SKB Environmental Cloquet Landfill, Inc.

2020 Coal Combustion Residuals Annual Monitoring Report

SKB Environmental Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota
Permit SW-399-001

January 29, 2021

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Table of Contents

Figures

Tables

Appendices

Appendix A – Field Data Sheets
Appendix B – Laboratory Analytical Reports
Appendix C – Statistical Evaluation Data

Acronyms

BTV	Background Threshold Values
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
COC	Chemicals of Concern
Eurofins TA	Eurofins Test America, Inc.
GES	Groundwater & Environmental Services, Inc.
mg/l	milligrams per liter
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
NGVD	National Geodetic Vertical Datum
pci/l	picoCuries per liter
QA/QC	Quality assurance/quality control
Report	Coal Combustion Residuals Annual Monitoring Report
SAP	Sampling Analysis Plan
SKB Cloquet Landfill	SKB Environmental Cloquet Landfill
SSI	statistically significant increase
USL	Upper Simultaneous Limit

1 Introduction

The *Coal Combustion Residuals Annual Monitoring Report* (Report) was prepared to summarize the results of the 2020 groundwater monitoring events and associated analysis for Appendix III, per 40 Code of Federal Regulations (CFR) §§ 257.90 – 257.98, at the SKB Environmental Cloquet Landfill (SKB Cloquet Landfill). The SKB Cloquet Landfill initiated operations under Minnesota Pollution Control Agency (MPCA) Site Permit Number SW-399-001 in 2011. The SKB Cloquet Landfill is located in Cloquet, Carlton County, Minnesota (**Figure 1**).

Two groundwater monitoring events were conducted at the SKB Cloquet Landfill in the spring and fall of 2020. Analytical results from the groundwater monitoring events are compared and evaluated to Background Threshold Values (BTVs) established for the SKB Cloquet Landfill.

1.1 Scope of Work

The following scope of work was conducted for the 2020 Coal Combustion Residuals (CCR) groundwater monitoring events.

- Conduct 2 gauging and sampling events at the site's 7 monitoring wells.
- Due to a cell expansion at the SKB Cloquet Landfill, monitoring well P-3 was abandoned and sealed in accordance with Minnesota Department of Health (MDH) regulations on June 6, 2020. Monitoring well P-3R was installed as a replacement well for P-3 on August 25, 2020.
- 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 background threshold values (BTVs) for each analyte.
- Select tolerance or prediction interval procedure for future statistical analysis of groundwater monitoring data.
- Prepare a CCR Annual Monitoring Report summarizing the groundwater sampling and statistical evaluation.

2 Site Background

2.1 Site Location and Description

The facility is located on a 59-acre parcel of land in Section 25, Township 49 North, Range 17 West, city of Cloquet, Carlton County, Minnesota. With reference to roadways, the facility is located south of Interstate 35 and west of Minnesota State Highway 45. The facility entrance is off Minnesota State Highway 45. The site location is depicted on **Figure 1** and **Figure 2** presents a Site Plan Map.

The nearest body of water is the St. Louis River, which is approximately 0.25 miles east of the facility. The facility's current maximum elevation is approximately 1,234 feet above the National Geodetic Vertical Datum of 1929 (NGVD 29) on top of the existing legacy demolition landfill. The lowest elevation is the old sand pit floor (Ulland Brothers sand pit) in the southwest corner of the property, which is approximately 1,143 feet (NGVD 29). Stormwater flows either to depressions around the site or to a temporary stormwater basin on the east side of Phase 1. The site is sandy and stormwater is allowed to infiltrate the ground at each of the stormwater ponding locations.

3 Monitoring Network Systems and Sampling Schedule

The groundwater monitoring network at SKB Cloquet Landfill was designed based on the analysis of local and regional hydrologic conditions. Currently the system consists of 7 monitoring wells. The monitoring wells used as data collection points have been divided into 2 groups for the purpose of this report:

- Upgradient Monitoring Point. The upgradient monitoring point consists of monitoring well P-1.
- Downgradient Monitoring Points. The downgradient monitoring points consist of monitoring wells downgradient of the compliance boundary. The downgradient monitoring wells are P-2, P-3 (sealed June 6, 2020), P-3R (installed August 25, 2020), P-4R, P-5, P-6 and P-7.

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

- April 6-7, 2020
- October 13-14, 2020

4 Groundwater Sampling Methodology

For the SKB Cloquet 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 EurofinsTest America, Inc. (Eurofins TA) of Amherst, New York.

Groundwater samples obtained during the 2 sampling events in 2020 were analyzed for parameters specified in Appendix III per §§ 257.93 – 257.94 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 (Total)

- Boron (Method 200.7 Rev. 4.4)
- Calcium (Method 200.7 Rev. 4.4)

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 events are presented in **Table 1**. Groundwater contours maps were generated for the April 6 and October 13, 2020 monitoring events. Groundwater flow direction was calculated to be to the east-southeast (**Figures 3** and **4**).

5.2 Groundwater Analytical Data

Groundwater analytical results for the CCR monitoring events are presented in **Table 2**. QA/QC duplicate samples were collected for precision evaluation, but were not included in **Table 2**. A summary of the stabilization parameter tests performed for each well prior to sampling are provided in **Table 3** 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 Cloquet Landfill are provided in **Table 4**. Comparing the 2020 sampling results to the calculated BTVs indicated no analytes exceeded the BTVs.

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

5.2.1 Monitoring Well P-3R

Monitoring well P-3 was sealed on June 6, 2020. Replacement monitoring well P-3R was installed at the site on August 25, 2020. Monitoring well P-3R fall sampling results were compared to

established BTVs but the P-3R data is not part of the overall background calculations due to the lack of data points.

6 Statistical Evaluation of 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 4**. The statistical evaluation data is included in **Appendix C**.

7 Conclusions

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 Chloride, Fluoride, Sulfate as SO_4, Total Dissolved Solids, Boron, Calcium and in 7 monitoring wells (P-1, P-2, P-3 (Spring), P-4R, P-5, P-6 and P-7). Upper and lower threshold values were developed for pH using USL and box plot statistics (**Appendix C**). The resulting USLs were compared to the current concentrations for each COC and well pair. Compliance is determined by comparing the currently detected concentrations to the calculated USL. No exceedances of BTVs were reported.

8 Report Summary

Per the 40 CFR §§ 40.257.93 – 257.94, 2 monitoring events were conducted at the SKB Cloquet Landfill in 2020. Groundwater samples were analyzed for parameters indicated in Appendix III to per § 257.94. Groundwater samples were collected from the monitoring network's 7 monitoring wells located at the SKB Cloquet Landfill during the 2 monitoring events. Groundwater elevation information from the monitoring data indicates an east to southeast groundwater flow beneath the landfill.

No exceedances were reported above the interwell BTV's calculated.

9 Recommendations

CCR groundwater monitoring events will be conducted in the spring and fall of 2021. Groundwater samples will be analyzed for detection monitoring parameters specified in Appendix III per § 257.94. An evaluation of groundwater analytical results after each monitoring event will be completed to determine if a significant increase over BTVs (**Table 4**) for one or more parameter listed in Appendix III 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.

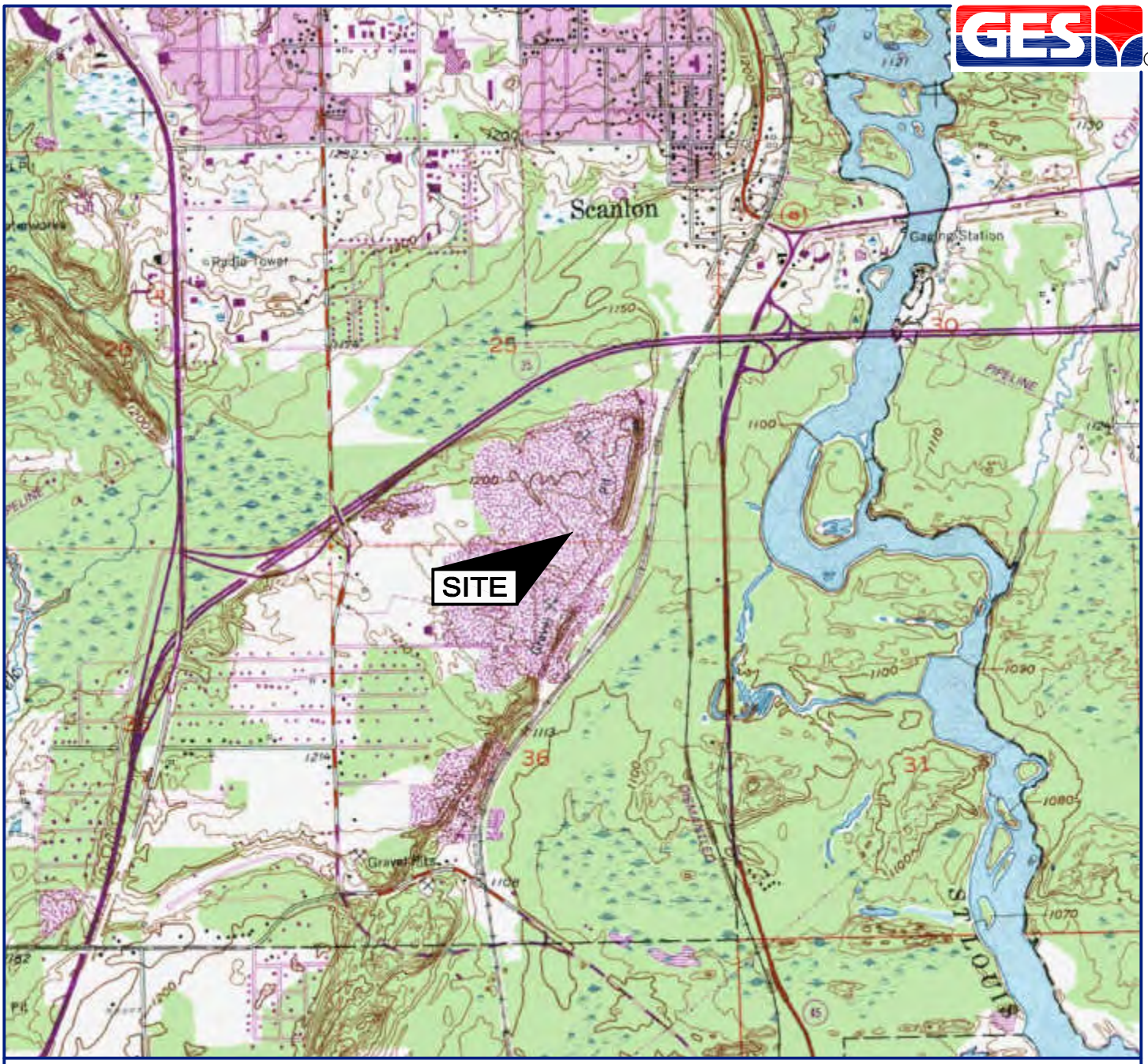
A 2021 Annual Monitoring Report will be prepared and include sampling results from the 2021 CCR groundwater monitoring events and an evaluation of the analytical results as they pertained to BTVs.

References

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

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

Figures

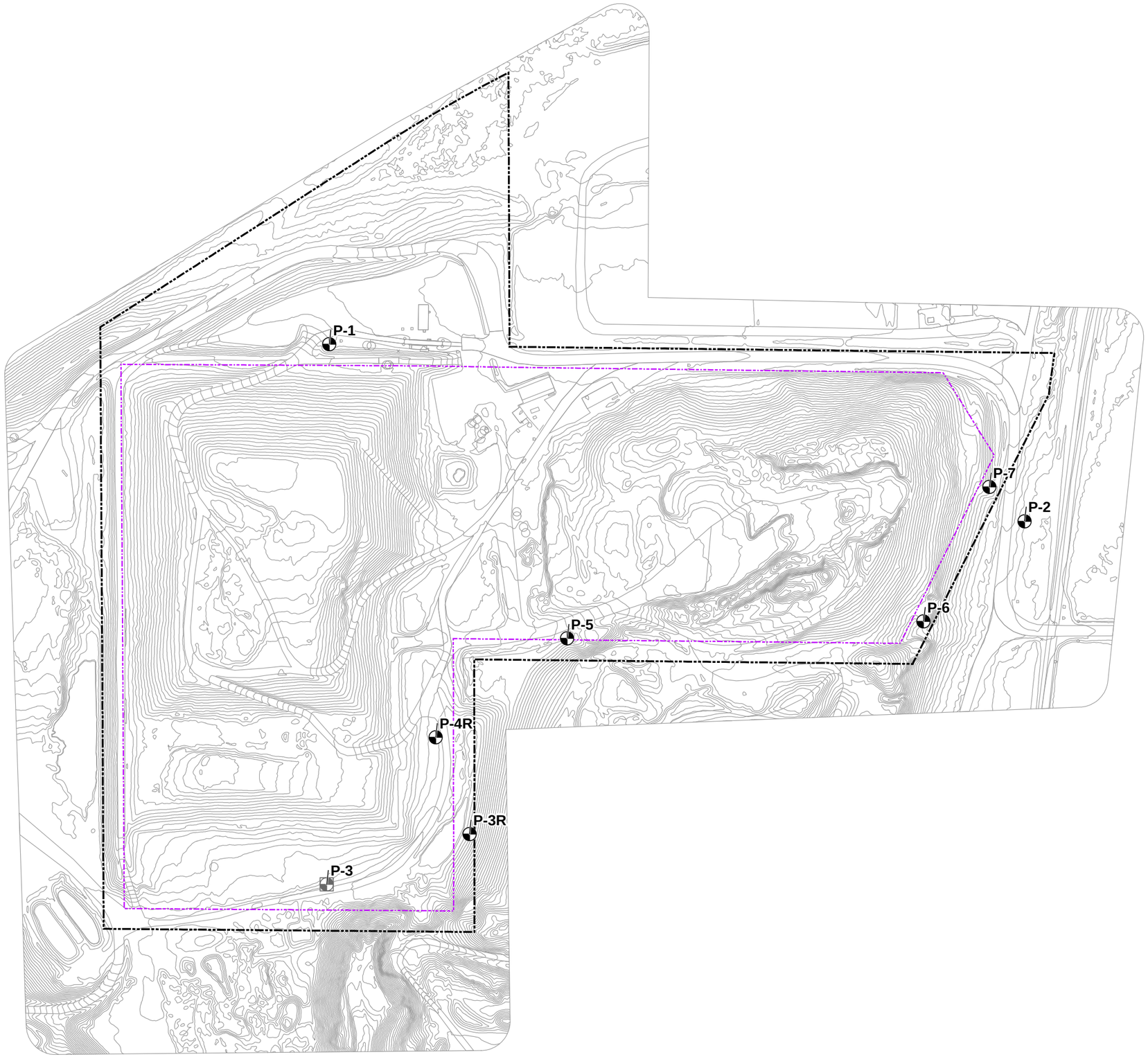


SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1993
CLOQUET, MINNESOTA
CONTOUR INTERVAL = 10'

QUADRANGLE LOCATION

DRAFTED BY: W.G.S. (N.J.)	SITE LOCATION MAP
CHECKED BY:	SKB ENVIRONMENTAL SHAMROCK ENVIRONMENTAL LANDFILL 761 MINNESOTA STATE HIGHWAY 45 CLOQUET, MINNESOTA
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1285 CORPORATE CENTER DRIVE, SUITE 120, EAGAN, MN 55121
NORTH	SCALE IN FEET: 0 – 2000 / DATE: 1-8-14 / FIGURE: 1

