SKB Environmental Cloquet Landfill, Inc.

# 2021 Coal Combustion Residuals Annual Monitoring Report

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

January 31, 2022

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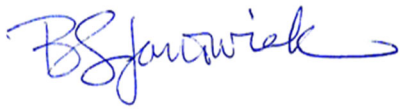

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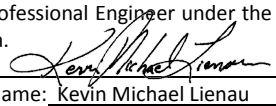
**Professional Engineer**

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

Signature: 
Typed or Printed Name: Kevin Michael Lienau
Date: 01/30/2022 License Number: 25086

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# 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 |
| QA/QC | Quality assurance/quality control |
| Report | Coal Combustion Residuals Annual Monitoring Report |
| 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 2021 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 2021. 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 2021 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 wells P-3R, P-4R and P-5 were sealed in July and August 2021 in accordance with Minnesota Department of Health (MDH) regulations. Monitoring wells P-8, P-9 and P-5R were installed as replacement wells in September and November 2021.
- 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 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 CCR sampling groundwater monitoring network at SKB Cloquet Landfill was designed based on the local and regional hydrologic conditions. Currently the groundwater monitoring network system consists of 7 monitoring wells (**Figure 2**). 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-3R (sealed in 2021), P-4R (sealed in 2021), P-5 (sealed in 2021), P-5R (installed in 2021), P-8 (installed in 2021), P-9 (installed in 2021), P-6 and P-7.

For the CCR evaluation, a total of 2 groundwater monitoring events were conducted in 2021 on the following dates:

- April 5-6, 2021
- December 2-3, 2021

## 3.1 Monitoring Network System Changes

### 3.1.1 Monitoring Wells P-5R, P-8, P-9

Monitoring wells P-3R, P-4R and P-5 were sealed in 2021 as part of the SKB Cloquet Landfill cell expansion activities. Monitoring well P-3R was sealed on July 15, 2021 and replacement monitoring well P-8 was installed on November 15, 2021. Monitoring well P-4R was sealed on July 15, 2021 and replacement monitoring well P-9 was installed on September 9, 2021. Monitoring well P-5 was sealed on August 17, 2021 and replacement monitoring well P-5R was installed on November 16, 2021.

# 4 Groundwater Sampling Methodology

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

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

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

Immediately following collection, samples were placed on ice in a field cooler and shipped with a chain of custody form to a EurofinsTest America, Inc. (Eurofins TA) of Amherst, New York.

Groundwater samples obtained during the 2 sampling events in 2021 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 (Method 4500 H+ B)
- Total Dissolved Solids (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 monitoring events are presented in **Table 1**. Groundwater contours maps were generated for the April 5 and December 2, 2021 monitoring events. Groundwater flow direction was calculated to be to the 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 2021 sampling results to the BTVs are summarized below.

Appendix III Analytes - Result Summary of BTV Exceedances

*Chloride (BTV = 232 milligrams per liter (mg/L))*

- Downgradient monitoring well
  - P-5R (245 mg/L) (12/3/2021) – Exceedance but not confirmed as statistically significant

No other analytes exceeded the BTVs. Monitoring well P-3R spring sampling results and newly installed monitoring wells P-8, P-9 and P-5R fall sampling results were compared to established BTVs. However, the data from these monitoring wells is not part of the overall background calculations due to the lack of data points. Additionally, due to insufficient water volume, groundwater samples were not collected at P-2 during the fall 2021 sampling event.

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

# 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 December 2021.

Statistical evaluation of the 2017 - 2021 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 – 2021 sampling events were statistically tested following the concepts outlined in this report to form a background data set. Interwell USLs were developed for Boron, Calcium, Chloride, Fluoride, Sulfate as $SO_4$, and Total Dissolved Solids and in 7 monitoring wells (P-1, P-2, P-3 (sealed in 2020), P-4R (sealed in 2021), P-5 (sealed in 2021), 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.

A Chloride concentration of 245 mg/L at monitoring well P-5R exceeded the Chloride BTV of 232 mg/L. Confirmation sampling during spring 2022 will determined if the exceedance is statistically significant.

# 8 Report Summary

Per the 40 CFR §§ 40.257.93 – 257.94, 2 monitoring events were conducted at the SKB Cloquet Landfill in 2021. Groundwater samples were analyzed for parameters indicated in Appendix III 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 a southeast groundwater flow beneath the landfill.

A Chloride concentration at monitoring well P-5R exceeded the calculated interwell BTV during the December 2021 sampling event. Confirmation sampling of the well in the spring 2022 will determine if the exceedance is statistically significant.

# 9 Recommendations

CCR groundwater monitoring events will be conducted in the spring and fall of 2022. 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. Any single constituent that exceeds the BTV is considered to be an exceedance. Confirmation sampling will determine whether the BTV exceedance is statistically significant.

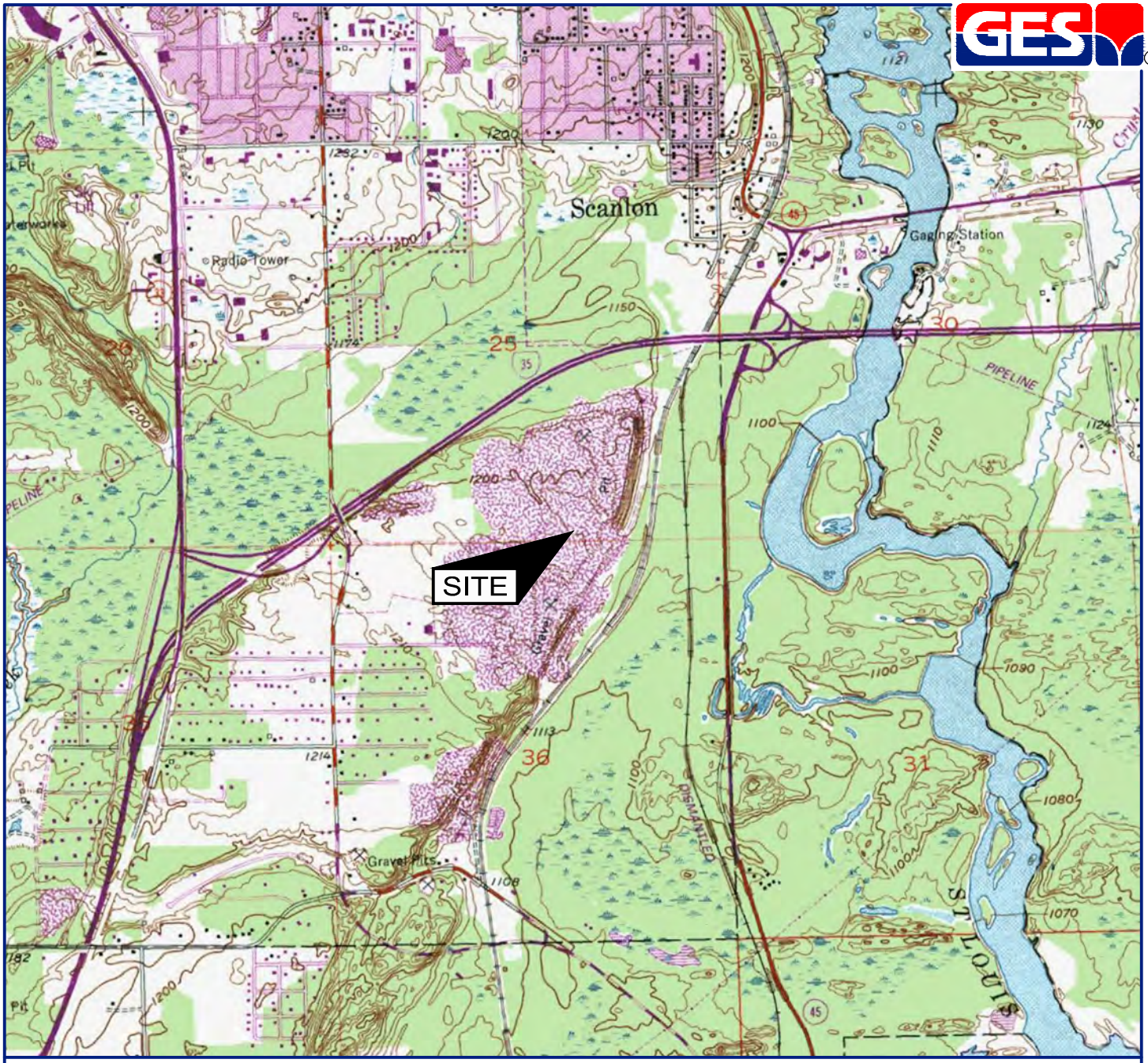
A 2022 Annual Monitoring Report will be prepared and include sampling results from the 2022 CCR groundwater monitoring events and an evaluation of the analytical results as they pertained to BTVs.

