2-A	Lab Control Sample	Total/NA	Water	7470A	524484
480-168155-4 MS	MW-2RD	Total/NA	Water	7470A	524484
480-168155-4 MSD	MW-2RD	Total/NA	Water	7470A	524484

Analysis Batch: 524599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	6020B	524381
480-168155-2	MW-3	Total/NA	Water	6020B	524381
480-168155-3	MW-1RD	Total/NA	Water	6020B	524381
480-168155-4	MW-2RD	Total/NA	Water	6020B	524381
480-168155-5	MW-2R	Total/NA	Water	6020B	524381
480-168155-6	MW-3RD	Total/NA	Water	6020B	524381
480-168155-7	MW-3R	Total/NA	Water	6020B	524381
480-168155-8	MW-4	Total/NA	Water	6020B	524381
480-168155-9	DUPLICATE	Total/NA	Water	6020B	524381
480-168155-10	FIELD BLANK	Total/NA	Water	6020B	524381
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	6020B	524381
MB 480-524381/1-A	Method Blank	Total/NA	Water	6020B	524381
LCS 480-524381/2-A	Lab Control Sample	Total/NA	Water	6020B	524381
LCSD 480-524381/3-A	Lab Control Sample Dup	Total/NA	Water	6020B	524381

Analysis Batch: 524630

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	6010D	524382
480-168155-2	MW-3	Total/NA	Water	6010D	524382
480-168155-3	MW-1RD	Total/NA	Water	6010D	524382
480-168155-4	MW-2RD	Total/NA	Water	6010D	524382
480-168155-5	MW-2R	Total/NA	Water	6010D	524382
480-168155-6	MW-3RD	Total/NA	Water	6010D	524382
480-168155-7	MW-3R	Total/NA	Water	6010D	524382
480-168155-8	MW-4	Total/NA	Water	6010D	524382
480-168155-9	DUPLICATE	Total/NA	Water	6010D	524382

Metals (Continued)

Analysis Batch: 524630 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-10	FIELD BLANK	Total/NA	Water	6010D	524382
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	6010D	524382
MB 480-524382/1-A	Method Blank	Total/NA	Water	6010D	524382
LCS 480-524382/2-A	Lab Control Sample	Total/NA	Water	6010D	524382

Analysis Batch: 525156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	6020B	524381
480-168155-2	MW-3	Total/NA	Water	6020B	524381
480-168155-3	MW-1RD	Total/NA	Water	6020B	524381
480-168155-4	MW-2RD	Total/NA	Water	6020B	524381
480-168155-5	MW-2R	Total/NA	Water	6020B	524381
480-168155-6	MW-3RD	Total/NA	Water	6020B	524381
480-168155-7	MW-3R	Total/NA	Water	6020B	524381
480-168155-8	MW-4	Total/NA	Water	6020B	524381
480-168155-9	DUPLICATE	Total/NA	Water	6020B	524381
480-168155-10	FIELD BLANK	Total/NA	Water	6020B	524381
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	6020B	524381
MB 480-524381/1-A	Method Blank	Total/NA	Water	6020B	524381
LCS 480-524381/2-A	Lab Control Sample	Total/NA	Water	6020B	524381

Analysis Batch: 525866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	6020B	524381
480-168155-2	MW-3	Total/NA	Water	6020B	524381
480-168155-3	MW-1RD	Total/NA	Water	6020B	524381
480-168155-4	MW-2RD	Total/NA	Water	6020B	524381
480-168155-5	MW-2R	Total/NA	Water	6020B	524381
480-168155-6	MW-3RD	Total/NA	Water	6020B	524381
480-168155-7	MW-3R	Total/NA	Water	6020B	524381
480-168155-8	MW-4	Total/NA	Water	6020B	524381
480-168155-9	DUPLICATE	Total/NA	Water	6020B	524381
480-168155-10	FIELD BLANK	Total/NA	Water	6020B	524381
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	6020B	524381
MB 480-524381/1-A	Method Blank	Total/NA	Water	6020B	524381
LCS 480-524381/2-A	Lab Control Sample	Total/NA	Water	6020B	524381
LCSD 480-524381/3-A	Lab Control Sample Dup	Total/NA	Water	6020B	524381

General Chemistry

Analysis Batch: 524272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	SM 2540C	
480-168155-2	MW-3	Total/NA	Water	SM 2540C	
480-168155-3	MW-1RD	Total/NA	Water	SM 2540C	
480-168155-4	MW-2RD	Total/NA	Water	SM 2540C	
MB 480-524272/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-524272/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-168155-4 DU	MW-2RD	Total/NA	Water	SM 2540C	

QC Association Summary

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

Job ID: 480-168155-1

General Chemistry

Analysis Batch: 524275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-5	MW-2R	Total/NA	Water	SM 2540C	
480-168155-6	MW-3RD	Total/NA	Water	SM 2540C	
480-168155-7	MW-3R	Total/NA	Water	SM 2540C	
480-168155-8	MW-4	Total/NA	Water	SM 2540C	
480-168155-9	DUPLICATE	Total/NA	Water	SM 2540C	
480-168155-10	FIELD BLANK	Total/NA	Water	SM 2540C	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	SM 2540C	
MB 480-524275/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-524275/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-168155-5 DU	MW-2R	Total/NA	Water	SM 2540C	

Analysis Batch: 524509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	SM 4500 H+ B	
480-168155-2	MW-3	Total/NA	Water	SM 4500 H+ B	
480-168155-3	MW-1RD	Total/NA	Water	SM 4500 H+ B	
480-168155-4	MW-2RD	Total/NA	Water	SM 4500 H+ B	
LCS 480-524509/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 524924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-5	MW-2R	Total/NA	Water	SM 4500 H+ B	
480-168155-6	MW-3RD	Total/NA	Water	SM 4500 H+ B	
480-168155-7	MW-3R	Total/NA	Water	SM 4500 H+ B	
480-168155-8	MW-4	Total/NA	Water	SM 4500 H+ B	
480-168155-9	DUPLICATE	Total/NA	Water	SM 4500 H+ B	
480-168155-10	FIELD BLANK	Total/NA	Water	SM 4500 H+ B	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	SM 4500 H+ B	
LCS 480-524924/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 525545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	300.0	
480-168155-2	MW-3	Total/NA	Water	300.0	
480-168155-3	MW-1RD	Total/NA	Water	300.0	
480-168155-4	MW-2RD	Total/NA	Water	300.0	
480-168155-5	MW-2R	Total/NA	Water	300.0	
480-168155-6	MW-3RD	Total/NA	Water	300.0	
480-168155-7	MW-3R	Total/NA	Water	300.0	
480-168155-8	MW-4	Total/NA	Water	300.0	
480-168155-9	DUPLICATE	Total/NA	Water	300.0	
480-168155-10	FIELD BLANK	Total/NA	Water	300.0	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	300.0	
MB 480-525545/28	Method Blank	Total/NA	Water	300.0	
LCS 480-525545/27	Lab Control Sample	Total/NA	Water	300.0	
480-168155-4 MS	MW-2RD	Total/NA	Water	300.0	
480-168155-4 MSD	MW-2RD	Total/NA	Water	300.0	

Rad

Prep Batch: 467046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	PrecSep-21	
480-168155-2	MW-3	Total/NA	Water	PrecSep-21	
480-168155-3	MW-1RD	Total/NA	Water	PrecSep-21	
480-168155-4	MW-2RD	Total/NA	Water	PrecSep-21	
480-168155-5	MW-2R	Total/NA	Water	PrecSep-21	
480-168155-6	MW-3RD	Total/NA	Water	PrecSep-21	
480-168155-7	MW-3R	Total/NA	Water	PrecSep-21	
480-168155-8	MW-4	Total/NA	Water	PrecSep-21	
480-168155-9	DUPLICATE	Total/NA	Water	PrecSep-21	
480-168155-10	FIELD BLANK	Total/NA	Water	PrecSep-21	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	PrecSep-21	
MB 160-467046/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-467046/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 467063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168155-1	MW-1	Total/NA	Water	PrecSep_0	
480-168155-2	MW-3	Total/NA	Water	PrecSep_0	
480-168155-3	MW-1RD	Total/NA	Water	PrecSep_0	
480-168155-4	MW-2RD	Total/NA	Water	PrecSep_0	
480-168155-5	MW-2R	Total/NA	Water	PrecSep_0	
480-168155-6	MW-3RD	Total/NA	Water	PrecSep_0	
480-168155-7	MW-3R	Total/NA	Water	PrecSep_0	
480-168155-8	MW-4	Total/NA	Water	PrecSep_0	
480-168155-9	DUPLICATE	Total/NA	Water	PrecSep_0	
480-168155-10	FIELD BLANK	Total/NA	Water	PrecSep_0	
480-168155-11	EQUIPMENT BLANK	Total/NA	Water	PrecSep_0	
MB 160-467063/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-467063/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168155-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1
Lab Sample ID: 480-168155-1
Date Collected: 04/02/20 07:35
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:13	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 16:52	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:34	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:33	KMP	TAL BUF
Total/NA	Prep	7470A			524483	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:08	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 16:05	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524272	04/03/20 17:09	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524509	04/06/20 13:36	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:39	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Client Sample ID: MW-3
Lab Sample ID: 480-168155-2
Date Collected: 04/02/20 10:25
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:17	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 16:54	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:36	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:36	KMP	TAL BUF
Total/NA	Prep	7470A			524483	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:09	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 16:19	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524272	04/03/20 17:09	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524509	04/06/20 13:39	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:39	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168155-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1RD
Lab Sample ID: 480-168155-3
Date Collected: 04/02/20 07:55
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:21	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 16:56	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:39	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:38	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:15	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 16:33	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524272	04/03/20 17:09	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524509	04/06/20 13:42	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:39	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Client Sample ID: MW-2RD
Lab Sample ID: 480-168155-4
Date Collected: 04/02/20 08:40
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:24	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 16:58	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:41	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:40	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:17	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 16:47	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524272	04/03/20 17:09	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524509	04/06/20 13:45	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:40	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168155-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-2R
Lab Sample ID: 480-168155-5
Date Collected: 04/02/20 08:25
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:28	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:01	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:43	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:42	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:22	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 17:58	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:32	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:40	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Client Sample ID: MW-3RD
Lab Sample ID: 480-168155-6
Date Collected: 04/02/20 10:15
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:32	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:03	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:45	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:45	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:23	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 18:12	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:35	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:41	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:53	CJQ	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168155-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-3R
Lab Sample ID: 480-168155-7
Date Collected: 04/02/20 10:00
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:36	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:05	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:48	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:47	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:25	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 18:26	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:38	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:41	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468448	04/21/20 12:54	CJQ	TAL SL

Client Sample ID: MW-4
Lab Sample ID: 480-168155-8
Date Collected: 04/02/20 12:45
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:40	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:07	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:57	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:56	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:29	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 18:40	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:41	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:41	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468466	04/21/20 12:48	CJQ	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168155-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: DUPLICATE
Lab Sample ID: 480-168155-9
Date Collected: 04/02/20 00:00
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:55	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:10	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 13:59	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 14:58	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:30	BMB	TAL BUF
Total/NA	Analysis	300.0		5	525545	04/13/20 18:55	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:44	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:41	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468466	04/21/20 12:48	CJQ	TAL SL

Client Sample ID: FIELD BLANK
Lab Sample ID: 480-168155-10
Date Collected: 04/02/20 12:55
Matrix: Water
Date Received: 04/03/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 20:59	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:19	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 14:01	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 15:01	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:31	BMB	TAL BUF
Total/NA	Analysis	300.0		1	525545	04/14/20 11:40	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:47	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:43	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468466	04/21/20 12:48	CJQ	TAL SL

Lab Chronicle

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

Job ID: 480-168155-1

Client Sample ID: EQUIPMENT BLANK

Date Collected: 04/02/20 13:00
Date Received: 04/03/20 09:30

Lab Sample ID: 480-168155-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			524382	04/06/20 07:59	NSW	TAL BUF
Total/NA	Analysis	6010D		1	524630	04/06/20 21:02	LMH	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	524599	04/06/20 17:21	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525156	04/09/20 14:04	KMP	TAL BUF
Total/NA	Prep	3020A			524381	04/06/20 07:42	NSW	TAL BUF
Total/NA	Analysis	6020B		1	525866	04/14/20 15:03	KMP	TAL BUF
Total/NA	Prep	7470A			524484	04/06/20 12:12	BMB	TAL BUF
Total/NA	Analysis	7470A		1	524535	04/06/20 16:32	BMB	TAL BUF
Total/NA	Analysis	300.0		1	525545	04/14/20 11:54	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524275	04/03/20 17:30	SRW	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	524924	04/07/20 16:50	SRA	TAL BUF
Total/NA	Prep	PrecSep-21			467046	04/07/20 13:48	TCD	TAL SL
Total/NA	Analysis	903.0		1	469141	04/29/20 04:43	AJD	TAL SL
Total/NA	Prep	PrecSep_0			467063	04/07/20 15:34	TCD	TAL SL
Total/NA	Analysis	904.0		1	468466	04/21/20 12:48	CJQ	TAL SL

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: 480-168155-1
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	1524384	12-31-20

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, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

Method Summary

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

Job ID: 480-168155-1

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 BUF
SM 4500 H+ B	pH	SM	TAL BUF
3005A	Preparation, Total Metals	SW846	TAL BUF
3020A	Preparation, Total Metals	SW846	TAL BUF
7470A	Preparation, Mercury	SW846	TAL BUF

Protocol References:

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: 480-168155-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168155-1	MW-1	Water	04/02/20 07:35	04/03/20 09:30	
480-168155-2	MW-3	Water	04/02/20 10:25	04/03/20 09:30	
480-168155-3	MW-1RD	Water	04/02/20 07:55	04/03/20 09:30	
480-168155-4	MW-2RD	Water	04/02/20 08:40	04/03/20 09:30	
480-168155-5	MW-2R	Water	04/02/20 08:25	04/03/20 09:30	
480-168155-6	MW-3RD	Water	04/02/20 10:15	04/03/20 09:30	
480-168155-7	MW-3R	Water	04/02/20 10:00	04/03/20 09:30	
480-168155-8	MW-4	Water	04/02/20 12:45	04/03/20 09:30	
480-168155-9	DUPLICATE	Water	04/02/20 00:00	04/03/20 09:30	
480-168155-10	FIELD BLANK	Water	04/02/20 12:55	04/03/20 09:30	
480-168155-11	EQUIPMENT BLANK	Water	04/02/20 13:00	04/03/20 09:30	

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

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Client Information	Sampler: N. Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-143911-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-8065	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 TAT			
State, Zip: MN, 55068				
Phone:	PO #: Purchase Order Requested 3064-20-00095			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	Project #: 48013603			
Site: Minnesota	SSOW#:			

Analysis Requested

480-168155 Chain of Custody

J - DI Water, K - EDTA, L - EDA, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify), . - TSP Dodecahydrate
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, 6020B, 7470A	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Standard Target List	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
MW-1	4/2/20	7:35	G	Water			X	X	X	X	X	X		
MW-3		10:25		Water										
Duplicate		-		Water										
Field Blank		12:55		Water										
Equip Blank		13:00		Water										
MW-1RD		7:55		Water			X							
MW-2RD		9:40		Water										
MW-2R		8:25		Water										
MW-3RD		10:15		Water										
MW-3R		10:00		Water										
MW-4		12:45		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:	Company	Received by:	Date/Time:	Company
1	[signature]	4/2/20 1530	GES	[signature]	4-2-20 1530	[signature]
2	[signature]	4-2-20 1700	[signature]	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	[signature]	4/3/20 930	TAB

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 4.2 3.6 3.1 #2

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-168155-1
SDG Number:

Login Number: 168155
List Number: 1
Creator: Wallace, Cameron

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.	N/A	
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	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-168155-2
SDG Number:

Login Number: 168155
List Number: 1
Creator: Wallace, Cameron

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.	N/A	
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	

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-168155-2
SDG Number:

Login Number: 168155
List Number: 2
Creator: Korrinhizer, Micha L

List Source: Eurofins TestAmerica, St. Louis
List Creation: 04/06/20 11:26 AM

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.	True	
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	
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.	False	Sample container 480-168155-B-10 was listed on the ICOC but not received.
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	

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ANALYTICAL REPORT

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

Laboratory Job ID: 480-176725-1
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:
12/31/2020 9:41:24 AM

Ryan VanDette, Project Manager II
(716)504-9830
Ryan.VanDette@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 480-176725-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-176725-1

Comments
This report has been revised to include select CCR parameters.

No additional comments.

Receipt
The samples were received on 10/17/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.3º C, 2.5º C and 2.8º C.

HPLC/IC
Method 300.0: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-2R (480-176725-3). Elevated reporting limits (RLs) are provided.

Method 300.0: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-4 (480-176725-8). Elevated reporting limits (RLs) are provided.

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

Metals
Methods 6010C, 6010D: The interference check standard solution (ICSA) associated with the following samples showed results for Barium at a level greater than 2 times the limit of detection (LOD). It is believed that the solution contains trace impurities of this element / these elements and the results are not due to matrix interference. These results are consistent with those found by the manufacturer of the ICSA solution. MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), MW-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10), DUPLICATE (480-176725-11), (LCS 480-555233/2-A), (MB 480-555233/1-A), (480-176725-D-7-D PDS) and (480-176725-D-7-D SD ^5)

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

General Chemistry
Method SM 4500 H+ B: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following sample has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: MW-2R (480-176725-3).

Method 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 (480-176725-1), MW-1RD (480-176725-2), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), MW-3RD (480-176725-7), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11).

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

Narrative

Job Narrative
480-176725-2

Comments
No additional comments.

Receipt
The samples were received on 10/17/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.3º C, 2.5º C and 2.8º C.

Job ID: 480-176725-1 (Continued)

Laboratory: Eurofins TestAmerica, Buffalo (Continued)

RAD

Methods 903.0, 9315: 9315 prep batch: 160-487007: 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-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11)

Method 903.0: Radium-226 prep batch 160-487270: 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 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), (LCS 160-487270/1-A), (LCSD 160-487270/2-A) and (MB 160-487270/10-A)

Method 904.0: 904 Prep Batch 160-487272: The following sample(s) did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences. The data have been reported with this narrative. MW-3 (480-176725-5)

Method 904.0: 904 Prep batch 160-48722: 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 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6)

Methods 904.0, 9320: 904 prep batch 160-487013: 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-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11)

Method PrecSep_0: Radium 228 Prep Batch 160-487272: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-2R (480-176725-3), MW-3 (480-176725-5) and MW-3R (480-176725-6).

Method PrecSep_0: Radium 228 Prep Batch 160-487272: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-487270: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-487270: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-2R (480-176725-3), MW-3 (480-176725-5) and MW-3R (480-176725-6).

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: 480-176725-1

Client Sample ID: MW-1 — Lab Sample ID: 480-176725-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.12	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.046		0.020		mg/L	1		6010D	Total/NA
Calcium	127		0.50		mg/L	1		6010D	Total/NA
Chloride	94.5		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.12		0.050		mg/L	1		300.0	Total/NA
Sulfate	55.9		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	454		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.3	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD — Lab Sample ID: 480-176725-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.16	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.031		0.020		mg/L	1		6010D	Total/NA
Calcium	81.7		0.50		mg/L	1		6010D	Total/NA
Molybdenum	3.1		1.0		ug/L	1		6020B	Total/NA
Chloride	24.0		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.19		0.050		mg/L	1		300.0	Total/NA
Sulfate	50.5		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	428		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R — Lab Sample ID: 480-176725-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.29	^	0.0020		mg/L	1		6010D	Total/NA
Boron	2.4		0.020		mg/L	1		6010D	Total/NA
Calcium	221		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.2		1.0		ug/L	1		6020B	Total/NA
Molybdenum	1.9		1.0		ug/L	1		6020B	Total/NA
Chloride	105		2.5		mg/L	5		300.0	Total/NA
Sulfate	137		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	1010		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	16.7	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2RD — Lab Sample ID: 480-176725-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.19	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.079		0.020		mg/L	1		6010D	Total/NA
Calcium	138		0.50		mg/L	1		6010D	Total/NA
Arsenic	2.1		1.0		ug/L	1		6020B	Total/NA
Molybdenum	2.4		1.0		ug/L	1		6020B	Total/NA
Selenium	9.0		1.0		ug/L	1		6020B	Total/NA
Chloride	36.4		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.19		0.050		mg/L	1		300.0	Total/NA
Sulfate	72.6		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	710		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

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

Job ID: 480-176725-1

Client Sample ID: MW-2RD (Continued) — Lab Sample ID: 480-176725-4

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Temperature	18.3	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 480-176725-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.39	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.23		0.020		mg/L	1		6010D	Total/NA
Calcium	233		0.50		mg/L	1		6010D	Total/NA
Arsenic	22.1		1.0		ug/L	1		6020B	Total/NA
Molybdenum	7.1		1.0		ug/L	1		6020B	Total/NA
Chloride	24.9		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.099		0.050		mg/L	1		300.0	Total/NA
Sulfate	10		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	1020		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.4	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3R — Lab Sample ID: 480-176725-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.56	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.060		0.020		mg/L	1		6010D	Total/NA
Calcium	213		0.50		mg/L	1		6010D	Total/NA
Arsenic	2.5		1.0		ug/L	1		6020B	Total/NA
Molybdenum	1.2		1.0		ug/L	1		6020B	Total/NA
Chloride	18.4		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.055		0.050		mg/L	1		300.0	Total/NA
Sulfate	4.4		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	724		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.4	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD — Lab Sample ID: 480-176725-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.032		0.020		mg/L	1		6010D	Total/NA
Calcium	120		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.7		1.0		ug/L	1		6020B	Total/NA
Molybdenum	4.3		1.0		ug/L	1		6020B	Total/NA
Chloride	27.1		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.18		0.050		mg/L	1		300.0	Total/NA
Sulfate	82.8	F1	2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	625		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 480-176725-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.51		0.020		mg/L	1		6010D	Total/NA
Calcium	181		0.50		mg/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-4 (Continued) — Lab Sample ID: 480-176725-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.4		1.0		ug/L	1		6020B	Total/NA
Molybdenum	3.0		1.0		ug/L	1		6020B	Total/NA
Chloride	13.8		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.16		0.10		mg/L	2		300.0	Total/NA
Sulfate	156		4.0		mg/L	2		300.0	Total/NA
Total Dissolved Solids	819		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FIELD BLANK 1 — Lab Sample ID: 480-176725-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: Equipment Blank — Lab Sample ID: 480-176725-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.0	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUPLICATE — Lab Sample ID: 480-176725-11

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	125		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.8		1.0		ug/L	1		6020B	Total/NA
Molybdenum	4.2		1.0		ug/L	1		6020B	Total/NA
Chloride	27.0		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.18		0.050		mg/L	1		300.0	Total/NA
Sulfate	82.7		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	552		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	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: 480-176725-1

Client Sample ID: MW-1

Date Collected: 10/15/20 13:05
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-1

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.12	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:10	1
Boron	0.046		0.020		mg/L		10/26/20 10:15	10/27/20 03:10	1
Calcium	127		0.50		mg/L		10/26/20 10:15	10/27/20 03:10	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:11	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	94.5		0.50		mg/L			10/24/20 23:42	1
Fluoride	0.12		0.050		mg/L			10/24/20 23:42	1
Sulfate	55.9		2.0		mg/L			10/24/20 23:42	1
Total Dissolved Solids	454		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1		SU			10/22/20 12:30	1
Temperature	19.3	HF	0.001		Degrees C			10/22/20 12:30	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	0.149		0.0854	0.0864	1.00	0.104	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*72.7*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.512	U	0.403	0.406	1.00	0.638	pCi/L	10/29/20 12:49	11/13/20 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*72.7*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:52*	*1*
Y Carrier	*69.9*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:52*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-1RD

Date Collected: 10/15/20 13:35
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-2

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.16	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:14	1
Boron	0.031		0.020		mg/L		10/26/20 10:15	10/27/20 03:14	1
Calcium	81.7		0.50		mg/L		10/26/20 10:15	10/27/20 03:14	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:13	1
Molybdenum	3.1		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.0		0.50		mg/L			10/24/20 23:56	1
Fluoride	0.19		0.050		mg/L			10/24/20 23:56	1
Sulfate	50.5		2.0		mg/L			10/24/20 23:56	1
Total Dissolved Solids	428		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1		SU			10/22/20 12:35	1
Temperature	18.8	HF	0.001		Degrees C			10/22/20 12:35	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	0.396		0.118	0.123	1.00	0.0939	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.499	U	0.337	0.341	1.00	0.523	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*78.1*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