M:\Graphics\3500-Minnesota\SKB Environmental\Cloquet\Cloquet SLM.dwg, Layout1, WShea



Legend

- MONITORING WELL
- SEALED MONITORING WELL
- PROPOSED WASTE LIMITS
- PROPERTY BOUNDARY

Site Map

SKB Environmental
Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

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

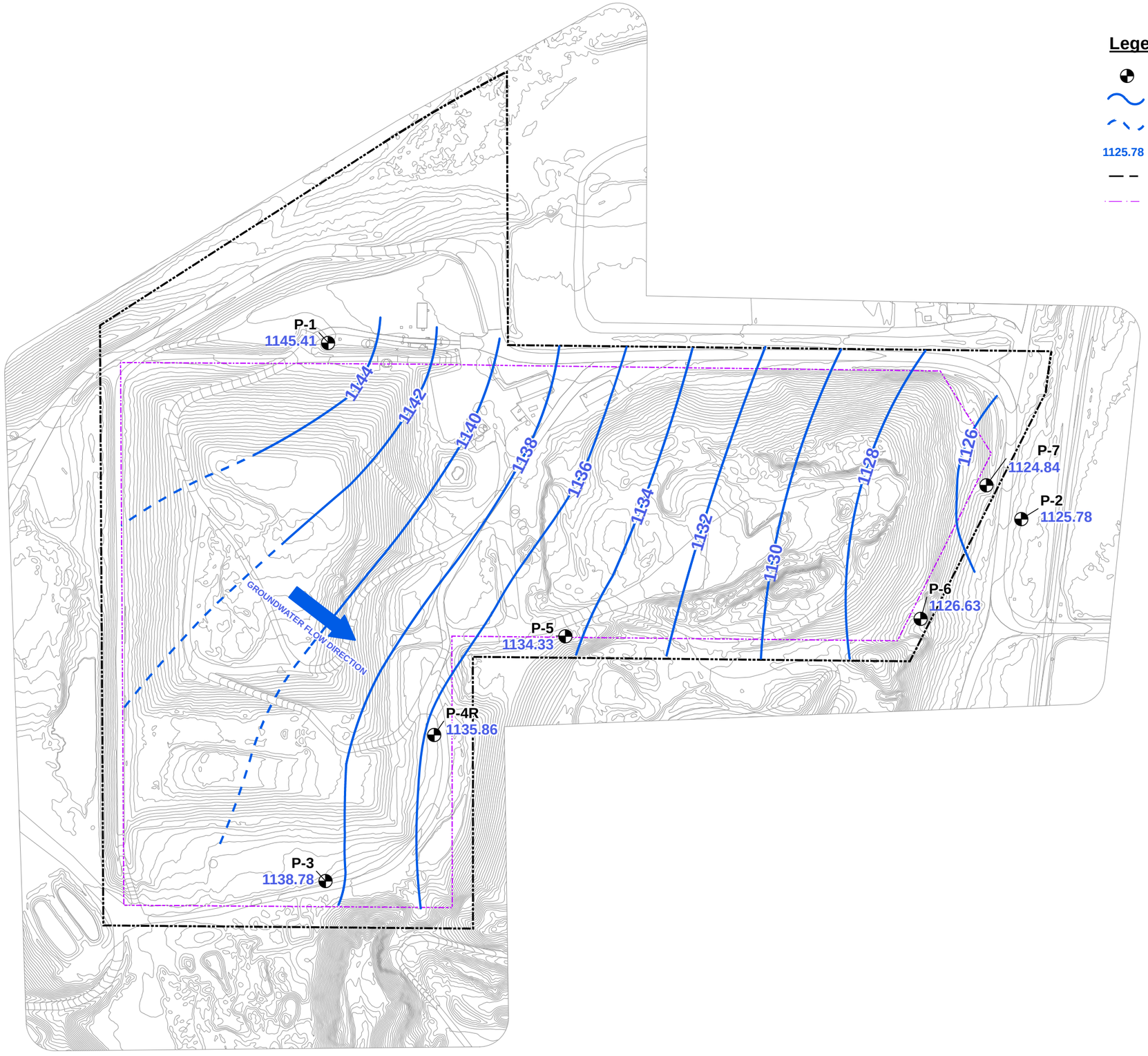
Date **9/25/20**
Figure **2**

N

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

L:\Projects\SKB Environmental\Shamrock Environmental Landfill_Cloquet\GIS\Shamrock_Site_Map.mxd - Scale 1:3,000 - 9/25/2020 11:11:01 AM - GStewart - GES



Legend

- MONITORING WELL
- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- INFERRED GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- 1125.78 MEASURED GROUNDWATER ELEVATION (ft MSL)
- PROPERTY BOUNDARY
- PROPOSED WASTE LIMITS

Groundwater Elevation Map
April 6, 2020

SKB Environmental
Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

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

Date **5/7/20**
Figure **3**

N

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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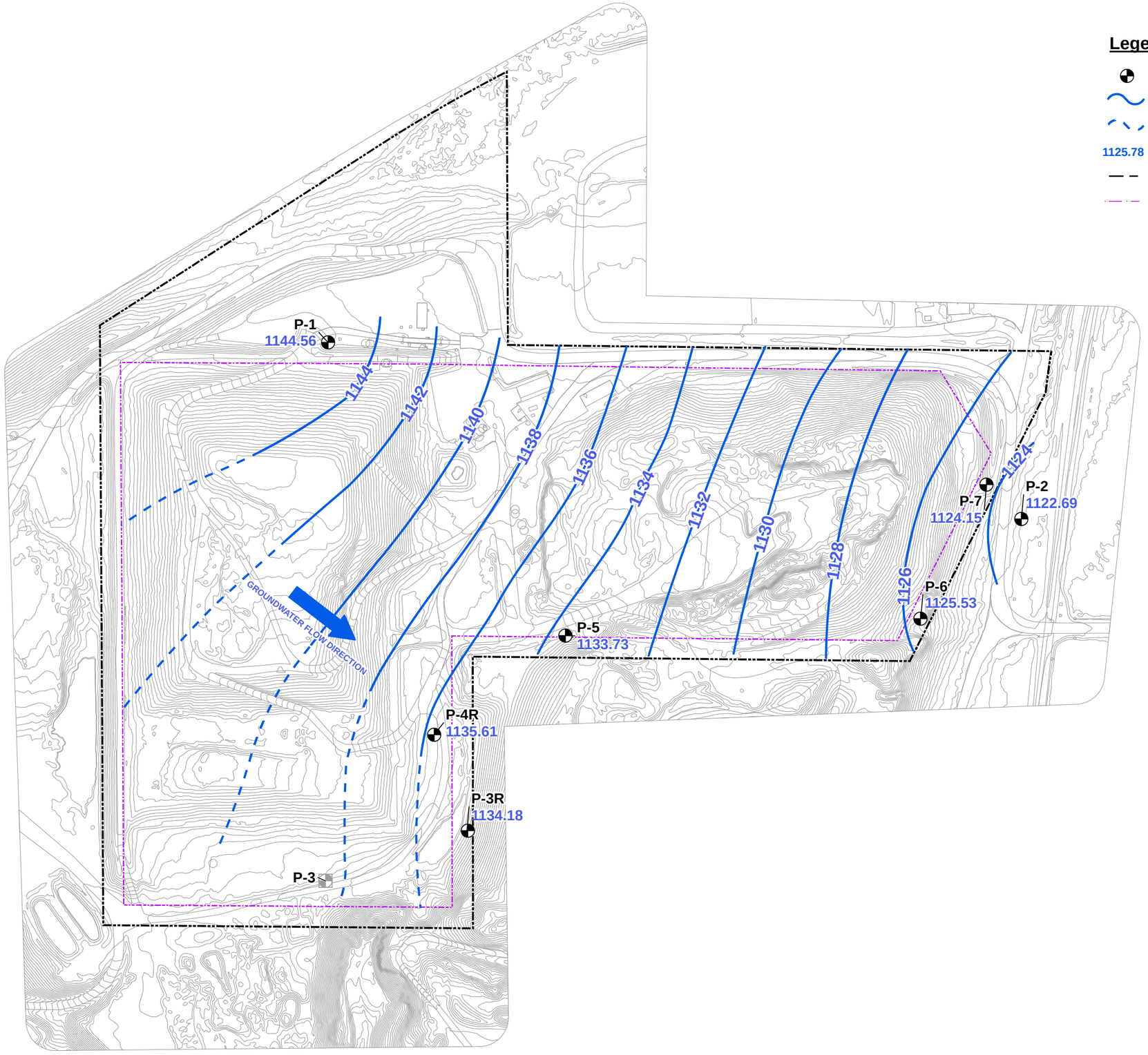

Legend

- MONITORING WELL
- GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- INFERRED GROUNDWATER ELEVATION ISOCONTOUR (ft MSL)
- 1125.78 MEASURED GROUNDWATER ELEVATION (ft MSL)
- PROPERTY BOUNDARY
- PROPOSED WASTE LIMITS

Groundwater Elevation Map
October 13, 2020

SKB Environmental
Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

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

Date **12/28/20**
Figure **4**

N

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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Tables

2020 CCR Annual Monitoring Report
SKB Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

Table 1

Groundwater Elevations

Date	P-1	P-2	P-3	P-3R	P-4R	P-5	P-6	P-7
04/06/2020	1145.41	1125.78	1138.78		1135.86	1134.33	1126.63	1124.84
10/13/2020	1144.56	1122.69		1134.18	1135.61	1133.73	1125.53	1124.15

2020 CCR Annual Monitoring Report
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Table 2

Groundwater Analytical Data

Location	Date	Parameter	Result	BTV	Units	CAS #
P-1	04/07/2020	Boron	0.046	0.39	mg/l	7440-42-8
P-1	10/13/2020	Boron	0.048	0.39	mg/l	7440-42-8
P-1	04/07/2020	Calcium	120	235	mg/l	7440-70-2
P-1	10/13/2020	Calcium	158	235	mg/l	7440-70-2
P-1	04/07/2020	Chloride	101	287	mg/l	16887-00-6
P-1	10/13/2020	Chloride	193	287	mg/l	16887-00-6
P-1	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-1	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-1	04/07/2020	pH	7.0	6.5 < 8.0	pH UNITS	PH
P-1	10/13/2020	pH	7.1	6.5 < 8.0	pH UNITS	PH
P-1	04/07/2020	Sulfate as SO4	29.7	161	mg/l	14808-79-8
P-1	10/13/2020	Sulfate as SO4	31.2	161	mg/l	14808-79-8
P-1	04/07/2020	Temperature in Fahrenheit	18.9	--	deg c	TEMP
P-1	10/13/2020	Temperature in Fahrenheit	15.9	--	deg c	TEMP
P-1	04/07/2020	Total Dissolved Solids	404	876	mg/l	TDS
P-1	10/13/2020	Total Dissolved Solids	850	876	mg/l	TDS
P-2	04/07/2020	Boron	0.037	0.39	mg/l	7440-42-8
P-2	10/14/2020	Boron	0.040	0.39	mg/l	7440-42-8
P-2	04/07/2020	Calcium	72.5	235	mg/l	7440-70-2
P-2	10/14/2020	Calcium	71.8	235	mg/l	7440-70-2
P-2	04/07/2020	Chloride	37.9	287	mg/l	16887-00-6
P-2	10/14/2020	Chloride	142	287	mg/l	16887-00-6
P-2	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-2	10/14/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-2	04/07/2020	pH	7.2	6.5 < 8.0	pH UNITS	PH
P-2	10/14/2020	pH	6.8	6.5 < 8.0	pH UNITS	PH
P-2	04/07/2020	Sulfate as SO4	36.5	161	mg/l	14808-79-8
P-2	10/14/2020	Sulfate as SO4	12.5	161	mg/l	14808-79-8
P-2	04/07/2020	Temperature in Fahrenheit	18.4	--	deg c	TEMP
P-2	10/14/2020	Temperature in Fahrenheit	15.6	--	deg c	TEMP
P-2	04/07/2020	Total Dissolved Solids	261	876	mg/l	TDS
P-2	10/14/2020	Total Dissolved Solids	534	876	mg/l	TDS
P-3	04/07/2020	Boron	0.039	0.39	mg/l	7440-42-8
P-3	04/07/2020	Calcium	118	235	mg/l	7440-70-2
P-3	04/07/2020	Chloride	59.7	287	mg/l	16887-00-6
P-3	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-3	04/07/2020	pH	7.4	6.5 < 8.0	pH UNITS	PH
P-3	04/07/2020	Sulfate as SO4	60.1	161	mg/l	14808-79-8
P-3	04/07/2020	Temperature in Fahrenheit	18.3	--	deg c	TEMP
P-3	04/07/2020	Total Dissolved Solids	451	876	mg/l	TDS
P-3R	10/13/2020	Boron	0.036	0.39	mg/l	7440-42-8
P-3R	10/13/2020	Calcium	120	235	mg/l	7440-70-2
P-3R	10/13/2020	Chloride	208	287	mg/l	16887-00-6
P-3R	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-3R	10/13/2020	pH	7.3	6.5 < 8.0	pH UNITS	PH
P-3R	10/13/2020	Sulfate as SO4	32.9	161	mg/l	14808-79-8
P-3R	10/13/2020	Temperature in Fahrenheit	15.9	--	deg c	TEMP
P-3R	10/13/2020	Total Dissolved Solids	538	876	mg/l	TDS
P-4R	04/07/2020	Boron	0.26	0.39	mg/l	7440-42-8
P-4R	10/13/2020	Boron	0.049	0.39	mg/l	7440-42-8
P-4R	04/07/2020	Calcium	123	235	mg/l	7440-70-2
P-4R	10/13/2020	Calcium	125	235	mg/l	7440-70-2