# 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

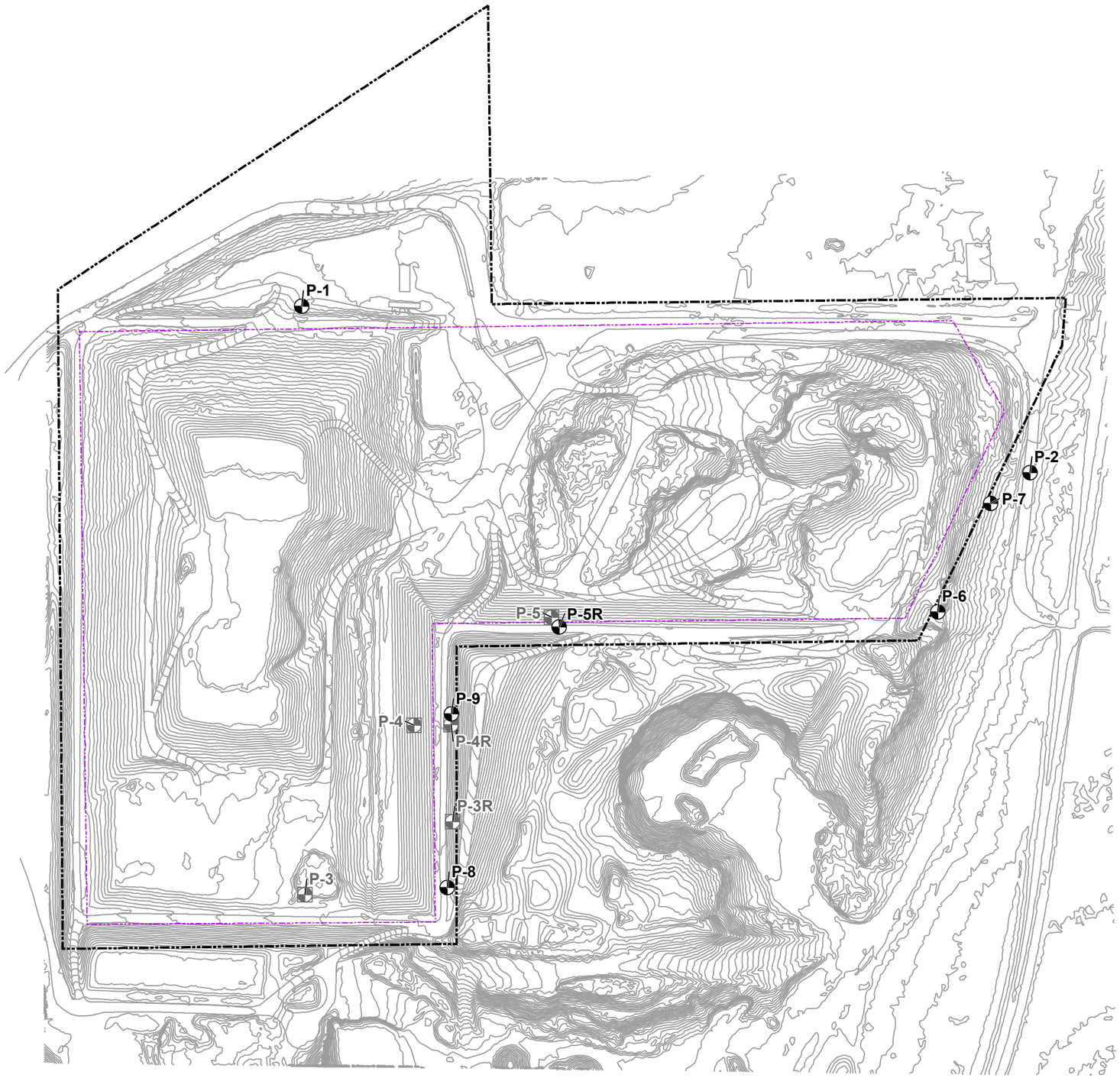



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1993
CLOQUET, MINNESOTA
CONTOUR INTERVAL = 10'


QUADRANGLE LOCATION

| | |
|---|---|
| DRAFTED BY: W.G.S. | SITE LOCATION MAP |
| CHECKED BY: NS | SKB ENVIRONMENTAL<br>CLOQUET LANDFILL<br>761 MINNESOTA STATE HIGHWAY 45<br>CLOQUET, MINNESOTA |
| REVIEWED BY: JFS | Groundwater & Environmental Services, Inc.<br>1285 CORPORATE CENTER DRIVE, SUITE 120, EAGAN, MN 55121 |
| NORTH | SCALE IN FEET: 0 — 2000 / DATE: 9-22-16 / FIGURE: 1 |

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




**Legend**

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

**Site Map**

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

Drawn **GKS**
Designed **DMC**
Approved **JFS**
Date **1/4/22**
Figure **2**

Scale In Feet (Approximate)
0 80

Groundwater & Environmental Services, Inc.