Client Sample Results

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

Job ID: 480-176725-1

Client Sample ID: MW-2R

Date Collected: 10/15/20 14:40
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-3

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.29**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 03:17	1
Boron	**2.4**		0.020		mg/L		10/26/20 10:15	10/27/20 03:17	1
Calcium	**221**		0.50		mg/L		10/26/20 10:15	10/27/20 03:17	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.2**		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:16	1
Molybdenum	**1.9**		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**105**		2.5		mg/L			10/25/20 00:11	5
Fluoride	ND		0.25		mg/L			10/25/20 00:11	5
Sulfate	**137**		10.0		mg/L			10/25/20 00:11	5
Total Dissolved Solids	**1010**		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.5**	**HF**	0.1		SU			10/21/20 16:02	1
Temperature	**16.7**	**HF**	0.001		Degrees C			10/21/20 16:02	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	**0.351**		0.138	0.141	1.00	0.138	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	**1.41**		0.498	0.514	1.00	0.671	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-2RD

Date Collected: 10/16/20 08:05
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-4

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.19	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:21	1
Boron	0.079		0.020		mg/L		10/26/20 10:15	10/27/20 03:21	1
Calcium	138		0.50		mg/L		10/26/20 10:15	10/27/20 03:21	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.1		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:18	1
Molybdenum	2.4		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1
Selenium	9.0		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	36.4		0.50		mg/L			10/25/20 00:26	1
Fluoride	0.19		0.050		mg/L			10/25/20 00:26	1
Sulfate	72.6		2.0		mg/L			10/25/20 00:26	1
Total Dissolved Solids	710		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1		SU			10/22/20 12:37	1
Temperature	18.3	HF	0.001		Degrees C			10/22/20 12:37	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	0.457		0.134	0.140	1.00	0.102	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.0*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.672		0.365	0.370	1.00	0.540	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

Client Sample ID: MW-3

Date Collected: 10/16/20 08:55
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-5

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.39**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 03:25	1
Boron	**0.23**		0.020		mg/L		10/26/20 10:15	10/27/20 03:25	1
Calcium	**233**		0.50		mg/L		10/26/20 10:15	10/27/20 03:25	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**22.1**		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:20	1
Molybdenum	**7.1**		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**24.9**		0.50		mg/L			10/25/20 00:40	1
Fluoride	**0.099**		0.050		mg/L			10/25/20 00:40	1
Sulfate	**10**		2.0		mg/L			10/25/20 00:40	1
Total Dissolved Solids	**1020**		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.5**	**HF**	0.1		SU			10/22/20 12:40	1
Temperature	**18.4**	**HF**	0.001		Degrees C			10/22/20 12:40	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	**0.585**		0.200	0.207	1.00	0.183	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	**1.11**	**G**	0.712	0.719	1.00	1.10	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.8*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*69.5*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-3R

Date Collected: 10/16/20 08:50
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-6

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.56	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:29	1
Boron	0.060		0.020		mg/L		10/26/20 10:15	10/27/20 03:29	1
Calcium	213		0.50		mg/L		10/26/20 10:15	10/27/20 03:29	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.5		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:22	1
Molybdenum	1.2		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18.4		0.50		mg/L			10/24/20 14:35	1
Fluoride	0.055		0.050		mg/L			10/27/20 07:10	1
Sulfate	4.4		2.0		mg/L			10/24/20 14:35	1
Total Dissolved Solids	724		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.5	HF	0.1		SU			10/22/20 12:42	1
Temperature	18.4	HF	0.001		Degrees C			10/22/20 12:42	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	0.393		0.163	0.167	1.00	0.174	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*64.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.820	U	0.562	0.567	1.00	0.871	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*64.8*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*76.3*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-3RD

Date Collected: 10/16/20 09:30
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-7

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.21	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:33	1
Boron	0.032		0.020		mg/L		10/26/20 10:15	10/27/20 03:33	1
Calcium	120		0.50		mg/L		10/26/20 10:15	10/27/20 03:33	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.7		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:25	1
Molybdenum	4.3		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.1		0.50		mg/L			10/24/20 15:46	1
Fluoride	0.18		0.050		mg/L			10/27/20 05:42	1
Sulfate	82.8	F1	2.0		mg/L			10/24/20 15:46	1
Total Dissolved Solids	625		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1		SU			10/22/20 12:45	1
Temperature	18.6	HF	0.001		Degrees C			10/22/20 12:45	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	0.738		0.200	0.211	1.00	0.147	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.5*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.427	U	0.292	0.295	1.00	0.452	pCi/L	10/28/20 11:56	11/24/20 11:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.5*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*
Y Carrier	*82.6*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-4

Date Collected: 10/16/20 11:55
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-8

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.21	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:03	1
Boron	0.51		0.020		mg/L		10/26/20 10:15	10/27/20 04:03	1
Calcium	181		0.50		mg/L		10/26/20 10:15	10/27/20 04:03	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.4		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:43	1
Molybdenum	3.0		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.8		0.50		mg/L			10/24/20 14:49	1
Fluoride	0.16		0.10		mg/L			10/27/20 07:25	2
Sulfate	156		4.0		mg/L			10/27/20 07:25	2
Total Dissolved Solids	819		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			10/22/20 12:47	1
Temperature	18.6	HF	0.001		Degrees C			10/22/20 12:47	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	0.323		0.141	0.144	1.00	0.143	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.9*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.561		0.321	0.325	1.00	0.486	pCi/L	10/28/20 11:56	11/24/20 11:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.9*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*
Y Carrier	*82.2*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*

Client Sample ID: FIELD BLANK 1

Lab Sample ID: 480-176725-9

Date Collected: 10/15/20 16:30

Matrix: Water

Date Received: 10/17/20 10:00

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:07	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 04:07	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 04:07	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:45	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/24/20 15:03	1
Fluoride	ND		0.050		mg/L			10/27/20 07:39	1
Sulfate	ND		2.0		mg/L			10/24/20 15:03	1
Total Dissolved Solids	ND		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.7**	**HF**	0.1		SU			10/22/20 12:50	1
Temperature	**18.6**	**HF**	0.001		Degrees C			10/22/20 12:50	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	-0.00997	U	0.0743	0.0743	1.00	0.165	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.180	U	0.304	0.304	1.00	0.514	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*81.9*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

Client Sample ID: Equipment Blank

Date Collected: 10/16/20 12:20
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-10
Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:10	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 04:10	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 04:10	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:47	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/24/20 15:18	1
Fluoride	ND		0.050		mg/L			10/27/20 07:54	1
Sulfate	ND		2.0		mg/L			10/24/20 15:18	1
Total Dissolved Solids	ND		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.4**	**HF**	0.1		SU			10/22/20 12:53	1
Temperature	**19.0**	**HF**	0.001		Degrees C			10/22/20 12:53	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	-0.0338	U	0.0681	0.0682	1.00	0.166	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.4*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.288	U	0.287	0.288	1.00	0.466	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.4*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*80.7*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

Client Sample ID: DUPLICATE

Date Collected: 10/16/20 00:00
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-11

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.21	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:14	1
Boron	0.032		0.020		mg/L		10/26/20 10:15	10/27/20 04:14	1
Calcium	125		0.50		mg/L		10/26/20 10:15	10/27/20 04:14	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.8		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:49	1
Molybdenum	4.2		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.0		0.50		mg/L			10/24/20 15:32	1
Fluoride	0.18		0.050		mg/L			10/27/20 08:08	1
Sulfate	82.7		2.0		mg/L			10/24/20 15:32	1
Total Dissolved Solids	552		10.0		mg/L			10/22/20 21:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			10/22/20 12:58	1
Temperature	19.1	HF	0.001		Degrees C			10/22/20 12:58	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	0.890		0.207	0.222	1.00	0.139	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.896		0.310	0.321	1.00	0.411	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

Tracer/Carrier Summary

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

Job ID: 480-176725-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
480-176725-1	MW-1	72.7
480-176725-2	MW-1RD	81.2
480-176725-3	MW-2R	77.4
480-176725-4	MW-2RD	71.0
480-176725-5	MW-3	57.8
480-176725-6	MW-3R	64.8
480-176725-7	MW-3RD	81.5
480-176725-8	MW-4	80.9
480-176725-9	FIELD BLANK 1	78.6
480-176725-10	Equipment Blank	82.4
480-176725-11	DUPLICATE	92.7
LCS 160-487007/1-A	Lab Control Sample	81.8
LCS 160-487270/1-A	Lab Control Sample	84.8
LCSD 160-487270/2-A	Lab Control Sample Dup	77.4
MB 160-487007/24-A	Method Blank	81.2
MB 160-487270/10-A	Method Blank	69.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
480-176725-1	MW-1	72.7	69.9
480-176725-2	MW-1RD	81.2	78.1
480-176725-3	MW-2R	77.4	80.0
480-176725-4	MW-2RD	71.0	80.0
480-176725-5	MW-3	57.8	69.5
480-176725-6	MW-3R	64.8	76.3
480-176725-7	MW-3RD	81.5	82.6
480-176725-8	MW-4	80.9	82.2
480-176725-9	FIELD BLANK 1	78.6	81.9
480-176725-10	Equipment Blank	82.4	80.7
480-176725-11	DUPLICATE	92.7	80.0
LCS 160-487013/1-A	Lab Control Sample	81.8	83.7
LCS 160-487272/1-A	Lab Control Sample	84.8	86.0
LCSD 160-487272/2-A	Lab Control Sample Dup	77.4	82.6
MB 160-487013/24-A	Method Blank	81.2	81.1
MB 160-487272/10-A	Method Blank	69.8	78.1

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 480-555233/1-A
Matrix: Water
Analysis Batch: 555926

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 555233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:02	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 03:02	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 03:02	1

Lab Sample ID: LCS 480-555233/2-A
Matrix: Water
Analysis Batch: 555926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.200	0.203	^	mg/L		101	80 - 120
Boron	0.200	0.194		mg/L		97	80 - 120
Calcium	10.0	9.91		mg/L		99	80 - 120

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555926

Client Sample ID: MS
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.21	^	0.200	0.408	^	mg/L		101	75 - 125
Boron	0.032		0.200	0.235		mg/L		101	75 - 125
Calcium	120		10.0	132.9	4	mg/L		126	75 - 125

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555926

Client Sample ID: MSD
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.21	^	0.200	0.411	^	mg/L		102	75 - 125	1	20
Boron	0.032		0.200	0.235		mg/L		101	75 - 125	0	20
Calcium	120		10.0	134.8	4	mg/L		146	75 - 125	1	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 480-555235/1-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 555235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:07	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1

Lab Sample ID: LCS 480-555235/2-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	20.0	19.32		ug/L		97	80 - 120
Cadmium	20.0	19.76		ug/L		99	80 - 120

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

Lab Sample ID: LCS 480-555235/2-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Molybdenum	20.0	20.81		ug/L		104	80 - 120
Selenium	20.0	20.08		ug/L		100	80 - 120

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 556419

Client Sample ID: MS
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.7		20.0	25.49		ug/L		109	75 - 125
Cadmium	ND		20.0	20.44		ug/L		102	75 - 125
Molybdenum	4.3		20.0	26.59		ug/L		112	75 - 125
Selenium	ND		20.0	21.49		ug/L		107	75 - 125

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 556419

Client Sample ID: MSD
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.7		20.0	25.38		ug/L		109	75 - 125	0	20
Cadmium	ND		20.0	20.04		ug/L		100	75 - 125	2	20
Molybdenum	4.3		20.0	26.26		ug/L		110	75 - 125	1	20
Selenium	ND		20.0	21.24		ug/L		106	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-555584/28
Matrix: Water
Analysis Batch: 555584

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			10/24/20 20:03	1
Fluoride	ND		0.050		mg/L			10/24/20 20:03	1
Sulfate	ND		2.0		mg/L			10/24/20 20:03	1

Lab Sample ID: LCS 480-555584/27
Matrix: Water
Analysis Batch: 555584

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	49.54		mg/L		99	90 - 110
Fluoride	5.00	4.85		mg/L		97	90 - 110
Sulfate	50.0	48.01		mg/L		96	90 - 110

Lab Sample ID: 480-176725-5 MS
Matrix: Water
Analysis Batch: 555584

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	24.9		50.0	71.94		mg/L		94	81 - 120
Fluoride	0.099		5.00	4.38		mg/L		86	82 - 120

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-176725-5 MS
Matrix: Water
Analysis Batch: 555584

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	10		50.0	55.64		mg/L		91	80 - 120		

Lab Sample ID: MB 480-555597/4
Matrix: Water
Analysis Batch: 555597

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			10/24/20 14:21	1
Fluoride	ND	^	0.050		mg/L			10/24/20 14:21	1
Sulfate	ND		2.0		mg/L			10/24/20 14:21	1

Lab Sample ID: LCS 480-555597/3
Matrix: Water
Analysis Batch: 555597

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	47.21		mg/L		94	90 - 110		
Fluoride			5.00	4.57	^	mg/L		91	90 - 110		
Sulfate			50.0	45.93		mg/L		92	90 - 110		

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555597

Client Sample ID: MS
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	27.1		50.0	72.02		mg/L		90	81 - 120		
Sulfate	82.8	F1	50.0	121.0	E F1	mg/L		76	80 - 120		

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555597

Client Sample ID: MSD
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	27.1		50.0	72.65		mg/L		91	81 - 120	1	15
Sulfate	82.8	F1	50.0	121.4	E F1	mg/L		77	80 - 120	0	15

Lab Sample ID: MB 480-555837/4
Matrix: Water
Analysis Batch: 555837

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			10/27/20 04:15	1
Fluoride	ND		0.050		mg/L			10/27/20 04:15	1
Sulfate	ND		2.0		mg/L			10/27/20 04:15	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-555837/3
Matrix: Water
Analysis Batch: 555837

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	48.79		mg/L		98	90 - 110		
Fluoride			5.00	5.02		mg/L		100	90 - 110		
Sulfate			50.0	48.17		mg/L		96	90 - 110		

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555837

Client Sample ID: MS
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	0.18		5.00	4.84		mg/L		93	82 - 120		

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555837

Client Sample ID: MSD
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	0.18		5.00	4.83		mg/L		93	82 - 120	0	15

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

Lab Sample ID: MB 480-555098/1
Matrix: Water
Analysis Batch: 555098

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			10/22/20 01:34	1

Lab Sample ID: LCS 480-555098/2
Matrix: Water
Analysis Batch: 555098

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			502	489.0		mg/L		97	85 - 115		

Lab Sample ID: 480-176725-10 DU
Matrix: Water
Analysis Batch: 555098

Client Sample ID: Equipment 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	10

Lab Sample ID: MB 480-555341/1
Matrix: Water
Analysis Batch: 555341

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			10/22/20 21:00	1

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

Lab Sample ID: LCS 480-555341/2
Matrix: Water
Analysis Batch: 555341

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			502	502.0		mg/L		100	85 - 115		

Lab Sample ID: 480-176725-11 DU
Matrix: Water
Analysis Batch: 555341

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	552			565.0		mg/L				2	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-555069/1
Matrix: Water
Analysis Batch: 555069

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: LCS 480-555275/1
Matrix: Water
Analysis Batch: 555275

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: 480-176725-1 DU
Matrix: Water
Analysis Batch: 555275

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7	HF		6.8		SU				1	5
Temperature	19.3	HF		19.2		Degrees C				0.7	10

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-487007/24-A
Matrix: Water
Analysis Batch: 490336

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487007

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.06642	U	0.110	0.110	1.00	0.192	pCi/L	10/28/20 11:17	11/27/20 09:39	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/28/20 11:17*	*11/27/20 09:39*	*1*

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

Lab Sample ID: LCS 160-487007/1-A
Matrix: Water
Analysis Batch: 490353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487007

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	10.53		1.19	1.00	0.203	pCi/L	93	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*81.8*		*40 - 110*

Lab Sample ID: MB 160-487270/10-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487270

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0008999	U	0.0626	0.0626	1.00	0.130	pCi/L	10/29/20 12:35	11/23/20 09:07	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*69.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:07*	*1*

Lab Sample ID: LCS 160-487270/1-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487270

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	10.27		1.08	1.00	0.0935	pCi/L	91	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*84.8*		*40 - 110*

Lab Sample ID: LCSD 160-487270/2-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 487270

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.3	10.43		1.11	1.00	0.136	pCi/L	92	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*77.4*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-487013/24-A
Matrix: Water
Analysis Batch: 490118

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487013

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.06339	U	0.279	0.279	1.00	0.489	pCi/L	10/28/20 11:56	11/24/20 11:57	1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.2		40 - 110	10/28/20 11:56	11/24/20 11:57	1
Y Carrier	81.1		40 - 110	10/28/20 11:56	11/24/20 11:57	1

Lab Sample ID: LCS 160-487013/1-A
Matrix: Water
Analysis Batch: 490121

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487013

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			7.63	7.109		0.940	1.00	0.514	pCi/L	93	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	81.8		40 - 110
Y Carrier	83.7		40 - 110

Lab Sample ID: MB 160-487272/10-A
Matrix: Water
Analysis Batch: 489049

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487272

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.03313	U	0.336	0.336	1.00	0.597	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	69.8		40 - 110	10/29/20 12:49	11/13/20 11:53	1
Y Carrier	78.1		40 - 110	10/29/20 12:49	11/13/20 11:53	1

Lab Sample ID: LCS 160-487272/1-A
Matrix: Water
Analysis Batch: 489049

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487272

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			7.66	7.538		0.951	1.00	0.408	pCi/L	98	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	84.8		40 - 110
Y Carrier	86.0		40 - 110

Lab Sample ID: LCSD 160-487272/2-A
Matrix: Water
Analysis Batch: 489049

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 487272

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			7.66	8.989		1.11	1.00	0.439	pCi/L	117	75 - 125	0.70	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	77.4		40 - 110
Y Carrier	82.6		40 - 110

Metals

Prep Batch: 555233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	3005A	
480-176725-2	MW-1RD	Total/NA	Water	3005A	
480-176725-3	MW-2R	Total/NA	Water	3005A	
480-176725-4	MW-2RD	Total/NA	Water	3005A	
480-176725-5	MW-3	Total/NA	Water	3005A	
480-176725-6	MW-3R	Total/NA	Water	3005A	
480-176725-7	MW-3RD	Total/NA	Water	3005A	
480-176725-8	MW-4	Total/NA	Water	3005A	
480-176725-9	FIELD BLANK 1	Total/NA	Water	3005A	
480-176725-10	Equipment Blank	Total/NA	Water	3005A	
480-176725-11	DUPLICATE	Total/NA	Water	3005A	
MB 480-555233/1-A	Method Blank	Total/NA	Water	3005A	
LCS 480-555233/2-A	Lab Control Sample	Total/NA	Water	3005A	
480-176725-7 MS	MS	Total/NA	Water	3005A	
480-176725-7 MSD	MSD	Total/NA	Water	3005A	

Prep Batch: 555235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	3020A	
480-176725-2	MW-1RD	Total/NA	Water	3020A	
480-176725-3	MW-2R	Total/NA	Water	3020A	
480-176725-4	MW-2RD	Total/NA	Water	3020A	
480-176725-5	MW-3	Total/NA	Water	3020A	
480-176725-6	MW-3R	Total/NA	Water	3020A	
480-176725-7	MW-3RD	Total/NA	Water	3020A	
480-176725-8	MW-4	Total/NA	Water	3020A	
480-176725-9	FIELD BLANK 1	Total/NA	Water	3020A	
480-176725-10	Equipment Blank	Total/NA	Water	3020A	
480-176725-11	DUPLICATE	Total/NA	Water	3020A	
MB 480-555235/1-A	Method Blank	Total/NA	Water	3020A	
LCS 480-555235/2-A	Lab Control Sample	Total/NA	Water	3020A	
480-176725-7 MS	MS	Total/NA	Water	3020A	
480-176725-7 MSD	MSD	Total/NA	Water	3020A	

Analysis Batch: 555926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	6010D	555233
480-176725-2	MW-1RD	Total/NA	Water	6010D	555233
480-176725-3	MW-2R	Total/NA	Water	6010D	555233
480-176725-4	MW-2RD	Total/NA	Water	6010D	555233
480-176725-5	MW-3	Total/NA	Water	6010D	555233
480-176725-6	MW-3R	Total/NA	Water	6010D	555233
480-176725-7	MW-3RD	Total/NA	Water	6010D	555233
480-176725-8	MW-4	Total/NA	Water	6010D	555233
480-176725-9	FIELD BLANK 1	Total/NA	Water	6010D	555233
480-176725-10	Equipment Blank	Total/NA	Water	6010D	555233
480-176725-11	DUPLICATE	Total/NA	Water	6010D	555233
MB 480-555233/1-A	Method Blank	Total/NA	Water	6010D	555233
LCS 480-555233/2-A	Lab Control Sample	Total/NA	Water	6010D	555233
480-176725-7 MS	MS	Total/NA	Water	6010D	555233
480-176725-7 MSD	MSD	Total/NA	Water	6010D	555233

QC Association Summary

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

Job ID: 480-176725-1

Metals

Analysis Batch: 556419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	6020B	555235
480-176725-2	MW-1RD	Total/NA	Water	6020B	555235
480-176725-3	MW-2R	Total/NA	Water	6020B	555235
480-176725-4	MW-2RD	Total/NA	Water	6020B	555235
480-176725-5	MW-3	Total/NA	Water	6020B	555235
480-176725-6	MW-3R	Total/NA	Water	6020B	555235
480-176725-7	MW-3RD	Total/NA	Water	6020B	555235
480-176725-8	MW-4	Total/NA	Water	6020B	555235
480-176725-9	FIELD BLANK 1	Total/NA	Water	6020B	555235
480-176725-10	Equipment Blank	Total/NA	Water	6020B	555235
480-176725-11	DUPLICATE	Total/NA	Water	6020B	555235
MB 480-555235/1-A	Method Blank	Total/NA	Water	6020B	555235
LCS 480-555235/2-A	Lab Control Sample	Total/NA	Water	6020B	555235
480-176725-7 MS	MS	Total/NA	Water	6020B	555235
480-176725-7 MSD	MSD	Total/NA	Water	6020B	555235

General Chemistry

Analysis Batch: 555069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-3	MW-2R	Total/NA	Water	SM 4500 H+ B	
LCS 480-555069/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 555098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	SM 2540C	
480-176725-2	MW-1RD	Total/NA	Water	SM 2540C	
480-176725-3	MW-2R	Total/NA	Water	SM 2540C	
480-176725-4	MW-2RD	Total/NA	Water	SM 2540C	
480-176725-5	MW-3	Total/NA	Water	SM 2540C	
480-176725-6	MW-3R	Total/NA	Water	SM 2540C	
480-176725-7	MW-3RD	Total/NA	Water	SM 2540C	
480-176725-8	MW-4	Total/NA	Water	SM 2540C	
480-176725-9	FIELD BLANK 1	Total/NA	Water	SM 2540C	
480-176725-10	Equipment Blank	Total/NA	Water	SM 2540C	
MB 480-555098/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-555098/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-176725-10 DU	Equipment Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 555275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	SM 4500 H+ B	
480-176725-2	MW-1RD	Total/NA	Water	SM 4500 H+ B	
480-176725-4	MW-2RD	Total/NA	Water	SM 4500 H+ B	
480-176725-5	MW-3	Total/NA	Water	SM 4500 H+ B	
480-176725-6	MW-3R	Total/NA	Water	SM 4500 H+ B	
480-176725-7	MW-3RD	Total/NA	Water	SM 4500 H+ B	
480-176725-8	MW-4	Total/NA	Water	SM 4500 H+ B	
480-176725-9	FIELD BLANK 1	Total/NA	Water	SM 4500 H+ B	
480-176725-10	Equipment Blank	Total/NA	Water	SM 4500 H+ B	
480-176725-11	DUPLICATE	Total/NA	Water	SM 4500 H+ B	

General Chemistry (Continued)

Analysis Batch: 555275 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-555275/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
480-176725-1 DU	MW-1	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 555341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-11	DUPLICATE	Total/NA	Water	SM 2540C	
MB 480-555341/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-555341/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-176725-11 DU	DUPLICATE	Total/NA	Water	SM 2540C	