Table 2

Groundwater Analytical Data

Location	Date	Parameter	Result	BTV	Units	CAS #
P-4R	04/07/2020	Chloride	110	287	mg/l	16887-00-6
P-4R	10/13/2020	Chloride	144	287	mg/l	16887-00-6
P-4R	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-4R	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-4R	04/07/2020	pH	7.5	6.5 < 8.0	pH UNITS	PH
P-4R	10/13/2020	pH	7.2	6.5 < 8.0	pH UNITS	PH
P-4R	04/07/2020	Sulfate as SO4	63.1	161	mg/l	14808-79-8
P-4R	10/13/2020	Sulfate as SO4	39.9	161	mg/l	14808-79-8
P-4R	04/07/2020	Temperature in Fahrenheit	18.4	--	deg c	TEMP
P-4R	10/13/2020	Temperature in Fahrenheit	18.1	--	deg c	TEMP
P-4R	04/07/2020	Total Dissolved Solids	512	876	mg/l	TDS
P-4R	10/13/2020	Total Dissolved Solids	627	876	mg/l	TDS
P-5	04/07/2020	Boron	0.050	0.39	mg/l	7440-42-8
P-5	10/13/2020	Boron	0.066	0.39	mg/l	7440-42-8
P-5	04/07/2020	Calcium	139	235	mg/l	7440-70-2
P-5	10/13/2020	Calcium	156	235	mg/l	7440-70-2
P-5	04/07/2020	Chloride	150	287	mg/l	16887-00-6
P-5	10/13/2020	Chloride	189	287	mg/l	16887-00-6
P-5	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-5	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-5	04/07/2020	pH	7.0	6.5 < 8.0	pH UNITS	PH
P-5	10/13/2020	pH	6.6	6.5 < 8.0	pH UNITS	PH
P-5	04/07/2020	Sulfate as SO4	41.1	161	mg/l	14808-79-8
P-5	10/13/2020	Sulfate as SO4	28.0	161	mg/l	14808-79-8
P-5	04/07/2020	Temperature in Fahrenheit	18.5	--	deg c	TEMP
P-5	10/13/2020	Temperature in Fahrenheit	18.3	--	deg c	TEMP
P-5	04/07/2020	Total Dissolved Solids	719	876	mg/l	TDS
P-5	10/13/2020	Total Dissolved Solids	858	876	mg/l	TDS
P-6	04/07/2020	Boron	0.25	0.39	mg/l	7440-42-8
P-6	10/13/2020	Boron	0.32	0.39	mg/l	7440-42-8
P-6	04/07/2020	Calcium	164	235	mg/l	7440-70-2
P-6	10/13/2020	Calcium	168	235	mg/l	7440-70-2
P-6	04/07/2020	Chloride	81.9	287	mg/l	16887-00-6
P-6	10/13/2020	Chloride	88.7	287	mg/l	16887-00-6
P-6	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-6	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-6	04/07/2020	pH	7.1	6.5 < 8.0	pH UNITS	PH
P-6	10/13/2020	pH	6.8	6.5 < 8.0	pH UNITS	PH
P-6	04/07/2020	Sulfate as SO4	149	161	mg/l	14808-79-8
P-6	10/13/2020	Sulfate as SO4	140	161	mg/l	14808-79-8
P-6	04/07/2020	Temperature in Fahrenheit	18.9	--	deg c	TEMP
P-6	10/13/2020	Temperature in Fahrenheit	17.3	--	deg c	TEMP
P-6	04/07/2020	Total Dissolved Solids	715	876	mg/l	TDS
P-6	10/13/2020	Total Dissolved Solids	789	876	mg/l	TDS
P-7	04/07/2020	Boron	0.15	0.39	mg/l	7440-42-8
P-7	10/13/2020	Boron	0.14	0.39	mg/l	7440-42-8
P-7	04/07/2020	Calcium	187	235	mg/l	7440-70-2
P-7	10/13/2020	Calcium	170	235	mg/l	7440-70-2
P-7	04/07/2020	Chloride	42.6	287	mg/l	16887-00-6
P-7	10/13/2020	Chloride	70.8	287	mg/l	16887-00-6
P-7	04/07/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8
P-7	10/13/2020	Fluoride	< 0.25	0.500	mg/l	16984-48-8

Table 2

Groundwater Analytical Data

Location	Date	Parameter	Result	BTV	Units	CAS #
P-7	04/07/2020	pH	7.2	6.5 < 8.0	pH UNITS	PH
P-7	10/13/2020	pH	6.8	6.5 < 8.0	pH UNITS	PH
P-7	04/07/2020	Sulfate as SO4	50.4	161	mg/l	14808-79-8
P-7	10/13/2020	Sulfate as SO4	66.2	161	mg/l	14808-79-8
P-7	04/07/2020	Temperature in Fahrenheit	19.3	--	deg c	TEMP
P-7	10/13/2020	Temperature in Fahrenheit	16.8	--	deg c	TEMP
P-7	04/07/2020	Total Dissolved Solids	553	876	mg/l	TDS
P-7	10/13/2020	Total Dissolved Solids	869	876	mg/l	TDS

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

2020 CCR Annual Monitoring Report
SKB Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

Table 3

Well Stabilization Data

Well ID	Measurement Date	Field pH	Field Specific Conductivity umhos/cm	Field Temp dec c	Purge Rate ml/min
P-1	4/7/20 9:40	7.59	1040	7.24	1000
P-1	4/7/20 9:45	6.96	938	7.09	1000
P-1	4/7/20 9:50	6.83	934	7.07	1000
P-1	4/7/20 9:55	6.81	936	7.06	1000
P-1	4/7/20 10:00	6.74	938	7.04	1000
P-1	10/13/20 10:20	10.37	1470	9.65	1000
P-1	10/13/20 10:40	9.3	1430	10.59	1000
P-1	10/13/20 10:47	9.09	1410	9.53	1000
P-1	10/13/20 10:50	9.05	1410	9.52	1000
P-1	10/13/20 10:55	8.89	1400	9.49	1000
P-2	4/7/20 14:10	7.84	682	5.56	1000
P-2	4/7/20 14:15	7.83	637	5.31	1000
P-2	4/7/20 14:20	7.83	600	5.11	1000
P-2	4/7/20 14:25	7.81	585	4.99	1000
P-2	4/7/20 14:30	7.79	561	4.79	1000
P-2	10/14/20 10:35	8.86	777	10.28	1000
P-2	10/14/20 10:40	8.36	834	9.94	1000
P-2	10/14/20 10:45	8.27	839	9.89	1000
P-2	10/14/20 10:50	8.26	841	9.85	1000
P-3	4/7/20 10:20	7.12	870	5.29	1000
P-3	4/7/20 10:30	6.84	940	4.20	1000
P-3	4/7/20 10:35	6.84	939	4.15	1000
P-3	4/7/20 10:40	6.84	937	4.15	1000
P-3	4/7/20 10:45	6.84	936	4.12	1000
P-3R	10/14/20 9:00	9.17	1220	11.76	1000
P-3R	10/14/20 9:10	9.03	1230	12.62	1000
P-3R	10/14/20 9:20	9.01	1260	12.77	1000
P-3R	10/14/20 9:25	8.98	1280	12.65	1000
P-3R	10/14/20 9:30	8.98	1280	12.85	1000
P-4R	4/7/20 11:10	7.24	1090	5.86	1000
P-4R	4/7/20 11:15	7.17	1100	5.49	1000
P-4R	4/7/20 11:20	7.16	1090	5.46	1000
P-4R	4/7/20 11:25	7.16	1090	5.45	1000
P-4R	4/7/20 11:30	7.17	1070	5.46	1000
P-4R	10/13/20 11:35	8.04	1310	12.47	1000
P-4R	10/13/20 11:45	8.18	1260	12.74	1000
P-4R	10/13/20 11:55	8.22	1240	12.73	1000
P-4R	10/13/20 12:05	8.31	1210	12.7	1000
P-4R	10/13/20 12:10	8.31	1210	12.7	1000
P-5	4/7/20 11:55	7.33	1430	8.90	1000
P-5	4/7/20 12:00	6.97	1350	9.45	1000
P-5	4/7/20 12:05	6.95	1350	9.45	1000
P-5	4/7/20 12:10	6.94	1350	9.45	1000
P-5	4/7/20 12:15	6.92	1350	9.50	1000

Table 3

Well Stabilization Data

Well ID	Measurement Date	Field pH	Field Specific Conductivity umhos/cm	Field Temp dec c	Purge Rate ml/min
P-5	10/13/20 12:30	8.4	1510	10.56	1000
P-5	10/13/20 12:35	8.43	1520	10.65	1000
P-5	10/13/20 12:40	8.43	1490	11.76	1000
P-5	10/13/20 12:50	8.27	1590	10.49	1000
P-5	10/13/20 12:55	8.29	1590	10.36	1000
P-6	4/7/20 12:40	7.21	1280	8.95	1000
P-6	4/7/20 12:45	6.99	1280	9.00	1000
P-6	4/7/20 12:50	6.89	1280	9.00	1000
P-6	4/7/20 12:55	6.89	1280	8.99	1000
P-6	4/7/20 13:00	6.88	1280	9.00	1000
P-6	10/13/20 13:20	8.42	1360	9.41	1000
P-6	10/13/20 13:25	8.35	1360	9.38	1000
P-6	10/13/20 13:30	8.37	1360	9.27	1000
P-6	10/13/20 13:35	8.36	1360	9.18	1000
P-6	10/13/20 13:40	8.34	1360	9.12	1000
P-7	4/7/20 13:25	7.52	1230	7.88	1000
P-7	4/7/20 13:30	7.35	1280	7.47	1000
P-7	4/7/20 13:35	7.34	1290	7.44	1000
P-7	4/7/20 13:40	7.33	1290	7.46	1000
P-7	4/7/20 13:45	7.30	1300	7.49	1000
P-7	10/13/20 14:10	8.37	1390	9.37	1000
P-7	10/13/20 14:15	8.33	1390	9.37	1000
P-7	10/13/20 14:20	8.35	1430	8.8	1000
P-7	10/13/20 14:25	8.78	1440	8.78	1000
P-7	10/13/20 14:30	8.37	1430	8.77	1000

Table 4

Background Threshold Values

Appendix III to Part 257

Parameter	Background Threshold Value (BTV)	Units	CAS #
Boron	0.39	mg/l	7440-42-8
Calcium	235	mg/l	7440-70-2
Chloride	287	mg/l	16887-00-6
Fluoride	0.500	mg/l	15984-48-8
pH	lower 6.5 upper 8.0	pH UNITS	PH
Sulfate as SO4	161	mg/l	14808-79-8
Total Dissolved Solids	876	mg/l	TDS

Results in mg/l (milligrams per liter)

Appendix A – Field Data Sheets

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SFB Closure
Project Number: 350212
Sampling Device: Dedicated Bladder Pump
Date: 4/7/20
Well ID: P-1

Tubing Diameter (ID): 2 inches
Depth to Water: 10.02 ft, TOC
Depth to Bottom of Well: 17.7 ft, TOC
Feet of Water in Well: 7.68 ft
Volume of Water in Well: 1.25 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	10.02'	7.59	1,040	7.24	1
5	10.03'	6.96	938	7.09	1
10	10.03'	6.93	934	7.07	1
15	10.05'	6.81	936	7.06	1

Purge Start Time: 9:40 Purge End Time: 10:00 Total Volume Purged: 3.0 gal

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

Weather Conditions: 43°F, cloudy, 0-5 mph E

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: GKB (Loquat)
Project Number: 3502112
Sampling Device: Dedicated Bladder Pump
Date: 4/7/20
Well ID: P-2

Tubing Diameter (ID): 2 inches
Depth to Water: 6.01 ft, TOC
Depth to Bottom of Well: 10.4 ft, TOC
Feet of Water in Well: ft
Volume of Water in Well: 0.7 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ/mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.01	7.84	602	5.56	1
5	7.27	7.93	637	5.31	1
10	7.96	7.93	600	5.11	1
15	8.76	7.91	585	4.99	1

Purge Start Time: 14:10 Purge End Time: 14:30 Total Volume Purged: 1.5 gal
Approximate Purge Rate: 1 L/min Purged/Sampled by: M. Schlegel
Weather Conditions: 52°F sunny, 0-5 mph E
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Airport
Project Number: 350211.2
Sampling Device: Geotech Bladder Pump
Date: 4/7/20
Well ID: P-3

Tubing Diameter (ID): 2 inches
Depth to Water: 7.30 ft, TOC
Depth to Bottom of Well: 12.95 ft, TOC
Feet of Water in Well: 5.65 ft
Volume of Water in Well: 0.92 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µs/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	7.30'	7.12	970	5.29	1
5	7.33'	6.84	940	4.20	1
10	7.33'	6.84	939	4.15	1
15	7.33'	6.84	937	4.15	1

Purge Start Time: 10:20 Purge End Time: 10:45 Total Volume Purged: 3.0 gal
Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Sullagell
Weather Conditions: 44°F, cloudy, 0-5 mph SE
Comments: Duplicate collected

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Cloquet
Project Number: 3502112
Sampling Device: Dedicated Bladder Pump
Date: 4/7/20
Well ID: P-42

Tubing Diameter (ID): 2 inches
Depth to Water: 6.03 ft, TOC
Depth to Bottom of Well: 16.9 ft, TOC
Feet of Water in Well: 10.87 ft
Volume of Water in Well: 1.77 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (uS/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	6.03'	7.24	1,090	5.86	1
5	6.05'	7.17	1,100	5.49	1
10	6.05'	7.16	1,090	5.46	1
15	6.05'	7.16	1,090	5.45	1

Purge Start Time: 11:10 Purge End Time: 11:30 Total Volume Purged: 5.5 gal
Approximate Purge Rate: 1 L/min. Purged/Sampled by: N. Schlagel
Weather Conditions: 43°F, cloudy, 0-5 mph SE
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Cigwet
Project Number: 3502112
Sampling Device: Ded. coated Bladder Pump
Date: 4/7/20
Well ID: P-5

Tubing Diameter (ID): 2 inches
Depth to Water: 31.91' ft, TOC
Depth to Bottom of Well: 37.3' ft, TOC
Feet of Water in Well: 5.39' ft
Volume of Water in Well: 0.87 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	31.91'	7.33	1,450	8.90	1
5	31.93'	6.97	1,350	9.45	1
10	31.93'	6.85	1,350	9.45	1
15	31.93'	6.84	1,350	9.45	1

Purge Start Time: 11:55 Purge End Time: 12:15 Total Volume Purged: 3.0 gal

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

Weather Conditions: 45 °F, cloudy, 0-5 mph S

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Closet
Project Number: 350211.2
Sampling Device: Dedicated Bladder Pump
Date: 4/7/20
Well ID: P-1

Tubing Diameter (ID): 2 inches
Depth to Water: 28.80 ft, TOC
Depth to Bottom of Well: 36.2 ft, TOC
Feet of Water in Well: 7.40' ft
Volume of Water in Well: 1.2 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µs / cm)	Temperature (°F) °C	Purge Rate (L/min)
1	28.80'	7.21	1,280	8.95	1
5	28.82'	6.99	1,290	9.00	1
10	28.82'	6.89	1,280	9.00	1
15	28.82'	6.89	1,286	8.99	1

Purge Start Time: 12:40 Purge End Time: 13:00 Total Volume Purged: 4.0 gal

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

Weather Conditions: 49°F, sunny, 0-5 mph W

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Closure
Project Number: 350212
Sampling Device: Dedicated Bladder Pump
Date: 4/7/20
Well ID: P-7

Tubing Diameter (ID): 2 inches
Depth to Water: 14.55' ft, TOC
Depth to Bottom of Well: 19.6' ft, TOC
Feet of Water in Well: 5.05' ft
Volume of Water in Well: 0.8 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µMhos)	Temperature (°F) °C	Purge Rate (L/min)
1	14.55	7.52	1,230	7.88	1
5	15.53	7.35	1,290	7.47	1
10	15.55	7.34	1,290	7.44	1
15	15.55	7.30	1,290	7.48	1

Purge Start Time: 13:25 Purge End Time: 13:45 Total Volume Purged: 2.5 gal
Approximate Purge Rate: 1 L/min Purged/Sampled by: N. Schlegel
Weather Conditions: 52°F, sunny, 0-5 mph E
Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Cliquot
Project Number: 350/2117
Sampling Device: Dedicated Bladder pump
Date: 10/13/20
Well ID: P-1

Tubing Diameter (ID): 2 inches
Depth to Water: 11.05 ft, TOC
Depth to Bottom of Well: 17.7 ft, TOC
Feet of Water in Well: ft
Volume of Water in Well: gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (uS/cm)	Temperature (°F) °C	Purge Rate (L/min)
1	11.05	10.37	1,470	9.65	1
10	11.07	9.30	1,470	10.54	1
20	11.07	9.09	1,410	9.53	1
30	11.07	9.05	1,410	9.52	1

Purge Start Time: 10:20 Purge End Time: 10:55 Total Volume Purged: 3.0 gal

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

Weather Conditions: 52°F, sunny, 15 mph SW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Hangar
Project Number: 350212
Sampling Device: Dedicated Bladder Pump
Date: 10/14/20
Well ID: P-2