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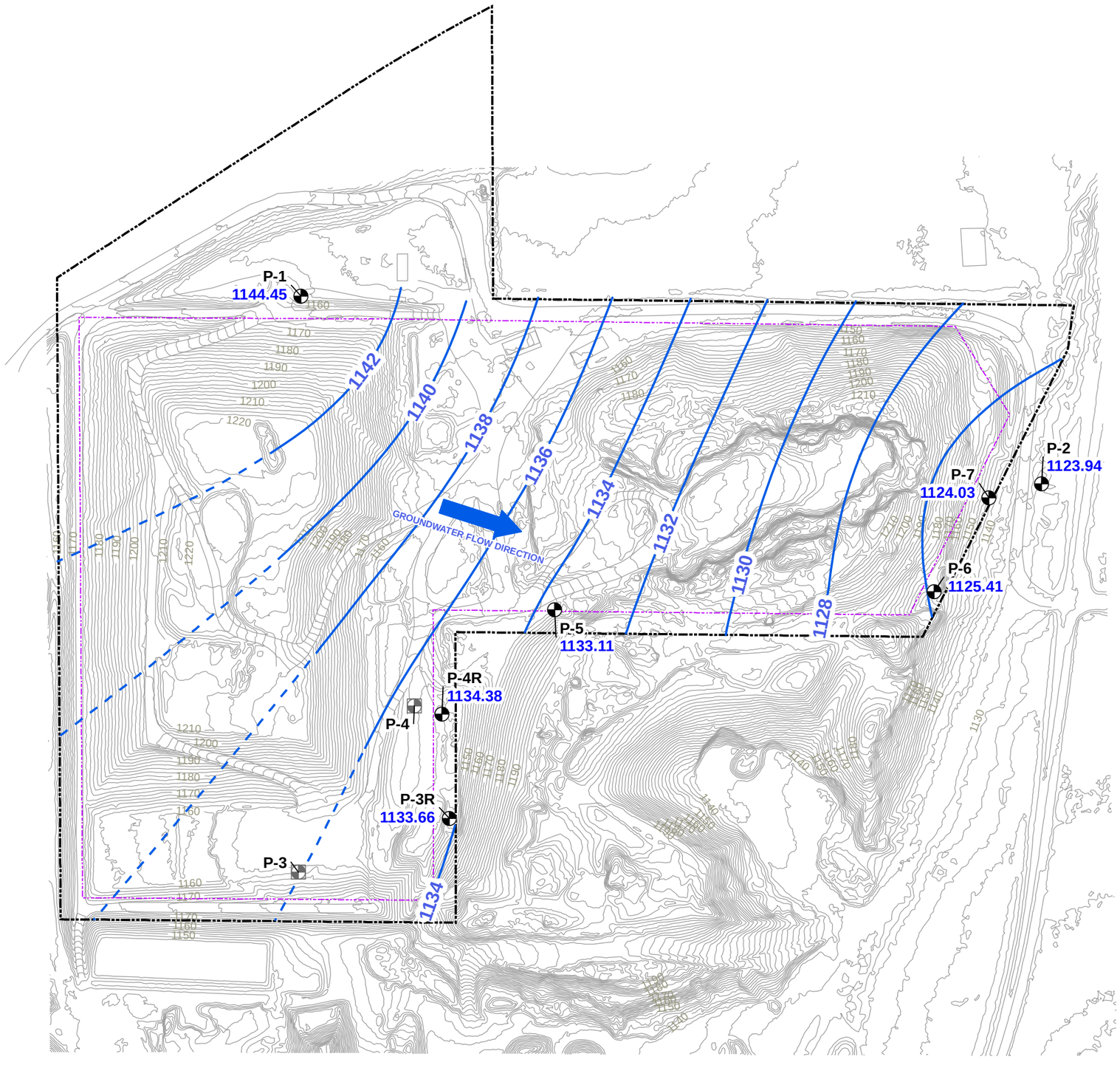


## Legend

- MONITORING WELL
- SEALED 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 Contour Map**
**April 5, 2021**

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

Drawn
**JCW**
Designed
**DMC**
Approved
**JFS**

Date
**6/2/21**
Figure
**3**

Scale In Feet (Approximate)
0 250

Groundwater & Environmental Services, Inc.

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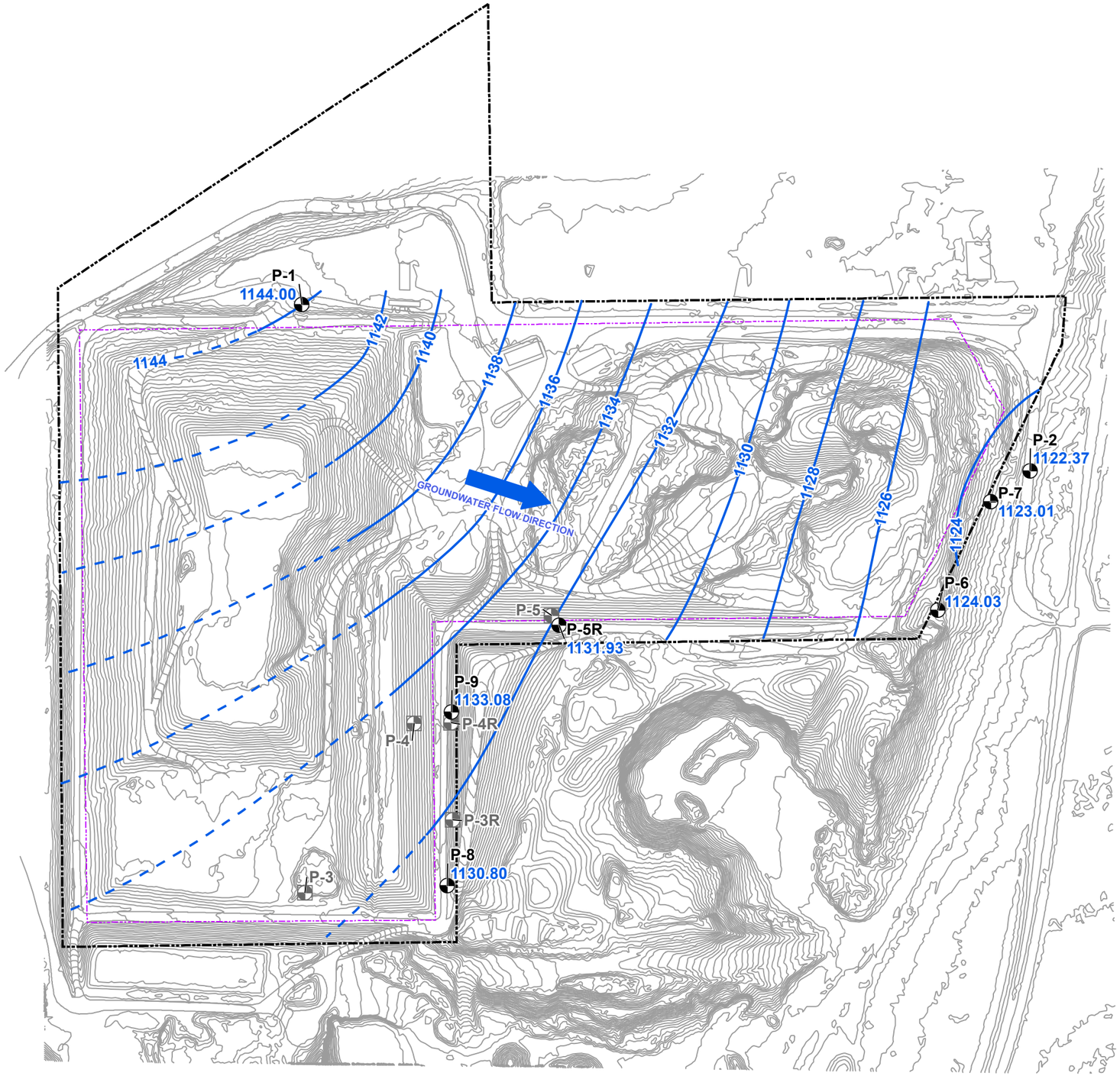