Analysis Batch: 555584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	300.0	
480-176725-2	MW-1RD	Total/NA	Water	300.0	
480-176725-3	MW-2R	Total/NA	Water	300.0	
480-176725-4	MW-2RD	Total/NA	Water	300.0	
480-176725-5	MW-3	Total/NA	Water	300.0	
MB 480-555584/28	Method Blank	Total/NA	Water	300.0	
LCS 480-555584/27	Lab Control Sample	Total/NA	Water	300.0	
480-176725-5 MS	MW-3	Total/NA	Water	300.0	

Analysis Batch: 555597

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-6	MW-3R	Total/NA	Water	300.0	
480-176725-7	MW-3RD	Total/NA	Water	300.0	
480-176725-8	MW-4	Total/NA	Water	300.0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	300.0	
480-176725-10	Equipment Blank	Total/NA	Water	300.0	
480-176725-11	DUPLICATE	Total/NA	Water	300.0	
MB 480-555597/4	Method Blank	Total/NA	Water	300.0	
LCS 480-555597/3	Lab Control Sample	Total/NA	Water	300.0	
480-176725-7 MS	MS	Total/NA	Water	300.0	
480-176725-7 MSD	MSD	Total/NA	Water	300.0	

Analysis Batch: 555837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-6	MW-3R	Total/NA	Water	300.0	
480-176725-7	MW-3RD	Total/NA	Water	300.0	
480-176725-8	MW-4	Total/NA	Water	300.0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	300.0	
480-176725-10	Equipment Blank	Total/NA	Water	300.0	
480-176725-11	DUPLICATE	Total/NA	Water	300.0	
MB 480-555837/4	Method Blank	Total/NA	Water	300.0	
LCS 480-555837/3	Lab Control Sample	Total/NA	Water	300.0	
480-176725-7 MS	MS	Total/NA	Water	300.0	
480-176725-7 MSD	MSD	Total/NA	Water	300.0	

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

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Prep Batch: 487007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-7	MW-3RD	Total/NA	Water	PrecSep-21	
480-176725-8	MW-4	Total/NA	Water	PrecSep-21	
480-176725-9	FIELD BLANK 1	Total/NA	Water	PrecSep-21	
480-176725-10	Equipment Blank	Total/NA	Water	PrecSep-21	
480-176725-11	DUPLICATE	Total/NA	Water	PrecSep-21	
MB 160-487007/24-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-487007/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 487013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-7	MW-3RD	Total/NA	Water	PrecSep_0	
480-176725-8	MW-4	Total/NA	Water	PrecSep_0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	PrecSep_0	
480-176725-10	Equipment Blank	Total/NA	Water	PrecSep_0	
480-176725-11	DUPLICATE	Total/NA	Water	PrecSep_0	
MB 160-487013/24-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-487013/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 487270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	PrecSep-21	
480-176725-2	MW-1RD	Total/NA	Water	PrecSep-21	
480-176725-3	MW-2R	Total/NA	Water	PrecSep-21	
480-176725-4	MW-2RD	Total/NA	Water	PrecSep-21	
480-176725-5	MW-3	Total/NA	Water	PrecSep-21	
480-176725-6	MW-3R	Total/NA	Water	PrecSep-21	
MB 160-487270/10-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-487270/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-487270/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 487272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	PrecSep_0	
480-176725-2	MW-1RD	Total/NA	Water	PrecSep_0	
480-176725-3	MW-2R	Total/NA	Water	PrecSep_0	
480-176725-4	MW-2RD	Total/NA	Water	PrecSep_0	
480-176725-5	MW-3	Total/NA	Water	PrecSep_0	
480-176725-6	MW-3R	Total/NA	Water	PrecSep_0	
MB 160-487272/10-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-487272/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-487272/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1
Lab Sample ID: 480-176725-1
Date Collected: 10/15/20 13:05
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:10	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:11	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/24/20 23:42	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:30	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:52	FLC	TAL SL

Client Sample ID: MW-1RD
Lab Sample ID: 480-176725-2
Date Collected: 10/15/20 13:35
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:14	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:13	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/24/20 23:56	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:35	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-2R
Lab Sample ID: 480-176725-3
Date Collected: 10/15/20 14:40
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:17	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:16	KMP	TAL BUF
Total/NA	Analysis	300.0		5	555584	10/25/20 00:11	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555069	10/21/20 16:02	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL

Client Sample ID: MW-2R
Date Collected: 10/15/20 14:40
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-2RD
Date Collected: 10/16/20 08:05
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:21	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:18	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/25/20 00:26	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:37	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3
Date Collected: 10/16/20 08:55
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:25	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:20	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/25/20 00:40	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:40	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3R
Date Collected: 10/16/20 08:50
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:29	LMH	TAL BUF

Lab Chronicle

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

Job ID: 480-176725-1

Client Sample ID: MW-3R

Lab Sample ID: 480-176725-6

Date Collected: 10/16/20 08:50

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:22	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:10	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 14:35	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:42	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3RD

Lab Sample ID: 480-176725-7

Date Collected: 10/16/20 09:30

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:33	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:25	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 05:42	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:46	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:45	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:44	FLC	TAL SL

Client Sample ID: MW-4

Lab Sample ID: 480-176725-8

Date Collected: 10/16/20 11:55

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:03	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:43	KMP	TAL BUF
Total/NA	Analysis	300.0		2	555837	10/27/20 07:25	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 14:49	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:47	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-4
Lab Sample ID: 480-176725-8
Date Collected: 10/16/20 11:55
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:44	FLC	TAL SL

Client Sample ID: FIELD BLANK 1
Lab Sample ID: 480-176725-9
Date Collected: 10/15/20 16:30
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:07	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:45	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:39	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:03	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:50	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

Client Sample ID: Equipment Blank
Lab Sample ID: 480-176725-10
Date Collected: 10/16/20 12:20
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:10	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:47	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:54	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:18	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:53	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: DUPLICATE
Lab Sample ID: 480-176725-11
Date Collected: 10/16/20 00:00
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:14	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:49	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 08:08	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:32	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555341	10/22/20 21:00	CSS	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:58	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

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: 480-176725-1
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	1524384	12-31-20

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
SM 4500 H+ B		Water	pH
SM 4500 H+ B		Water	Temperature

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	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-20
Iowa	State	373	11-30-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

Method Summary

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

Job ID: 480-176725-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	TAL BUF
6020B	Metals (ICP/MS)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL BUF
SM 4500 H+ B	pH	SM	TAL BUF
3005A	Preparation, Total Metals	SW846	TAL BUF
3020A	Preparation, Total Metals	SW846	TAL BUF

Protocol References:

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: 480-176725-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-176725-1	MW-1	Water	10/15/20 13:05	10/17/20 10:00	
480-176725-2	MW-1RD	Water	10/15/20 13:35	10/17/20 10:00	
480-176725-3	MW-2R	Water	10/15/20 14:40	10/17/20 10:00	
480-176725-4	MW-2RD	Water	10/16/20 08:05	10/17/20 10:00	
480-176725-5	MW-3	Water	10/16/20 08:55	10/17/20 10:00	
480-176725-6	MW-3R	Water	10/16/20 08:50	10/17/20 10:00	
480-176725-7	MW-3RD	Water	10/16/20 09:30	10/17/20 10:00	
480-176725-8	MW-4	Water	10/16/20 11:55	10/17/20 10:00	
480-176725-9	FIELD BLANK 1	Water	10/15/20 16:30	10/17/20 10:00	
480-176725-10	Equipment Blank	Water	10/16/20 12:20	10/17/20 10:00	
480-176725-11	DUPLICATE	Water	10/16/20 00:00	10/17/20 10:00	

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	Sampler: N. Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-151494-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6055	E-Mail: Ryan.VanDette@Eurofinset.com		Page: Page 1 of 2
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			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	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)	300.0_28D - Cl/F/SO4	6010D, 6020B, 7470A	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Standard Target List	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
MW-1	10/15/20	13:05	6	Water			X	X	X	X	X	X		
MW-3	10/16/20	8:55	6	Water			X	X	X	X	X	X		
Duplicate	10/16/20	—	6	Water			X	X	X	X	X	X		
MS	10/16/20	9:40	6	Water	Y		X	X	X	X	X	X		
MSD	10/16/20	9:45	6	Water	Y		X	X	X	X	X	X		
MW-1RD	10/15/20	13:35	6	Water			X	X	X	X	X	X		
MW-2RD	10/16/20	8:05	6	Water			X	X	X	X	X	X		
MW-2R	10/15/20	14:40	6	Water			X	X	X	X	X	X		
MW-3RD	10/16/20	9:30	6	Water			X	X	X	X	X	X		
MW-3R	10/16/20	8:50	6	Water			X	X	X	X	X	X		
MW-4	10/16/20	11:55	6	Water			X	X	X	X	X	X		

480-176725 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:	Company	Received by:	Date/Time:	Company
1	Michelle Stiles	10/16/20	GES	Thomas S. Reis	10-16-20 14:35	EUROFINS
2	Thomas S. Reis	10/16 17:00	Eurofins	C Wallace	10/17/20 1000	TAS
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		#1 2.8, 2.5, 2.3

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

TestAmerica Minneapolis SC 213

eurofins | Environment Testing America

Client Information	Sampler: N. Schlegel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-151494-22509.2
Client Contact: Nathaniel Beinemann	Phone: 651-792-6065	E-Mail: Ryan.VanDette@Eurofinset.com		Page: Page 2 of 2
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			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	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)	300.0_28D - Cl/F/SO4	6010D, 6020B, 7470A	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Standard Target List	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
Field Blank	10/15/20	16:30	6	Water			X	X	X	X	X	X		
Equipment Blank	10/16/20	12:20	6	Water			X	X	X	X	X	X		

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	[illegible]	10/16/20	GES	Thomas J. Reis	10-16-20 14:35	EUROFINS
2	Thomas J. Reis	10-16 17:00	Eurofins	[illegible]	10/17/20 1000	TAB
3	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: #1 2.8

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-176725-1

Login Number: 176725
List Number: 1
Creator: Sabuda, Brendan 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	2.8 2.5 2.3 #1 ICE
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.	True	

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ANALYTICAL REPORT

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

Laboratory Job ID: 480-176725-1
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:
1/4/2021 4:46:40 PM

Ryan VanDette, Project Manager II
(716)504-9830
Ryan.VanDette@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 480-176725-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-176725-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 12/9/2020. This report has been revised to add select CCR parameters.

Receipt
The samples were received on 10/17/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.3º C, 2.5º C and 2.8º C.

HPLC/IC
Method 300.0: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-2R (480-176725-3). Elevated reporting limits (RLs) are provided.

Method 300.0: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-4 (480-176725-8). Elevated reporting limits (RLs) are provided.

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

Metals
Methods 6010C, 6010D: The interference check standard solution (ICSA) associated with the following samples showed results for Barium at a level greater than 2 times the limit of detection (LOD). It is believed that the solution contains trace impurities of this element / these elements and the results are not due to matrix interference. These results are consistent with those found by the manufacturer of the ICSA solution. MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), MW-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10), DUPLICATE (480-176725-11), (LCS 480-555233/2-A), (MB 480-555233/1-A), (480-176725-D-7-D PDS) and (480-176725-D-7-D SD ^5)

Method 6020B: The interference check standard solution (ICSA) associated with batch 480-556419 had results for one or more elements at a level greater than 2 times the limit of detection (LOD). The initial ICSA result(s) was >2X LOD for Total Cobalt, and the closing ICSA result(s) was >2X LOD for Total Cobalt. The vendor acknowledges that these elements are trace impurities in the ICSA standard. These results are not indicative of a matrix interference.

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

General Chemistry
Method SM 4500 H+ B: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following sample has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: MW-2R (480-176725-3).

Method 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 (480-176725-1), MW-1RD (480-176725-2), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), MW-3RD (480-176725-7), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11).

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

Narrative

Job Narrative
480-176725-2

Job ID: 480-176725-1 (Continued)

Laboratory: Eurofins TestAmerica, Buffalo (Continued)

Comments
No additional comments.

Receipt
The samples were received on 10/17/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.3º C, 2.5º C and 2.8º C.

RAD
Methods 903.0, 9315: 9315 prep batch: 160-487007: 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-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11)

Method 903.0: Radium-226 prep batch 160-487270: 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 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5), MW-3R (480-176725-6), (LCS 160-487270/1-A), (LCSD 160-487270/2-A) and (MB 160-487270/10-A)

Method 904.0: 904 Prep Batch 160-487272: The following sample(s) did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences. The data have been reported with this narrative. MW-3 (480-176725-5)

Method 904.0: 904 Prep batch 160-48722: 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 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6)

Methods 904.0, 9320: 904 prep batch 160-487013: 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-3RD (480-176725-7), MS (480-176725-7[MS]), MSD (480-176725-7[MSD]), MW-4 (480-176725-8), FIELD BLANK 1 (480-176725-9), Equipment Blank (480-176725-10) and DUPLICATE (480-176725-11)

Method PrecSep_0: Radium 228 Prep Batch 160-487272: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-2R (480-176725-3), MW-3 (480-176725-5) and MW-3R (480-176725-6).

Method PrecSep_0: Radium 228 Prep Batch 160-487272: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-487270: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (480-176725-1), MW-1RD (480-176725-2), MW-2R (480-176725-3), MW-2RD (480-176725-4), MW-3 (480-176725-5) and MW-3R (480-176725-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-487270: The following samples were prepared at a reduced aliquot due to yellow discoloration: MW-2R (480-176725-3), MW-3 (480-176725-5) and MW-3R (480-176725-6).

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: 480-176725-1

Client Sample ID: MW-1 — Lab Sample ID: 480-176725-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.12	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.046		0.020		mg/L	1		6010D	Total/NA
Calcium	127		0.50		mg/L	1		6010D	Total/NA
Chloride	94.5		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.12		0.050		mg/L	1		300.0	Total/NA
Sulfate	55.9		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	454		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.3	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-1RD — Lab Sample ID: 480-176725-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.16	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.031		0.020		mg/L	1		6010D	Total/NA
Calcium	81.7		0.50		mg/L	1		6010D	Total/NA
Cobalt	0.99	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	3.1		1.0		ug/L	1		6020B	Total/NA
Chloride	24.0		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.19		0.050		mg/L	1		300.0	Total/NA
Sulfate	50.5		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	428		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2R — Lab Sample ID: 480-176725-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.29	^	0.0020		mg/L	1		6010D	Total/NA
Boron	2.4		0.020		mg/L	1		6010D	Total/NA
Calcium	221		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.2		1.0		ug/L	1		6020B	Total/NA
Cobalt	1.6	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	1.9		1.0		ug/L	1		6020B	Total/NA
Chloride	105		2.5		mg/L	5		300.0	Total/NA
Sulfate	137		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	1010		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	16.7	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-2RD — Lab Sample ID: 480-176725-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.19	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.079		0.020		mg/L	1		6010D	Total/NA
Calcium	138		0.50		mg/L	1		6010D	Total/NA
Arsenic	2.1		1.0		ug/L	1		6020B	Total/NA
Cobalt	2.7	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	2.4		1.0		ug/L	1		6020B	Total/NA
Selenium	9.0		1.0		ug/L	1		6020B	Total/NA
Chloride	36.4		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.19		0.050		mg/L	1		300.0	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: 480-176725-1

Client Sample ID: MW-2RD (Continued) — Lab Sample ID: 480-176725-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	72.6		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	710		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.3	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 480-176725-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.39	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.23		0.020		mg/L	1		6010D	Total/NA
Calcium	233		0.50		mg/L	1		6010D	Total/NA
Arsenic	22.1		1.0		ug/L	1		6020B	Total/NA
Cobalt	3.6	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	7.1		1.0		ug/L	1		6020B	Total/NA
Chloride	24.9		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.099		0.050		mg/L	1		300.0	Total/NA
Sulfate	10		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	1020		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.4	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3R — Lab Sample ID: 480-176725-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.56	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.060		0.020		mg/L	1		6010D	Total/NA
Calcium	213		0.50		mg/L	1		6010D	Total/NA
Arsenic	2.5		1.0		ug/L	1		6020B	Total/NA
Cobalt	0.56	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	1.2		1.0		ug/L	1		6020B	Total/NA
Chloride	18.4		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.055		0.050		mg/L	1		300.0	Total/NA
Sulfate	4.4		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	724		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.4	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-3RD — Lab Sample ID: 480-176725-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.032		0.020		mg/L	1		6010D	Total/NA
Calcium	120		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.7		1.0		ug/L	1		6020B	Total/NA
Cobalt	0.32	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	4.3		1.0		ug/L	1		6020B	Total/NA
Chloride	27.1		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.18		0.050		mg/L	1		300.0	Total/NA
Sulfate	82.8	F1	2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	625		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	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: 480-176725-1

Client Sample ID: MW-4 — Lab Sample ID: 480-176725-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.21	^	0.0020		mg/L	1		6010D	Total/NA
Boron	0.51		0.020		mg/L	1		6010D	Total/NA
Calcium	181		0.50		mg/L	1		6010D	Total/NA
Arsenic	1.4		1.0		ug/L	1		6020B	Total/NA
Cobalt	1.2	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	3.0		1.0		ug/L	1		6020B	Total/NA
Chloride	13.8		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.16		0.10		mg/L	2		300.0	Total/NA
Sulfate	156		4.0		mg/L	2		300.0	Total/NA
Total Dissolved Solids	819		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FIELD BLANK 1 — Lab Sample ID: 480-176725-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: Equipment Blank — Lab Sample ID: 480-176725-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.0	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUPLICATE — Lab Sample ID: 480-176725-11

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	125		0.50		mg/L	1		6010D	Total/NA
Arsenic	3.8		1.0		ug/L	1		6020B	Total/NA
Cobalt	0.32	^	0.30		ug/L	1		6020B	Total/NA
Molybdenum	4.2		1.0		ug/L	1		6020B	Total/NA
Chloride	27.0		0.50		mg/L	1		300.0	Total/NA
Fluoride	0.18		0.050		mg/L	1		300.0	Total/NA
Sulfate	82.7		2.0		mg/L	1		300.0	Total/NA
Total Dissolved Solids	552		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF	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: 10/15/20 13:05
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-1

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.12**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 03:10	1
Boron	**0.046**		0.020		mg/L		10/26/20 10:15	10/27/20 03:10	1
Calcium	**127**		0.50		mg/L		10/26/20 10:15	10/27/20 03:10	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:11	1
Cobalt	ND	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:11	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**94.5**		0.50		mg/L			10/24/20 23:42	1
Fluoride	**0.12**		0.050		mg/L			10/24/20 23:42	1
Sulfate	**55.9**		2.0		mg/L			10/24/20 23:42	1
Total Dissolved Solids	**454**		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.7**	**HF**	0.1		SU			10/22/20 12:30	1
Temperature	**19.3**	**HF**	0.001		Degrees C			10/22/20 12:30	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	**0.149**		0.0854	0.0864	1.00	0.104	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*72.7*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.512	U	0.403	0.406	1.00	0.638	pCi/L	10/29/20 12:49	11/13/20 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*72.7*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:52*	*1*
Y Carrier	*69.9*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:52*	*1*

Client Sample ID: MW-1RD

Date Collected: 10/15/20 13:35
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-2

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.16**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 03:14	1
Boron	**0.031**		0.020		mg/L		10/26/20 10:15	10/27/20 03:14	1
Calcium	**81.7**		0.50		mg/L		10/26/20 10:15	10/27/20 03:14	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:13	1
Cobalt	**0.99**	**^**	0.30		ug/L		10/26/20 09:55	10/28/20 14:13	1
Molybdenum	**3.1**		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**24.0**		0.50		mg/L			10/24/20 23:56	1
Fluoride	**0.19**		0.050		mg/L			10/24/20 23:56	1
Sulfate	**50.5**		2.0		mg/L			10/24/20 23:56	1
Total Dissolved Solids	**428**		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			10/22/20 12:35	1
Temperature	**18.8**	**HF**	0.001		Degrees C			10/22/20 12:35	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	**0.396**		0.118	0.123	1.00	0.0939	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.499	U	0.337	0.341	1.00	0.523	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*78.1*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

Client Sample Results

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

Job ID: 480-176725-1

Client Sample ID: MW-2R

Date Collected: 10/15/20 14:40
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-3

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.29	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:17	1
Boron	2.4		0.020		mg/L		10/26/20 10:15	10/27/20 03:17	1
Calcium	221		0.50		mg/L		10/26/20 10:15	10/27/20 03:17	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.2		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:16	1
Cobalt	1.6	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:16	1
Molybdenum	1.9		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	105		2.5		mg/L			10/25/20 00:11	5
Fluoride	ND		0.25		mg/L			10/25/20 00:11	5
Sulfate	137		10.0		mg/L			10/25/20 00:11	5
Total Dissolved Solids	1010		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.5	HF	0.1		SU			10/21/20 16:02	1
Temperature	16.7	HF	0.001		Degrees C			10/21/20 16:02	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	0.351		0.138	0.141	1.00	0.138	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	1.41		0.498	0.514	1.00	0.671	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-2RD

Date Collected: 10/16/20 08:05
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-4

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.19	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:21	1
Boron	0.079		0.020		mg/L		10/26/20 10:15	10/27/20 03:21	1
Calcium	138		0.50		mg/L		10/26/20 10:15	10/27/20 03:21	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.1		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:18	1
Cobalt	2.7	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:18	1
Molybdenum	2.4		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1
Selenium	9.0		1.0		ug/L		10/26/20 09:55	10/28/20 14:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	36.4		0.50		mg/L			10/25/20 00:26	1
Fluoride	0.19		0.050		mg/L			10/25/20 00:26	1
Sulfate	72.6		2.0		mg/L			10/25/20 00:26	1
Total Dissolved Solids	710		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1		SU			10/22/20 12:37	1
Temperature	18.3	HF	0.001		Degrees C			10/22/20 12:37	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	0.457		0.134	0.140	1.00	0.102	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.0*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.672		0.365	0.370	1.00	0.540	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-3

Date Collected: 10/16/20 08:55
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-5

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.39	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:25	1
Boron	0.23		0.020		mg/L		10/26/20 10:15	10/27/20 03:25	1
Calcium	233		0.50		mg/L		10/26/20 10:15	10/27/20 03:25	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22.1		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:20	1
Cobalt	3.6	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:20	1
Molybdenum	7.1		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.9		0.50		mg/L			10/25/20 00:40	1
Fluoride	0.099		0.050		mg/L			10/25/20 00:40	1
Sulfate	10		2.0		mg/L			10/25/20 00:40	1
Total Dissolved Solids	1020		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.5	HF	0.1		SU			10/22/20 12:40	1
Temperature	18.4	HF	0.001		Degrees C			10/22/20 12:40	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	0.585		0.200	0.207	1.00	0.183	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	1.11	G	0.712	0.719	1.00	1.10	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.8*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*69.5*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

Client Sample ID: MW-3R

Date Collected: 10/16/20 08:50
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-6

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.56**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 03:29	1
Boron	**0.060**		0.020		mg/L		10/26/20 10:15	10/27/20 03:29	1
Calcium	**213**		0.50		mg/L		10/26/20 10:15	10/27/20 03:29	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.5**		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:22	1
Cobalt	**0.56**	**^**	0.30		ug/L		10/26/20 09:55	10/28/20 14:22	1
Molybdenum	**1.2**		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**18.4**		0.50		mg/L			10/24/20 14:35	1
Fluoride	**0.055**		0.050		mg/L			10/27/20 07:10	1
Sulfate	**4.4**		2.0		mg/L			10/24/20 14:35	1
Total Dissolved Solids	**724**		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.5**	**HF**	0.1		SU			10/22/20 12:42	1
Temperature	**18.4**	**HF**	0.001		Degrees C			10/22/20 12:42	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	**0.393**		0.163	0.167	1.00	0.174	pCi/L	10/29/20 12:35	11/23/20 09:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*64.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:06*	*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	0.820	U	0.562	0.567	1.00	0.871	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*64.8*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*
Y Carrier	*76.3*		*40 - 110*	*10/29/20 12:49*	*11/13/20 11:53*	*1*

Client Sample Results

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

Job ID: 480-176725-1

Client Sample ID: MW-3RD

Date Collected: 10/16/20 09:30
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-7

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.21	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:33	1
Boron	0.032		0.020		mg/L		10/26/20 10:15	10/27/20 03:33	1
Calcium	120		0.50		mg/L		10/26/20 10:15	10/27/20 03:33	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.7		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:25	1
Cobalt	0.32	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:25	1
Molybdenum	4.3		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.1		0.50		mg/L			10/24/20 15:46	1
Fluoride	0.18		0.050		mg/L			10/27/20 05:42	1
Sulfate	82.8	F1	2.0		mg/L			10/24/20 15:46	1
Total Dissolved Solids	625		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1		SU			10/22/20 12:45	1
Temperature	18.6	HF	0.001		Degrees C			10/22/20 12:45	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	0.738		0.200	0.211	1.00	0.147	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.5*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.427	U	0.292	0.295	1.00	0.452	pCi/L	10/28/20 11:56	11/24/20 11:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.5*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*
Y Carrier	*82.6*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*