Tubing Diameter (ID): 2 inches
Depth to Water: 9.10 ft, TOC
Depth to Bottom of Well: 10.4 ft, TOC
Feet of Water in Well: 1.30 ft
Volume of Water in Well: 0.2 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / uhos)	Temperature (°F)	Purge Rate (L/min)
1	9.10	8.85	777	10.28	0.5
5	9.50	8.36	834	9.94	0.5
10	9.75	8.27	839	9.89	0.5
15	10.00	8.26	841	9.85	0.5

Purge Start Time: 10:35 Purge End Time: 10:50 Total Volume Purged: 0.5 gal

Approximate Purge Rate: 0.5 L/min Purged/Sampled by: M-Schlegel

Weather Conditions: 58°F, cloudy 15 mph NS

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SK B Clauset	Tubing Diameter (ID):	2	inches
Project Number:	350212	Depth to Water:	14.22	ft, TOC
Sampling Device:	Dedicated Bladder Pump	Depth to Bottom of Well:	24.0	ft, TOC
Date:	10/14/20	Feet of Water in Well:	9.78	ft
Well ID:	P-3R	Volume of Water in Well:	16	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mho)	Temperature (°F) °C	Purge Rate (L/min)
1	14.22	9.17	1,220	11.76	1
5	14.25	9.03	1,230	12.62	1
10	14.25	9.01	1,260	12.77	1
15	14.25	8.98	1,280	12.85	1

Purge Start Time: 9:00 Purge End Time: 9:30 Total Volume Purged: 5.0 gal

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

Weather Conditions: 50°F rain 5-10 mph SE

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Okauet
Project Number: 350212
Sampling Device: Dedicated Bladder Pump
Date: 10/13/20
Well ID: P-4R

Tubing Diameter (ID): 2 inches
Depth to Water: 6.28 ft, TOC
Depth to Bottom of Well: 16.9 ft, TOC
Feet of Water in Well: 10.62 ft
Volume of Water in Well: 1.7 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	6.28	8.04	1,310	12.47	1
5	6.30	8.18	1,260	12.74	1
10	6.30	8.22	1,240	12.73	1
15	6.30	8.31	1,210	12.70	1

Purge Start Time: 11:35 Purge End Time: 12:10 Total Volume Purged: 5.5 gal

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

Weather Conditions: 54°F, clear, 15mph SW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SLAB Cloquet
Project Number: 3502112
Sampling Device: Dedicated Bladder Pump
Date: 10/13/20
Well ID: P-5

Tubing Diameter (ID): 2 inches
Depth to Water: 32.51 ft, TOC
Depth to Bottom of Well: 37.3 ft, TOC
Feet of Water in Well: 4.79 ft
Volume of Water in Well: 0.8 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u /mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	32.51	8.40	1510	10.56	1
5	32.53	8.43	1,520	10.65	1
10	32.53	8.43	1,490	11.76	1
15	32.53	8.27	1,590	10.49	1

Purge Start Time: 12:30 Purge End Time: 12:55 Total Volume Purged: 2.5 gal

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

Weather Conditions: 58°F clear, 15 mph SW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site: SKB Lloyd
Project Number: 350241.2
Sampling Device: Dedicated Bladder Pump
Date: 10/13/20
Well ID: P-6

Tubing Diameter (ID): 2 inches
Depth to Water: 29.90 ft, TOC
Depth to Bottom of Well: 76.2 ft, TOC
Feet of Water in Well: 8.30 ft
Volume of Water in Well: 1.0 gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (u / mhos)	Temperature (°F) °C	Purge Rate (L/min)
1	29.90				1
5	29.92				1
10	29.92				1
15	29.92				1

Purge Start Time: 13:20 Purge End Time: 13:40 Total Volume Purged: 3.0 gal

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

Weather Conditions: 60°F, clear, 15 mph SW

Comments:

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

Site:	SKB Cloquet		Tubing Diameter (ID):	2	inches
Project Number:	350211.2		Depth to Water:	15.24	ft, TOC
Sampling Device:	Dedicated Bladder Pump		Depth to Bottom of Well:	14.6	ft, TOC
Date:	10/13/20		Feet of Water in Well:	4.36	ft
Well ID:	P-7		Volume of Water in Well:	0.7	gal

Elapsed Time (min)	Depth to Water (ft, TOC)	pH (s.u.)	Specific Conductance (µ /µ)	Temperature (°F) °C	Purge Rate (L/min)
1	15.25	8.37	1,390	9.37	1
5	15.26	8.32	1,390	9.37	1
10	15.26	8.35	1,430	8.80	1
15	15.26	8.36	1,440	8.78	1

Purge Start Time: 14:10 Purge End Time: 14:30 Total Volume Purged: 2.0 gal

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

Weather Conditions: 60°, clear 5 mph SE

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: 480-168319-1
Client Project/Site: SKB Cloquet - CCR Groundwater
Sampling Event: CCR Groundwater

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

Attn: Nathaniel Beinemann

Authorized for release by:
4/21/2020 9:41:14 AM
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 Cloquet - CCR Groundwater

Job ID: 480-168319-1

Qualifiers

General Chemistry

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

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)

Case Narrative

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

Job ID: 480-168319-1

Job ID: 480-168319-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-168319-1

Comments
No additional comments.

Receipt
The samples were received on 4/8/2020 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.4º C, 2.8º C and 3.3º C.

HPLC/IC
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: P-1 (480-168319-1), P-4R (480-168319-4), P-5 (480-168319-5) and P-6 (480-168319-6). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were reported with elevated reporting limits for all analytes: P-2 (480-168319-2) and P-3 (480-168319-3). The sample was analyzed at a dilution based on screening results.

Method 300.0: The following samples were diluted due to the nature of the sample matrix: P-7 (480-168319-7) and Duplicate (480-168319-8). 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
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 2540C: Due to the matrix, the initial volume(s) used for the following samples deviated from the standard procedure: P-1 (480-168319-1) and (480-168319-D-1 DU). The reporting limits (RLs) have been adjusted proportionately.

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: P-1 (480-168319-1), P-2 (480-168319-2), P-3 (480-168319-3), P-4R (480-168319-4), P-5 (480-168319-5), P-6 (480-168319-6), P-7 (480-168319-7), Duplicate (480-168319-8), Field Blank (480-168319-9) and Equip Blank (480-168319-10).

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 Cloquet - CCR Groundwater

Job ID: 480-168319-1

Client Sample ID: P-1 — Lab Sample ID: 480-168319-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.046		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	120		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	101		2.5		mg/L	5		300.0	Total/NA
Sulfate	29.7		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	404		40.0		mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-2 — Lab Sample ID: 480-168319-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.037		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	72.5		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	37.9		2.5		mg/L	5		300.0	Total/NA
Sulfate	36.5		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	261		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	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: P-3 — Lab Sample ID: 480-168319-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.039		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	118		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	59.7		2.5		mg/L	5		300.0	Total/NA
Sulfate	60.1		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	451		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	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: P-4R — Lab Sample ID: 480-168319-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.26		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	123		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	110		2.5		mg/L	5		300.0	Total/NA
Sulfate	63.1		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	512		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	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: P-5 — Lab Sample ID: 480-168319-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.050		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	139		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	150		2.5		mg/L	5		300.0	Total/NA
Sulfate	41.1		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	719		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.5	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 Cloquet - CCR Groundwater

Job ID: 480-168319-1

Client Sample ID: P-6 — Lab Sample ID: 480-168319-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.25		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	164		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	81.9		2.5		mg/L	5		300.0	Total/NA
Sulfate	149		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	715		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-7 — Lab Sample ID: 480-168319-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.15		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	187		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	42.6		2.5		mg/L	5		300.0	Total/NA
Sulfate	50.4		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	553		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	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: Duplicate — Lab Sample ID: 480-168319-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.037		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	119		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	61.0		2.5		mg/L	5		300.0	Total/NA
Sulfate	61.2		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	458		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: Field Blank — Lab Sample ID: 480-168319-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: Equip Blank — Lab Sample ID: 480-168319-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-1

Date Collected: 04/07/20 10:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-1

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.046**		0.020		mg/L		04/09/20 08:05	04/10/20 17:00	1
Calcium	**120**		0.50		mg/L		04/09/20 08:05	04/10/20 17:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**101**		2.5		mg/L			04/16/20 01:13	5
Fluoride	ND		0.25		mg/L			04/16/20 01:13	5
Sulfate	**29.7**		10.0		mg/L			04/16/20 01:13	5
Total Dissolved Solids	**404**		40.0		mg/L			04/08/20 18:01	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1		SU			04/09/20 14:32	1
Temperature	**18.9**	**HF**	0.001		Degrees C			04/09/20 14:32	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-2

Date Collected: 04/07/20 14:30
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-2

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.037**		0.020		mg/L		04/09/20 08:05	04/10/20 17:04	1
Calcium	**72.5**		0.50		mg/L		04/09/20 08:05	04/10/20 17:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**37.9**		2.5		mg/L			04/16/20 01:27	5
Fluoride	ND		0.25		mg/L			04/16/20 01:27	5
Sulfate	**36.5**		10.0		mg/L			04/16/20 01:27	5
Total Dissolved Solids	**261**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.2**	**HF**	0.1		SU			04/09/20 14:37	1
Temperature	**18.4**	**HF**	0.001		Degrees C			04/09/20 14:37	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-3

Date Collected: 04/07/20 10:45
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-3

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.039**		0.020		mg/L		04/09/20 08:05	04/10/20 17:08	1
Calcium	**118**		0.50		mg/L		04/09/20 08:05	04/10/20 17:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**59.7**		2.5		mg/L			04/16/20 01:41	5
Fluoride	ND		0.25		mg/L			04/16/20 01:41	5
Sulfate	**60.1**		10.0		mg/L			04/16/20 01:41	5
Total Dissolved Solids	**451**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.4**	**HF**	0.1		SU			04/09/20 14:40	1
Temperature	**18.3**	**HF**	0.001		Degrees C			04/09/20 14:40	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-4R

Date Collected: 04/07/20 11:30
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-4

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.26**		0.020		mg/L		04/09/20 08:05	04/10/20 17:23	1
Calcium	**123**		0.50		mg/L		04/09/20 08:05	04/10/20 17:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		2.5		mg/L			04/16/20 01:55	5
Fluoride	ND		0.25		mg/L			04/16/20 01:55	5
Sulfate	**63.1**		10.0		mg/L			04/16/20 01:55	5
Total Dissolved Solids	**512**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1		SU			04/09/20 14:43	1
Temperature	**18.4**	**HF**	0.001		Degrees C			04/09/20 14:43	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-5

Date Collected: 04/07/20 12:15
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-5

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.050**		0.020		mg/L		04/09/20 08:05	04/10/20 17:27	1
Calcium	**139**		0.50		mg/L		04/09/20 08:05	04/10/20 17:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		2.5		mg/L			04/16/20 02:10	5
Fluoride	ND		0.25		mg/L			04/16/20 02:10	5
Sulfate	**41.1**		10.0		mg/L			04/16/20 02:10	5
Total Dissolved Solids	**719**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1		SU			04/09/20 14:46	1
Temperature	**18.5**	**HF**	0.001		Degrees C			04/09/20 14:46	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-6

Date Collected: 04/07/20 13:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-6

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.25**		0.020		mg/L		04/09/20 08:05	04/10/20 17:30	1
Calcium	**164**		0.50		mg/L		04/09/20 08:05	04/10/20 17:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**81.9**		2.5		mg/L			04/16/20 00:17	5
Fluoride	ND		0.25		mg/L			04/16/20 00:17	5
Sulfate	**149**		10.0		mg/L			04/16/20 00:17	5
Total Dissolved Solids	**715**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			04/09/20 14:49	1
Temperature	**18.9**	**HF**	0.001		Degrees C			04/09/20 14:49	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: P-7

Date Collected: 04/07/20 13:45
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-7

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.15**		0.020		mg/L		04/09/20 08:05	04/10/20 17:34	1
Calcium	**187**		0.50		mg/L		04/09/20 08:05	04/10/20 17:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**42.6**		2.5		mg/L			04/16/20 11:54	5
Fluoride	ND		0.25		mg/L			04/16/20 11:54	5
Sulfate	**50.4**		10.0		mg/L			04/16/20 11:54	5
Total Dissolved Solids	**553**		10.0		mg/L			04/10/20 18:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.2**	**HF**	0.1		SU			04/09/20 14:52	1
Temperature	**19.3**	**HF**	0.001		Degrees C			04/09/20 14:52	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: Duplicate

Date Collected: 04/07/20 00:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-8

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.037**		0.020		mg/L		04/09/20 08:05	04/10/20 17:38	1
Calcium	**119**		0.50		mg/L		04/09/20 08:05	04/10/20 17:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**61.0**		2.5		mg/L			04/16/20 12:08	5
Fluoride	ND		0.25		mg/L			04/16/20 12:08	5
Sulfate	**61.2**		10.0		mg/L			04/16/20 12:08	5
Total Dissolved Solids	**458**		10.0		mg/L			04/08/20 18:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.4**	**HF**	0.1		SU			04/09/20 14:58	1
Temperature	**18.9**	**HF**	0.001		Degrees C			04/09/20 14:58	1

Client Sample Results

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

Job ID: 480-168319-1

Client Sample ID: Field Blank

Date Collected: 04/07/20 14:45
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-9

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		04/09/20 08:05	04/10/20 17:42	1
Calcium	ND		0.50		mg/L		04/09/20 08:05	04/10/20 17:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			04/16/20 12:22	1
Fluoride	ND		0.050		mg/L			04/16/20 12:22	1
Sulfate	ND		2.0		mg/L			04/16/20 12:22	1
Total Dissolved Solids	ND		10.0		mg/L			04/10/20 18:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.2**	**HF**	0.1		SU			04/09/20 15:01	1
Temperature	**18.9**	**HF**	0.001		Degrees C			04/09/20 15:01	1

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

Job ID: 480-168319-1

Client Sample ID: Equip Blank

Date Collected: 04/07/20 15:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-10

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		04/09/20 08:05	04/10/20 17:46	1
Calcium	ND		0.50		mg/L		04/09/20 08:05	04/10/20 17:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			04/16/20 12:37	1
Fluoride	ND		0.050		mg/L			04/16/20 12:37	1
Sulfate	ND		2.0		mg/L			04/16/20 12:37	1
Total Dissolved Solids	ND		10.0		mg/L			04/10/20 18:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.0**	**HF**	0.1		SU			04/09/20 15:04	1
Temperature	**18.9**	**HF**	0.001		Degrees C			04/09/20 15:04	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 480-524984/1-A
Matrix: Water
Analysis Batch: 525552

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 524984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		04/09/20 08:05	04/10/20 16:53	1
Calcium	ND		0.50		mg/L		04/09/20 08:05	04/10/20 16:53	1

Lab Sample ID: LCS 480-524984/2-A
Matrix: Water
Analysis Batch: 525552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 524984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.200	0.216		mg/L		108	85 - 115
Calcium	10.0	10.34		mg/L		103	85 - 115

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-526083/4
Matrix: Water
Analysis Batch: 526083

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			04/15/20 21:41	1
Fluoride	ND		0.050		mg/L			04/15/20 21:41	1
Sulfate	ND		2.0		mg/L			04/15/20 21:41	1

Lab Sample ID: LCS 480-526083/3
Matrix: Water
Analysis Batch: 526083

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	49.76		mg/L		100	90 - 110
Fluoride	5.00	5.18		mg/L		104	90 - 110
Sulfate	50.0	49.53		mg/L		99	90 - 110