## Legend

- MONITORING WELL
- SEALED 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 Contour Map**
**December 2, 2021**

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

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

Date **1/4/22**
Figure **4**

N

Scale In Feet (Approximate)
0 80

GES
Groundwater & Environmental Services, Inc.

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# Tables

2021 CCR Annual Monitoring Report
SKB Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

**Table 1**

**Groundwater Elevations**

| Date | P-1 | P-2 | P-3R | P-4R | P-5 | P-5R | P-6 | P-7 | P-8 | P-9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 04/05/2021 | 1144.45 | 1123.94 | 1133.66 | 1134.38 | 1133.11 | | 1125.41 | 1124.03 | | |
| 12/02/2021 | 1144.00 | 1122.37 | | | | 1131.93 | 1124.03 | 1123.01 | 1130.80 | 1133.08 |

2021 CCR Annual Monitoring Report
SKB Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

**Table 2**

**Groundwater Analytical Data**
**Appendix III**

| Location | Date | Parameter | Result | Background Threshold Value (BTV) | Units | CAS # |
|---|---|---|---|---|---|---|
| P-1 | 04/05/2021 | Boron | 0.037 | 0.41 | mg/l | 7440-42-8 |
| P-1 | 12/02/2021 | Boron | 0.039 | 0.41 | mg/l | 7440-42-8 |
| P-1 | 04/05/2021 | Calcium | 139 | 235 | mg/l | 7440-70-2 |
| P-1 | 12/02/2021 | Calcium | 166 | 235 | mg/l | 7440-70-2 |
| P-1 | 04/05/2021 | Chloride | 208 | 232 | mg/l | 16887-00-6 |
| P-1 | 12/02/2021 | Chloride | 213 | 232 | mg/l | 16887-00-6 |
| P-1 | 04/05/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-1 | 12/02/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-1 | 04/05/2021 | pH | 6.7 | 6.5 < 8.0 | pH UNITS | PH |
| P-1 | 12/02/2021 | pH | 6.6 | 6.5 < 8.0 | pH UNITS | PH |
| P-1 | 04/05/2021 | Sulfate as SO4 | 30.2 | 161 | mg/l | 14808-79-8 |
| P-1 | 12/02/2021 | Sulfate as SO4 | 28.0 | 161 | mg/l | 14808-79-8 |
| P-1 | 04/05/2021 | Total Dissolved Solids | 807 | 969 | mg/l | TDS |
| P-1 | 12/02/2021 | Total Dissolved Solids | 693 | 969 | mg/l | TDS |
| P-2 | 04/06/2021 | Boron | 0.030 | 0.41 | mg/l | 7440-42-8 |
| P-2 | 04/06/2021 | Calcium | 96.2 | 235 | mg/l | 7440-70-2 |
| P-2 | 04/06/2021 | Chloride | 150 | 232 | mg/l | 16887-00-6 |
| P-2 | 04/06/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-2 | 04/06/2021 | pH | 6.6 | 6.5 < 8.0 | pH UNITS | PH |
| P-2 | 04/06/2021 | Sulfate as SO4 | 24.5 | 161 | mg/l | 14808-79-8 |
| P-2 | 04/06/2021 | Total Dissolved Solids | 535 | 969 | mg/l | TDS |
| P-3R | 04/05/2021 | Boron | 0.027 | 0.41 | mg/l | 7440-42-8 |
| P-3R | 04/05/2021 | Calcium | 113 | 235 | mg/l | 7440-70-2 |
| P-3R | 04/05/2021 | Chloride | 183 | 232 | mg/l | 16887-00-6 |
| P-3R | 04/05/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-3R | 04/05/2021 | pH | 7.6 | 6.5 < 8.0 | pH UNITS | PH |
| P-3R | 04/05/2021 | Sulfate as SO4 | 43.1 | 161 | mg/l | 14808-79-8 |
| P-3R | 04/05/2021 | Total Dissolved Solids | 643 | 969 | mg/l | TDS |
| P-4R | 04/05/2021 | Boron | 0.38 | 0.41 | mg/l | 7440-42-8 |
| P-4R | 04/05/2021 | Calcium | 97.7 | 235 | mg/l | 7440-70-2 |
| P-4R | 04/05/2021 | Chloride | 19.3 | 232 | mg/l | 16887-00-6 |
| P-4R | 04/05/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-4R | 04/05/2021 | pH | 7.4 | 6.5 < 8.0 | pH UNITS | PH |
| P-4R | 04/05/2021 | Sulfate as SO4 | 334 | 161 | mg/l | 14808-79-8 |
| P-4R | 04/05/2021 | Total Dissolved Solids | 532 | 969 | mg/l | TDS |
| P-5 | 04/05/2021 | Boron | 0.063 | 0.41 | mg/l | 7440-42-8 |
| P-5 | 04/05/2021 | Calcium | 142 | 235 | mg/l | 7440-70-2 |
| P-5 | 04/05/2021 | Chloride | 223 | 232 | mg/l | 16887-00-6 |
| P-5 | 04/05/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-5 | 04/05/2021 | pH | 6.7 | 6.5 < 8.0 | pH UNITS | PH |
| P-5 | 04/05/2021 | Sulfate as SO4 | 21.6 | 161 | mg/l | 14808-79-8 |
| P-5 | 04/05/2021 | Total Dissolved Solids | 926 | 969 | mg/l | TDS |
| P-5R | 12/03/2021 | Boron | 0.049 | 0.41 | mg/l | 7440-42-8 |
| P-5R | 12/03/2021 | Calcium | 158 | 235 | mg/l | 7440-70-2 |
| P-5R | 12/03/2021 | Chloride | **245** | 232 | mg/l | 16887-00-6 |
| P-5R | 12/03/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-5R | 12/03/2021 | pH | 6.7 | 6.5 < 8.0 | pH UNITS | PH |
| P-5R | 12/03/2021 | Sulfate as SO4 | 22.8 | 161 | mg/l | 14808-79-8 |
| P-5R | 12/03/2021 | Total Dissolved Solids | 764 | 969 | mg/l | TDS |
| P-6 | 04/05/2021 | Boron | 0.22 | 0.41 | mg/l | 7440-42-8 |