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

Job ID: 480-176725-1

Client Sample ID: MW-4

Date Collected: 10/16/20 11:55
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-8

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.21	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:03	1
Boron	0.51		0.020		mg/L		10/26/20 10:15	10/27/20 04:03	1
Calcium	181		0.50		mg/L		10/26/20 10:15	10/27/20 04:03	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.4		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:43	1
Cobalt	1.2	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:43	1
Molybdenum	3.0		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.8		0.50		mg/L			10/24/20 14:49	1
Fluoride	0.16		0.10		mg/L			10/27/20 07:25	2
Sulfate	156		4.0		mg/L			10/27/20 07:25	2
Total Dissolved Solids	819		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			10/22/20 12:47	1
Temperature	18.6	HF	0.001		Degrees C			10/22/20 12:47	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	0.323		0.141	0.144	1.00	0.143	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.9*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.561		0.321	0.325	1.00	0.486	pCi/L	10/28/20 11:56	11/24/20 11:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.9*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*
Y Carrier	*82.2*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:44*	*1*

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

Job ID: 480-176725-1

Client Sample ID: FIELD BLANK 1

Lab Sample ID: 480-176725-9

Date Collected: 10/15/20 16:30

Matrix: Water

Date Received: 10/17/20 10:00

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:07	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 04:07	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 04:07	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:45	1
Cobalt	ND	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:45	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/24/20 15:03	1
Fluoride	ND		0.050		mg/L			10/27/20 07:39	1
Sulfate	ND		2.0		mg/L			10/24/20 15:03	1
Total Dissolved Solids	ND		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.7**	**HF**	0.1		SU			10/22/20 12:50	1
Temperature	**18.6**	**HF**	0.001		Degrees C			10/22/20 12:50	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	-0.00997	U	0.0743	0.0743	1.00	0.165	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.180	U	0.304	0.304	1.00	0.514	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.6*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*81.9*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

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

Job ID: 480-176725-1

Client Sample ID: Equipment Blank

Lab Sample ID: 480-176725-10

Date Collected: 10/16/20 12:20

Matrix: Water

Date Received: 10/17/20 10:00

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 04:10	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 04:10	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 04:10	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:47	1
Cobalt	ND	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:47	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/24/20 15:18	1
Fluoride	ND		0.050		mg/L			10/27/20 07:54	1
Sulfate	ND		2.0		mg/L			10/24/20 15:18	1
Total Dissolved Solids	ND		10.0		mg/L			10/22/20 01:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.4**	**HF**	0.1		SU			10/22/20 12:53	1
Temperature	**19.0**	**HF**	0.001		Degrees C			10/22/20 12:53	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	-0.0338	U	0.0681	0.0682	1.00	0.166	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.4*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	0.288	U	0.287	0.288	1.00	0.466	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.4*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*80.7*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

Client Sample ID: DUPLICATE

Date Collected: 10/16/20 00:00
Date Received: 10/17/20 10:00

Lab Sample ID: 480-176725-11

Matrix: Water

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.21**	**^**	0.0020		mg/L		10/26/20 10:15	10/27/20 04:14	1
Boron	**0.032**		0.020		mg/L		10/26/20 10:15	10/27/20 04:14	1
Calcium	**125**		0.50		mg/L		10/26/20 10:15	10/27/20 04:14	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.8**		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:49	1
Cobalt	**0.32**	**^**	0.30		ug/L		10/26/20 09:55	10/28/20 14:49	1
Molybdenum	**4.2**		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27.0**		0.50		mg/L			10/24/20 15:32	1
Fluoride	**0.18**		0.050		mg/L			10/27/20 08:08	1
Sulfate	**82.7**		2.0		mg/L			10/24/20 15:32	1
Total Dissolved Solids	**552**		10.0		mg/L			10/22/20 21:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1		SU			10/22/20 12:58	1
Temperature	**19.1**	**HF**	0.001		Degrees C			10/22/20 12:58	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	**0.890**		0.207	0.222	1.00	0.139	pCi/L	10/28/20 11:17	11/27/20 08:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*10/28/20 11:17*	*11/27/20 08:39*	*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	**0.896**		0.310	0.321	1.00	0.411	pCi/L	10/28/20 11:56	11/24/20 11:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.7*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*
Y Carrier	*80.0*		*40 - 110*	*10/28/20 11:56*	*11/24/20 11:45*	*1*

Tracer/Carrier Summary

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

Job ID: 480-176725-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
480-176725-1	MW-1	72.7
480-176725-2	MW-1RD	81.2
480-176725-3	MW-2R	77.4
480-176725-4	MW-2RD	71.0
480-176725-5	MW-3	57.8
480-176725-6	MW-3R	64.8
480-176725-7	MW-3RD	81.5
480-176725-8	MW-4	80.9
480-176725-9	FIELD BLANK 1	78.6
480-176725-10	Equipment Blank	82.4
480-176725-11	DUPLICATE	92.7
LCS 160-487007/1-A	Lab Control Sample	81.8
LCS 160-487270/1-A	Lab Control Sample	84.8
LCSD 160-487270/2-A	Lab Control Sample Dup	77.4
MB 160-487007/24-A	Method Blank	81.2
MB 160-487270/10-A	Method Blank	69.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
480-176725-1	MW-1	72.7	69.9
480-176725-2	MW-1RD	81.2	78.1
480-176725-3	MW-2R	77.4	80.0
480-176725-4	MW-2RD	71.0	80.0
480-176725-5	MW-3	57.8	69.5
480-176725-6	MW-3R	64.8	76.3
480-176725-7	MW-3RD	81.5	82.6
480-176725-8	MW-4	80.9	82.2
480-176725-9	FIELD BLANK 1	78.6	81.9
480-176725-10	Equipment Blank	82.4	80.7
480-176725-11	DUPLICATE	92.7	80.0
LCS 160-487013/1-A	Lab Control Sample	81.8	83.7
LCS 160-487272/1-A	Lab Control Sample	84.8	86.0
LCSD 160-487272/2-A	Lab Control Sample Dup	77.4	82.6
MB 160-487013/24-A	Method Blank	81.2	81.1
MB 160-487272/10-A	Method Blank	69.8	78.1

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 480-555233/1-A
Matrix: Water
Analysis Batch: 555926

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 555233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND	^	0.0020		mg/L		10/26/20 10:15	10/27/20 03:02	1
Boron	ND		0.020		mg/L		10/26/20 10:15	10/27/20 03:02	1
Calcium	ND		0.50		mg/L		10/26/20 10:15	10/27/20 03:02	1

Lab Sample ID: LCS 480-555233/2-A
Matrix: Water
Analysis Batch: 555926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.200	0.203	^	mg/L		101	80 - 120
Boron	0.200	0.194		mg/L		97	80 - 120
Calcium	10.0	9.91		mg/L		99	80 - 120

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555926

Client Sample ID: MS
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	0.21	^	0.200	0.408	^	mg/L		101	75 - 125
Boron	0.032		0.200	0.235		mg/L		101	75 - 125
Calcium	120		10.0	132.9	4	mg/L		126	75 - 125

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555926

Client Sample ID: MSD
Prep Type: Total/NA
Prep Batch: 555233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.21	^	0.200	0.411	^	mg/L		102	75 - 125	1	20
Boron	0.032		0.200	0.235		mg/L		101	75 - 125	0	20
Calcium	120		10.0	134.8	4	mg/L		146	75 - 125	1	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 480-555235/1-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 555235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1
Cadmium	ND		0.50		ug/L		10/26/20 09:55	10/28/20 14:07	1
Cobalt	ND	^	0.30		ug/L		10/26/20 09:55	10/28/20 14:07	1
Molybdenum	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1
Selenium	ND		1.0		ug/L		10/26/20 09:55	10/28/20 14:07	1

Lab Sample ID: LCS 480-555235/2-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	20.0	19.32		ug/L		97	80 - 120

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

Lab Sample ID: LCS 480-555235/2-A
Matrix: Water
Analysis Batch: 556419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	20.0	19.76		ug/L		99	80 - 120
Cobalt	20.0	20.04	^	ug/L		100	80 - 120
Molybdenum	20.0	20.81		ug/L		104	80 - 120
Selenium	20.0	20.08		ug/L		100	80 - 120

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 556419

Client Sample ID: MS
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.7		20.0	25.49		ug/L		109	75 - 125
Cadmium	ND		20.0	20.44		ug/L		102	75 - 125
Cobalt	0.32	^	20.0	19.10	^	ug/L		94	75 - 125
Molybdenum	4.3		20.0	26.59		ug/L		112	75 - 125
Selenium	ND		20.0	21.49		ug/L		107	75 - 125

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 556419

Client Sample ID: MSD
Prep Type: Total/NA
Prep Batch: 555235

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.7		20.0	25.38		ug/L		109	75 - 125	0	20
Cadmium	ND		20.0	20.04		ug/L		100	75 - 125	2	20
Cobalt	0.32	^	20.0	19.24	^	ug/L		95	75 - 125	1	20
Molybdenum	4.3		20.0	26.26		ug/L		110	75 - 125	1	20
Selenium	ND		20.0	21.24		ug/L		106	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-555584/28
Matrix: Water
Analysis Batch: 555584

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			10/24/20 20:03	1
Fluoride	ND		0.050		mg/L			10/24/20 20:03	1
Sulfate	ND		2.0		mg/L			10/24/20 20:03	1

Lab Sample ID: LCS 480-555584/27
Matrix: Water
Analysis Batch: 555584

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	49.54		mg/L		99	90 - 110
Fluoride	5.00	4.85		mg/L		97	90 - 110
Sulfate	50.0	48.01		mg/L		96	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-176725-5 MS
Matrix: Water
Analysis Batch: 555584

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	24.9		50.0	71.94		mg/L		94	81 - 120
Fluoride	0.099		5.00	4.38		mg/L		86	82 - 120
Sulfate	10		50.0	55.64		mg/L		91	80 - 120

Lab Sample ID: MB 480-555597/4
Matrix: Water
Analysis Batch: 555597

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			10/24/20 14:21	1
Fluoride	ND	^	0.050		mg/L			10/24/20 14:21	1
Sulfate	ND		2.0		mg/L			10/24/20 14:21	1

Lab Sample ID: LCS 480-555597/3
Matrix: Water
Analysis Batch: 555597

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	47.21		mg/L		94	90 - 110
Fluoride	5.00	4.57	^	mg/L		91	90 - 110
Sulfate	50.0	45.93		mg/L		92	90 - 110

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555597

Client Sample ID: MS
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	27.1		50.0	72.02		mg/L		90	81 - 120
Sulfate	82.8	F1	50.0	121.0	E F1	mg/L		76	80 - 120

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555597

Client Sample ID: MSD
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	27.1		50.0	72.65		mg/L		91	81 - 120	1	15
Sulfate	82.8	F1	50.0	121.4	E F1	mg/L		77	80 - 120	0	15

Lab Sample ID: MB 480-555837/4
Matrix: Water
Analysis Batch: 555837

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			10/27/20 04:15	1
Fluoride	ND		0.050		mg/L			10/27/20 04:15	1
Sulfate	ND		2.0		mg/L			10/27/20 04:15	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-555837/3
Matrix: Water
Analysis Batch: 555837

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	48.79		mg/L		98	90 - 110		
Fluoride			5.00	5.02		mg/L		100	90 - 110		
Sulfate			50.0	48.17		mg/L		96	90 - 110		

Lab Sample ID: 480-176725-7 MS
Matrix: Water
Analysis Batch: 555837

Client Sample ID: MS
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	0.18		5.00	4.84		mg/L		93	82 - 120		

Lab Sample ID: 480-176725-7 MSD
Matrix: Water
Analysis Batch: 555837

Client Sample ID: MSD
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	0.18		5.00	4.83		mg/L		93	82 - 120	0	15

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

Lab Sample ID: MB 480-555098/1
Matrix: Water
Analysis Batch: 555098

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			10/22/20 01:34	1

Lab Sample ID: LCS 480-555098/2
Matrix: Water
Analysis Batch: 555098

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			502	489.0		mg/L		97	85 - 115		

Lab Sample ID: 480-176725-10 DU
Matrix: Water
Analysis Batch: 555098

Client Sample ID: Equipment 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	10

Lab Sample ID: MB 480-555341/1
Matrix: Water
Analysis Batch: 555341

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			10/22/20 21:00	1

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

Lab Sample ID: LCS 480-555341/2
Matrix: Water
Analysis Batch: 555341

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			502	502.0		mg/L		100	85 - 115		

Lab Sample ID: 480-176725-11 DU
Matrix: Water
Analysis Batch: 555341

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	552			565.0		mg/L				2	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-555069/1
Matrix: Water
Analysis Batch: 555069

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: LCS 480-555275/1
Matrix: Water
Analysis Batch: 555275

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: 480-176725-1 DU
Matrix: Water
Analysis Batch: 555275

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7	HF		6.8		SU				1	5
Temperature	19.3	HF		19.2		Degrees C				0.7	10

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-487007/24-A
Matrix: Water
Analysis Batch: 490336

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487007

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.06642	U	0.110	0.110	1.00	0.192	pCi/L	10/28/20 11:17	11/27/20 09:39	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.2*		*40 - 110*	*10/28/20 11:17*	*11/27/20 09:39*	*1*

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

Lab Sample ID: LCS 160-487007/1-A
Matrix: Water
Analysis Batch: 490353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487007

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	10.53		1.19	1.00	0.203	pCi/L	93	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*81.8*		*40 - 110*

Lab Sample ID: MB 160-487270/10-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487270

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0008999	U	0.0626	0.0626	1.00	0.130	pCi/L	10/29/20 12:35	11/23/20 09:07	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*69.8*		*40 - 110*	*10/29/20 12:35*	*11/23/20 09:07*	*1*

Lab Sample ID: LCS 160-487270/1-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 487270

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.3	10.27		1.08	1.00	0.0935	pCi/L	91	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*84.8*		*40 - 110*

Lab Sample ID: LCSD 160-487270/2-A
Matrix: Water
Analysis Batch: 490007

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 487270

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.3	10.43		1.11	1.00	0.136	pCi/L	92	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*77.4*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-487013/24-A
Matrix: Water
Analysis Batch: 490118

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 487013

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.06339	U	0.279	0.279	1.00	0.489	pCi/L	10/28/20 11:56	11/24/20 11:57	1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.2		40 - 110	10/28/20 11:56	11/24/20 11:57	1
Y Carrier	81.1		40 - 110	10/28/20 11:56	11/24/20 11:57	1

Lab Sample ID: LCS 160-487013/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 490121 — **Prep Batch: 487013**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			7.63	7.109		0.940	1.00	0.514	pCi/L	93	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	81.8		40 - 110
Y Carrier	83.7		40 - 110

Lab Sample ID: MB 160-487272/10-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 489049 — **Prep Batch: 487272**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.03313	U	0.336	0.336	1.00	0.597	pCi/L	10/29/20 12:49	11/13/20 11:53	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	69.8		40 - 110	10/29/20 12:49	11/13/20 11:53	1
Y Carrier	78.1		40 - 110	10/29/20 12:49	11/13/20 11:53	1

Lab Sample ID: LCS 160-487272/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 489049 — **Prep Batch: 487272**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			7.66	7.538		0.951	1.00	0.408	pCi/L	98	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	84.8		40 - 110
Y Carrier	86.0		40 - 110

Lab Sample ID: LCSD 160-487272/2-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 489049 — **Prep Batch: 487272**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			7.66	8.989		1.11	1.00	0.439	pCi/L	117	75 - 125	0.70	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	77.4		40 - 110
Y Carrier	82.6		40 - 110

Metals

Prep Batch: 555233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	3005A	
480-176725-2	MW-1RD	Total/NA	Water	3005A	
480-176725-3	MW-2R	Total/NA	Water	3005A	
480-176725-4	MW-2RD	Total/NA	Water	3005A	
480-176725-5	MW-3	Total/NA	Water	3005A	
480-176725-6	MW-3R	Total/NA	Water	3005A	
480-176725-7	MW-3RD	Total/NA	Water	3005A	
480-176725-8	MW-4	Total/NA	Water	3005A	
480-176725-9	FIELD BLANK 1	Total/NA	Water	3005A	
480-176725-10	Equipment Blank	Total/NA	Water	3005A	
480-176725-11	DUPLICATE	Total/NA	Water	3005A	
MB 480-555233/1-A	Method Blank	Total/NA	Water	3005A	
LCS 480-555233/2-A	Lab Control Sample	Total/NA	Water	3005A	
480-176725-7 MS	MS	Total/NA	Water	3005A	
480-176725-7 MSD	MSD	Total/NA	Water	3005A	

Prep Batch: 555235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	3020A	
480-176725-2	MW-1RD	Total/NA	Water	3020A	
480-176725-3	MW-2R	Total/NA	Water	3020A	
480-176725-4	MW-2RD	Total/NA	Water	3020A	
480-176725-5	MW-3	Total/NA	Water	3020A	
480-176725-6	MW-3R	Total/NA	Water	3020A	
480-176725-7	MW-3RD	Total/NA	Water	3020A	
480-176725-8	MW-4	Total/NA	Water	3020A	
480-176725-9	FIELD BLANK 1	Total/NA	Water	3020A	
480-176725-10	Equipment Blank	Total/NA	Water	3020A	
480-176725-11	DUPLICATE	Total/NA	Water	3020A	
MB 480-555235/1-A	Method Blank	Total/NA	Water	3020A	
LCS 480-555235/2-A	Lab Control Sample	Total/NA	Water	3020A	
480-176725-7 MS	MS	Total/NA	Water	3020A	
480-176725-7 MSD	MSD	Total/NA	Water	3020A	

Analysis Batch: 555926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	6010D	555233
480-176725-2	MW-1RD	Total/NA	Water	6010D	555233
480-176725-3	MW-2R	Total/NA	Water	6010D	555233
480-176725-4	MW-2RD	Total/NA	Water	6010D	555233
480-176725-5	MW-3	Total/NA	Water	6010D	555233
480-176725-6	MW-3R	Total/NA	Water	6010D	555233
480-176725-7	MW-3RD	Total/NA	Water	6010D	555233
480-176725-8	MW-4	Total/NA	Water	6010D	555233
480-176725-9	FIELD BLANK 1	Total/NA	Water	6010D	555233
480-176725-10	Equipment Blank	Total/NA	Water	6010D	555233
480-176725-11	DUPLICATE	Total/NA	Water	6010D	555233
MB 480-555233/1-A	Method Blank	Total/NA	Water	6010D	555233
LCS 480-555233/2-A	Lab Control Sample	Total/NA	Water	6010D	555233
480-176725-7 MS	MS	Total/NA	Water	6010D	555233
480-176725-7 MSD	MSD	Total/NA	Water	6010D	555233

Metals

Analysis Batch: 556419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	6020B	555235
480-176725-2	MW-1RD	Total/NA	Water	6020B	555235
480-176725-3	MW-2R	Total/NA	Water	6020B	555235
480-176725-4	MW-2RD	Total/NA	Water	6020B	555235
480-176725-5	MW-3	Total/NA	Water	6020B	555235
480-176725-6	MW-3R	Total/NA	Water	6020B	555235
480-176725-7	MW-3RD	Total/NA	Water	6020B	555235
480-176725-8	MW-4	Total/NA	Water	6020B	555235
480-176725-9	FIELD BLANK 1	Total/NA	Water	6020B	555235
480-176725-10	Equipment Blank	Total/NA	Water	6020B	555235
480-176725-11	DUPLICATE	Total/NA	Water	6020B	555235
MB 480-555235/1-A	Method Blank	Total/NA	Water	6020B	555235
LCS 480-555235/2-A	Lab Control Sample	Total/NA	Water	6020B	555235
480-176725-7 MS	MS	Total/NA	Water	6020B	555235
480-176725-7 MSD	MSD	Total/NA	Water	6020B	555235

General Chemistry

Analysis Batch: 555069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-3	MW-2R	Total/NA	Water	SM 4500 H+ B	
LCS 480-555069/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 555098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	SM 2540C	
480-176725-2	MW-1RD	Total/NA	Water	SM 2540C	
480-176725-3	MW-2R	Total/NA	Water	SM 2540C	
480-176725-4	MW-2RD	Total/NA	Water	SM 2540C	
480-176725-5	MW-3	Total/NA	Water	SM 2540C	
480-176725-6	MW-3R	Total/NA	Water	SM 2540C	
480-176725-7	MW-3RD	Total/NA	Water	SM 2540C	
480-176725-8	MW-4	Total/NA	Water	SM 2540C	
480-176725-9	FIELD BLANK 1	Total/NA	Water	SM 2540C	
480-176725-10	Equipment Blank	Total/NA	Water	SM 2540C	
MB 480-555098/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-555098/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-176725-10 DU	Equipment Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 555275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	SM 4500 H+ B	
480-176725-2	MW-1RD	Total/NA	Water	SM 4500 H+ B	
480-176725-4	MW-2RD	Total/NA	Water	SM 4500 H+ B	
480-176725-5	MW-3	Total/NA	Water	SM 4500 H+ B	
480-176725-6	MW-3R	Total/NA	Water	SM 4500 H+ B	
480-176725-7	MW-3RD	Total/NA	Water	SM 4500 H+ B	
480-176725-8	MW-4	Total/NA	Water	SM 4500 H+ B	
480-176725-9	FIELD BLANK 1	Total/NA	Water	SM 4500 H+ B	
480-176725-10	Equipment Blank	Total/NA	Water	SM 4500 H+ B	
480-176725-11	DUPLICATE	Total/NA	Water	SM 4500 H+ B	

General Chemistry (Continued)

Analysis Batch: 555275 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-555275/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
480-176725-1 DU	MW-1	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 555341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-11	DUPLICATE	Total/NA	Water	SM 2540C	
MB 480-555341/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-555341/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-176725-11 DU	DUPLICATE	Total/NA	Water	SM 2540C	

Analysis Batch: 555584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	300.0	
480-176725-2	MW-1RD	Total/NA	Water	300.0	
480-176725-3	MW-2R	Total/NA	Water	300.0	
480-176725-4	MW-2RD	Total/NA	Water	300.0	
480-176725-5	MW-3	Total/NA	Water	300.0	
MB 480-555584/28	Method Blank	Total/NA	Water	300.0	
LCS 480-555584/27	Lab Control Sample	Total/NA	Water	300.0	
480-176725-5 MS	MW-3	Total/NA	Water	300.0	

Analysis Batch: 555597

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-6	MW-3R	Total/NA	Water	300.0	
480-176725-7	MW-3RD	Total/NA	Water	300.0	
480-176725-8	MW-4	Total/NA	Water	300.0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	300.0	
480-176725-10	Equipment Blank	Total/NA	Water	300.0	
480-176725-11	DUPLICATE	Total/NA	Water	300.0	
MB 480-555597/4	Method Blank	Total/NA	Water	300.0	
LCS 480-555597/3	Lab Control Sample	Total/NA	Water	300.0	
480-176725-7 MS	MS	Total/NA	Water	300.0	
480-176725-7 MSD	MSD	Total/NA	Water	300.0	

Analysis Batch: 555837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-6	MW-3R	Total/NA	Water	300.0	
480-176725-7	MW-3RD	Total/NA	Water	300.0	
480-176725-8	MW-4	Total/NA	Water	300.0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	300.0	
480-176725-10	Equipment Blank	Total/NA	Water	300.0	
480-176725-11	DUPLICATE	Total/NA	Water	300.0	
MB 480-555837/4	Method Blank	Total/NA	Water	300.0	
LCS 480-555837/3	Lab Control Sample	Total/NA	Water	300.0	
480-176725-7 MS	MS	Total/NA	Water	300.0	
480-176725-7 MSD	MSD	Total/NA	Water	300.0	