Lab Sample ID: 480-168319-5 MS
Matrix: Water
Analysis Batch: 526083

Client Sample ID: P-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	150		250	390.4		mg/L		96	81 - 120
Fluoride	ND		25.0	25.42		mg/L		102	82 - 120
Sulfate	41.1		250	285.3		mg/L		98	80 - 120

Lab Sample ID: MB 480-526291/4
Matrix: Water
Analysis Batch: 526291

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			04/16/20 11:40	1
Fluoride	ND		0.050		mg/L			04/16/20 11:40	1
Sulfate	ND		2.0		mg/L			04/16/20 11:40	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-526291/3
Matrix: Water
Analysis Batch: 526291

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	48.55		mg/L		97	90 - 110
Fluoride	5.00	5.03		mg/L		101	90 - 110
Sulfate	50.0	48.31		mg/L		97	90 - 110

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

Lab Sample ID: MB 480-524960/1
Matrix: Water
Analysis Batch: 524960

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			04/08/20 18:01	1

Lab Sample ID: LCS 480-524960/2
Matrix: Water
Analysis Batch: 524960

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	480.0		mg/L		95	85 - 115

Lab Sample ID: 480-168319-1 DU
Matrix: Water
Analysis Batch: 524960

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	404		424.0		mg/L		5	10

Lab Sample ID: MB 480-524961/1
Matrix: Water
Analysis Batch: 524961

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			04/08/20 18:19	1

Lab Sample ID: LCS 480-524961/2
Matrix: Water
Analysis Batch: 524961

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	458.0		mg/L		91	85 - 115

Lab Sample ID: 480-168319-8 DU
Matrix: Water
Analysis Batch: 524961

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	458		470.0		mg/L		3	10

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

Lab Sample ID: MB 480-525415/1
Matrix: Water
Analysis Batch: 525415

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			04/10/20 18:17	1

Lab Sample ID: LCS 480-525415/2
Matrix: Water
Analysis Batch: 525415

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	478.0		mg/L		95	85 - 115		

Lab Sample ID: 480-168319-7 DU
Matrix: Water
Analysis Batch: 525415

Client Sample ID: P-7
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	553			599.0		mg/L				8	10

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-525169/23
Matrix: Water
Analysis Batch: 525169

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: 480-168319-1 DU
Matrix: Water
Analysis Batch: 525169

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.0	HF		7.0		SU				0.1	5
Temperature	18.9	HF		18.6		Degrees C				2	10

Metals

Prep Batch: 524984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-1	P-1	Total/NA	Water	200.7	
480-168319-2	P-2	Total/NA	Water	200.7	
480-168319-3	P-3	Total/NA	Water	200.7	
480-168319-4	P-4R	Total/NA	Water	200.7	
480-168319-5	P-5	Total/NA	Water	200.7	
480-168319-6	P-6	Total/NA	Water	200.7	
480-168319-7	P-7	Total/NA	Water	200.7	
480-168319-8	Duplicate	Total/NA	Water	200.7	
480-168319-9	Field Blank	Total/NA	Water	200.7	
480-168319-10	Equip Blank	Total/NA	Water	200.7	
MB 480-524984/1-A	Method Blank	Total/NA	Water	200.7	
LCS 480-524984/2-A	Lab Control Sample	Total/NA	Water	200.7	

Analysis Batch: 525552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-1	P-1	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-2	P-2	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-3	P-3	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-4	P-4R	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-5	P-5	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-6	P-6	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-7	P-7	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-8	Duplicate	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-9	Field Blank	Total/NA	Water	200.7 Rev 4.4	524984
480-168319-10	Equip Blank	Total/NA	Water	200.7 Rev 4.4	524984
MB 480-524984/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	524984
LCS 480-524984/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	524984

General Chemistry

Analysis Batch: 524960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-1	P-1	Total/NA	Water	SM 2540C	
MB 480-524960/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-524960/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-168319-1 DU	P-1	Total/NA	Water	SM 2540C	

Analysis Batch: 524961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-2	P-2	Total/NA	Water	SM 2540C	
480-168319-3	P-3	Total/NA	Water	SM 2540C	
480-168319-4	P-4R	Total/NA	Water	SM 2540C	
480-168319-5	P-5	Total/NA	Water	SM 2540C	
480-168319-6	P-6	Total/NA	Water	SM 2540C	
480-168319-8	Duplicate	Total/NA	Water	SM 2540C	
MB 480-524961/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-524961/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-168319-8 DU	Duplicate	Total/NA	Water	SM 2540C	

QC Association Summary

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

Job ID: 480-168319-1

General Chemistry

Analysis Batch: 525169

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-1	P-1	Total/NA	Water	SM 4500 H+ B	
480-168319-2	P-2	Total/NA	Water	SM 4500 H+ B	
480-168319-3	P-3	Total/NA	Water	SM 4500 H+ B	
480-168319-4	P-4R	Total/NA	Water	SM 4500 H+ B	
480-168319-5	P-5	Total/NA	Water	SM 4500 H+ B	
480-168319-6	P-6	Total/NA	Water	SM 4500 H+ B	
480-168319-7	P-7	Total/NA	Water	SM 4500 H+ B	
480-168319-8	Duplicate	Total/NA	Water	SM 4500 H+ B	
480-168319-9	Field Blank	Total/NA	Water	SM 4500 H+ B	
480-168319-10	Equip Blank	Total/NA	Water	SM 4500 H+ B	
LCS 480-525169/23	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
480-168319-1 DU	P-1	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 525415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-7	P-7	Total/NA	Water	SM 2540C	
480-168319-9	Field Blank	Total/NA	Water	SM 2540C	
480-168319-10	Equip Blank	Total/NA	Water	SM 2540C	
MB 480-525415/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-525415/2	Lab Control Sample	Total/NA	Water	SM 2540C	
480-168319-7 DU	P-7	Total/NA	Water	SM 2540C	

Analysis Batch: 526083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-1	P-1	Total/NA	Water	300.0	
480-168319-2	P-2	Total/NA	Water	300.0	
480-168319-3	P-3	Total/NA	Water	300.0	
480-168319-4	P-4R	Total/NA	Water	300.0	
480-168319-5	P-5	Total/NA	Water	300.0	
480-168319-6	P-6	Total/NA	Water	300.0	
MB 480-526083/4	Method Blank	Total/NA	Water	300.0	
LCS 480-526083/3	Lab Control Sample	Total/NA	Water	300.0	
480-168319-5 MS	P-5	Total/NA	Water	300.0	

Analysis Batch: 526291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-168319-7	P-7	Total/NA	Water	300.0	
480-168319-8	Duplicate	Total/NA	Water	300.0	
480-168319-9	Field Blank	Total/NA	Water	300.0	
480-168319-10	Equip Blank	Total/NA	Water	300.0	
MB 480-526291/4	Method Blank	Total/NA	Water	300.0	
LCS 480-526291/3	Lab Control Sample	Total/NA	Water	300.0	

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-168319-1
Project/Site: SKB Cloquet - CCR Groundwater

Client Sample ID: P-1
Lab Sample ID: 480-168319-1
Date Collected: 04/07/20 10:00
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:00	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 01:13	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524960	04/08/20 18:01	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:32	BEF	TAL BUF

Client Sample ID: P-2
Lab Sample ID: 480-168319-2
Date Collected: 04/07/20 14:30
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:04	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 01:27	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:37	BEF	TAL BUF

Client Sample ID: P-3
Lab Sample ID: 480-168319-3
Date Collected: 04/07/20 10:45
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:08	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 01:41	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:40	BEF	TAL BUF

Client Sample ID: P-4R
Lab Sample ID: 480-168319-4
Date Collected: 04/07/20 11:30
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:23	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 01:55	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:43	BEF	TAL BUF

Lab Chronicle

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

Job ID: 480-168319-1

Client Sample ID: P-5
Date Collected: 04/07/20 12:15
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:27	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 02:10	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:46	BEF	TAL BUF

Client Sample ID: P-6
Date Collected: 04/07/20 13:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:30	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526083	04/16/20 00:17	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:49	BEF	TAL BUF

Client Sample ID: P-7
Date Collected: 04/07/20 13:45
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:34	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526291	04/16/20 11:54	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	525415	04/10/20 18:17	CSS	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:52	BEF	TAL BUF

Client Sample ID: Duplicate
Date Collected: 04/07/20 00:00
Date Received: 04/08/20 10:00

Lab Sample ID: 480-168319-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:38	LMH	TAL BUF
Total/NA	Analysis	300.0		5	526291	04/16/20 12:08	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	524961	04/08/20 18:19	E1T	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 14:58	BEF	TAL BUF

Lab Chronicle

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

Job ID: 480-168319-1

Client Sample ID: Field Blank

Lab Sample ID: 480-168319-9

Date Collected: 04/07/20 14:45
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:42	LMH	TAL BUF
Total/NA	Analysis	300.0		1	526291	04/16/20 12:22	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	525415	04/10/20 18:17	CSS	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 15:01	BEF	TAL BUF

Client Sample ID: Equip Blank

Lab Sample ID: 480-168319-10

Date Collected: 04/07/20 15:00
Matrix: Water
Date Received: 04/08/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			524984	04/09/20 08:05	NSW	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	525552	04/10/20 17:46	LMH	TAL BUF
Total/NA	Analysis	300.0		1	526291	04/16/20 12:37	IMZ	TAL BUF
Total/NA	Analysis	SM 2540C		1	525415	04/10/20 18:17	CSS	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	525169	04/09/20 15:04	BEF	TAL BUF

Laboratory References:

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

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 480-168319-1
Project/Site: SKB Cloquet - 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

Method Summary

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

Job ID: 480-168319-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	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
200.7	Preparation, Total Metals	EPA	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

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

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

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 Cloquet - CCR Groundwater

Job ID: 480-168319-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-168319-1	P-1	Water	04/07/20 10:00	04/08/20 10:00	
480-168319-2	P-2	Water	04/07/20 14:30	04/08/20 10:00	
480-168319-3	P-3	Water	04/07/20 10:45	04/08/20 10:00	
480-168319-4	P-4R	Water	04/07/20 11:30	04/08/20 10:00	
480-168319-5	P-5	Water	04/07/20 12:15	04/08/20 10:00	
480-168319-6	P-6	Water	04/07/20 13:00	04/08/20 10:00	
480-168319-7	P-7	Water	04/07/20 13:45	04/08/20 10:00	
480-168319-8	Duplicate	Water	04/07/20 00:00	04/08/20 10:00	
480-168319-9	Field Blank	Water	04/07/20 14:45	04/08/20 10:00	
480-168319-10	Equip Blank	Water	04/07/20 15:00	04/08/20 10:00	

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

Chain of Custody Record

America Duluth SC 269

eurofins | Environment Testing TestAmerica

Client Information	Sampler: N. Schlegel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-143916-22507.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6085	E-Mail: ryan.vandette@testamericainc.com		Page: Page 1 of 1
Company: Waste Connections, Inc.				Job #:
Address: 13425 Courthouse Blvd	Due Date Requested:			
City: Rosemount	TAT Requested (days): Standard			
State, Zip: MN, 55068				
Phone:	PO #: Purchase Order Requested 3078-20-00107			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Cloquet/ Event Desc: CCR Groundwater	Project #: 48013722			
Site: Minnesota	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	300.0_28D - Cl/F/SO4	200.7, 200.8, 245.1	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	D	N	D	N	N	X	
P-1	4/7/20	10:00	6	Water			X	X	X	X	X		
P-2		14:30		Water									
P-3		10:45		Water									
P-4R		11:30		Water									
P-5		12:15		Water									
P-6		13:00		Water									
P-7		13:45		Water									
Duplicate		—		Water									
Field Blank		14:45		Water									
Equip Blank		15:00		Water									

480-168319 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
	4/7/20 1580	GES		4/7/20 1600	
Melissa Lee	4/7/20 1550		Amikow Cikolb	04/08/20 0600	TA

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

Cooler Temperature(s) °C and Other Remarks: TestAmerica Duluth SC 269 3.3 2,4 2.8 #1 ICE

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-168319-1

Login Number: 168319
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	3.3 2.4 2.8 #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.	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	GES
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

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

Laboratory Job ID: 480-176637-1
Client Project/Site: SKB Cloquet - CCR Groundwater
Sampling Event: CCR Groundwater

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

Attn: Nathaniel Beinemann

Authorized for release by:
10/27/2020 11:01:56 AM

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

Table of Contents

Definitions/Glossary

Client: Waste Connections, Inc.
Job ID: 480-176637-1
Project/Site: SKB Cloquet - CCR Groundwater

Qualifiers

Metals

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

General Chemistry

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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: 480-176637-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-176637-1

Comments
No additional comments.

Receipt
The samples were received on 10/15/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.0º C.

HPLC/IC
Method 300.0: The following sample was diluted due to the nature of the sample matrix: P-7 (480-176637-7). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: P-1 (480-176637-1), P-2 (480-176637-2), P-3R (480-176637-3), P-4R (480-176637-4), P-5 (480-176637-5), P-6 (480-176637-6) and DUPLICATE (480-176637-8). 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
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: P-1 (480-176637-1), P-2 (480-176637-2), P-3R (480-176637-3), P-4R (480-176637-4), P-5 (480-176637-5), P-6 (480-176637-6), P-7 (480-176637-7), DUPLICATE (480-176637-8), FIELD BLANK (480-176637-9) and EQUIP BLANK (480-176637-10).

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 Cloquet - CCR Groundwater

Job ID: 480-176637-1

Client Sample ID: P-1 — Lab Sample ID: 480-176637-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.048		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	158		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	193		2.5		mg/L	5		300.0	Total/NA
Sulfate	31.2		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	850		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	15.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-2 — Lab Sample ID: 480-176637-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.040		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	71.8		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	142		2.5		mg/L	5		300.0	Total/NA
Sulfate	12.5		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	534		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	15.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-3R — Lab Sample ID: 480-176637-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.036		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	120		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	208		2.5		mg/L	5		300.0	Total/NA
Sulfate	32.9		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	538		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	15.9	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-4R — Lab Sample ID: 480-176637-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.049		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	125		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	144		2.5		mg/L	5		300.0	Total/NA
Sulfate	39.9		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	627		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.1	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-5 — Lab Sample ID: 480-176637-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.066		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	156		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	189		2.5		mg/L	5		300.0	Total/NA
Sulfate	28.0		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	858		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.6	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

This Detection Summary does not include radiochemical test results.

Detection Summary

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

Job ID: 480-176637-1

Client Sample ID: P-6 — Lab Sample ID: 480-176637-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.32		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	168		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	88.7		2.5		mg/L	5		300.0	Total/NA
Sulfate	140		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	789		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.3	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: P-7 — Lab Sample ID: 480-176637-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.14		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	170		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	70.8		2.5		mg/L	5		300.0	Total/NA
Sulfate	66.2		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	869		10.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	16.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUPLICATE — Lab Sample ID: 480-176637-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.037		0.020		mg/L	1		200.7 Rev 4.4	Total/NA
Calcium	122		0.50		mg/L	1		200.7 Rev 4.4	Total/NA
Chloride	204		2.5		mg/L	5		300.0	Total/NA
Sulfate	32.6		10.0		mg/L	5		300.0	Total/NA
Total Dissolved Solids	687		10.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	16.8	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: FIELD BLANK — Lab Sample ID: 480-176637-9

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA
Temperature	17.6	HF	0.001		Degrees C	1		SM 4500 H+ B	Total/NA

Client Sample ID: EQUIP BLANK — Lab Sample ID: 480-176637-10

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.1	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

This Detection Summary does not include radiochemical test results.