**Table 2**

**Groundwater Analytical Data**
**Appendix III**

| Location | Date | Parameter | Result | Background Threshold Value (BTV) | Units | CAS # |
|---|---|---|---|---|---|---|
| P-6 | 12/03/2021 | Boron | 0.17 | 0.41 | mg/l | 7440-42-8 |
| P-6 | 04/05/2021 | Calcium | 159 | 235 | mg/l | 7440-70-2 |
| P-6 | 12/03/2021 | Calcium | 118 | 235 | mg/l | 7440-70-2 |
| P-6 | 04/05/2021 | Chloride | 85.6 | 232 | mg/l | 16887-00-6 |
| P-6 | 12/03/2021 | Chloride | 54.1 | 232 | mg/l | 16887-00-6 |
| P-6 | 04/05/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-6 | 12/03/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-6 | 04/05/2021 | pH | 6.9 | 6.5 < 8.0 | pH UNITS | PH |
| P-6 | 12/03/2021 | pH | 6.9 | 6.5 < 8.0 | pH UNITS | PH |
| P-6 | 04/05/2021 | Sulfate as SO4 | 91.6 | 161 | mg/l | 14808-79-8 |
| P-6 | 12/03/2021 | Sulfate as SO4 | 85.8 | 161 | mg/l | 14808-79-8 |
| P-6 | 04/05/2021 | Total Dissolved Solids | 704 | 969 | mg/l | TDS |
| P-6 | 12/03/2021 | Total Dissolved Solids | 569 | 969 | mg/l | TDS |
| P-7 | 04/06/2021 | Boron | 0.12 | 0.41 | mg/l | 7440-42-8 |
| P-7 | 12/03/2021 | Boron | 0.15 | 0.41 | mg/l | 7440-42-8 |
| P-7 | 04/06/2021 | Calcium | 153 | 235 | mg/l | 7440-70-2 |
| P-7 | 12/03/2021 | Calcium | 168 | 235 | mg/l | 7440-70-2 |
| P-7 | 04/06/2021 | Chloride | 77.6 | 232 | mg/l | 16887-00-6 |
| P-7 | 12/03/2021 | Chloride | 65.9 | 232 | mg/l | 16887-00-6 |
| P-7 | 04/06/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-7 | 12/03/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-7 | 04/06/2021 | pH | 7.0 | 6.5 < 8.0 | pH UNITS | PH |
| P-7 | 12/03/2021 | pH | 6.9 | 6.5 < 8.0 | pH UNITS | PH |
| P-7 | 04/06/2021 | Sulfate as SO4 | 38.6 | 161 | mg/l | 14808-79-8 |
| P-7 | 12/03/2021 | Sulfate as SO4 | 53.7 | 161 | mg/l | 14808-79-8 |
| P-7 | 04/06/2021 | Total Dissolved Solids | 685 | 969 | mg/l | TDS |
| P-7 | 12/03/2021 | Total Dissolved Solids | 701 | 969 | mg/l | TDS |
| P-8 | 12/03/2021 | Boron | < 0.020 | 0.41 | mg/l | 7440-42-8 |
| P-8 | 12/03/2021 | Calcium | 93.4 | 235 | mg/l | 7440-70-2 |
| P-8 | 12/03/2021 | Chloride | 98.2 | 232 | mg/l | 16887-00-6 |
| P-8 | 12/03/2021 | Fluoride | < 0.10 | 0.50 | mg/l | 16984-48-8 |
| P-8 | 12/03/2021 | pH | 7.8 | 6.5 < 8.0 | pH UNITS | PH |
| P-8 | 12/03/2021 | Sulfate as SO4 | 28.9 | 161 | mg/l | 14808-79-8 |
| P-8 | 12/03/2021 | Total Dissolved Solids | 456 | 969 | mg/l | TDS |
| P-9 | 12/03/2021 | Boron | 0.035 | 0.41 | mg/l | 7440-42-8 |
| P-9 | 12/03/2021 | Calcium | 82.8 | 235 | mg/l | 7440-70-2 |
| P-9 | 12/03/2021 | Chloride | 117 | 232 | mg/l | 16887-00-6 |
| P-9 | 12/03/2021 | Fluoride | < 0.25 | 0.50 | mg/l | 16984-48-8 |
| P-9 | 12/03/2021 | pH | 7.7 | 6.5 < 8.0 | pH UNITS | PH |
| P-9 | 12/03/2021 | Sulfate as SO4 | 28.3 | 161 | mg/l | 14808-79-8 |
| P-9 | 12/03/2021 | Total Dissolved Solids | 425 | 969 | mg/l | TDS |