QC Association Summary

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

Job ID: 480-176725-1

Rad

Prep Batch: 487007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-7	MW-3RD	Total/NA	Water	PrecSep-21	
480-176725-8	MW-4	Total/NA	Water	PrecSep-21	
480-176725-9	FIELD BLANK 1	Total/NA	Water	PrecSep-21	
480-176725-10	Equipment Blank	Total/NA	Water	PrecSep-21	
480-176725-11	DUPLICATE	Total/NA	Water	PrecSep-21	
MB 160-487007/24-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-487007/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 487013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-7	MW-3RD	Total/NA	Water	PrecSep_0	
480-176725-8	MW-4	Total/NA	Water	PrecSep_0	
480-176725-9	FIELD BLANK 1	Total/NA	Water	PrecSep_0	
480-176725-10	Equipment Blank	Total/NA	Water	PrecSep_0	
480-176725-11	DUPLICATE	Total/NA	Water	PrecSep_0	
MB 160-487013/24-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-487013/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 487270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	PrecSep-21	
480-176725-2	MW-1RD	Total/NA	Water	PrecSep-21	
480-176725-3	MW-2R	Total/NA	Water	PrecSep-21	
480-176725-4	MW-2RD	Total/NA	Water	PrecSep-21	
480-176725-5	MW-3	Total/NA	Water	PrecSep-21	
480-176725-6	MW-3R	Total/NA	Water	PrecSep-21	
MB 160-487270/10-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-487270/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-487270/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 487272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176725-1	MW-1	Total/NA	Water	PrecSep_0	
480-176725-2	MW-1RD	Total/NA	Water	PrecSep_0	
480-176725-3	MW-2R	Total/NA	Water	PrecSep_0	
480-176725-4	MW-2RD	Total/NA	Water	PrecSep_0	
480-176725-5	MW-3	Total/NA	Water	PrecSep_0	
480-176725-6	MW-3R	Total/NA	Water	PrecSep_0	
MB 160-487272/10-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-487272/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-487272/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-1
Lab Sample ID: 480-176725-1
Date Collected: 10/15/20 13:05
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:10	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:11	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/24/20 23:42	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:30	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:52	FLC	TAL SL

Client Sample ID: MW-1RD
Lab Sample ID: 480-176725-2
Date Collected: 10/15/20 13:35
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:14	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:13	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/24/20 23:56	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:35	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-2R
Lab Sample ID: 480-176725-3
Date Collected: 10/15/20 14:40
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:17	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:16	KMP	TAL BUF
Total/NA	Analysis	300.0		5	555584	10/25/20 00:11	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555069	10/21/20 16:02	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-2R
Lab Sample ID: 480-176725-3
Date Collected: 10/15/20 14:40
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-2RD
Lab Sample ID: 480-176725-4
Date Collected: 10/16/20 08:05
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:21	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:18	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/25/20 00:26	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:37	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3
Lab Sample ID: 480-176725-5
Date Collected: 10/16/20 08:55
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:25	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:20	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555584	10/25/20 00:40	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:40	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3R
Lab Sample ID: 480-176725-6
Date Collected: 10/16/20 08:50
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:29	LMH	TAL BUF

Lab Chronicle

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

Job ID: 480-176725-1

Client Sample ID: MW-3R

Lab Sample ID: 480-176725-6

Date Collected: 10/16/20 08:50

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:22	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:10	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 14:35	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:42	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487270	10/29/20 12:35	AVB	TAL SL
Total/NA	Analysis	903.0		1	490007	11/23/20 09:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487272	10/29/20 12:49	AVB	TAL SL
Total/NA	Analysis	904.0		1	489049	11/13/20 11:53	FLC	TAL SL

Client Sample ID: MW-3RD

Lab Sample ID: 480-176725-7

Date Collected: 10/16/20 09:30

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 03:33	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:25	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 05:42	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:46	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:45	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:44	FLC	TAL SL

Client Sample ID: MW-4

Lab Sample ID: 480-176725-8

Date Collected: 10/16/20 11:55

Matrix: Water

Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:03	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:43	KMP	TAL BUF
Total/NA	Analysis	300.0		2	555837	10/27/20 07:25	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 14:49	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:47	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: MW-4
Lab Sample ID: 480-176725-8
Date Collected: 10/16/20 11:55
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:44	FLC	TAL SL

Client Sample ID: FIELD BLANK 1
Lab Sample ID: 480-176725-9
Date Collected: 10/15/20 16:30
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:07	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:45	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:39	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:03	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:50	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

Client Sample ID: Equipment Blank
Lab Sample ID: 480-176725-10
Date Collected: 10/16/20 12:20
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:10	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:47	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 07:54	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:18	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555098	10/22/20 01:34	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:53	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176725-1
Project/Site: SKB Lansing - CCR Groundwater

Client Sample ID: DUPLICATE
Lab Sample ID: 480-176725-11
Date Collected: 10/16/20 00:00
Matrix: Water
Date Received: 10/17/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			555233	10/26/20 10:15	ASD	TAL BUF
Total/NA	Analysis	6010D		1	555926	10/27/20 04:14	LMH	TAL BUF
Total/NA	Prep	3020A			555235	10/26/20 09:55	ASD	TAL BUF
Total/NA	Analysis	6020B		1	556419	10/28/20 14:49	KMP	TAL BUF
Total/NA	Analysis	300.0		1	555837	10/27/20 08:08	RJS	TAL BUF
Total/NA	Analysis	300.0		1	555597	10/24/20 15:32	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	555341	10/22/20 21:00	CSS	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	555275	10/22/20 12:58	BEF	TAL BUF
Total/NA	Prep	PrecSep-21			487007	10/28/20 11:17	AVB	TAL SL
Total/NA	Analysis	903.0		1	490353	11/27/20 08:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			487013	10/28/20 11:56	AVB	TAL SL
Total/NA	Analysis	904.0		1	490121	11/24/20 11:45	FLC	TAL SL

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: 480-176725-1
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	1524384	12-31-20

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
SM 4500 H+ B		Water	pH
SM 4500 H+ B		Water	Temperature

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	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-20
Iowa	State	373	11-30-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

Method Summary

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

Job ID: 480-176725-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	TAL BUF
6020B	Metals (ICP/MS)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL BUF
SM 4500 H+ B	pH	SM	TAL BUF
3005A	Preparation, Total Metals	SW846	TAL BUF
3020A	Preparation, Total Metals	SW846	TAL BUF

Protocol References:

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: 480-176725-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-176725-1	MW-1	Water	10/15/20 13:05	10/17/20 10:00	
480-176725-2	MW-1RD	Water	10/15/20 13:35	10/17/20 10:00	
480-176725-3	MW-2R	Water	10/15/20 14:40	10/17/20 10:00	
480-176725-4	MW-2RD	Water	10/16/20 08:05	10/17/20 10:00	
480-176725-5	MW-3	Water	10/16/20 08:55	10/17/20 10:00	
480-176725-6	MW-3R	Water	10/16/20 08:50	10/17/20 10:00	
480-176725-7	MW-3RD	Water	10/16/20 09:30	10/17/20 10:00	
480-176725-8	MW-4	Water	10/16/20 11:55	10/17/20 10:00	
480-176725-9	FIELD BLANK 1	Water	10/15/20 16:30	10/17/20 10:00	
480-176725-10	Equipment Blank	Water	10/16/20 12:20	10/17/20 10:00	
480-176725-11	DUPLICATE	Water	10/16/20 00:00	10/17/20 10:00	

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 America

Client Information	Sampler: N. Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-151494-22509.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6055	E-Mail: Ryan.VanDette@Eurofinset.com		Page: Page 1 of 2
Company: Waste Connections, Inc.				Job #:

Address: 13425 Courthouse Blvd	Due Date Requested:	Analysis Requested
City: Rosemount	TAT Requested (days): Standard	
State, Zip: MN, 55068		
Phone:	PO #: Purchase Order Requested	
Email: nathanielb@wcnx.org	WO #:	
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	Project #: 48013603	
Site: Minnesota	SSOW#:	

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)	300.0_28D - Cl/F/SO4	6010D, 6020B, 7470A	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Standard Target List	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
MW-1	10/15/20	13:05	6	Water			X	X	X	X	X	X		
MW-3	10/16/20	8:55	6	Water			X	X	X	X	X	X		
Duplicate	10/16/20	—	6	Water			X	X	X	X	X	X		
MS	10/16/20	9:40	6	Water	Y		X	X	X	X	X	X		
MSD	10/16/20	9:45	6	Water	Y		X	X	X	X	X	X		
MW-1RD	10/15/20	13:35	6	Water			X	X	X	X	X	X		
MW-2RD	10/16/20	8:05	6	Water			X	X	X	X	X	X		
MW-2R	10/15/20	14:40	6	Water			X	X	X	X	X	X		
MW-3RD	10/16/20	9:30	6	Water			X	X	X	X	X	X		
MW-3R	10/16/20	8:50	6	Water			X	X	X	X	X	X		
MW-4	10/16/20	11:55	6	Water			X	X	X	X	X	X		

480-176725 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: Michelle Hall	Date/Time: 10/16/20	Company: GES	Received by: Thomas S. Reis	Date/Time: 10-16-20 14:35	Company: EUROFINS
Relinquished by: Thomas S. Reis	Date/Time: 10/16 17:00	Company: Eurofins	Received by: C Wallace	Date/Time: 10/17/20 1000	Company: TAS
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: #1 2.8, 2.5, 2.3

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

TestAmerica Minneapolis SC 213

eurofins | Environment Testing America

Client Information	Sampler: N. Schlegel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-151494-22509.2
Client Contact: Nathaniel Beinemann	Phone: 651-792-6065	E-Mail: Ryan.VanDette@Eurofinset.com		Page: Page 2 of 2
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			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Lansing/ Event Desc: CCR Groundwater	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)	300.0_28D - Cl/F/SO4	6010D, 6020B, 7470A	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	904.0 - Standard Target List	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D		
Field Blank	10/15/20	16:30	6	Water			X	X	X	X	X	X		
Equipment Blank	10/16/20	12:20	6	Water			X	X	X	X	X	X		

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	[illegible]	10/16/20	GES	Thomas J. Reis	10-16-20 14:35	EUROFINS
2	Thomas J. Reis	10-16 17:00	Eurofins	[illegible]	10/17/20 1000	TAB
3	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: #1 2.8

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-176725-1

Login Number: 176725
List Number: 1
Creator: Sabuda, Brendan 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	2.8 2.5 2.3 #1 ICE
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.	True	

Appendix C – Statistical Evaluation Data

1			Background Statistics for Uncensored Full Data Sets								
2	User Selected Options										
3	Date/Time of Computation		ProUCL 5.11/6/2021 12:51:59 PM								
4	From File		C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Lansing Facility\2017 to 2020 stats raw.xlsx								
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	Antimony										
12											
13	General Statistics										
14				Total Number of Observations	71			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	0.00286			SD	0.00571		
19				Coefficient of Variation	1.993			Skewness	2.751		
20				Mean of logged Data	-6.627			SD of logged Data	0.912		
21											
22				Critical Values for Background Threshold Values (BTVs)							
23				Tolerance Factor K (For UTL)	1.983			d2max (for USL)	3.089		
24											
25				Normal GOF Test							
26				Shapiro Wilk Test Statistic	0.346			Normal GOF Test			
27				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
28				Lilliefors Test Statistic	0.529			Lilliefors GOF Test			
29				5% Lilliefors Critical Value	0.105			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	0.0142			90% Percentile (z)	0.0102		
34				95% UPL (t)	0.0124			95% Percentile (z)	0.0123		
35				95% USL	0.0205			99% Percentile (z)	0.0161		
36											
37				Gamma GOF Test							
38				A-D Test Statistic	23.52			Anderson-Darling Gamma GOF Test			
39				5% A-D Critical Value	0.792			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic	0.551			Kolmogorov-Smirnov Gamma GOF Test			
41				5% K-S Critical Value	0.11			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)	0.773			k star (bias corrected MLE)	0.75		
46				Theta hat (MLE)	0.00371			Theta star (bias corrected MLE)	0.00382		
47				nu hat (MLE)	109.8			nu star (bias corrected)	106.5		
48				MLE Mean (bias corrected)	0.00286			MLE Sd (bias corrected)	0.00331		
49											
50				Background Statistics Assuming Gamma Distribution							
51			95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0084			90% Percentile	0.00707		
52			95% Hawkins Wixley (HW) Approx. Gamma UPL		0.00782			95% Percentile	0.00951		
53			95% WH Approx. Gamma UTL with	95% Coverage	0.0105			99% Percentile	0.0153		

	A	B	C	D	E	F	G	H	I	J	K	L
54				95% HW Approx. Gamma UTL with	95% Coverage	0.00991						
55					95% WH USL	0.0211				95% HW USL		0.0213
56												
57					Lognormal GOF Test							
58					Shapiro Wilk Test Statistic	0.386		Shapiro Wilk Lognormal GOF Test				
59					5% Shapiro Wilk P Value	0		Data Not Lognormal at 5% Significance Level				
60					Lilliefors Test Statistic	0.522		Lilliefors Lognormal GOF Test				
61					5% Lilliefors Critical Value	0.105		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	0.00808				90% Percentile (z)		0.00426
66					95% UPL (t)	0.00612				95% Percentile (z)		0.00594
67					95% USL	0.0222				99% Percentile (z)		0.0111
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	70				95% UTL with	95% Coverage	0.02
74					Approx, f used to compute achieved CC	1.842				pproximate Actual Confidence Coefficient achieved by UTL		0.876
75										Approximate Sample Size needed to achieve specified CC		93
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		0.001
78					90% Chebyshev UPL	0.0201				95% Percentile		0.02
79					95% Chebyshev UPL	0.0279				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	Arsenic											
89												
90	General Statistics											
91					Total Number of Observations	65				Number of Distinct Observations		24
92										Number of Missing Observations		440
93					Minimum	0.001				First Quartile		0.0012
94					Second Largest	0.015				Median		0.0025
95					Maximum	0.015				Third Quartile		0.004
96					Mean	0.0037				SD		0.00414
97					Coefficient of Variation	1.119				Skewness		2.199
98					Mean of logged Data	-5.996				SD of logged Data		0.823
99												
100					Critical Values for Background Threshold Values (BTVs)							
101					Tolerance Factor K (For UTL)	2				d2max (for USL)		3.057
102												
103					Normal GOF Test							
104					Shapiro Wilk Test Statistic	0.604		Normal GOF Test				
105					5% Shapiro Wilk P Value	0		Data Not Normal at 5% Significance Level				
106					Lilliefors Test Statistic	0.285		Lilliefors GOF Test				

	A	B	C	D	E	F	G	H	I	J	K	L
107					5% Lilliefors Critical Value	0.11	Data Not Normal at 5% Significance Level					
108	Data Not Normal at 5% Significance Level											
109												
110	Background Statistics Assuming Normal Distribution											
111				95% UTL with	95% Coverage	0.012				90% Percentile (z)		0.009
112					95% UPL (t)	0.0107				95% Percentile (z)		0.0105
113					95% USL	0.0163				99% Percentile (z)		0.0133
114												
115	Gamma GOF Test											
116					A-D Test Statistic	3.988	Anderson-Darling Gamma GOF Test					
117					5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level					
118					K-S Test Statistic	0.166	Kolmogorov-Smirnov Gamma GOF Test					
119					5% K-S Critical Value	0.113	Data Not Gamma Distributed at 5% Significance Level					
120	Data Not Gamma Distributed at 5% Significance Level											
121												
122	Gamma Statistics											
123					k hat (MLE)	1.407				k star (bias corrected MLE)		1.353
124					Theta hat (MLE)	0.00263				Theta star (bias corrected MLE)		0.00273
125					nu hat (MLE)	183				nu star (bias corrected)		175.9
126					MLE Mean (bias corrected)	0.0037				MLE Sd (bias corrected)		0.00318
127												
128	Background Statistics Assuming Gamma Distribution											
129				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0098				90% Percentile		0.0079
130				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.00977				95% Percentile		0.00997
131				95% WH Approx. Gamma UTL with	95% Coverage	0.0118				99% Percentile		0.0147
132				95% HW Approx. Gamma UTL with	95% Coverage	0.012						
133					95% WH USL	0.0205				95% HW USL		0.0219
134												
135	Lognormal GOF Test											
136					Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Lognormal GOF Test					
137					5% Shapiro Wilk P Value	4.5557E-8	Data Not Lognormal at 5% Significance Level					
138					Lilliefors Test Statistic	0.134	Lilliefors Lognormal GOF Test					
139					5% Lilliefors Critical Value	0.11	Data Not Lognormal at 5% Significance Level					
140	Data Not Lognormal at 5% Significance Level											
141												
142	Background Statistics assuming Lognormal Distribution											
143				95% UTL with	95% Coverage	0.0129				90% Percentile (z)		0.00715
144					95% UPL (t)	0.00994				95% Percentile (z)		0.00964
145					95% USL	0.0308				99% Percentile (z)		0.0169
146												
147	Nonparametric Distribution Free Background Statistics											
148	Data do not follow a Discernible Distribution (0.05)											
149												
150	Nonparametric Upper Limits for Background Threshold Values											
151					Order of Statistic, r	64				95% UTL with	95% Coverage	0.015
152				Approx, f used to compute achieved CC		1.684				pproximate Actual Confidence Coefficient achieved by UTL		0.842
153										Approximate Sample Size needed to achieve specified CC		93
154				95% Percentile Bootstrap UTL with	95% Coverage	0.015				95% BCA Bootstrap UTL with	95% Coverage	0.015
155					95% UPL	0.015				90% Percentile		0.011
156					90% Chebyshev UPL	0.0162				95% Percentile		0.015
157					95% Chebyshev UPL	0.0219				99% Percentile		0.015
158					95% USL	0.015						
159												

160	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
161	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
162	and consists of observations collected from clean unimpacted locations.										
163	The use of USL tends to provide a balance between false positives and false negatives provided the data										
164	represents a background data set and when many onsite observations need to be compared with the BTV.										
165											
166	Barium										
167											
168	General Statistics										
169				Total Number of Observations	7			Number of Distinct Observations	6		
170								Number of Missing Observations	487		
171				Minimum	0.14			First Quartile	0.21		
172				Second Largest	0.29			Median	0.24		
173				Maximum	0.6			Third Quartile	0.28		
174				Mean	0.28			SD	0.149		
175				Coefficient of Variation	0.533			Skewness	2.056		
176				Mean of logged Data	-1.368			SD of logged Data	0.445		
177											
178	Critical Values for Background Threshold Values (BTVs)										
179				Tolerance Factor K (For UTL)	3.399			d2max (for USL)	1.938		
180											
181	Normal GOF Test										
182				Shapiro Wilk Test Statistic	0.763			Shapiro Wilk GOF Test			
183				5% Shapiro Wilk Critical Value	0.803			Data Not Normal at 5% Significance Level			
184				Lilliefors Test Statistic	0.33			Lilliefors GOF Test			
185				5% Lilliefors Critical Value	0.304			Data Not Normal at 5% Significance Level			
186	Data Not Normal at 5% Significance Level										
187											
188	Background Statistics Assuming Normal Distribution										
189				95% UTL with 95% Coverage	0.787			90% Percentile (z)	0.471		
190				95% UPL (t)	0.59			95% Percentile (z)	0.525		
191				95% USL	0.569			99% Percentile (z)	0.627		
192											
193	Gamma GOF Test										
194				A-D Test Statistic	0.537			Anderson-Darling Gamma GOF Test			
195				5% A-D Critical Value	0.71			Detected data appear Gamma Distributed at 5% Significance Level			
196				K-S Test Statistic	0.268			Kolmogorov-Smirnov Gamma GOF Test			
197				5% K-S Critical Value	0.313			Detected data appear Gamma Distributed at 5% Significance Level			
198	Detected data appear Gamma Distributed at 5% Significance Level										
199											
200	Gamma Statistics										
201				k hat (MLE)	5.45			k star (bias corrected MLE)	3.209		
202				Theta hat (MLE)	0.0514			Theta star (bias corrected MLE)	0.0872		
203				nu hat (MLE)	76.3			nu star (bias corrected)	44.93		
204				MLE Mean (bias corrected)	0.28			MLE Sd (bias corrected)	0.156		
205											
206	Background Statistics Assuming Gamma Distribution										
207				95% Wilson Hilferty (WH) Approx. Gamma UPL	0.613			90% Percentile	0.49		
208				95% Hawkins Wixley (HW) Approx. Gamma UPL	0.619			95% Percentile	0.576		
209				95% WH Approx. Gamma UTL with 95% Coverage	0.949			99% Percentile	0.764		
210				95% HW Approx. Gamma UTL with 95% Coverage	0.987						
211				95% WH USL	0.583			95% HW USL	0.587		
212											

	A	B	C	D	E	F	G	H	I	J	K	L
213	Lognormal GOF Test											
214					Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Lognormal GOF Test					
215					5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level					
216					Lilliefors Test Statistic	0.243	Lilliefors Lognormal GOF Test					
217					5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level					
218	Data appear Lognormal at 5% Significance Level											
219												
220	Background Statistics assuming Lognormal Distribution											
221				95% UTL with	95% Coverage	1.158			90% Percentile (z)	0.451		
222					95% UPL (t)	0.643			95% Percentile (z)	0.53		
223					95% USL	0.604			99% Percentile (z)	0.718		
224												
225	Nonparametric Distribution Free Background Statistics											
226	Data appear Gamma Distributed at 5% Significance Level											
227												
228	Nonparametric Upper Limits for Background Threshold Values											
229					Order of Statistic, r	7			95% UTL with	95% Coverage	0.6	
230					Approx, f used to compute achieved CC	0.368			pproximate Actual Confidence Coefficient achieved by UTL		0.302	
231									Approximate Sample Size needed to achieve specified CC		59	
232			95% Percentile Bootstrap UTL with	95% Coverage		0.6			95% BCA Bootstrap UTL with	95% Coverage	0.6	
233					95% UPL	0.6			90% Percentile		0.414	
234					90% Chebyshev UPL	0.759			95% Percentile		0.507	
235					95% Chebyshev UPL	0.975			99% Percentile		0.581	
236					95% USL	0.6						
237												
238	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
239	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
240	and consists of observations collected from clean unimpacted locations.											
241	The use of USL tends to provide a balance between false positives and false negatives provided the data											
242	represents a background data set and when many onsite observations need to be compared with the BTV.											
243												
244	Beryllium											
245												
246	General Statistics											
247					Total Number of Observations	59			Number of Distinct Observations		2	
248									Number of Missing Observations		297	
249					Minimum	7.0000E-4			First Quartile		7.0000E-4	
250					Second Largest	0.002			Median		7.0000E-4	
251					Maximum	0.002			Third Quartile		7.0000E-4	
252					Mean	8.5424E-4			SD		4.2399E-4	
253					Coefficient of Variation	0.496			Skewness		2.421	
254					Mean of logged Data	-7.14			SD of logged Data		0.342	
255												
256	Critical Values for Background Threshold Values (BTVs)											
257					Tolerance Factor K (For UTL)	2.02			d2max (for USL)		3.021	
258												
259	Normal GOF Test											
260					Shapiro Wilk Test Statistic	0.376	Normal GOF Test					
261					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
262					Lilliefors Test Statistic	0.523	Lilliefors GOF Test					
263					5% Lilliefors Critical Value	0.115	Data Not Normal at 5% Significance Level					
264	Data Not Normal at 5% Significance Level											
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266	Background Statistics Assuming Normal Distribution											
267				95% UTL with	95% Coverage	0.00171				90% Percentile (z)		0.0014
268					95% UPL (t)	0.00157				95% Percentile (z)		0.00155
269					95% USL	0.00213				99% Percentile (z)		0.00184
270												
271	Gamma GOF Test											
272					A-D Test Statistic	18.8	Anderson-Darling Gamma GOF Test					
273					5% A-D Critical Value	0.752	Data Not Gamma Distributed at 5% Significance Level					
274					K-S Test Statistic	0.528	Kolmogorov-Smirnov Gamma GOF Test					
275					5% K-S Critical Value	0.116	Data Not Gamma Distributed at 5% Significance Level					
276	Data Not Gamma Distributed at 5% Significance Level											
277												
278	Gamma Statistics											
279					k hat (MLE)	6.867				k star (bias corrected MLE)		6.529
280					Theta hat (MLE)	1.2439E-4				Theta star (bias corrected MLE)		1.3083E-4
281					nu hat (MLE)	810.3				nu star (bias corrected)		770.5
282					MLE Mean (bias corrected)	8.5424E-4				MLE Sd (bias corrected)		3.3431E-4
283												
284	Background Statistics Assuming Gamma Distribution											
285			95% Wilson Hilferty (WH) Approx. Gamma UPL			0.00147				90% Percentile		0.0013
286			95% Hawkins Wixley (HW) Approx. Gamma UPL			0.00145				95% Percentile		0.00147
287			95% WH Approx. Gamma UTL with	95% Coverage		0.00163				99% Percentile		0.00182
288			95% HW Approx. Gamma UTL with	95% Coverage		0.00162						
289					95% WH USL	0.00219				95% HW USL		0.0022
290												
291	Lognormal GOF Test											
292					Shapiro Wilk Test Statistic	0.376	Shapiro Wilk Lognormal GOF Test					
293					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
294					Lilliefors Test Statistic	0.523	Lilliefors Lognormal GOF Test					
295					5% Lilliefors Critical Value	0.115	Data Not Lognormal at 5% Significance Level					
296	Data Not Lognormal at 5% Significance Level											
297												
298	Background Statistics assuming Lognormal Distribution											
299				95% UTL with	95% Coverage	0.00158				90% Percentile (z)		0.00123
300					95% UPL (t)	0.00141				95% Percentile (z)		0.00139
301					95% USL	0.00223				99% Percentile (z)		0.00176
302												
303	Nonparametric Distribution Free Background Statistics											
304	Data do not follow a Discernible Distribution (0.05)											
305												
306	Nonparametric Upper Limits for Background Threshold Values											
307					Order of Statistic, r	58				95% UTL with	95% Coverage	0.002
308					Approx, f used to compute achieved CC	1.526				pproximate Actual Confidence Coefficient achieved by UTL		0.801
309										Approximate Sample Size needed to achieve specified CC		93
310			95% Percentile Bootstrap UTL with	95% Coverage		N/A				95% BCA Bootstrap UTL with	95% Coverage	N/A
311					95% UPL	0.002				90% Percentile		0.002
312					90% Chebyshev UPL	0.00214				95% Percentile		0.002
313					95% Chebyshev UPL	0.00272				99% Percentile		0.002
314					95% USL	0.002						
315												
316	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
317	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
318	and consists of observations collected from clean unimpacted locations.											