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-1

Date Collected: 10/13/20 10:55
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-1

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.048**		0.020		mg/L		10/19/20 11:02	10/19/20 23:47	1
Calcium	**158**		0.50		mg/L		10/19/20 11:02	10/19/20 23:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**193**		2.5		mg/L			10/23/20 19:22	5
Fluoride	ND		0.25		mg/L			10/23/20 19:22	5
Sulfate	**31.2**		10.0		mg/L			10/23/20 19:22	5
Total Dissolved Solids	**850**		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			10/19/20 11:35	1
Temperature	**15.9**	**HF**	0.001		Degrees C			10/19/20 11:35	1

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-2

Date Collected: 10/14/20 10:50
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-2

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.040**		0.020		mg/L		10/19/20 11:02	10/19/20 23:50	1
Calcium	**71.8**		0.50		mg/L		10/19/20 11:02	10/19/20 23:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**142**		2.5		mg/L			10/23/20 19:36	5
Fluoride	ND		0.25		mg/L			10/23/20 19:36	5
Sulfate	**12.5**		10.0		mg/L			10/23/20 19:36	5
Total Dissolved Solids	**534**		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1		SU			10/19/20 11:37	1
Temperature	**15.6**	**HF**	0.001		Degrees C			10/19/20 11:37	1

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-3R

Date Collected: 10/13/20 09:30
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-3

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.036		0.020		mg/L		10/19/20 11:02	10/19/20 23:54	1
Calcium	120		0.50		mg/L		10/19/20 11:02	10/19/20 23:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	208		2.5		mg/L			10/23/20 19:51	5
Fluoride	ND		0.25		mg/L			10/23/20 19:51	5
Sulfate	32.9		10.0		mg/L			10/23/20 19:51	5
Total Dissolved Solids	538		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			10/19/20 11:40	1
Temperature	15.9	HF	0.001		Degrees C			10/19/20 11:40	1

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

Job ID: 480-176637-1

Client Sample ID: P-4R

Date Collected: 10/13/20 12:10
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-4

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.049		0.020		mg/L		10/19/20 11:02	10/19/20 23:58	1
Calcium	125		0.50		mg/L		10/19/20 11:02	10/19/20 23:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	144		2.5		mg/L			10/23/20 20:05	5
Fluoride	ND		0.25		mg/L			10/23/20 20:05	5
Sulfate	39.9		10.0		mg/L			10/23/20 20:05	5
Total Dissolved Solids	627		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			10/19/20 11:45	1
Temperature	18.1	HF	0.001		Degrees C			10/19/20 11:45	1

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-5

Date Collected: 10/13/20 12:55
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-5

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.066		0.020		mg/L		10/19/20 11:02	10/20/20 00:09	1
Calcium	156		0.50		mg/L		10/19/20 11:02	10/20/20 00:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	189		2.5		mg/L			10/23/20 21:18	5
Fluoride	ND		0.25		mg/L			10/23/20 21:18	5
Sulfate	28.0		10.0		mg/L			10/23/20 21:18	5
Total Dissolved Solids	858		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.6	HF	0.1		SU			10/19/20 11:47	1
Temperature	18.3	HF	0.001		Degrees C			10/19/20 11:47	1

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-6

Date Collected: 10/13/20 13:40
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-6

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.32		0.020		mg/L		10/19/20 11:02	10/20/20 00:13	1
Calcium	168		0.50		mg/L		10/19/20 11:02	10/20/20 00:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	88.7		2.5		mg/L			10/23/20 21:33	5
Fluoride	ND		0.25		mg/L			10/23/20 21:33	5
Sulfate	140		10.0		mg/L			10/23/20 21:33	5
Total Dissolved Solids	789		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			10/19/20 11:50	1
Temperature	17.3	HF	0.001		Degrees C			10/19/20 11:50	1

Client Sample Results

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

Job ID: 480-176637-1

Client Sample ID: P-7

Date Collected: 10/13/20 14:30
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-7

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.14		0.020		mg/L		10/19/20 11:02	10/20/20 00:28	1
Calcium	170		0.50		mg/L		10/19/20 11:02	10/20/20 00:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	70.8		2.5		mg/L			10/23/20 21:47	5
Fluoride	ND		0.25		mg/L			10/23/20 21:47	5
Sulfate	66.2		10.0		mg/L			10/23/20 21:47	5
Total Dissolved Solids	869		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			10/19/20 11:52	1
Temperature	16.8	HF	0.001		Degrees C			10/19/20 11:52	1

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

Job ID: 480-176637-1

Client Sample ID: DUPLICATE

Date Collected: 10/14/20 00:00
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-8

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.037		0.020		mg/L		10/19/20 11:02	10/20/20 00:31	1
Calcium	122		0.50		mg/L		10/19/20 11:02	10/20/20 00:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	204		2.5		mg/L			10/23/20 22:02	5
Fluoride	ND		0.25		mg/L			10/23/20 22:02	5
Sulfate	32.6		10.0		mg/L			10/23/20 22:02	5
Total Dissolved Solids	687		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU			10/19/20 11:55	1
Temperature	16.8	HF	0.001		Degrees C			10/19/20 11:55	1

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

Job ID: 480-176637-1

Client Sample ID: FIELD BLANK

Date Collected: 10/14/20 11:30
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-9
Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		10/19/20 11:02	10/20/20 00:35	1
Calcium	ND		0.50		mg/L		10/19/20 11:02	10/20/20 00:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/23/20 22:17	1
Fluoride	ND		0.050		mg/L			10/23/20 22:17	1
Sulfate	ND		2.0		mg/L			10/23/20 22:17	1
Total Dissolved Solids	ND		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1		SU			10/19/20 11:58	1
Temperature	**17.6**	**HF**	0.001		Degrees C			10/19/20 11:58	1

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

Job ID: 480-176637-1

Client Sample ID: EQUIP BLANK

Date Collected: 10/14/20 11:40
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-10

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		10/19/20 11:02	10/20/20 00:39	1
Calcium	ND		0.50		mg/L		10/19/20 11:02	10/20/20 00:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50		mg/L			10/23/20 22:31	1
Fluoride	ND		0.050		mg/L			10/23/20 22:31	1
Sulfate	ND		2.0		mg/L			10/23/20 22:31	1
Total Dissolved Solids	ND		10.0		mg/L			10/16/20 19:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.1**	**HF**	0.1		SU			10/19/20 12:03	1
Temperature	**19.0**	**HF**	0.001		Degrees C			10/19/20 12:03	1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 480-554577/1-A
Matrix: Water
Analysis Batch: 554744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 554577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020		mg/L		10/19/20 11:02	10/19/20 22:32	1
Calcium	ND		0.50		mg/L		10/19/20 11:02	10/19/20 22:32	1

Lab Sample ID: LCS 480-554577/2-A
Matrix: Water
Analysis Batch: 554744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 554577

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.200	0.197		mg/L		98	85 - 115
Calcium	10.0	9.46		mg/L		95	85 - 115

Lab Sample ID: 480-176637-4 MS
Matrix: Water
Analysis Batch: 554744

Client Sample ID: P-4R
Prep Type: Total/NA
Prep Batch: 554577

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.049		0.200	0.249		mg/L		100	70 - 130
Calcium	125		10.0	133.3	4	mg/L		81	70 - 130

Lab Sample ID: 480-176637-4 MSD
Matrix: Water
Analysis Batch: 554744

Client Sample ID: P-4R
Prep Type: Total/NA
Prep Batch: 554577

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.049		0.200	0.249		mg/L		100	70 - 130	0	20
Calcium	125		10.0	133.7	4	mg/L		85	70 - 130	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-555432/28
Matrix: Water
Analysis Batch: 555432

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			10/23/20 18:38	1
Fluoride	ND		0.050		mg/L			10/23/20 18:38	1
Sulfate	ND		2.0		mg/L			10/23/20 18:38	1

Lab Sample ID: LCS 480-555432/27
Matrix: Water
Analysis Batch: 555432

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.52		mg/L		101	90 - 110
Fluoride	5.00	4.96		mg/L		99	90 - 110
Sulfate	50.0	49.21		mg/L		98	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-176637-4 MS
Matrix: Water
Analysis Batch: 555432

Client Sample ID: P-4R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	144		250	385.4		mg/L		97	81 - 120
Fluoride	ND		25.0	23.89		mg/L		96	82 - 120
Sulfate	39.9		250	277.3		mg/L		95	80 - 120

Lab Sample ID: 480-176637-4 MSD
Matrix: Water
Analysis Batch: 555432

Client Sample ID: P-4R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	144		250	383.6		mg/L		96	81 - 120	0	15
Fluoride	ND		25.0	23.82		mg/L		95	82 - 120	0	15
Sulfate	39.9		250	275.9		mg/L		94	80 - 120	0	15

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

Lab Sample ID: MB 480-554384/1
Matrix: Water
Analysis Batch: 554384

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			10/16/20 19:59	1

Lab Sample ID: LCS 480-554384/2
Matrix: Water
Analysis Batch: 554384

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	474.0		mg/L		94	85 - 115

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 480-554619/23
Matrix: Water
Analysis Batch: 554619

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

Lab Sample ID: 480-176637-3 DU
Matrix: Water
Analysis Batch: 554619

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.3	HF	7.4		SU		0.7	5
Temperature	15.9	HF	16.7		Degrees C		4	10

QC Association Summary

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

Job ID: 480-176637-1

Metals

Prep Batch: 554577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176637-1	P-1	Total/NA	Water	200.7	
480-176637-2	P-2	Total/NA	Water	200.7	
480-176637-3	P-3R	Total/NA	Water	200.7	
480-176637-4	P-4R	Total/NA	Water	200.7	
480-176637-5	P-5	Total/NA	Water	200.7	
480-176637-6	P-6	Total/NA	Water	200.7	
480-176637-7	P-7	Total/NA	Water	200.7	
480-176637-8	DUPLICATE	Total/NA	Water	200.7	
480-176637-9	FIELD BLANK	Total/NA	Water	200.7	
480-176637-10	EQUIP BLANK	Total/NA	Water	200.7	
MB 480-554577/1-A	Method Blank	Total/NA	Water	200.7	
LCS 480-554577/2-A	Lab Control Sample	Total/NA	Water	200.7	
480-176637-4 MS	P-4R	Total/NA	Water	200.7	
480-176637-4 MSD	P-4R	Total/NA	Water	200.7	

Analysis Batch: 554744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176637-1	P-1	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-2	P-2	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-3	P-3R	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-4	P-4R	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-5	P-5	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-6	P-6	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-7	P-7	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-8	DUPLICATE	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-9	FIELD BLANK	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-10	EQUIP BLANK	Total/NA	Water	200.7 Rev 4.4	554577
MB 480-554577/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	554577
LCS 480-554577/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-4 MS	P-4R	Total/NA	Water	200.7 Rev 4.4	554577
480-176637-4 MSD	P-4R	Total/NA	Water	200.7 Rev 4.4	554577

General Chemistry

Analysis Batch: 554384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176637-1	P-1	Total/NA	Water	SM 2540C	
480-176637-2	P-2	Total/NA	Water	SM 2540C	
480-176637-3	P-3R	Total/NA	Water	SM 2540C	
480-176637-4	P-4R	Total/NA	Water	SM 2540C	
480-176637-5	P-5	Total/NA	Water	SM 2540C	
480-176637-6	P-6	Total/NA	Water	SM 2540C	
480-176637-7	P-7	Total/NA	Water	SM 2540C	
480-176637-8	DUPLICATE	Total/NA	Water	SM 2540C	
480-176637-9	FIELD BLANK	Total/NA	Water	SM 2540C	
480-176637-10	EQUIP BLANK	Total/NA	Water	SM 2540C	
MB 480-554384/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 480-554384/2	Lab Control Sample	Total/NA	Water	SM 2540C	

QC Association Summary

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

Job ID: 480-176637-1

General Chemistry

Analysis Batch: 554619

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176637-1	P-1	Total/NA	Water	SM 4500 H+ B	
480-176637-2	P-2	Total/NA	Water	SM 4500 H+ B	
480-176637-3	P-3R	Total/NA	Water	SM 4500 H+ B	
480-176637-4	P-4R	Total/NA	Water	SM 4500 H+ B	
480-176637-5	P-5	Total/NA	Water	SM 4500 H+ B	
480-176637-6	P-6	Total/NA	Water	SM 4500 H+ B	
480-176637-7	P-7	Total/NA	Water	SM 4500 H+ B	
480-176637-8	DUPLICATE	Total/NA	Water	SM 4500 H+ B	
480-176637-9	FIELD BLANK	Total/NA	Water	SM 4500 H+ B	
480-176637-10	EQUIP BLANK	Total/NA	Water	SM 4500 H+ B	
LCS 480-554619/23	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
480-176637-3 DU	P-3R	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 555432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-176637-1	P-1	Total/NA	Water	300.0	
480-176637-2	P-2	Total/NA	Water	300.0	
480-176637-3	P-3R	Total/NA	Water	300.0	
480-176637-4	P-4R	Total/NA	Water	300.0	
480-176637-5	P-5	Total/NA	Water	300.0	
480-176637-6	P-6	Total/NA	Water	300.0	
480-176637-7	P-7	Total/NA	Water	300.0	
480-176637-8	DUPLICATE	Total/NA	Water	300.0	
480-176637-9	FIELD BLANK	Total/NA	Water	300.0	
480-176637-10	EQUIP BLANK	Total/NA	Water	300.0	
MB 480-555432/28	Method Blank	Total/NA	Water	300.0	
LCS 480-555432/27	Lab Control Sample	Total/NA	Water	300.0	
480-176637-4 MS	P-4R	Total/NA	Water	300.0	
480-176637-4 MSD	P-4R	Total/NA	Water	300.0	

Lab Chronicle

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

Job ID: 480-176637-1

Client Sample ID: P-1
Date Collected: 10/13/20 10:55
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/19/20 23:47	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 19:22	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:35	BEF	TAL BUF

Client Sample ID: P-2
Date Collected: 10/14/20 10:50
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/19/20 23:50	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 19:36	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:37	BEF	TAL BUF

Client Sample ID: P-3R
Date Collected: 10/13/20 09:30
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/19/20 23:54	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 19:51	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:40	BEF	TAL BUF

Client Sample ID: P-4R
Date Collected: 10/13/20 12:10
Date Received: 10/16/20 10:42

Lab Sample ID: 480-176637-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/19/20 23:58	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 20:05	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:45	BEF	TAL BUF

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176637-1
Project/Site: SKB Cloquet - CCR Groundwater

Client Sample ID: P-5
Lab Sample ID: 480-176637-5
Date Collected: 10/13/20 12:55
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:09	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 21:18	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:47	BEF	TAL BUF

Client Sample ID: P-6
Lab Sample ID: 480-176637-6
Date Collected: 10/13/20 13:40
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:13	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 21:33	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:50	BEF	TAL BUF

Client Sample ID: P-7
Lab Sample ID: 480-176637-7
Date Collected: 10/13/20 14:30
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:28	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 21:47	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:52	BEF	TAL BUF

Client Sample ID: DUPLICATE
Lab Sample ID: 480-176637-8
Date Collected: 10/14/20 00:00
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:31	LMH	TAL BUF
Total/NA	Analysis	300.0		5	555432	10/23/20 22:02	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:55	BEF	TAL BUF

Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-176637-1
Project/Site: SKB Cloquet - CCR Groundwater