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

2021 CCR Annual Monitoring Report
SKB Cloquet Landfill
761 Minnesota State Highway 45
Cloquet, Minnesota

**Table 3**

**Well Stabilization Data**

| Well ID | Sample Date | Purge Rate ml/min | Purge Volume gal | Field pH pH | Field Specific Conductivity umhos/cm | Field Temp deg c | Dissolved Oxygen mg/l | Turbidity NTU | Eh mV |
|---|---|---|---|---|---|---|---|---|---|
| P-1 | 4/5/2021 | 1000 | 0.1 | 7.76 | 1260 | 8.38 | 3.6 | 71.4 | 138 |
| P-1 | 4/5/2021 | 1000 | 1 | 7.41 | 1260 | 7.99 | 2.49 | 67.0 | 153 |
| P-1 | 4/5/2021 | 1000 | 2 | 7.30 | 1260 | 7.92 | 2.49 | 67.0 | 153 |
| P-1 | 4/5/2021 | 1000 | 3.5 | 7.29 | 1260 | 7.94 | 1.34 | 45.2 | 168 |
| P-1 | 4/5/2021 | | | 7.29 | 1260 | 7.94 | 1.34 | 45.2 | 168 |
| P-1 | 12/2/2021 | 1000 | 0.1 | 9.37 | 1240 | 13.63 | 5.45 | 2.2 | 162 |
| P-1 | 12/2/2021 | 1000 | 1 | 6.23 | 1330 | 11.24 | 0 | 0.0 | 163 |
| P-1 | 12/2/2021 | 1000 | 2 | 6.18 | 1360 | 10.87 | 0 | 0.0 | 163 |
| P-1 | 12/2/2021 | 1000 | 3 | 6.17 | 1360 | 10.86 | 0 | 0.0 | 163 |
| P-1 | 12/2/2021 | | | 6.18 | 1360 | 10.88 | 0 | 0.0 | 163 |
| P-3R | 4/5/2021 | 1000 | 0.1 | 7.21 | 1080 | 6.14 | 0 | 71.4 | 173 |
| P-3R | 4/5/2021 | 1000 | 1.5 | 7.30 | 1090 | 6.15 | 0 | 67.0 | 173 |
| P-3R | 4/5/2021 | 1000 | 3 | 7.34 | 1130 | 5.92 | 0 | 67.0 | 170 |
| P-3R | 4/5/2021 | 1000 | 4.5 | 7.31 | 1150 | 5.87 | 0 | 45.2 | 179 |
| P-3R | 4/5/2021 | | | 7.31 | 1150 | 5.85 | 0 | 45.2 | 179 |
| P-4R | 4/5/2021 | 1000 | 0.1 | 7.78 | 845 | 7.85 | 8.89 | 71.4 | 146 |
| P-4R | 4/5/2021 | 1000 | 1.5 | 7.68 | 857 | 6.13 | 7.22 | 67.0 | 153 |
| P-4R | 4/5/2021 | 1000 | 3 | 7.60 | 877 | 5.69 | 6.15 | 67.0 | 158 |
| P-4R | 4/5/2021 | 1000 | 4.6 | 7.56 | 908 | 5.60 | 5.32 | 45.2 | 160 |
| P-4R | 4/5/2021 | | | 7.56 | 913 | 5.61 | 5.13 | 45.2 | 160 |
| P-5 | 4/5/2021 | 1000 | 0.1 | 7.25 | 1560 | 9.56 | 4.21 | 71.4 | 175 |
| P-5 | 4/5/2021 | 1000 | 0.75 | 6.94 | 1570 | 9.79 | 0 | 67.0 | 136 |
| P-5 | 4/5/2021 | 1000 | 1.5 | 6.83 | 1580 | 9.84 | 0 | 67.0 | 94 |
| P-5 | 4/5/2021 | 1000 | 2 | 6.80 | 1580 | 9.86 | 0 | 45.2 | 83 |
| P-5 | 4/5/2021 | | | 6.79 | 1580 | 9.83 | 0 | 45.2 | 81 |
| P-5R | 12/3/2021 | 1000 | 0.1 | 6.92 | 1690 | 10.37 | 0 | 260.0 | 5 |
| P-5R | 12/3/2021 | 1000 | 2 | 6.31 | 1690 | 9.87 | 0 | 671.0 | -52 |
| P-5R | 12/3/2021 | 1000 | 4 | 6.34 | 1690 | 9.77 | 0 | 494.0 | -63 |
| P-5R | 12/3/2021 | 1000 | 6 | 6.37 | 1670 | 9.77 | 0 | 172.0 | -67 |
| P-5R | 12/3/2021 | | | 6.37 | 1670 | 9.78 | 0 | 156.0 | -67 |
| P-6 | 4/5/2021 | 1000 | 0.1 | 7.42 | 1260 | 9.45 | 5.85 | 71.4 | 124 |
| P-6 | 4/5/2021 | 1000 | 1 | 7.05 | 1290 | 9.04 | 0.85 | 67.0 | 133 |
| P-6 | 4/5/2021 | 1000 | 2 | 6.99 | 1300 | 9.00 | 0.56 | 67.0 | 135 |
| P-6 | 4/5/2021 | 1000 | 3 | 6.97 | 1300 | 8.98 | 0.45 | 45.2 | 136 |
| P-6 | 4/5/2021 | | | 6.94 | 1300 | 8.97 | 0.35 | 45.2 | 137 |
| P-6 | 12/3/2021 | 1000 | 0.1 | 6.95 | 1150 | 8.23 | 0.46 | 50.6 | 142 |
| P-6 | 12/3/2021 | 1000 | 1 | 6.40 | 970 | 8.74 | 0 | 19.1 | 157 |
| P-6 | 12/3/2021 | 1000 | 2 | 6.28 | 969 | 8.74 | 0 | 10.7 | 166 |
| P-6 | 12/3/2021 | 1000 | 2.5 | 6.26 | 978 | 8.74 | 0 | 9.1 | 169 |
| P-6 | 12/3/2021 | | | 6.26 | 986 | 8.74 | 0 | 8.5 | 169 |
| P-7 | 4/6/2021 | 1000 | 0.1 | 8.14 | 1340 | 5.80 | 10.52 | 62.5 | 194 |
| P-7 | 4/6/2021 | 1000 | 0.7 | 7.24 | 1250 | 6.88 | 2.49 | 78.8 | 209 |
| P-7 | 4/6/2021 | 1000 | 1.4 | 7.05 | 1260 | 7.11 | 2.02 | 60.4 | 212 |
| P-7 | 4/6/2021 | 1000 | 2 | 7.04 | 1260 | 7.13 | 1.92 | 59.3 | 213 |
| P-7 | 4/6/2021 | | | 7.03 | 1270 | 7.13 | 1.82 | 53.6 | 213 |
| P-7 | 12/3/2021 | 1000 | 0.1 | 6.85 | 1320 | 7.67 | 7.35 | 149.0 | 185 |
| P-7 | 12/3/2021 | 1000 | 0.5 | 6.47 | 1340 | 8.25 | 2.25 | 173.0 | 194 |
| P-7 | 12/3/2021 | 1000 | 0.75 | 6.43 | 1350 | 8.34 | 1.43 | 167.0 | 193 |
| P-7 | 12/3/2021 | 1000 | 1 | 6.41 | 1350 | 8.41 | 1.16 | 164.0 | 193 |
| P-7 | 12/3/2021 | | | 6.42 | 1360 | 8.44 | 0.84 | 152.0 | 192 |
| P-8 | 12/3/2021 | 1000 | 0.1 | 7.12 | 788 | 10.01 | 12.07 | 57.6 | -14 |

**Table 3**

**Well Stabilization Data**

| Well ID | Sample Date | Purge Rate ml/min | Purge Volume gal | Field pH pH | Field Specific Conductivity umhos/cm | Field Temp deg c | Dissolved Oxygen mg/l | Turbidity NTU | Eh mV |
|---|---|---|---|---|---|---|---|---|---|
| P-8 | 12/3/2021 | 1000 | 5 | 7.43 | 794 | 9.39 | 0 | 37.3 | -84 |
| P-8 | 12/3/2021 | 1000 | 10 | 7.55 | 797 | 9.20 | 0 | 11.7 | -76 |
| P-8 | 12/3/2021 | 1000 | 15 | 7.65 | 801 | 9.15 | 0 | 12.4 | -73 |
| P-8 | 12/3/2021 | | | 7.63 | 801 | 9.15 | 0 | 13.1 | -72 |
| P-9 | 12/3/2021 | 1000 | 0.1 | 8.07 | 949 | 12.62 | 5.91 | 176.0 | 90 |
| P-9 | 12/3/2021 | 1000 | 1.5 | 7.51 | 907 | 12.89 | 0 | 26.0 | -97 |
| P-9 | 12/3/2021 | 1000 | 3 | 7.44 | 910 | 12.82 | 0 | 13.8 | -91 |
| P-9 | 12/3/2021 | 1000 | 4.5 | 7.43 | 911 | 12.90 | 0 | 10.3 | -86 |
| P-9 | 12/3/2021 | | | 7.41 | 910 | 12.80 | 0 | 9.7 | -87 |