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

1				Background Statistics for Uncensored Full Data Sets							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.11/6/2021 5:58:29 PM							
4			From File	C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Lansing Facility\boron.xlsx							
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	Boron										
12											
13	General Statistics										
14					Total Number of Observations	54			Number of Distinct Observations	43	
15					Minimum	0.02			First Quartile	0.033	
16					Second Largest	1			Median	0.0575	
17					Maximum	1.1			Third Quartile	0.418	
18					Mean	0.259			SD	0.324	
19					Coefficient of Variation	1.249			Skewness	1.363	
20					Mean of logged Data	-2.179			SD of logged Data	1.317	
21											
22					Critical Values for Background Threshold Values (BTVs)						
23					Tolerance Factor K (For UTL)	2.04			d2max (for USL)	2.987	
24											
25					Normal GOF Test						
26					Shapiro Wilk Test Statistic	0.725			Normal GOF Test		
27					5% Shapiro Wilk P Value	9.961E-13			Data Not Normal at 5% Significance Level		
28					Lilliefors Test Statistic	0.277			Lilliefors GOF Test		
29					5% Lilliefors Critical Value	0.12			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	0.919			90% Percentile (z)	0.674	
34					95% UPL (t)	0.806			95% Percentile (z)	0.792	
35					95% USL	1.226			99% Percentile (z)	1.012	
36											
37					Gamma GOF Test						
38					A-D Test Statistic	3.537			Anderson-Darling Gamma GOF Test		
39					5% A-D Critical Value	0.795			Data Not Gamma Distributed at 5% Significance Level		
40					K-S Test Statistic	0.242			Kolmogorov-Smirnov Gamma GOF Test		
41					5% K-S Critical Value	0.126			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)	0.726			k star (bias corrected MLE)	0.698	
46					Theta hat (MLE)	0.357			Theta star (bias corrected MLE)	0.371	
47					nu hat (MLE)	78.36			nu star (bias corrected)	75.34	
48					MLE Mean (bias corrected)	0.259			MLE Sd (bias corrected)	0.31	
49											
50					Background Statistics Assuming Gamma Distribution						
51					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.863			90% Percentile	0.651	
52					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.889			95% Percentile	0.883	
53					95% WH Approx. Gamma UTL with 95% Coverage	1.121			99% Percentile	1.437	

	A	B	C	D	E	F	G	H	I	J	K	L
54				95% HW Approx. Gamma UTL with	95% Coverage	1.195						
55					95% WH USL	2.065					95% HW USL	2.412
56												
57					Lognormal GOF Test							
58					Shapiro Wilk Test Statistic	0.848			Shapiro Wilk Lognormal GOF Test			
59					5% Shapiro Wilk P Value	3.0649E-7			Data Not Lognormal at 5% Significance Level			
60					Lilliefors Test Statistic	0.208			Lilliefors Lognormal GOF Test			
61					5% Lilliefors Critical Value	0.12			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	1.663				90% Percentile (z)		0.612
66					95% UPL (t)	1.047				95% Percentile (z)		0.988
67					95% USL	5.785				99% Percentile (z)		2.424
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	53				95% UTL with	95% Coverage	1
74					Approx, f used to compute achieved CC	1.395				pproximate Actual Confidence Coefficient achieved by UTL		0.759
75										Approximate Sample Size needed to achieve specified CC		93
76				95% Percentile Bootstrap UTL with	95% Coverage	1.035				95% BCA Bootstrap UTL with	95% Coverage	1.035
77					95% UPL	0.993				90% Percentile		0.887
78					90% Chebyshev UPL	1.239				95% Percentile		0.971
79					95% Chebyshev UPL	1.683				99% Percentile		1.047
80					95% USL	1.1						
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												

372											
373											
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391											
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394											
395											
396											
397											
398											
399											
400	Cadmium										
401											
402	General Statistics										
403				Total Number of Observations	65			Number of Distinct Observations	9		
404								Number of Missing Observations	440		
405				Minimum	5.0000E-4			First Quartile	5.0000E-4		
406				Second Largest	0.002			Median	5.0000E-4		
407				Maximum	0.002			Third Quartile	5.0000E-4		
408				Mean	6.8862E-4			SD	4.7429E-4		
409				Coefficient of Variation	0.689			Skewness	2.388		
410				Mean of logged Data	-7.413			SD of logged Data	0.444		
411											
412				Critical Values for Background Threshold Values (BTVs)							
413				Tolerance Factor K (For UTL)	2			d2max (for USL)	3.057		
414											
415				Normal GOF Test							
416				Shapiro Wilk Test Statistic	0.426			Normal GOF Test			
417				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
418				Lilliefors Test Statistic	0.424			Lilliefors GOF Test			
419				5% Lilliefors Critical Value	0.11			Data Not Normal at 5% Significance Level			
420				Data Not Normal at 5% Significance Level							
421											
422				Background Statistics Assuming Normal Distribution							
423				95% UTL with 95% Coverage	0.00164			90% Percentile (z)	0.0013		
424				95% UPL (t)	0.00149			95% Percentile (z)	0.00147		

425				95% USL	0.00214				99% Percentile (z)	0.00179	
426											
427					Gamma GOF Test						
428				A-D Test Statistic	17.45			Anderson-Darling Gamma GOF Test			
429				5% A-D Critical Value	0.755			Data Not Gamma Distributed at 5% Significance Level			
430				K-S Test Statistic	0.436			Kolmogorov-Smirnov Gamma GOF Test			
431				5% K-S Critical Value	0.111			Data Not Gamma Distributed at 5% Significance Level			
432					Data Not Gamma Distributed at 5% Significance Level						
433											
434					Gamma Statistics						
435				k hat (MLE)	3.943				k star (bias corrected MLE)	3.771	
436				Theta hat (MLE)	1.7464E-4				Theta star (bias corrected MLE)	1.8259E-4	
437				nu hat (MLE)	512.6				nu star (bias corrected)	490.3	
438				MLE Mean (bias corrected)	6.8862E-4				MLE Sd (bias corrected)	3.5459E-4	
439											
440					Background Statistics Assuming Gamma Distribution						
441				95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00135				90% Percentile	0.00116	
442				95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00133				95% Percentile	0.00136	
443				95% WH Approx. Gamma UTL with 95% Coverage	0.00153				99% Percentile	0.00177	
444				95% HW Approx. Gamma UTL with 95% Coverage	0.00152						
445				95% WH USL	0.00225				95% HW USL	0.00227	
446											
447					Lognormal GOF Test						
448				Shapiro Wilk Test Statistic	0.455			Shapiro Wilk Lognormal GOF Test			
449				5% Shapiro Wilk P Value	0			Data Not Lognormal at 5% Significance Level			
450				Lilliefors Test Statistic	0.433			Lilliefors Lognormal GOF Test			
451				5% Lilliefors Critical Value	0.11			Data Not Lognormal at 5% Significance Level			
452					Data Not Lognormal at 5% Significance Level						
453											
454					Background Statistics assuming Lognormal Distribution						
455				95% UTL with 95% Coverage	0.00147				90% Percentile (z)	0.00107	
456				95% UPL (t)	0.00127				95% Percentile (z)	0.00125	
457				95% USL	0.00235				99% Percentile (z)	0.0017	
458											
459					Nonparametric Distribution Free Background Statistics						
460					Data do not follow a Discernible Distribution (0.05)						
461											
462					Nonparametric Upper Limits for Background Threshold Values						
463				Order of Statistic, r	64				95% UTL with 95% Coverage	0.002	
464				Approx, f used to compute achieved CC	1.684				pproximate Actual Confidence Coefficient achieved by UTL	0.842	
465									Approximate Sample Size needed to achieve specified CC	93	
466				95% Percentile Bootstrap UTL with 95% Coverage	0.002				95% BCA Bootstrap UTL with 95% Coverage	0.002	
467				95% UPL	0.002				90% Percentile	0.00176	
468				90% Chebyshev UPL	0.00212				95% Percentile	0.002	
469				95% Chebyshev UPL	0.00277				99% Percentile	0.002	
470				95% USL	0.002						
471											
472					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
473					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
474					and consists of observations collected from clean unimpacted locations.						
475					The use of USL tends to provide a balance between false positives and false negatives provided the data						
476					represents a background data set and when many onsite observations need to be compared with the BTV.						
477											

	A	B	C	D	E	F	G	H	I	J	K	L
478	Calcium											
479												
480	General Statistics											
481					Total Number of Observations	7			Number of Distinct Observations			7
482									Number of Missing Observations			487
483					Minimum	124			First Quartile			131
484					Second Largest	223			Median			186
485					Maximum	226			Third Quartile			213.5
486					Mean	175			SD			45.44
487					Coefficient of Variation	0.26			Skewness			-0.101
488					Mean of logged Data	5.134			SD of logged Data			0.269
489												
490					Critical Values for Background Threshold Values (BTVs)							
491					Tolerance Factor K (For UTL)	3.399			d2max (for USL)			1.938
492												
493					Normal GOF Test							
494					Shapiro Wilk Test Statistic	0.848			Shapiro Wilk GOF Test			
495					5% Shapiro Wilk Critical Value	0.803			Data appear Normal at 5% Significance Level			
496					Lilliefors Test Statistic	0.233			Lilliefors GOF Test			
497					5% Lilliefors Critical Value	0.304			Data appear Normal at 5% Significance Level			
498					Data appear Normal at 5% Significance Level							
499												
500					Background Statistics Assuming Normal Distribution							
501				95% UTL with	95% Coverage	329.5			90% Percentile (z)			233.2
502					95% UPL (t)	269.4			95% Percentile (z)			249.7
503					95% USL	263.1			99% Percentile (z)			280.7
504												
505					Gamma GOF Test							
506					A-D Test Statistic	0.58			Anderson-Darling Gamma GOF Test			
507					5% A-D Critical Value	0.707			Detected data appear Gamma Distributed at 5% Significance Level			
508					K-S Test Statistic	0.245			Kolmogorov-Smirnov Gamma GOF Test			
509					5% K-S Critical Value	0.312			Detected data appear Gamma Distributed at 5% Significance Level			
510					Detected data appear Gamma Distributed at 5% Significance Level							
511												
512					Gamma Statistics							
513					k hat (MLE)	16.62			k star (bias corrected MLE)			9.592
514					Theta hat (MLE)	10.53			Theta star (bias corrected MLE)			18.24
515					nu hat (MLE)	232.7			nu star (bias corrected)			134.3
516					MLE Mean (bias corrected)	175			MLE Sd (bias corrected)			56.5
517												
518					Background Statistics Assuming Gamma Distribution							
519					95% Wilson Hilferty (WH) Approx. Gamma UPL	285.3			90% Percentile			250.2
520					95% Hawkins Wixley (HW) Approx. Gamma UPL	287.9			95% Percentile			277.1
521				95% WH Approx. Gamma UTL with	95% Coverage	379			99% Percentile			332.5
522				95% HW Approx. Gamma UTL with	95% Coverage	388.3						
523					95% WH USL	276.5			95% HW USL			278.6
524												
525					Lognormal GOF Test							
526					Shapiro Wilk Test Statistic	0.838			Shapiro Wilk Lognormal GOF Test			
527					5% Shapiro Wilk Critical Value	0.803			Data appear Lognormal at 5% Significance Level			
528					Lilliefors Test Statistic	0.223			Lilliefors Lognormal GOF Test			
529					5% Lilliefors Critical Value	0.304			Data appear Lognormal at 5% Significance Level			
530					Data appear Lognormal at 5% Significance Level							

531											
532	Background Statistics assuming Lognormal Distribution										
533			95% UTL with	95% Coverage	424			90% Percentile (z)	239.7		
534				95% UPL (t)	297			95% Percentile (z)	264.4		
535				95% USL	286.1			99% Percentile (z)	317.6		
536											
537	Nonparametric Distribution Free Background Statistics										
538	Data appear Normal at 5% Significance Level										
539											
540	Nonparametric Upper Limits for Background Threshold Values										
541				Order of Statistic, r	7			95% UTL with	95% Coverage	226	
542				Approx, f used to compute achieved CC	0.368			pproximate Actual Confidence Coefficient achieved by UTL		0.302	
543								Approximate Sample Size needed to achieve specified CC		59	
544			95% Percentile Bootstrap UTL with	95% Coverage	226			95% BCA Bootstrap UTL with	95% Coverage	226	
545				95% UPL	226			90% Percentile		224.2	
546				90% Chebyshev UPL	320.7			95% Percentile		225.1	
547				95% Chebyshev UPL	386.8			99% Percentile		225.8	
548				95% USL	226						
549											
550	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
551	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
552	and consists of observations collected from clean unimpacted locations.										
553	The use of USL tends to provide a balance between false positives and false negatives provided the data										
554	represents a background data set and when many onsite observations need to be compared with the BTV.										
555											
556	Cobalt										
557											
558	General Statistics										
559				Total Number of Observations	52			Number of Distinct Observations		37	
560								Number of Missing Observations		453	
561				Minimum	3.0000E-4			First Quartile		5.7500E-4	
562				Second Largest	0.0056			Median		8.6000E-4	
563				Maximum	0.0062			Third Quartile		0.004	
564				Mean	0.00182			SD		0.00187	
565				Coefficient of Variation	1.03			Skewness		1.131	
566				Mean of logged Data	-6.805			SD of logged Data		0.987	
567											
568	Critical Values for Background Threshold Values (BTVs)										
569				Tolerance Factor K (For UTL)	2.049			d2max (for USL)		2.972	
570											
571	Normal GOF Test										
572				Shapiro Wilk Test Statistic	0.726			Normal GOF Test			
573				5% Shapiro Wilk P Value	3.802E-12			Data Not Normal at 5% Significance Level			
574				Lilliefors Test Statistic	0.303			Lilliefors GOF Test			
575				5% Lilliefors Critical Value	0.122			Data Not Normal at 5% Significance Level			
576	Data Not Normal at 5% Significance Level										
577											
578	Background Statistics Assuming Normal Distribution										
579			95% UTL with	95% Coverage	0.00566			90% Percentile (z)		0.00422	
580				95% UPL (t)	0.00499			95% Percentile (z)		0.0049	
581				95% USL	0.00739			99% Percentile (z)		0.00618	
582											
583	Gamma GOF Test										

584				A-D Test Statistic	3.513	Anderson-Darling Gamma GOF Test					
585				5% A-D Critical Value	0.776	Data Not Gamma Distributed at 5% Significance Level					
586				K-S Test Statistic	0.236	Kolmogorov-Smirnov Gamma GOF Test					
587				5% K-S Critical Value	0.126	Data Not Gamma Distributed at 5% Significance Level					
588				Data Not Gamma Distributed at 5% Significance Level							
589											
590				Gamma Statistics							
591				k hat (MLE)	1.148	k star (bias corrected MLE)	1.095				
592				Theta hat (MLE)	0.00158	Theta star (bias corrected MLE)	0.00166				
593				nu hat (MLE)	119.4	nu star (bias corrected)	113.9				
594				MLE Mean (bias corrected)	0.00182	MLE Sd (bias corrected)	0.00174				
595											
596				Background Statistics Assuming Gamma Distribution							
597				95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00526	90% Percentile	0.00409				
598				95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00536	95% Percentile	0.00528				
599				95% WH Approx. Gamma UTL with 95% Coverage	0.0066	99% Percentile	0.008				
600				95% HW Approx. Gamma UTL with 95% Coverage	0.00688						
601				95% WH USL	0.0111	95% HW USL	0.0123				
602											
603				Lognormal GOF Test							
604				Shapiro Wilk Test Statistic	0.869	Shapiro Wilk Lognormal GOF Test					
605				5% Shapiro Wilk P Value	5.5272E-6	Data Not Lognormal at 5% Significance Level					
606				Lilliefors Test Statistic	0.176	Lilliefors Lognormal GOF Test					
607				5% Lilliefors Critical Value	0.122	Data Not Lognormal at 5% Significance Level					
608				Data Not Lognormal at 5% Significance Level							
609											
610				Background Statistics assuming Lognormal Distribution							
611				95% UTL with 95% Coverage	0.00838	90% Percentile (z)	0.00393				
612				95% UPL (t)	0.00589	95% Percentile (z)	0.00562				
613				95% USL	0.0208	99% Percentile (z)	0.011				
614											
615				Nonparametric Distribution Free Background Statistics							
616				Data do not follow a Discernible Distribution (0.05)							
617											
618				Nonparametric Upper Limits for Background Threshold Values							
619				Order of Statistic, r	51	95% UTL with 95% Coverage	0.0056				
620				Approx, f used to compute achieved CC	1.342	pproximate Actual Confidence Coefficient achieved by UTL	0.741				
621						Approximate Sample Size needed to achieve specified CC	93				
622				95% Percentile Bootstrap UTL with 95% Coverage	0.00587	95% BCA Bootstrap UTL with 95% Coverage	0.00587				
623				95% UPL	0.00554	90% Percentile	0.00509				
624				90% Chebyshev UPL	0.00749	95% Percentile	0.00545				
625				95% Chebyshev UPL	0.0101	99% Percentile	0.00589				
626				95% USL	0.0062						
627											
628				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
629				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
630				and consists of observations collected from clean unimpacted locations.							
631				The use of USL tends to provide a balance between false positives and false negatives provided the data							
632				represents a background data set and when many onsite observations need to be compared with the BTV.							
633											
634	MOLYBDENUM										
635											
636	General Statistics										

637	Total Number of Observations				51			Number of Distinct Observations			23
638								Number of Missing Observations			454
639				Minimum	0.001				First Quartile		0.00165
640				Second Largest	0.0075				Median		0.002
641				Maximum	0.0083				Third Quartile		0.0039
642				Mean	0.00278				SD		0.00189
643				Coefficient of Variation	0.678				Skewness		1.321
644				Mean of logged Data	-6.076				SD of logged Data		0.608
645											
646	Critical Values for Background Threshold Values (BTVs)										
647				Tolerance Factor K (For UTL)	2.054				d2max (for USL)		2.965
648											
649	Normal GOF Test										
650				Shapiro Wilk Test Statistic	0.802			Normal GOF Test			
651				5% Shapiro Wilk P Value	8.2683E-9			Data Not Normal at 5% Significance Level			
652				Lilliefors Test Statistic	0.288			Lilliefors GOF Test			
653				5% Lilliefors Critical Value	0.123			Data Not Normal at 5% Significance Level			
654	Data Not Normal at 5% Significance Level										
655											
656	Background Statistics Assuming Normal Distribution										
657			95% UTL with	95% Coverage	0.00666				90% Percentile (z)		0.0052
658				95% UPL (t)	0.00598				95% Percentile (z)		0.00589
659				95% USL	0.00838				99% Percentile (z)		0.00717
660											
661	Gamma GOF Test										
662				A-D Test Statistic	2.312			Anderson-Darling Gamma GOF Test			
663				5% A-D Critical Value	0.758			Data Not Gamma Distributed at 5% Significance Level			
664				K-S Test Statistic	0.234			Kolmogorov-Smirnov Gamma GOF Test			
665				5% K-S Critical Value	0.125			Data Not Gamma Distributed at 5% Significance Level			
666	Data Not Gamma Distributed at 5% Significance Level										
667											
668	Gamma Statistics										
669				k hat (MLE)	2.757				k star (bias corrected MLE)		2.608
670				Theta hat (MLE)	0.00101				Theta star (bias corrected MLE)		0.00107
671				nu hat (MLE)	281.2				nu star (bias corrected)		266
672				MLE Mean (bias corrected)	0.00278				MLE Sd (bias corrected)		0.00172
673											
674	Background Statistics Assuming Gamma Distribution										
675			95% Wilson Hilferty (WH) Approx. Gamma UPL		0.00613				90% Percentile		0.00509
676			95% Hawkins Wixley (HW) Approx. Gamma UPL		0.00618				95% Percentile		0.00609
677			95% WH Approx. Gamma UTL with	95% Coverage	0.00722				99% Percentile		0.00826
678			95% HW Approx. Gamma UTL with	95% Coverage	0.00737						
679				95% WH USL	0.0105				95% HW USL		0.0111
680											
681	Lognormal GOF Test										
682				Shapiro Wilk Test Statistic	0.901			Shapiro Wilk Lognormal GOF Test			
683				5% Shapiro Wilk P Value	2.5525E-4			Data Not Lognormal at 5% Significance Level			
684				Lilliefors Test Statistic	0.195			Lilliefors Lognormal GOF Test			
685				5% Lilliefors Critical Value	0.123			Data Not Lognormal at 5% Significance Level			
686	Data Not Lognormal at 5% Significance Level										
687											
688	Background Statistics assuming Lognormal Distribution										
689			95% UTL with	95% Coverage	0.00801				90% Percentile (z)		0.00501

690				95% UPL (t)	0.00643				95% Percentile (z)	0.00625	
691				95% USL	0.0139				99% Percentile (z)	0.00946	
692											
693	Nonparametric Distribution Free Background Statistics										
694	Data do not follow a Discernible Distribution (0.05)										
695											
696	Nonparametric Upper Limits for Background Threshold Values										
697				Order of Statistic, r	50				95% UTL with 95% Coverage	0.0075	
698				Approx, f used to compute achieved CC	1.316				pproximate Actual Confidence Coefficient achieved by UTL	0.731	
699									Approximate Sample Size needed to achieve specified CC	93	
700			95% Percentile Bootstrap UTL with	95% Coverage	0.0079				95% BCA Bootstrap UTL with 95% Coverage	0.0075	
701				95% UPL	0.0069				90% Percentile	0.0057	
702				90% Chebyshev UPL	0.0085				95% Percentile	0.00645	
703				95% Chebyshev UPL	0.0111				99% Percentile	0.0079	
704				95% USL	0.0083						
705											
706	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
707	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
708	and consists of observations collected from clean unimpacted locations.										
709	The use of USL tends to provide a balance between false positives and false negatives provided the data										
710	represents a background data set and when many onsite observations need to be compared with the BTV.										
711											
712	Selenium										
713											
714	General Statistics										
715				Total Number of Observations	60				Number of Distinct Observations	5	
716									Number of Missing Observations	445	
717				Minimum	0.001				First Quartile	0.001	
718				Second Largest	0.025				Median	0.001	
719				Maximum	0.025				Third Quartile	0.001	
720				Mean	0.00381				SD	0.00777	
721				Coefficient of Variation	2.037				Skewness	2.45	
722				Mean of logged Data	-6.522				SD of logged Data	1.039	
723											
724	Critical Values for Background Threshold Values (BTVs)										
725				Tolerance Factor K (For UTL)	2.017				d2max (for USL)	3.027	
726											
727	Normal GOF Test										
728				Shapiro Wilk Test Statistic	0.375				Normal GOF Test		
729				5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
730				Lilliefors Test Statistic	0.51				Lilliefors GOF Test		
731				5% Lilliefors Critical Value	0.114				Data Not Normal at 5% Significance Level		
732	Data Not Normal at 5% Significance Level										
733											
734	Background Statistics Assuming Normal Distribution										
735			95% UTL with	95% Coverage	0.0195				90% Percentile (z)	0.0138	
736				95% UPL (t)	0.0169				95% Percentile (z)	0.0166	
737				95% USL	0.0273				99% Percentile (z)	0.0219	
738											
739	Gamma GOF Test										
740				A-D Test Statistic	19.19				Anderson-Darling Gamma GOF Test		
741				5% A-D Critical Value	0.802				Data Not Gamma Distributed at 5% Significance Level		
742				K-S Test Statistic	0.499				Kolmogorov-Smirnov Gamma GOF Test		