Client Sample ID: FIELD BLANK
Lab Sample ID: 480-176637-9
Date Collected: 10/14/20 11:30
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:35	LMH	TAL BUF
Total/NA	Analysis	300.0		1	555432	10/23/20 22:17	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 11:58	BEF	TAL BUF

Client Sample ID: EQUIP BLANK
Lab Sample ID: 480-176637-10
Date Collected: 10/14/20 11:40
Matrix: Water
Date Received: 10/16/20 10:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			554577	10/19/20 11:02	ADM	TAL BUF
Total/NA	Analysis	200.7 Rev 4.4		1	554744	10/20/20 00:39	LMH	TAL BUF
Total/NA	Analysis	300.0		1	555432	10/23/20 22:31	RJS	TAL BUF
Total/NA	Analysis	SM 2540C		1	554384	10/16/20 19:59	T1S	TAL BUF
Total/NA	Analysis	SM 4500 H+ B		1	554619	10/19/20 12:03	BEF	TAL BUF

Laboratory References:

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

Accreditation/Certification Summary

Client: Waste Connections, Inc.
Job ID: 480-176637-1
Project/Site: SKB Cloquet - 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

Method Summary

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

Job ID: 480-176637-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	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
200.7	Preparation, Total Metals	EPA	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

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

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

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 Cloquet - CCR Groundwater

Job ID: 480-176637-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-176637-1	P-1	Water	10/13/20 10:55	10/16/20 10:42	
480-176637-2	P-2	Water	10/14/20 10:50	10/16/20 10:42	
480-176637-3	P-3R	Water	10/13/20 09:30	10/16/20 10:42	
480-176637-4	P-4R	Water	10/13/20 12:10	10/16/20 10:42	
480-176637-5	P-5	Water	10/13/20 12:55	10/16/20 10:42	
480-176637-6	P-6	Water	10/13/20 13:40	10/16/20 10:42	
480-176637-7	P-7	Water	10/13/20 14:30	10/16/20 10:42	
480-176637-8	DUPLICATE	Water	10/14/20 00:00	10/16/20 10:42	
480-176637-9	FIELD BLANK	Water	10/14/20 11:30	10/16/20 10:42	
480-176637-10	EQUIP BLANK	Water	10/14/20 11:40	10/16/20 10:42	

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. Schlagel	Lab PM: VanDette, Ryan T	Carrier Tracking No(s):	COC No: 480-151489-25622.1
Client Contact: Nathaniel Beinemann	Phone: 651-792-6065	E-Mail: Ryan.VanDette@Eurofinset.com		Page: Page 1 of 1
Company: Waste Connections, Inc.				Job #:
Address: 13425 Courthouse Blvd	Due Date Requested:			
City: Rosemount	TAT Requested (days): Standard			
State, Zip: MN, 55068				
Phone:	PO #: Purchase Order Requested			
Email: nathanielb@wcnx.org	WO #:			
Project Name: SKB Cloquet/ Event Desc: CCR Groundwater	Project #: 48013722			
Site: Minnesota	SSOW#:			

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Cl/F/SO4	2540C_Calcd - Total Dissolved Solids	SM4500_H+ - pH	200.7 - B,Ca	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D		
P-1	10/13/20	10:55	G	Water			X	X	X	X		
P-2	10/14/20	10:50	G	Water			X	X	X	X		
P-3R	10/14/20	9:30	G	Water			X	X	X	X		
P-4R	10/13/20	12:10	G	Water			X	X	X	X		
P-5	10/13/20	12:55	G	Water			X	X	X	X		
P-6	10/13/20	13:40	G	Water			X	X	X	X		
P-7	10/13/20	14:30	G	Water			X	X	X	X		
Duplicate	10/14/20	~~9:30~~	G	Water			X	X	X	X		
Field Blank	10/14/20	11:30	G	Water			X	X	X	X		
Equip Blank	10/14/20	11:40	G	Water			X	X	X	X		

480-176637 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:

	Date/Time	Company		Date/Time	Company
Relinquished by: Nicholas Schlagel	10/14/20 1400	GES	Received by: Barb Rutten	10/14/20 1400	TA
Relinquished by: Barb Rutten	10/14/20 1700	TA	Received by: Mon Mon Cind	10/15/20 1000	TA
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: 3.0 # ICE

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-176637-1
SDG Number:

Login Number: 176637
List Number: 1
Creator: Kolb, Chris M

List Source: Eurofins TestAmerica, Buffalo

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

Appendix C – Statistical Evaluation Data

1				Background Statistics for Uncensored Full Data Sets							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.11/7/2021 8:17:10 AM							
4			From File	C:\Users\bjanowiak\Desktop\Projects Desktop\SKB\Shamrock\Annual 2020\Cloquet raw data 2020A.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	128			Number of Distinct Observations	60	
15									Number of Missing Observations	154	
16					Minimum	0.02			First Quartile	0.0418	
17					Second Largest	0.38			Median	0.0585	
18					Maximum	0.39			Third Quartile	0.13	
19					Mean	0.107			SD	0.0982	
20					Coefficient of Variation	0.919			Skewness	1.586	
21					Mean of logged Data	-2.562			SD of logged Data	0.769	
22											
23					Critical Values for Background Threshold Values (BTVs)						
24					Tolerance Factor K (For UTL)	1.888			d2max (for USL)	3.292	
25											
26					Normal GOF Test						
27					Shapiro Wilk Test Statistic	0.726			Normal GOF Test		
28					5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level		
29					Lilliefors Test Statistic	0.229			Lilliefors GOF Test		
30					5% Lilliefors Critical Value	0.0787			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	0.292			90% Percentile (z)	0.233	
35					95% UPL (t)	0.27			95% Percentile (z)	0.268	
36					95% USL	0.43			99% Percentile (z)	0.335	
37											
38					Gamma GOF Test						
39					A-D Test Statistic	6.745			Anderson-Darling Gamma GOF Test		
40					5% A-D Critical Value	0.768			Data Not Gamma Distributed at 5% Significance Level		
41					K-S Test Statistic	0.186			Kolmogorov-Smirnov Gamma GOF Test		
42					5% K-S Critical Value	0.0836			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)	1.68			k star (bias corrected MLE)	1.646	
47					Theta hat (MLE)	0.0636			Theta star (bias corrected MLE)	0.0649	
48					nu hat (MLE)	430.1			nu star (bias corrected)	421.4	
49					MLE Mean (bias corrected)	0.107			MLE Sd (bias corrected)	0.0833	
50											
51					Background Statistics Assuming Gamma Distribution						
52					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.267			90% Percentile	0.218	
53					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.268			95% Percentile	0.27	

54			95% WH Approx. Gamma UTL with	95% Coverage	0.303				99% Percentile		0.387
55			95% HW Approx. Gamma UTL with	95% Coverage	0.307						
56				95% WH USL	0.599				95% HW USL		0.651
57											
58					Lognormal GOF Test						
59				Shapiro Wilk Test Statistic	0.896			Shapiro Wilk Lognormal GOF Test			
60				5% Shapiro Wilk P Value	7.858E-13			Data Not Lognormal at 5% Significance Level			
61				Lilliefors Test Statistic	0.152			Lilliefors Lognormal GOF Test			
62				5% Lilliefors Critical Value	0.0787			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	0.329				90% Percentile (z)		0.207
67				95% UPL (t)	0.277				95% Percentile (z)		0.273
68				95% USL	0.969				99% Percentile (z)		0.461
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	125			95% UTL with	95% Coverage		0.37
75				Approx, f used to compute achieved CC	1.645			pproximate Actual Confidence Coefficient achieved by UTL			0.887
76								Approximate Sample Size needed to achieve specified CC			153
77			95% Percentile Bootstrap UTL with	95% Coverage	0.37			95% BCA Bootstrap UTL with	95% Coverage		0.37
78				95% UPL	0.347				90% Percentile		0.283
79				90% Chebyshev UPL	0.403				95% Percentile		0.327
80				95% Chebyshev UPL	0.537				99% Percentile		0.38
81				95% USL	0.39						
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	Calcium										
90											
91	General Statistics										
92				Total Number of Observations	125				Number of Distinct Observations		80
93									Number of Missing Observations		2
94				Minimum	0.5				First Quartile		119
95				Second Largest	207				Median		143
96				Maximum	235				Third Quartile		163
97				Mean	137.5				SD		34.9
98				Coefficient of Variation	0.254				Skewness		-0.858
99				Mean of logged Data	4.852				SD of logged Data		0.574
100											
101					Critical Values for Background Threshold Values (BTVs)						
102				Tolerance Factor K (For UTL)	1.891				d2max (for USL)		3.284
103											
104					Normal GOF Test						
105				Shapiro Wilk Test Statistic	0.952			Normal GOF Test			
106				5% Shapiro Wilk P Value	8.2267E-4			Data Not Normal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
107					Lilliefors Test Statistic	0.094	Lilliefors GOF Test					
108					5% Lilliefors Critical Value	0.0796	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	203.5				90% Percentile (z)	182.2	
113					95% UPL (t)	195.6				95% Percentile (z)	194.9	
114					95% USL	252.1				99% Percentile (z)	218.7	
115												
116	Gamma GOF Test											
117					A-D Test Statistic	7.5	Anderson-Darling Gamma GOF Test					
118					5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level					
119					K-S Test Statistic	0.176	Kolmogorov-Smirnov Gamma GOF Test					
120					5% K-S Critical Value	0.0831	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)	7.19				k star (bias corrected MLE)	7.023	
125					Theta hat (MLE)	19.12				Theta star (bias corrected MLE)	19.58	
126					nu hat (MLE)	1798				nu star (bias corrected)	1756	
127					MLE Mean (bias corrected)	137.5				MLE Sd (bias corrected)	51.88	
128												
129	Background Statistics Assuming Gamma Distribution											
130				95% Wilson Hilferty (WH) Approx. Gamma UPL		226				90% Percentile	206.8	
131				95% Hawkins Wixley (HW) Approx. Gamma UPL		237.8				95% Percentile	232.5	
132				95% WH Approx. Gamma UTL with	95% Coverage	241.3				99% Percentile	285.9	
133				95% HW Approx. Gamma UTL with	95% Coverage	256.1						
134					95% WH USL	350.8				95% HW USL	392.3	
135												
136	Lognormal GOF Test											
137					Shapiro Wilk Test Statistic	0.474	Shapiro Wilk Lognormal GOF Test					
138					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
139					Lilliefors Test Statistic	0.241	Lilliefors Lognormal GOF Test					
140					5% Lilliefors Critical Value	0.0796	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	379				90% Percentile (z)	267.1	
145					95% UPL (t)	332.6				95% Percentile (z)	329	
146					95% USL	842.7				99% Percentile (z)	486.5	
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	122				95% UTL with	95% Coverage	185
153					Approx, f used to compute achieved CC	1.605				pproximate Actual Confidence Coefficient achieved by UTL		0.876
154										Approximate Sample Size needed to achieve specified CC		153
155				95% Percentile Bootstrap UTL with	95% Coverage	185				95% BCA Bootstrap UTL with	95% Coverage	184.6
156					95% UPL	179.8				90% Percentile		170.6
157					90% Chebyshev UPL	242.6				95% Percentile		176.4
158					95% Chebyshev UPL	290.2				99% Percentile		202.2
159					95% USL	235						

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	Chloride										
168											
169	General Statistics										
170					Total Number of Observations	92			Number of Distinct Observations	85	
171									Number of Missing Observations	2	
172					Minimum	7.5			First Quartile	64.65	
173					Second Largest	242			Median	94.95	
174					Maximum	287			Third Quartile	139.8	
175					Mean	109.2			SD	59.2	
176					Coefficient of Variation	0.542			Skewness	0.825	
177					Mean of logged Data	4.535			SD of logged Data	0.602	
178											
179	Critical Values for Background Threshold Values (BTVs)										
180					Tolerance Factor K (For UTL)	1.937			d2max (for USL)	3.181	
181											
182	Normal GOF Test										
183					Shapiro Wilk Test Statistic	0.929			Normal GOF Test		
184					5% Shapiro Wilk P Value	4.0840E-5			Data Not Normal at 5% Significance Level		
185					Lilliefors Test Statistic	0.112			Lilliefors GOF Test		
186					5% Lilliefors Critical Value	0.0926			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	223.8			90% Percentile (z)	185	
191					95% UPL (t)	208.1			95% Percentile (z)	206.5	
192					95% USL	297.5			99% Percentile (z)	246.9	
193											
194	Gamma GOF Test										
195					A-D Test Statistic	0.301			Anderson-Darling Gamma GOF Test		
196					5% A-D Critical Value	0.758			Detected data appear Gamma Distributed at 5% Significance Level		
197					K-S Test Statistic	0.0536			Kolmogorov-Smirnov Gamma GOF Test		
198					5% K-S Critical Value	0.0938			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)	3.32			k star (bias corrected MLE)	3.219	
203					Theta hat (MLE)	32.88			Theta star (bias corrected MLE)	33.91	
204					nu hat (MLE)	610.9			nu star (bias corrected)	592.3	
205					MLE Mean (bias corrected)	109.2			MLE Sd (bias corrected)	60.84	
206											
207	Background Statistics Assuming Gamma Distribution										
208					95% Wilson Hilferty (WH) Approx. Gamma UPL	225.2			90% Percentile	190.7	
209					95% Hawkins Wixley (HW) Approx. Gamma UPL	230.2			95% Percentile	224.5	
210					95% WH Approx. Gamma UTL with 95% Coverage	252.1			99% Percentile	297.5	
211					95% HW Approx. Gamma UTL with 95% Coverage	259.9					
212					95% WH USL	406.4			95% HW USL	438.8	