**Table 4**

**Background Threshold Values**

**Appendix III to Part 257**

| Parameter | Background Threshold Value (BTV) | Units | CAS # |
|---|---|---|---|
| Boron | 0.41 | mg/l | 7440-42-8 |
| Calcium | 235 | mg/l | 7440-70-2 |
| Chloride | 232 | mg/l | 16887-00-6 |
| Fluoride | 0.50 | 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 | 969 | mg/l | TDS |

Results in milligrams per liter (mg/l)

# Appendix A – Field Data Sheets

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-1

Duplicate Collected: No

Location: Cloquet, MN

Sampler(s): N. Schlagel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 17.7

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 10:50 4/5/21

Casing Diameter (inches): 2

Initial Water Level (feet): 11.16 ~~11.02~~

One Casing Volume (gal): 1.1 ~~1.1~~

Ground Water Elevation (ft, msl): ~~1144.59~~

Total Volume Purged (gal): 3.5

Top of Casing (ft, msl) 1155.61

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 11.18'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 4/5/21 11:10

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 10:50 | 1000 | 0.1 | 8.38 | 7.76 | 1,260 | 71.4 | 3.60 | 139 |
| 10:55 | 1000 | 1.0 | 7.99 | 7.41 | 1,260 | 73.6 | 2.75 | 148 |
| 11:00 | 1000 | 2.0 | 7.92 | 7.30 | 1,260 | 82.0 | 2.49 | 153 |
| 11:05 | 1000 | 3.5 | 7.94 | 7.29 | 1,260 | 45.2 | 1.31 | 168 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-1

Water Lever @ Sampling (ft): 11.18' Well Collection Sequence 1 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 4/5/21 1210 | VOCs: 10 ° Other: 1000 | 7.94 | 7.29 | 1,280 | 45.2 | 1.34 | 168 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 50°F sunny 5-10 mph E

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 11

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 725520

Date: 4/5/21 By: [illegible] Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-3R

Duplicate Collected: Yes

Location: Cloquet, MN

Sampler(s): M. Sullivan

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft): 24

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 4/5/21 11:35

Casing Diameter (inches): 2

Initial Water Level (feet): 14.74' ~~7.59~~

One Casing Volume (gal): 1.5 ~~0.9~~

Ground Water Elevation (ft, msl): ~~1138.49~~

Total Volume Purged (gal): 4.5

Top of Casing (ft, msl) 1146.08

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 14.75'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 4/5/21 11:55

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 11:35 | 1000 | 0.1 | 6.44 | 7.21 | 1,080 | 196 | 0.00 | 173 |
| 11:40 | 1000 | 1.5 | 6.15 | 7.30 | 1,090 | 146 | 0.00 | 173 |
| 11:45 | 1000 | 3.0 | 5.92 | 7.34 | 1,130 | 108 | 0.00 | 170 |
| 11:50 | 1000 | 4.5 | 5.87 | 7.31 | 1,150 | 171 | 0.00 | 179 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-3R

Water Lever @ Sampling (ft): 14.75' Well Collection Sequence 2 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 11:55 4/5/21 | VOCs: 100 Other: 1000 | 5.85 | 7.31 | 1,150 | 187 | 0.00 | 179 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 51°F, sunny, 5-10 mph E

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: 11

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

Notes: _____

Minnesota Unique Well ID: 762046

Date: 4/5/21 By: M. Schlagel Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-4R

Duplicate Collected: No

Sampler(s): N. Sivinski

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/5/21 12:45

Initial Water Level (feet): 7.51 ~~5.58~~

Ground Water Elevation (ft, msl): ~~1136~~.31

Top of Casing (ft, msl) 1141.89

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 16.9

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.53 ~~1.2~~

Total Volume Purged (gal): 4.6

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 7.52

Date/Time Completed: 4/5/21 13:05

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 12:45 | 1000 | 0.1 | 7.85 | 7.78 | 845 | 92.1 | 8.89 | 146 |
| 12:50 | 1000 | 1.5 | 6.13 | 7.68 | 857 | 71.4 | 7.22 | 153 |
| 12:55 | 1000 | 3.0 | 5.69 | 7.60 | 877 | 43.6 | 6.18 | 158 |
| 13:00 | 1000 | 4.6 | 5.60 | 7.56 | 908 | 34.1 | 5.52 | 160 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-4R

Water Lever @ Sampling (ft): 7.52' Well Collection Sequence 8 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 13:05 4/5/21 | VOCs: 100 Other: 1000 | 5.61 | 7.56 | 913 | 33.6 | 5.13 | 160 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 54°F, partly cloudy, 5-10 mph NE

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 11

Well Closed and Locked: Yes No (circle)

Notes:

Minnesota Unique Well ID: 782080

Date: 4/5/21 By: N. Schlegel Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-5

Duplicate Collected: N.D

Location: Cloquet, MN

Sampler(s): N. Schmidt

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 37.3

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 4/6/21 13:25

Casing Diameter (inches): 2

Initial Water Level (feet): 33.13' ~~31.84~~

One Casing Volume (gal): 0.7 ~~0.9~~

Ground Water Elevation (ft, msl): ~~1134.4~~

Total Volume Purged (gal): 2.0

Top of Casing (ft, msl) 1166.24

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 33.14

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 4/15/21 13:40

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 13:25 | 1000 | 0.1 | 9.56 | 7.25 | 1,560 | 40.5 | 4.21 | 175 |
| 13:30 | 1000 | 0.75 | 9.79 | 6.94 | 1,570 | 37.9 | 0.00 | 136 |
| 13:35 | 1000 | 1.5 | 9.84 | 6.83 | 1,580 | 28.0 | 0.00 | 94 |
| 13:40 | 1000 | 2.0 | 9.86 | 6.80 | 1,580 | 24.4 | 0.00 | 93 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: P-5

Water Lever @ Sampling (ft): 33.14'

Well Collection Sequence 4 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 13:40 4/5/21 | VOCs: 100<br>Other: 100 | 9.83 | 6.79 | 1,580 | 24.1 | 0.00 | 81 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 55°F; sunny, 5-10 mph NE

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 11

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 728524

Date: 4/5/21 By: N. Schlegel Title: Staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-6