743				5% K-S Critical Value	0.12	Data Not Gamma Distributed at 5% Significance Level					
744	Data Not Gamma Distributed at 5% Significance Level										
745											
746	Gamma Statistics										
747				k hat (MLE)	0.643	k star (bias corrected MLE)				0.622	
748				Theta hat (MLE)	0.00593	Theta star (bias corrected MLE)				0.00613	
749				nu hat (MLE)	77.11	nu star (bias corrected)				74.59	
750				MLE Mean (bias corrected)	0.00381	MLE Sd (bias corrected)				0.00483	
751											
752	Background Statistics Assuming Gamma Distribution										
753			95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0118	90% Percentile				0.00983	
754			95% Hawkins Wixley (HW) Approx. Gamma UPL		0.011	95% Percentile				0.0135	
755			95% WH Approx. Gamma UTL with	95% Coverage	0.0153	99% Percentile				0.0225	
756			95% HW Approx. Gamma UTL with	95% Coverage	0.0145						
757				95% WH USL	0.0301	95% HW USL				0.0308	
758											
759	Lognormal GOF Test										
760				Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Lognormal GOF Test					
761				5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
762				Lilliefors Test Statistic	0.462	Lilliefors Lognormal GOF Test					
763				5% Lilliefors Critical Value	0.114	Data Not Lognormal at 5% Significance Level					
764	Data Not Lognormal at 5% Significance Level										
765											
766	Background Statistics assuming Lognormal Distribution										
767			95% UTL with	95% Coverage	0.012	90% Percentile (z)				0.00557	
768				95% UPL (t)	0.00847	95% Percentile (z)				0.00813	
769				95% USL	0.0342	99% Percentile (z)				0.0165	
770											
771	Nonparametric Distribution Free Background Statistics										
772	Data do not follow a Discernible Distribution (0.05)										
773											
774	Nonparametric Upper Limits for Background Threshold Values										
775				Order of Statistic, r	59	95% UTL with	95% Coverage			0.025	
776				Approx, f used to compute achieved CC	1.553	pproximate Actual Confidence Coefficient achieved by UTL				0.808	
777						Approximate Sample Size needed to achieve specified CC				93	
778			95% Percentile Bootstrap UTL with	95% Coverage	0.025	95% BCA Bootstrap UTL with	95% Coverage			0.025	
779				95% UPL	0.025	90% Percentile				0.025	
780				90% Chebyshev UPL	0.0273	95% Percentile				0.025	
781				95% Chebyshev UPL	0.0379	99% Percentile				0.025	
782				95% USL	0.025						
783											
784	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
785	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
786	and consists of observations collected from clean unimpacted locations.										
787	The use of USL tends to provide a balance between false positives and false negatives provided the data										
788	represents a background data set and when many onsite observations need to be compared with the BTV.										
789											
790	Thallium										
791											
792	General Statistics										
793				Total Number of Observations	64	Number of Distinct Observations				2	
794						Number of Missing Observations				292	
795				Minimum	2.0000E-4	First Quartile				2.0000E-4	

796				Second Largest	0.02				Median	2.0000E-4	
797				Maximum	0.02				Third Quartile	2.0000E-4	
798				Mean	0.00237				SD	0.00623	
799				Coefficient of Variation	2.633				Skewness	2.564	
800				Mean of logged Data	-8.014				SD of logged Data	1.449	
801											
802				Critical Values for Background Threshold Values (BTVs)							
803				Tolerance Factor K (For UTL)	2.003				d2max (for USL)	3.051	
804											
805				Normal GOF Test							
806				Shapiro Wilk Test Statistic	0.36			Normal GOF Test			
807				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
808				Lilliefors Test Statistic	0.527			Lilliefors GOF Test			
809				5% Lilliefors Critical Value	0.111			Data Not Normal at 5% Significance Level			
810				Data Not Normal at 5% Significance Level							
811											
812				Background Statistics Assuming Normal Distribution							
813			95% UTL with	95% Coverage	0.0148			90% Percentile (z)		0.0103	
814				95% UPL (t)	0.0128			95% Percentile (z)		0.0126	
815				95% USL	0.0214			99% Percentile (z)		0.0169	
816											
817				Gamma GOF Test							
818				A-D Test Statistic	21.31			Anderson-Darling Gamma GOF Test			
819				5% A-D Critical Value	0.854			Data Not Gamma Distributed at 5% Significance Level			
820				K-S Test Statistic	0.56			Kolmogorov-Smirnov Gamma GOF Test			
821				5% K-S Critical Value	0.12			Data Not Gamma Distributed at 5% Significance Level			
822				Data Not Gamma Distributed at 5% Significance Level							
823											
824				Gamma Statistics							
825				k hat (MLE)	0.343			k star (bias corrected MLE)		0.337	
826				Theta hat (MLE)	0.0069			Theta star (bias corrected MLE)		0.00701	
827				nu hat (MLE)	43.91			nu star (bias corrected)		43.18	
828				MLE Mean (bias corrected)	0.00237			MLE Sd (bias corrected)		0.00407	
829											
830				Background Statistics Assuming Gamma Distribution							
831			95% Wilson Hilferty (WH) Approx. Gamma UPL		0.00736			90% Percentile		0.00687	
832			95% Hawkins Wixley (HW) Approx. Gamma UPL		0.00643			95% Percentile		0.0104	
833			95% WH Approx. Gamma UTL with	95% Coverage	0.0101			99% Percentile		0.0195	
834			95% HW Approx. Gamma UTL with	95% Coverage	0.00913						
835				95% WH USL	0.0234			95% HW USL		0.0241	
836											
837				Lognormal GOF Test							
838				Shapiro Wilk Test Statistic	0.36			Shapiro Wilk Lognormal GOF Test			
839				5% Shapiro Wilk P Value	0			Data Not Lognormal at 5% Significance Level			
840				Lilliefors Test Statistic	0.527			Lilliefors Lognormal GOF Test			
841				5% Lilliefors Critical Value	0.111			Data Not Lognormal at 5% Significance Level			
842				Data Not Lognormal at 5% Significance Level							
843											
844				Background Statistics assuming Lognormal Distribution							
845			95% UTL with	95% Coverage	0.00603			90% Percentile (z)		0.00212	
846				95% UPL (t)	0.00379			95% Percentile (z)		0.00359	
847				95% USL	0.0275			99% Percentile (z)		0.00963	
848											

	A	B	C	D	E	F	G	H	I	J	K	L
849	Nonparametric Distribution Free Background Statistics											
850	Data do not follow a Discernible Distribution (0.05)											
851												
852	Nonparametric Upper Limits for Background Threshold Values											
853					Order of Statistic, r	63			95% UTL with	95% Coverage		0.02
854					Approx, f used to compute achieved CC	1.658			pproximate Actual Confidence Coefficient achieved by UTL			0.836
855									Approximate Sample Size needed to achieve specified CC			93
856				95% Percentile Bootstrap UTL with	95% Coverage	N/A			95% BCA Bootstrap UTL with	95% Coverage		N/A
857					95% UPL	0.02				90% Percentile		0.0141
858					90% Chebyshev UPL	0.0212				95% Percentile		0.02
859					95% Chebyshev UPL	0.0297				99% Percentile		0.02
860					95% USL	0.02						
861												
862	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
863	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
864	and consists of observations collected from clean unimpacted locations.											
865	The use of USL tends to provide a balance between false positives and false negatives provided the data											
866	represents a background data set and when many onsite observations need to be compared with the BTV.											
867												

1			Background Statistics for Uncensored Full Data Sets								
2	User Selected Options										
3	Date/Time of Computation		ProUCL 5.11/6/2021 1:41:05 PM								
4	From File		C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Lansing Facility\oddball analytes.xlsx								
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	Fluoride										
12											
13	General Statistics										
14				Total Number of Observations		87			Number of Distinct Observations		17
15									Number of Missing Observations		37
16				Minimum		0.05			First Quartile		0.25
17				Second Largest		0.26			Median		0.25
18				Maximum		0.33			Third Quartile		0.25
19				Mean		0.225			SD		0.0582
20				Coefficient of Variation		0.259			Skewness		-1.948
21				Mean of logged Data		-1.553			SD of logged Data		0.412
22											
23				Critical Values for Background Threshold Values (BTVs)							
24				Tolerance Factor K (For UTL)		1.946			d2max (for USL)		3.161
25											
26				Normal GOF Test							
27				Shapiro Wilk Test Statistic		0.58			Normal GOF Test		
28				5% Shapiro Wilk P Value		0			Data Not Normal at 5% Significance Level		
29				Lilliefors Test Statistic		0.449			Lilliefors GOF Test		
30				5% Lilliefors Critical Value		0.0951			Data Not Normal at 5% Significance Level		
31				Data Not Normal at 5% Significance Level							
32											
33				Background Statistics Assuming Normal Distribution							
34				95% UTL with 95% Coverage		0.338			90% Percentile (z)		0.299
35				95% UPL (t)		0.322			95% Percentile (z)		0.32
36				95% USL		0.409			99% Percentile (z)		0.36
37											
38				Gamma GOF Test							
39				A-D Test Statistic		18.81			Anderson-Darling Gamma GOF Test		
40				5% A-D Critical Value		0.753			Data Not Gamma Distributed at 5% Significance Level		
41				K-S Test Statistic		0.447			Kolmogorov-Smirnov Gamma GOF Test		
42				5% K-S Critical Value		0.0959			Data Not Gamma Distributed at 5% Significance Level		
43				Data Not Gamma Distributed at 5% Significance Level							
44											
45				Gamma Statistics							
46				k hat (MLE)		8.419			k star (bias corrected MLE)		8.136
47				Theta hat (MLE)		0.0267			Theta star (bias corrected MLE)		0.0276
48				nu hat (MLE)		1465			nu star (bias corrected)		1416
49				MLE Mean (bias corrected)		0.225			MLE Sd (bias corrected)		0.0788
50											
51				Background Statistics Assuming Gamma Distribution							
52				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.369			90% Percentile		0.33
53				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.379			95% Percentile		0.368

54			95% WH Approx. Gamma UTL with	95% Coverage	0.399				99% Percentile		0.447
55			95% HW Approx. Gamma UTL with	95% Coverage	0.413						
56				95% WH USL	0.553				95% HW USL		0.591
57											
58					Lognormal GOF Test						
59				Shapiro Wilk Test Statistic	0.511			Shapiro Wilk Lognormal GOF Test			
60				5% Shapiro Wilk P Value	0			Data Not Lognormal at 5% Significance Level			
61				Lilliefors Test Statistic	0.439			Lilliefors Lognormal GOF Test			
62				5% Lilliefors Critical Value	0.0951			Data Not Lognormal at 5% Significance Level			
63					Data Not Lognormal at 5% Significance Level						
64											
65					Background Statistics assuming Lognormal Distribution						
66			95% UTL with	95% Coverage	0.472				90% Percentile (z)		0.359
67				95% UPL (t)	0.421				95% Percentile (z)		0.417
68				95% USL	0.778				99% Percentile (z)		0.552
69											
70					Nonparametric Distribution Free Background Statistics						
71					Data do not follow a Discernible Distribution (0.05)						
72											
73					Nonparametric Upper Limits for Background Threshold Values						
74				Order of Statistic, r	85			95% UTL with	95% Coverage		0.26
75				Approx, f used to compute achieved CC	1.491			pproximate Actual Confidence Coefficient achieved by UTL			0.816
76								Approximate Sample Size needed to achieve specified CC			124
77			95% Percentile Bootstrap UTL with	95% Coverage	0.26			95% BCA Bootstrap UTL with	95% Coverage		0.25
78				95% UPL	0.25				90% Percentile		0.25
79				90% Chebyshev UPL	0.4				95% Percentile		0.25
80				95% Chebyshev UPL	0.48				99% Percentile		0.27
81				95% USL	0.33						
82											
83					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
84					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
85					and consists of observations collected from clean unimpacted locations.						
86					The use of USL tends to provide a balance between false positives and false negatives provided the data						
87					represents a background data set and when many onsite observations need to be compared with the BTV.						
88											
89	Radium (226)										
90											
91	General Statistics										
92				Total Number of Observations	55				Number of Distinct Observations		52
93									Number of Missing Observations		69
94				Minimum	0.0816				First Quartile		0.207
95				Second Largest	0.77				Median		0.353
96				Maximum	0.881				Third Quartile		0.534
97				Mean	0.387				SD		0.209
98				Coefficient of Variation	0.541				Skewness		0.517
99				Mean of logged Data	-1.116				SD of logged Data		0.618
100											
101					Critical Values for Background Threshold Values (BTVs)						
102				Tolerance Factor K (For UTL)	2.036				d2max (for USL)		2.994
103											
104					Normal GOF Test						
105				Shapiro Wilk Test Statistic	0.936			Normal GOF Test			
106				5% Shapiro Wilk P Value	0.00856			Data Not Normal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
107					Lilliefors Test Statistic	0.133	Lilliefors GOF Test					
108					5% Lilliefors Critical Value	0.119	Data Not Normal at 5% Significance Level					
109	Data Not Normal at 5% Significance Level											
110												
111	Background Statistics Assuming Normal Distribution											
112			95% UTL with	95% Coverage		0.813			90% Percentile (z)			0.655
113					95% UPL (t)	0.74			95% Percentile (z)			0.731
114					95% USL	1.013			99% Percentile (z)			0.873
115												
116	Gamma GOF Test											
117					A-D Test Statistic	0.42	Anderson-Darling Gamma GOF Test					
118					5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level					
119					K-S Test Statistic	0.0738	Kolmogorov-Smirnov Gamma GOF Test					
120					5% K-S Critical Value	0.121	Detected data appear Gamma Distributed at 5% Significance Level					
121	Detected data appear Gamma Distributed at 5% Significance Level											
122												
123	Gamma Statistics											
124					k hat (MLE)	3.159			k star (bias corrected MLE)			2.999
125					Theta hat (MLE)	0.122			Theta star (bias corrected MLE)			0.129
126					nu hat (MLE)	347.5			nu star (bias corrected)			329.9
127					MLE Mean (bias corrected)	0.387			MLE Sd (bias corrected)			0.223
128												
129	Background Statistics Assuming Gamma Distribution											
130			95% Wilson Hilferty (WH) Approx. Gamma UPL			0.82			90% Percentile			0.686
131			95% Hawkins Wixley (HW) Approx. Gamma UPL			0.84			95% Percentile			0.812
132			95% WH Approx. Gamma UTL with	95% Coverage		0.952			99% Percentile			1.084
133			95% HW Approx. Gamma UTL with	95% Coverage		0.988						
134					95% WH USL	1.39			95% HW USL			1.496
135												
136	Lognormal GOF Test											
137					Shapiro Wilk Test Statistic	0.943	Shapiro Wilk Lognormal GOF Test					
138					5% Shapiro Wilk P Value	0.0186	Data Not Lognormal at 5% Significance Level					
139					Lilliefors Test Statistic	0.109	Lilliefors Lognormal GOF Test					
140					5% Lilliefors Critical Value	0.119	Data appear Lognormal at 5% Significance Level					
141	Data appear Approximate Lognormal at 5% Significance Level											
142												
143	Background Statistics assuming Lognormal Distribution											
144			95% UTL with	95% Coverage		1.152			90% Percentile (z)			0.723
145					95% UPL (t)	0.93			95% Percentile (z)			0.905
146					95% USL	2.082			99% Percentile (z)			1.378
147												
148	Nonparametric Distribution Free Background Statistics											
149	Data appear Gamma Distributed at 5% Significance Level											
150												
151	Nonparametric Upper Limits for Background Threshold Values											
152					Order of Statistic, r	54			95% UTL with	95% Coverage		0.77
153					Approx, f used to compute achieved CC	1.421			pproximate Actual Confidence Coefficient achieved by UTL			0.768
154									Approximate Sample Size needed to achieve specified CC			93
155			95% Percentile Bootstrap UTL with	95% Coverage		0.803			95% BCA Bootstrap UTL with	95% Coverage		0.794
156					95% UPL	0.764				90% Percentile		0.707
157					90% Chebyshev UPL	1.02				95% Percentile		0.759
158					95% Chebyshev UPL	1.307				99% Percentile		0.821
159					95% USL	0.881						

160											
161	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
162	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
163	and consists of observations collected from clean unimpacted locations.										
164	The use of USL tends to provide a balance between false positives and false negatives provided the data										
165	represents a background data set and when many onsite observations need to be compared with the BTV.										
166											
167	Radium 228										
168											
169	General Statistics										
170					Total Number of Observations	55			Number of Distinct Observations	54	
171									Number of Missing Observations	69	
172					Minimum	0.297			First Quartile	0.511	
173					Second Largest	1.75			Median	0.654	
174					Maximum	1.88			Third Quartile	0.861	
175					Mean	0.738			SD	0.34	
176					Coefficient of Variation	0.46			Skewness	1.559	
177					Mean of logged Data	-0.392			SD of logged Data	0.412	
178											
179	Critical Values for Background Threshold Values (BTVs)										
180					Tolerance Factor K (For UTL)	2.036			d2max (for USL)	2.994	
181											
182	Normal GOF Test										
183					Shapiro Wilk Test Statistic	0.862			Normal GOF Test		
184					5% Shapiro Wilk P Value	1.2002E-6			Data Not Normal at 5% Significance Level		
185					Lilliefors Test Statistic	0.152			Lilliefors GOF Test		
186					5% Lilliefors Critical Value	0.119			Data Not Normal at 5% Significance Level		
187	Data Not Normal at 5% Significance Level										
188											
189	Background Statistics Assuming Normal Distribution										
190					95% UTL with 95% Coverage	1.43			90% Percentile (z)	1.173	
191					95% UPL (t)	1.312			95% Percentile (z)	1.297	
192					95% USL	1.755			99% Percentile (z)	1.528	
193											
194	Gamma GOF Test										
195					A-D Test Statistic	0.628			Anderson-Darling Gamma GOF Test		
196					5% A-D Critical Value	0.753			Detected data appear Gamma Distributed at 5% Significance Level		
197					K-S Test Statistic	0.0983			Kolmogorov-Smirnov Gamma GOF Test		
198					5% K-S Critical Value	0.12			Detected data appear Gamma Distributed at 5% Significance Level		
199	Detected data appear Gamma Distributed at 5% Significance Level										
200											
201	Gamma Statistics										
202					k hat (MLE)	5.865			k star (bias corrected MLE)	5.557	
203					Theta hat (MLE)	0.126			Theta star (bias corrected MLE)	0.133	
204					nu hat (MLE)	645.1			nu star (bias corrected)	611.3	
205					MLE Mean (bias corrected)	0.738			MLE Sd (bias corrected)	0.313	
206											
207	Background Statistics Assuming Gamma Distribution										
208					95% Wilson Hilferty (WH) Approx. Gamma UPL	1.323			90% Percentile	1.157	
209					95% Hawkins Wixley (HW) Approx. Gamma UPL	1.329			95% Percentile	1.317	
210					95% WH Approx. Gamma UTL with 95% Coverage	1.487			99% Percentile	1.653	
211					95% HW Approx. Gamma UTL with 95% Coverage	1.502					
212					95% WH USL	2.008			95% HW USL	2.066	

213											
214					Lognormal GOF Test						
215				Shapiro Wilk Test Statistic	0.975	Shapiro Wilk Lognormal GOF Test					
216				5% Shapiro Wilk P Value	0.521	Data appear Lognormal at 5% Significance Level					
217				Lilliefors Test Statistic	0.0689	Lilliefors Lognormal GOF Test					
218				5% Lilliefors Critical Value	0.119	Data appear Lognormal at 5% Significance Level					
219					Data appear Lognormal at 5% Significance Level						
220											
221					Background Statistics assuming Lognormal Distribution						
222				95% UTL with 95% Coverage	1.563	90% Percentile (z)	1.146				
223				95% UPL (t)	1.355	95% Percentile (z)	1.33				
224				95% USL	2.318	99% Percentile (z)	1.761				
225											
226					Nonparametric Distribution Free Background Statistics						
227					Data appear Gamma Distributed at 5% Significance Level						
228											
229					Nonparametric Upper Limits for Background Threshold Values						
230				Order of Statistic, r	54	95% UTL with 95% Coverage	1.75				
231				Approx, f used to compute achieved CC	1.421	pproximate Actual Confidence Coefficient achieved by UTL	0.768				
232						Approximate Sample Size needed to achieve specified CC	93				
233				95% Percentile Bootstrap UTL with 95% Coverage	1.789	95% BCA Bootstrap UTL with 95% Coverage	1.75				
234				95% UPL	1.598	90% Percentile	1.094				
235				90% Chebyshev UPL	1.766	95% Percentile	1.455				
236				95% Chebyshev UPL	2.232	99% Percentile	1.81				
237				95% USL	1.88						
238											
239					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
240					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
241					and consists of observations collected from clean unimpacted locations.						
242					The use of USL tends to provide a balance between false positives and false negatives provided the data						
243					represents a background data set and when many onsite observations need to be compared with the BTV.						
244											
245	Sulfate										
246											
247	General Statistics										
248				Total Number of Observations	109	Number of Distinct Observations	99				
249						Number of Missing Observations	12				
250				Minimum	2.9	First Quartile	28.9				
251				Second Largest	307	Median	82.3				
252				Maximum	359	Third Quartile	124				
253				Mean	86.93	SD	71.8				
254				Coefficient of Variation	0.826	Skewness	1.373				
255				Mean of logged Data	4.046	SD of logged Data	1.047				
256											
257					Critical Values for Background Threshold Values (BTVs)						
258				Tolerance Factor K (For UTL)	1.91	d2max (for USL)	3.239				
259											
260					Normal GOF Test						
261				Shapiro Wilk Test Statistic	0.866	Normal GOF Test					
262				5% Shapiro Wilk P Value	1.521E-14	Data Not Normal at 5% Significance Level					
263				Lilliefors Test Statistic	0.121	Lilliefors GOF Test					
264				5% Lilliefors Critical Value	0.0852	Data Not Normal at 5% Significance Level					
265					Data Not Normal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	Background Statistics Assuming Normal Distribution											
268					95% UTL with	95% Coverage	224.1			90% Percentile (z)		178.9
269					95% UPL (t)		206.6			95% Percentile (z)		205
270					95% USL		319.5			99% Percentile (z)		254
271												
272	Gamma GOF Test											
273					A-D Test Statistic		1.114	Anderson-Darling Gamma GOF Test				
274					5% A-D Critical Value		0.774	Data Not Gamma Distributed at 5% Significance Level				
275					K-S Test Statistic		0.125	Kolmogorov-Smirnov Gamma GOF Test				
276					5% K-S Critical Value		0.0891	Data Not Gamma Distributed at 5% Significance Level				
277	Data Not Gamma Distributed at 5% Significance Level											
278												
279	Gamma Statistics											
280					k hat (MLE)		1.336			k star (bias corrected MLE)		1.305
281					Theta hat (MLE)		65.08			Theta star (bias corrected MLE)		66.61
282					nu hat (MLE)		291.2			nu star (bias corrected)		284.5
283					MLE Mean (bias corrected)		86.93			MLE Sd (bias corrected)		76.1
284												
285	Background Statistics Assuming Gamma Distribution											
286					95% Wilson Hilferty (WH) Approx. Gamma UPL		236.8			90% Percentile		187.4
287					95% Hawkins Wixley (HW) Approx. Gamma UPL		249.1			95% Percentile		237.4
288					95% WH Approx. Gamma UTL with	95% Coverage	274.1			99% Percentile		351.2
289					95% HW Approx. Gamma UTL with	95% Coverage	293.4					
290					95% WH USL		547.7			95% HW USL		646.5
291												
292	Lognormal GOF Test											
293					Shapiro Wilk Test Statistic		0.931	Shapiro Wilk Lognormal GOF Test				
294					5% Shapiro Wilk P Value		7.9264E-6	Data Not Lognormal at 5% Significance Level				
295					Lilliefors Test Statistic		0.161	Lilliefors Lognormal GOF Test				
296					5% Lilliefors Critical Value		0.0852	Data Not Lognormal at 5% Significance Level				
297	Data Not Lognormal at 5% Significance Level											
298												
299	Background Statistics assuming Lognormal Distribution											
300					95% UTL with	95% Coverage	422.3			90% Percentile (z)		218.7
301					95% UPL (t)		327.2			95% Percentile (z)		319.8
302					95% USL		1696			99% Percentile (z)		652.7
303												
304	Nonparametric Distribution Free Background Statistics											
305	Data do not follow a Discernible Distribution (0.05)											
306												
307	Nonparametric Upper Limits for Background Threshold Values											
308					Order of Statistic, r		107			95% UTL with	95% Coverage	297
309					Approx, f used to compute achieved CC		1.877			pproximate Actual Confidence Coefficient achieved by UTL		0.914
310										Approximate Sample Size needed to achieve specified CC		124
311					95% Percentile Bootstrap UTL with	95% Coverage	287.4			95% BCA Bootstrap UTL with	95% Coverage	291.4
312					95% UPL		265			90% Percentile		155.2
313					90% Chebyshev UPL		303.3			95% Percentile		254.8
314					95% Chebyshev UPL		401.3			99% Percentile		306.2
315					95% USL		359					
316												
317	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
318	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											