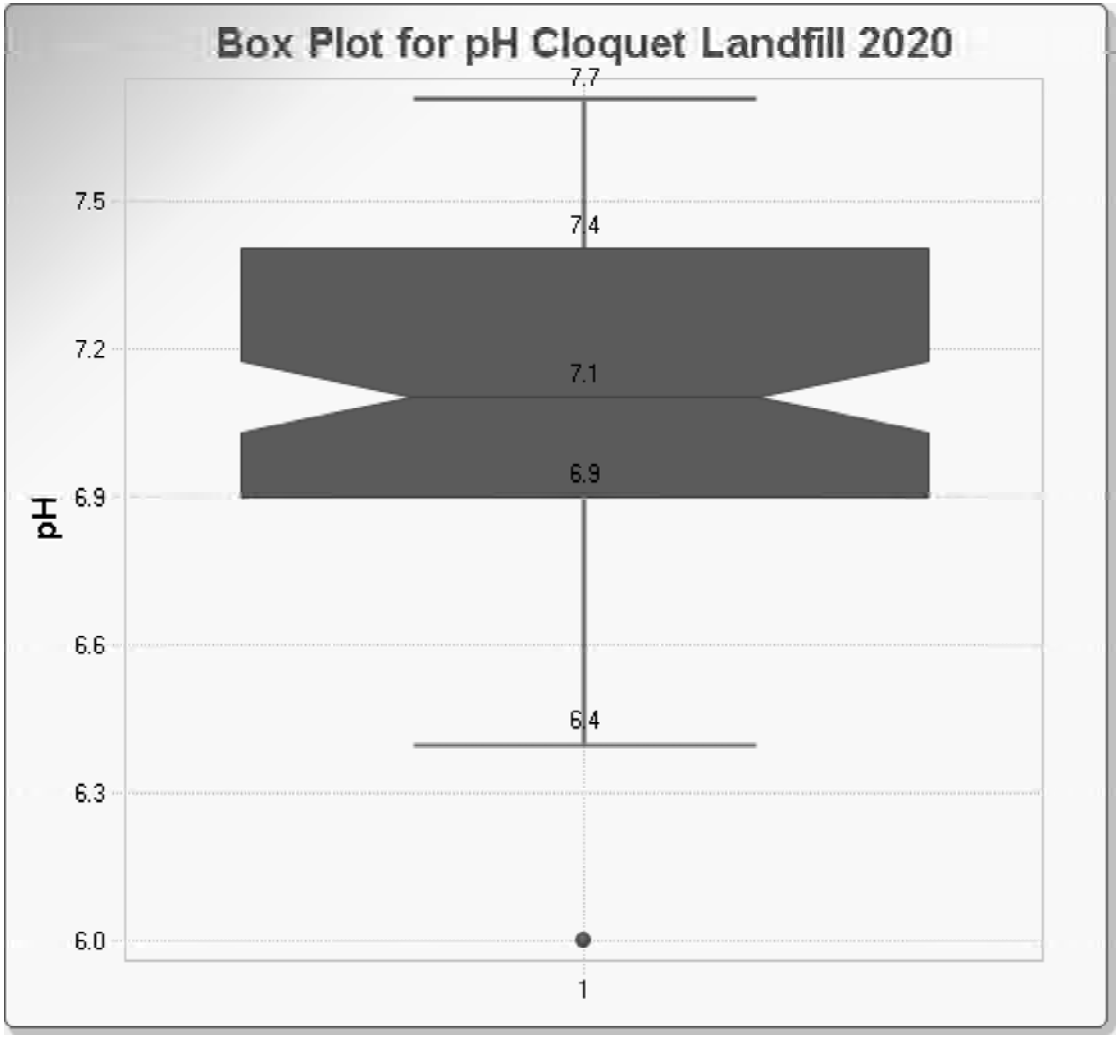
213											
214						Lognormal GOF Test					
215					Shapiro Wilk Test Statistic	0.961		Shapiro Wilk Lognormal GOF Test			
216					5% Shapiro Wilk P Value	0.0352		Data Not Lognormal at 5% Significance Level			
217					Lilliefors Test Statistic	0.0582		Lilliefors Lognormal GOF Test			
218					5% Lilliefors Critical Value	0.0926		Data appear Lognormal at 5% Significance Level			
219						Data appear Approximate Lognormal at 5% Significance Level					
220											
221						Background Statistics assuming Lognormal Distribution					
222					95% UTL with 95% Coverage	299.3		90% Percentile (z)	201.7		
223					95% UPL (t)	255		95% Percentile (z)	251		
224					95% USL	633.3		99% Percentile (z)	378.5		
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	90		95% UTL with 95% Coverage	232		
231					Approx, f used to compute achieved CC	1.579		pproximate Actual Confidence Coefficient achieved by UTL	0.844		
232								Approximate Sample Size needed to achieve specified CC	124		
233					95% Percentile Bootstrap UTL with 95% Coverage	232		95% BCA Bootstrap UTL with 95% Coverage	236.5		
234					95% UPL	230.1		90% Percentile	193.9		
235					90% Chebyshev UPL	287.7		95% Percentile	227.9		
236					95% Chebyshev UPL	368.6		99% Percentile	246.1		
237					95% USL	287					
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	Fluoride										
246											
247	General Statistics										
248					Total Number of Observations	96		Number of Distinct Observations	9		
249					Minimum	0.05		First Quartile	0.25		
250					Second Largest	0.5		Median	0.25		
251					Maximum	0.5		Third Quartile	0.25		
252					Mean	0.26		SD	0.121		
253					Coefficient of Variation	0.467		Skewness	0.7		
254					Mean of logged Data	-1.475		SD of logged Data	0.549		
255											
256						Critical Values for Background Threshold Values (BTVs)					
257					Tolerance Factor K (For UTL)	1.93		d2max (for USL)	3.196		
258											
259						Normal GOF Test					
260					Shapiro Wilk Test Statistic	0.741		Normal GOF Test			
261					5% Shapiro Wilk P Value	0		Data Not Normal at 5% Significance Level			
262					Lilliefors Test Statistic	0.375		Lilliefors GOF Test			
263					5% Lilliefors Critical Value	0.0907		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	0.493				90% Percentile (z)		0.415
268					95% UPL (t)	0.462				95% Percentile (z)		0.459
269					95% USL	0.647				99% Percentile (z)		0.541
270												
271	Gamma GOF Test											
272					A-D Test Statistic	10.89	Anderson-Darling Gamma GOF Test					
273					5% A-D Critical Value	0.756	Data Not Gamma Distributed at 5% Significance Level					
274					K-S Test Statistic	0.348	Kolmogorov-Smirnov Gamma GOF Test					
275					5% K-S Critical Value	0.0916	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)	4.104				k star (bias corrected MLE)		3.983
280					Theta hat (MLE)	0.0633				Theta star (bias corrected MLE)		0.0652
281					nu hat (MLE)	788				nu star (bias corrected)		764.7
282					MLE Mean (bias corrected)	0.26				MLE Sd (bias corrected)		0.13
283												
284	Background Statistics Assuming Gamma Distribution											
285				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.506				90% Percentile		0.434
286				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.518				95% Percentile		0.504
287				95% WH Approx. Gamma UTL with	95% Coverage	0.56				99% Percentile		0.653
288				95% HW Approx. Gamma UTL with	95% Coverage	0.577						
289					95% WH USL	0.877				95% HW USL		0.944
290												
291	Lognormal GOF Test											
292					Shapiro Wilk Test Statistic	0.753	Shapiro Wilk Lognormal GOF Test					
293					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
294					Lilliefors Test Statistic	0.377	Lilliefors Lognormal GOF Test					
295					5% Lilliefors Critical Value	0.0907	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	0.66				90% Percentile (z)		0.462
300					95% UPL (t)	0.572				95% Percentile (z)		0.564
301					95% USL	1.323				99% Percentile (z)		0.821
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	94				95% UTL with	95% Coverage	0.5
308					Approx, f used to compute achieved CC	1.649				pproximate Actual Confidence Coefficient achieved by UTL		0.864
309										Approximate Sample Size needed to achieve specified CC		124
310				95% Percentile Bootstrap UTL with	95% Coverage	0.5				95% BCA Bootstrap UTL with	95% Coverage	0.25
311					95% UPL	0.5				90% Percentile		0.5
312					90% Chebyshev UPL	0.625				95% Percentile		0.5
313					95% Chebyshev UPL	0.79				99% Percentile		0.5
314					95% USL	0.5						
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.											

319	The use of USL tends to provide a balance between false positives and false negatives provided the data										
320	represents a background data set and when many onsite observations need to be compared with the BTV.										
321											
322	Sulfate as SO5										
323											
324	General Statistics										
325				Total Number of Observations	120			Number of Distinct Observations	108		
326				Minimum	5			First Quartile	34.9		
327				Second Largest	160			Median	48		
328				Maximum	161			Third Quartile	65.9		
329				Mean	57.18			SD	37		
330				Coefficient of Variation	0.647			Skewness	1.322		
331				Mean of logged Data	3.846			SD of logged Data	0.664		
332											
333	Critical Values for Background Threshold Values (BTVs)										
334				Tolerance Factor K (For UTL)	1.897			d2max (for USL)	3.271		
335											
336	Normal GOF Test										
337				Shapiro Wilk Test Statistic	0.84			Normal GOF Test			
338				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level			
339				Lilliefors Test Statistic	0.17			Lilliefors GOF Test			
340				5% Lilliefors Critical Value	0.0812			Data Not Normal at 5% Significance Level			
341	Data Not Normal at 5% Significance Level										
342											
343	Background Statistics Assuming Normal Distribution										
344			95% UTL with	95% Coverage	127.4			90% Percentile (z)	104.6		
345				95% UPL (t)	118.8			95% Percentile (z)	118		
346				95% USL	178.2			99% Percentile (z)	143.3		
347											
348	Gamma GOF Test										
349				A-D Test Statistic	1.556			Anderson-Darling Gamma GOF Test			
350				5% A-D Critical Value	0.761			Data Not Gamma Distributed at 5% Significance Level			
351				K-S Test Statistic	0.0937			Kolmogorov-Smirnov Gamma GOF Test			
352				5% K-S Critical Value	0.0851			Data Not Gamma Distributed at 5% Significance Level			
353	Data Not Gamma Distributed at 5% Significance Level										
354											
355	Gamma Statistics										
356				k hat (MLE)	2.655			k star (bias corrected MLE)	2.594		
357				Theta hat (MLE)	21.54			Theta star (bias corrected MLE)	22.04		
358				nu hat (MLE)	637.2			nu star (bias corrected)	622.6		
359				MLE Mean (bias corrected)	57.18			MLE Sd (bias corrected)	35.5		
360											
361	Background Statistics Assuming Gamma Distribution										
362			95% Wilson Hilferty (WH) Approx. Gamma UPL		125.1			90% Percentile	104.8		
363			95% Hawkins Wixley (HW) Approx. Gamma UPL		127.6			95% Percentile	125.2		
364			95% WH Approx. Gamma UTL with	95% Coverage	139.3			99% Percentile	169.9		
365			95% HW Approx. Gamma UTL with	95% Coverage	143.3						
366				95% WH USL	246			95% HW USL	268.1		
367											
368	Lognormal GOF Test										
369				Shapiro Wilk Test Statistic	0.95			Shapiro Wilk Lognormal GOF Test			
370				5% Shapiro Wilk P Value	6.0332E-4			Data Not Lognormal at 5% Significance Level			
371				Lilliefors Test Statistic	0.0875			Lilliefors Lognormal GOF Test			

372				5% Lilliefors Critical Value		0.0812		Data Not Lognormal at 5% Significance Level			
373						Data Not Lognormal at 5% Significance Level					
374											
375						Background Statistics assuming Lognormal Distribution					
376				95% UTL with	95% Coverage	165.1			90% Percentile (z)	109.7	
377				95% UPL (t)		141.5			95% Percentile (z)	139.7	
378				95% USL		411.3			99% Percentile (z)	219.6	
379											
380						Nonparametric Distribution Free Background Statistics					
381						Data do not follow a Discernible Distribution (0.05)					
382											
383						Nonparametric Upper Limits for Background Threshold Values					
384				Order of Statistic, r		117			95% UTL with	95% Coverage	149
385				Approx, f used to compute achieved CC		1.539			pproximate Actual Confidence Coefficient achieved by UTL		0.856
386									Approximate Sample Size needed to achieve specified CC		153
387				95% Percentile Bootstrap UTL with	95% Coverage	149.1			95% BCA Bootstrap UTL with	95% Coverage	149.1
388				95% UPL		142.9			90% Percentile		126.1
389				90% Chebyshev UPL		168.7			95% Percentile		141.1
390				95% Chebyshev UPL		219.1			99% Percentile		158.3
391				95% USL		161					
392											
393						Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.					
394						Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers					
395						and consists of observations collected from clean unimpacted locations.					
396						The use of USL tends to provide a balance between false positives and false negatives provided the data					
397						represents a background data set and when many onsite observations need to be compared with the BTV.					
398											
399	Total Dissolved Solids										
400											
401	General Statistics										
402				Total Number of Observations		24			Number of Distinct Observations		24
403									Number of Missing Observations		1
404				Minimum		300			First Quartile		533.3
405				Second Largest		832			Median		679
406				Maximum		876			Third Quartile		743.8
407				Mean		641			SD		150.1
408				Coefficient of Variation		0.234			Skewness		-0.566
409				Mean of logged Data		6.432			SD of logged Data		0.265
410											
411						Critical Values for Background Threshold Values (BTVs)					
412				Tolerance Factor K (For UTL)		2.309			d2max (for USL)		2.644
413											
414						Normal GOF Test					
415				Shapiro Wilk Test Statistic		0.958			Shapiro Wilk GOF Test		
416				5% Shapiro Wilk Critical Value		0.916			Data appear Normal at 5% Significance Level		
417				Lilliefors Test Statistic		0.152			Lilliefors GOF Test		
418				5% Lilliefors Critical Value		0.177			Data appear Normal at 5% Significance Level		
419						Data appear Normal at 5% Significance Level					
420											
421						Background Statistics Assuming Normal Distribution					
422				95% UTL with	95% Coverage	987.6			90% Percentile (z)		833.4
423				95% UPL (t)		903.6			95% Percentile (z)		887.9
424				95% USL		1038			99% Percentile (z)		990.2

425											
426	Gamma GOF Test										
427					A-D Test Statistic	0.625	Anderson-Darling Gamma GOF Test				
428					5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level				
429					K-S Test Statistic	0.18	Kolmogorov-Smirnov Gamma GOF Test				
430					5% K-S Critical Value	0.178	Data Not Gamma Distributed at 5% Significance Level				
431	Detected data follow Appr. Gamma Distribution at 5% Significance Level										
432											
433	Gamma Statistics										
434					k hat (MLE)	16.38	k star (bias corrected MLE)	14.36			
435					Theta hat (MLE)	39.14	Theta star (bias corrected MLE)	44.64			
436					nu hat (MLE)	786.2	nu star (bias corrected)	689.3			
437					MLE Mean (bias corrected)	641	MLE Sd (bias corrected)	169.2			
438											
439	Background Statistics Assuming Gamma Distribution										
440				95% Wilson Hilferty (WH) Approx. Gamma UPL		951	90% Percentile	865.1			
441				95% Hawkins Wixley (HW) Approx. Gamma UPL		959.2	95% Percentile	942.3			
442				95% WH Approx. Gamma UTL with	95% Coverage	1074	99% Percentile	1099			
443				95% HW Approx. Gamma UTL with	95% Coverage	1089					
444					95% WH USL	1152	95% HW USL	1173			
445											
446	Lognormal GOF Test										
447					Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Lognormal GOF Test				
448					5% Shapiro Wilk Critical Value	0.916	Data Not Lognormal at 5% Significance Level				
449					Lilliefors Test Statistic	0.188	Lilliefors Lognormal GOF Test				
450					5% Lilliefors Critical Value	0.177	Data Not Lognormal at 5% Significance Level				
451	Data Not Lognormal at 5% Significance Level										
452											
453	Background Statistics assuming Lognormal Distribution										
454				95% UTL with	95% Coverage	1147	90% Percentile (z)	873.4			
455					95% UPL (t)	988.8	95% Percentile (z)	961.8			
456					95% USL	1254	99% Percentile (z)	1152			
457											
458	Nonparametric Distribution Free Background Statistics										
459	Data appear Normal at 5% Significance Level										
460											
461	Nonparametric Upper Limits for Background Threshold Values										
462					Order of Statistic, r	24	95% UTL with	95% Coverage	876		
463					Approx, f used to compute achieved CC	1.263	pproximate Actual Confidence Coefficient achieved by UTL		0.708		
464							Approximate Sample Size needed to achieve specified CC		59		
465				95% Percentile Bootstrap UTL with	95% Coverage	876	95% BCA Bootstrap UTL with	95% Coverage	869.4		
466					95% UPL	865	90% Percentile	811			
467					90% Chebyshev UPL	1101	95% Percentile	830.7			
468					95% Chebyshev UPL	1309	99% Percentile	865.9			
469					95% USL	876					
470											
471	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
472	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
473	and consists of observations collected from clean unimpacted locations.										
474	The use of USL tends to provide a balance between false positives and false negatives provided the data										
475	represents a background data set and when many onsite observations need to be compared with the BTV.										
476											


Box Plot for pH Cloquet Landfill 2020
pH
7.7
7.5
7.4
7.2
7.1
6.9
6.9
6.6
6.4
6.3
6.0
1