319	and consists of observations collected from clean unimpacted locations.										
320	The use of USL tends to provide a balance between false positives and false negatives provided the data										
321	represents a background data set and when many onsite observations need to be compared with the BTV.										
322											
323	Total Dissolved Solids										
324											
325	General Statistics										
326					Total Number of Observations	114			Number of Distinct Observations	95	
327									Number of Missing Observations	10	
328					Minimum	287			First Quartile	582.8	
329					Second Largest	1300			Median	796	
330					Maximum	1380			Third Quartile	870.5	
331					Mean	763.7			SD	226.7	
332					Coefficient of Variation	0.297			Skewness	0.264	
333					Mean of logged Data	6.591			SD of logged Data	0.32	
334											
335	Critical Values for Background Threshold Values (BTVs)										
336					Tolerance Factor K (For UTL)	1.904			d2max (for USL)	3.254	
337											
338	Normal GOF Test										
339					Shapiro Wilk Test Statistic	0.967			Normal GOF Test		
340					5% Shapiro Wilk P Value	0.0648			Data appear Normal at 5% Significance Level		
341					Lilliefors Test Statistic	0.0873			Lilliefors GOF Test		
342					5% Lilliefors Critical Value	0.0833			Data Not Normal at 5% Significance Level		
343	Data appear Approximate Normal at 5% Significance Level										
344											
345	Background Statistics Assuming Normal Distribution										
346				95% UTL with	95% Coverage	1195			90% Percentile (z)	1054	
347					95% UPL (t)	1141			95% Percentile (z)	1137	
348					95% USL	1501			99% Percentile (z)	1291	
349											
350	Gamma GOF Test										
351					A-D Test Statistic	1.019			Anderson-Darling Gamma GOF Test		
352					5% A-D Critical Value	0.752			Data Not Gamma Distributed at 5% Significance Level		
353					K-S Test Statistic	0.106			Kolmogorov-Smirnov Gamma GOF Test		
354					5% K-S Critical Value	0.0858			Data Not Gamma Distributed at 5% Significance Level		
355	Data Not Gamma Distributed at 5% Significance Level										
356											
357	Gamma Statistics										
358					k hat (MLE)	10.7			k star (bias corrected MLE)	10.42	
359					Theta hat (MLE)	71.37			Theta star (bias corrected MLE)	73.26	
360					nu hat (MLE)	2440			nu star (bias corrected)	2377	
361					MLE Mean (bias corrected)	763.7			MLE Sd (bias corrected)	236.5	
362											
363	Background Statistics Assuming Gamma Distribution										
364				95% Wilson Hilferty (WH) Approx. Gamma UPL		1193			90% Percentile	1078	
365				95% Hawkins Wixley (HW) Approx. Gamma UPL		1203			95% Percentile	1190	
366				95% WH Approx. Gamma UTL with	95% Coverage	1269			99% Percentile	1419	
367				95% HW Approx. Gamma UTL with	95% Coverage	1284					
368					95% WH USL	1767			95% HW USL	1824	
369											
370	Lognormal GOF Test										
371					Shapiro Wilk Test Statistic	0.948			Shapiro Wilk Lognormal GOF Test		

372				5% Shapiro Wilk P Value	5.8460E-4	Data Not Lognormal at 5% Significance Level						
373				Lilliefors Test Statistic	0.123	Lilliefors Lognormal GOF Test						
374				5% Lilliefors Critical Value	0.0833	Data Not Lognormal at 5% Significance Level						
375				Data Not Lognormal at 5% Significance Level								
376												
377				Background Statistics assuming Lognormal Distribution								
378				95% UTL with 95% Coverage	1339					90% Percentile (z)	1097	
379				95% UPL (t)	1241					95% Percentile (z)	1233	
380				95% USL	2062					99% Percentile (z)	1533	
381												
382				Nonparametric Distribution Free Background Statistics								
383				Data appear Approximate Normal at 5% Significance Level								
384												
385				Nonparametric Upper Limits for Background Threshold Values								
386				Order of Statistic, r	111					95% UTL with 95% Coverage	1260	
387				Approx, f used to compute achieved CC	1.461					pproximate Actual Confidence Coefficient achieved by UTL	0.827	
388										Approximate Sample Size needed to achieve specified CC	153	
389				95% Percentile Bootstrap UTL with 95% Coverage	1271					95% BCA Bootstrap UTL with 95% Coverage	1271	
390				95% UPL	1188					90% Percentile	1037	
391				90% Chebyshev UPL	1447					95% Percentile	1157	
392				95% Chebyshev UPL	1756					99% Percentile	1299	
393				95% USL	1380							
394												
395				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.								
396				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers								
397				and consists of observations collected from clean unimpacted locations.								
398				The use of USL tends to provide a balance between false positives and false negatives provided the data								
399				represents a background data set and when many onsite observations need to be compared with the BTV.								
400												

1			Background Statistics for Uncensored Full Data Sets								
2	User Selected Options										
3	Date/Time of Computation		ProUCL 5.11/6/2021 1:09:18 PM								
4	From File		C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Lansing Facility\2017 to 2020 stats raw_diss								
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	Chromium										
12											
13	General Statistics										
14				Total Number of Observations	68				Number of Distinct Observations	2	
15									Number of Missing Observations	156	
16				Minimum	0.004				First Quartile	0.004	
17				Second Largest	0.004				Median	0.004	
18				Maximum	0.0048				Third Quartile	0.004	
19				Mean	0.00401				SD	9.7014E-5	
20				Coefficient of Variation	0.0242				Skewness	8.246	
21				Mean of logged Data	-5.519				SD of logged Data	0.0221	
22											
23						Critical Values for Background Threshold Values (BTVs)						
24				Tolerance Factor K (For UTL)	1.991				d2max (for USL)	3.073	
25											
26						Normal GOF Test					
27				Shapiro Wilk Test Statistic	0.123				Normal GOF Test		
28				5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
29				Lilliefors Test Statistic	0.534				Lilliefors GOF Test		
30				5% Lilliefors Critical Value	0.107				Data Not Normal at 5% Significance Level		
31						Data Not Normal at 5% Significance Level					
32											
33						Background Statistics Assuming Normal Distribution					
34				95% UTL with 95% Coverage	0.0042				90% Percentile (z)	0.00414	
35				95% UPL (t)	0.00417				95% Percentile (z)	0.00417	
36				95% USL	0.00431				99% Percentile (z)	0.00424	
37											
38						Gamma GOF Test					
39				A-D Test Statistic	26.08				Anderson-Darling Gamma GOF Test		
40				5% A-D Critical Value	0.749				Data Not Gamma Distributed at 5% Significance Level		
41				K-S Test Statistic	0.542				Kolmogorov-Smirnov Gamma GOF Test		
42				5% K-S Critical Value	0.108				Data Not Gamma Distributed at 5% Significance Level		
43						Data Not Gamma Distributed at 5% Significance Level					
44											
45						Gamma Statistics					
46				k hat (MLE)	1956				k star (bias corrected MLE)	1870	
47				Theta hat (MLE)	2.0511E-6				Theta star (bias corrected MLE)	2.1458E-6	
48				nu hat (MLE)	266001				nu star (bias corrected)	254267	
49				MLE Mean (bias corrected)	0.00401				MLE Sd (bias corrected)	9.2781E-5	
50											
51						Background Statistics Assuming Gamma Distribution					
52				95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00417				90% Percentile	0.00413	
53				95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00417				95% Percentile	0.00417	

54	95% WH Approx. Gamma UTL with 95% Coverage				0.0042				99% Percentile		0.00423
55	95% HW Approx. Gamma UTL with 95% Coverage				0.00419						
56				95% WH USL	0.0043				95% HW USL		0.0043
57											
58	Lognormal GOF Test										
59				Shapiro Wilk Test Statistic	0.123	Shapiro Wilk Lognormal GOF Test					
60				5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
61				Lilliefors Test Statistic	0.534	Lilliefors Lognormal GOF Test					
62				5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level					
63	Data Not Lognormal at 5% Significance Level										
64											
65	Background Statistics assuming Lognormal Distribution										
66			95% UTL with 95% Coverage		0.00419				90% Percentile (z)		0.00413
67				95% UPL (t)	0.00416				95% Percentile (z)		0.00416
68				95% USL	0.00429				99% Percentile (z)		0.00422
69											
70	Nonparametric Distribution Free Background Statistics										
71	Data do not follow a Discernible Distribution (0.05)										
72											
73	Nonparametric Upper Limits for Background Threshold Values										
74				Order of Statistic, r	67				95% UTL with 95% Coverage		0.004
75			Approx, f used to compute achieved CC		1.763	pproximate Actual Confidence Coefficient achieved by UTL					0.86
76						Approximate Sample Size needed to achieve specified CC					93
77			95% Percentile Bootstrap UTL with 95% Coverage		N/A				95% BCA Bootstrap UTL with 95% Coverage		N/A
78				95% UPL	0.004				90% Percentile		0.004
79				90% Chebyshev UPL	0.0043				95% Percentile		0.004
80				95% Chebyshev UPL	0.00444				99% Percentile		0.00426
81				95% USL	0.0048						
82											
83	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
84	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
85	and consists of observations collected from clean unimpacted locations.										
86	The use of USL tends to provide a balance between false positives and false negatives provided the data										
87	represents a background data set and when many onsite observations need to be compared with the BTV.										
88											
89	Lead										
90											
91	General Statistics										
92				Total Number of Observations	68				Number of Distinct Observations		2
93									Number of Missing Observations		156
94				Minimum	0.01				First Quartile		0.01
95				Second Largest	0.01				Median		0.01
96				Maximum	0.02				Third Quartile		0.01
97				Mean	0.0101				SD		0.00121
98				Coefficient of Variation	0.12				Skewness		8.246
99				Mean of logged Data	-4.595				SD of logged Data		0.0841
100											
101	Critical Values for Background Threshold Values (BTVs)										
102				Tolerance Factor K (For UTL)	1.991				d2max (for USL)		3.073
103											
104	Normal GOF Test										
105				Shapiro Wilk Test Statistic	0.123	Normal GOF Test					
106				5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
107					Lilliefors Test Statistic	0.534	Lilliefors GOF Test					
108					5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level					
109	Data Not Normal at 5% Significance Level											
110												
111	Background Statistics Assuming Normal Distribution											
112				95% UTL with	95% Coverage	0.0126				90% Percentile (z)		0.0117
113					95% UPL (t)	0.0122				95% Percentile (z)		0.0121
114					95% USL	0.0139				99% Percentile (z)		0.013
115												
116	Gamma GOF Test											
117					A-D Test Statistic	25.88	Anderson-Darling Gamma GOF Test					
118					5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level					
119					K-S Test Statistic	0.535	Kolmogorov-Smirnov Gamma GOF Test					
120					5% K-S Critical Value	0.108	Data Not Gamma Distributed at 5% Significance Level					
121	Data Not Gamma Distributed at 5% Significance Level											
122												
123	Gamma Statistics											
124					k hat (MLE)	113.7				k star (bias corrected MLE)		108.7
125					Theta hat (MLE)	8.9274E-5				Theta star (bias corrected MLE)		9.3386E-5
126					nu hat (MLE)	15458				nu star (bias corrected)		14777
127					MLE Mean (bias corrected)	0.0101				MLE Sd (bias corrected)		9.7344E-4
128												
129	Background Statistics Assuming Gamma Distribution											
130				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0118				90% Percentile		0.0114
131				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.0118				95% Percentile		0.0118
132				95% WH Approx. Gamma UTL with	95% Coverage	0.0121				99% Percentile		0.0125
133				95% HW Approx. Gamma UTL with	95% Coverage	0.0121						
134					95% WH USL	0.0133				95% HW USL		0.0133
135												
136	Lognormal GOF Test											
137					Shapiro Wilk Test Statistic	0.123	Shapiro Wilk Lognormal GOF Test					
138					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
139					Lilliefors Test Statistic	0.534	Lilliefors Lognormal GOF Test					
140					5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level					
141	Data Not Lognormal at 5% Significance Level											
142												
143	Background Statistics assuming Lognormal Distribution											
144				95% UTL with	95% Coverage	0.0119				90% Percentile (z)		0.0113
145					95% UPL (t)	0.0116				95% Percentile (z)		0.0116
146					95% USL	0.0131				99% Percentile (z)		0.0123
147												
148	Nonparametric Distribution Free Background Statistics											
149	Data do not follow a Discernible Distribution (0.05)											
150												
151	Nonparametric Upper Limits for Background Threshold Values											
152					Order of Statistic, r	67				95% UTL with	95% Coverage	0.01
153					Approx, f used to compute achieved CC	1.763				pproximate Actual Confidence Coefficient achieved by UTL		0.86
154										Approximate Sample Size needed to achieve specified CC		93
155				95% Percentile Bootstrap UTL with	95% Coverage	N/A				95% BCA Bootstrap UTL with	95% Coverage	N/A
156					95% UPL	0.01				90% Percentile		0.01
157					90% Chebyshev UPL	0.0138				95% Percentile		0.01
158					95% Chebyshev UPL	0.0155				99% Percentile		0.0133
159					95% USL	0.02						

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Mercury

General Statistics

Total Number of Observations	68	Number of Distinct Observations	1
		Number of Missing Observations	162
Minimum	2.0000E-4	First Quartile	2.0000E-4
Second Largest	2.0000E-4	Median	2.0000E-4
Maximum	2.0000E-4	Third Quartile	2.0000E-4
Mean	2.0000E-4	SD	1.365E-19
Coefficient of Variation	6.827E-16	Skewness	-1.023

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Mercury was not processed!

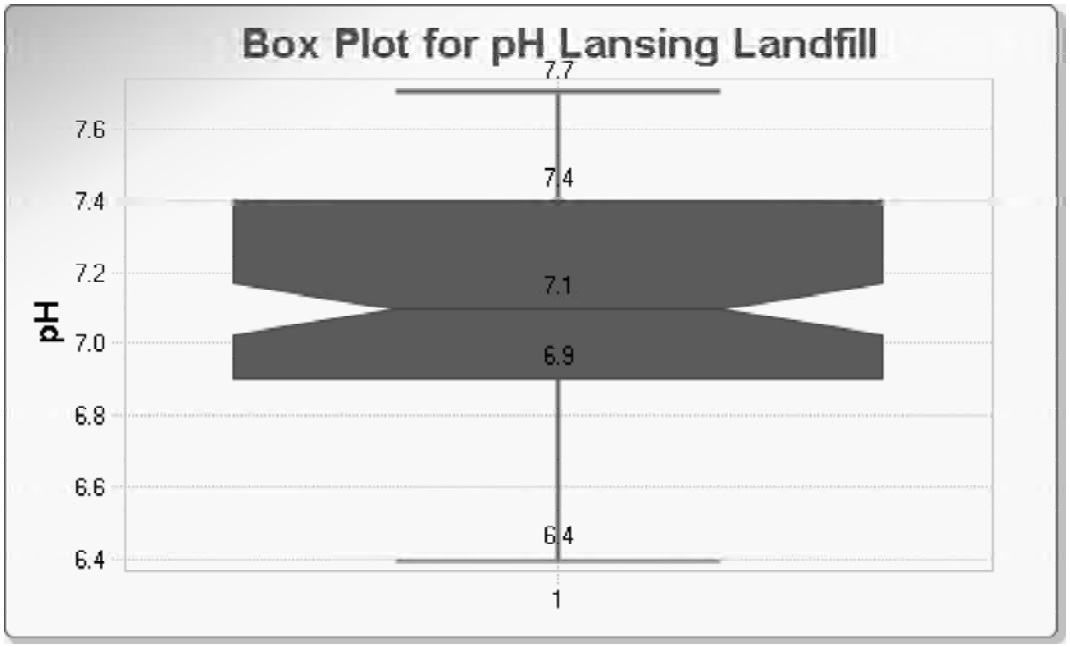
If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

1			Background Statistics for Uncensored Full Data Sets								
2	User Selected Options										
3	Date/Time of Computation		ProUCL 5.11/6/2021 4:55:19 PM								
4	From File		C:\Users\bjanowiak\Desktop\Projects Desktop\SKB\Lansing 2Q 2020\2020 4Q\Source file 4Q 2020._TOT								
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	|Chloride|T^										
12											
13	General Statistics										
14				Total Number of Observations	118			Number of Distinct Observations	102		
15				Minimum	500			First Quartile	19650		
16				Second Largest	120000			Median	28750		
17				Maximum	125000			Third Quartile	39550		
18				Mean	37686			SD	26835		
19				Coefficient of Variation	0.712			Skewness	1.556		
20				Mean of logged Data	10.3			SD of logged Data	0.787		
21											
22						Critical Values for Background Threshold Values (BTVs)						
23				Tolerance Factor K (For UTL)	1.899			d2max (for USL)	3.265		
24											
25						Normal GOF Test					
26				Shapiro Wilk Test Statistic	0.79			Normal GOF Test			
27				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
28				Lilliefors Test Statistic	0.237			Lilliefors GOF Test			
29				5% Lilliefors Critical Value	0.0819			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	88648			90% Percentile (z)	72077		
34				95% UPL (t)	82367			95% Percentile (z)	81826		
35				95% USL	125306			99% Percentile (z)	100115		
36											
37						Gamma GOF Test					
38				A-D Test Statistic	3.946			Anderson-Darling Gamma GOF Test			
39				5% A-D Critical Value	0.764			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic	0.151			Kolmogorov-Smirnov Gamma GOF Test			
41				5% K-S Critical Value	0.0858			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)	2.252			k star (bias corrected MLE)	2.201		
46				Theta hat (MLE)	16731			Theta star (bias corrected MLE)	17123		
47				nu hat (MLE)	531.6			nu star (bias corrected)	519.4		
48				MLE Mean (bias corrected)	37686			MLE Sd (bias corrected)	25403		
49											
50						Background Statistics Assuming Gamma Distribution					
51			95% Wilson Hilferty (WH) Approx. Gamma UPL		85776			90% Percentile	71676		
52			95% Hawkins Wixley (HW) Approx. Gamma UPL		88341			95% Percentile	86751		
53			95% WH Approx. Gamma UTL with	95% Coverage	96173			99% Percentile	119998		

54	95% HW Approx. Gamma UTL with 95% Coverage				100076						
55				95% WH USL	173939					95% HW USL	193473
56											
57	Lognormal GOF Test										
58				Shapiro Wilk Test Statistic	0.814	Shapiro Wilk Lognormal GOF Test					
59				5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
60				Lilliefors Test Statistic	0.151	Lilliefors Lognormal GOF Test					
61				5% Lilliefors Critical Value	0.0819	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		132328				90% Percentile (z)	81406	
66				95% UPL (t)	110071				95% Percentile (z)	108340	
67				95% USL	387604				99% Percentile (z)	185201	
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	115				95% UTL with 95% Coverage	102000	
74				Approx, f used to compute achieved CC	1.513	pproximate Actual Confidence Coefficient achieved by UTL				0.847	
75						Approximate Sample Size needed to achieve specified CC				153	
76	95% Percentile Bootstrap UTL with 95% Coverage				103950				95% BCA Bootstrap UTL with 95% Coverage	103950	
77				95% UPL	100050				90% Percentile	84570	
78				90% Chebyshev UPL	118533				95% Percentile	98470	
79				95% Chebyshev UPL	155153				99% Percentile	119150	
80				95% USL	125000	ug/l or 125 mg/l					
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	|Lithium|T^										
89											
90	General Statistics										
91				Total Number of Observations	72				Number of Distinct Observations	4	
92				Minimum	11				First Quartile	30	
93				Second Largest	30				Median	30	
94				Maximum	30				Third Quartile	30	
95				Mean	29.43				SD	2.901	
96				Coefficient of Variation	0.0986				Skewness	-5.387	
97				Mean of logged Data	3.374				SD of logged Data	0.143	
98											
99	Critical Values for Background Threshold Values (BTVs)										
100				Tolerance Factor K (For UTL)	1.98				d2max (for USL)	3.094	
101											
102	Normal GOF Test										
103				Shapiro Wilk Test Statistic	0.217	Normal GOF Test					
104				5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
105				Lilliefors Test Statistic	0.536	Lilliefors GOF Test					
106				5% Lilliefors Critical Value	0.104	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
107	Data Not Normal at 5% Significance Level											
108												
109	Background Statistics Assuming Normal Distribution											
110				95% UTL with	95% Coverage	35.17				90% Percentile (z)		33.15
111					95% UPL (t)	34.3				95% Percentile (z)		34.2
112					95% USL	38.41				99% Percentile (z)		36.18
113												
114	Gamma GOF Test											
115					A-D Test Statistic	25.61	Anderson-Darling Gamma GOF Test					
116					5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level					
117					K-S Test Statistic	0.536	Kolmogorov-Smirnov Gamma GOF Test					
118					5% K-S Critical Value	0.105	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)	64.19				k star (bias corrected MLE)		61.53
123					Theta hat (MLE)	0.458				Theta star (bias corrected MLE)		0.478
124					nu hat (MLE)	9244				nu star (bias corrected)		8860
125					MLE Mean (bias corrected)	29.43				MLE Sd (bias corrected)		3.752
126												
127	Background Statistics Assuming Gamma Distribution											
128				95% Wilson Hilferty (WH) Approx. Gamma UPL		35.88				90% Percentile		34.33
129				95% Hawkins Wixley (HW) Approx. Gamma UPL		36.15				95% Percentile		35.86
130				95% WH Approx. Gamma UTL with	95% Coverage	37.17				99% Percentile		38.86
131				95% HW Approx. Gamma UTL with	95% Coverage	37.51						
132					95% WH USL	42.16				95% HW USL		42.85
133												
134	Lognormal GOF Test											
135					Shapiro Wilk Test Statistic	0.212	Shapiro Wilk Lognormal GOF Test					
136					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
137					Lilliefors Test Statistic	0.533	Lilliefors Lognormal GOF Test					
138					5% Lilliefors Critical Value	0.104	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	38.73				90% Percentile (z)		35.06
143					95% UPL (t)	37.1				95% Percentile (z)		36.93
144					95% USL	45.41				99% Percentile (z)		40.7
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	71				95% UTL with	95% Coverage	30
151					Approx, f used to compute achieved CC	1.868				pproximate Actual Confidence Coefficient achieved by UTL		0.881
152										Approximate Sample Size needed to achieve specified CC		93
153				95% Percentile Bootstrap UTL with	95% Coverage	30				95% BCA Bootstrap UTL with	95% Coverage	30
154					95% UPL	30				90% Percentile		30
155					90% Chebyshev UPL	38.19				95% Percentile		30
156					95% Chebyshev UPL	42.16				99% Percentile		30
157					95% USL	30	ug/l	or 0.03 mg/l				
158												
159	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											

	A	B	C	D	E	F	G	H	I	J	K	L
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												


Box Plot for pH Lansing Landfill
pH
7.6
7.4
7.2
7.0
6.8
6.6
6.4
7.7
7.4
7.1
6.9
6.4
1