Duplicate Collected: No

Sampler(s): M. Schlagel

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/5/21 14:40

Initial Water Level (feet): 30.02' ~~29.9~~

Ground Water Elevation (ft, msl): 1125.53

Top of Casing (ft, msl) 1155.43

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 36.2

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.0 ~~1.1~~

Total Volume Purged (gal): 3.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 30.03'

Date/Time Completed: 4/5/21 15:00

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 14:40 | 1000 | 0.1 | 9.45 | 7.42 | 1,280 | 31.6 | 5.05 | 124 |
| 14:45 | 1000 | 1.0 | 9.04 | 7.05 | 1,290 | 25.8 | 0.85 | 133 |
| 14:50 | 1000 | 2.0 | 9.00 | 6.99 | 1,300 | 25.2 | 0.56 | 135 |
| 14:55 | 1000 | 3.0 | 8.98 | 6.97 | 1,300 | 25.1 | 0.45 | 136 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-6

Water Lever @ Sampling (ft): 30.03' Well Collection Sequence 5 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 1300 4/15/21 | VOCs: 100<br>Other: 1000 | 8.97 | 6.94 | 1,300 | 24.4 | 0.85 | 137 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 54°F, partly cloudy 5-10 mph E

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 11

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 772808

Date: 4/15/21 By: N. Schlagel Title: Staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-7

Duplicate Collected: No

Sampler(s): M. Schlagel

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/6/21 8:05

Initial Water Level (feet): 15.36 ~~16.12~~

Ground Water Elevation (ft, msl): ~~1123.27~~

Top of Casing (ft, msl) 1139.39

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 19.6

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 0.7 ~~0.6~~

Total Volume Purged (gal): 2.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 17.86'

Date/Time Completed: 4/6/21 8:25

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 8:05 | 1000 | 0.1 | 5.80 | 8.14 | 1,340 | 62.5 | 10.52 | 144 |
| 8:10 | 1000 | 0.7 | 6.08 | 7.24 | 1,250 | 78.8 | 2.49 | 209 |
| 8:15 | 1000 | 1.4 | 7.11 | 7.05 | 1,260 | 60.4 | 2.02 | 212 |
| 8:20 | 1000 | 2.0 | 7.13 | 7.04 | 1,260 | 59.3 | 1.92 | 213 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-7

Water Lever @ Sampling (ft): 17.86' Well Collection Sequence 6 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 8:25 4/6/21 | VOCs: 100 Other: 100 | 7.13 | 7.03 | 1,270 | 53.6 | 1.82 | 213 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 45°F, sunny, 0-5 mph W

Sampling Characteristics: Clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 11

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 712807

Date: 4/6/21 By: M. Sundgaard Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-2

Duplicate Collected: No

Sampler(s): N. Sunlogel

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 4/6/21 8:45

Initial Water Level (feet): 7.85 ~~8.79~~

Ground Water Elevation (ft, msl): 1123

Top of Casing (ft, msl) 1131.79

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 10.4

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 0.4 ~~0.3~~

Total Volume Purged (gal): 0.75 slow recharge

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 9.86

Date/Time Completed: 4/6/21 9:05

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 8:45 | 1000 | 0.1 | 5.44 | 7.69 | 910 | 938 | 10.37 | 199 |
| 8:50 | 1000 | 0.5 | 4.42 | 7.23 | 914 | 513 | 6.33 | 207 |
| 8:55 | 1000 | 0.6 | 4.40 | 7.05 | 904 | 247 | 5.75 | 204 |
| 9:00 | 1000 | 0.75 | 4.40 | 7.05 | 904 | 246 | 5.64 | 204 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-2

Water Lever @ Sampling (ft): 9.86 Well Collection Sequence 7 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 9:25 4/6/21 | VOCs: —<br>Other: 1000 | 4.42 | 7.00 | 904 | 286 | 5.53 | 204 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 48°F, sunny, 0-5 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 3

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 728521

Date: 4/6/21 By: N. Schlegel Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-1

Duplicate Collected: NO

Sampler(s): N. Schlagel

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 12/2/21 7:45

Initial Water Level (feet): 11.61 ~~11.02~~

Ground Water Elevation (ft, msl): ~~1144.59~~

Top of Casing (ft, msl) 1155.61

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 17.7

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 1.0 ~~1.1~~

Total Volume Purged (gal): 3.0

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 11.63'

Date/Time Completed: 12/2/21 8:15

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 7:45 | 1000 | 0.1 | 13.63 | 9.37 | 1,240 | 2.2 | 5.45 | 162 |
| 7:50 | 1000 | 1.0 | 11.24 | 6.25 | 1,350 | 0.0 | 0.00 | 163 |
| 7:55 | 1000 | 2.0 | 10.87 | 6.19 | 1,360 | 0.0 | 0.00 | 163 |
| 8:00 | 1000 | 3.0 | 10.96 | 6.17 | 1,360 | 0.0 | 0.00 | 163 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION:

Sample Point ID: P-1

Water Lever @ Sampling (ft): 11.63'

Well Collection Sequence 1 of 7

Parameters: Annual _____ Semiannual: _____

Quarterly: X Monthly: _____ Other: _____

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 12/2/21 8:05 | VOCs: 100<br>Other: 1000 | 10.93 | 6.19 | 1,360 | 0.0 | 7.21 | 163 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 36 °F, partly cloudy, 10-15 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle)

# of Bottles Collected: MPH CCR FS 2 / 5 / 1

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

Notes: _____

Minnesota Unique Well ID: 728520

Date: 12/2/21 By: N. Seeboth Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-2

Duplicate Collected: No

Location: Cloquet, MN

Sampler(s): M-Schlagel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 10.4

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 12/3/21 :

Casing Diameter (inches): 2

Initial Water Level (feet): 9.42' ~~8.79~~

One Casing Volume (gal): 0.16 ~~0.13~~

Ground Water Elevation (ft, msl): 1123

Total Volume Purged (gal): 0.0

Top of Casing (ft, msl) 1131.79

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 9.42'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 12/3/21 1:

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-2

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

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| | VOCs: | | | | | | |
| | Other: | | | | | | |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: _____

_____

Sampling Characteristics: _____

COMMENTS AND OBSERVATIONS:

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

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: _____

Date: _____ By: _____ Title: _____

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Location: Cloquet, MN

Sample Matrix: Groundwater

Sample Location: P-5R

Duplicate Collected: ~~N. Schlagel~~ No

Sampler(s): N. Schlagel

PURGE INFORMATION

Method of Well Purge: Dedicated Bladder Pump

Date/Time Initiated: 12/2/21 10:10

Initial Water Level (feet): 61.05

Ground Water Elevation (ft, msl): 0

Top of Casing (ft, msl) –

PID (Background) 0.0 (PPM)

PID (Headspace) 0.0 (PPM)

Casing Length (ft) 73.2

Dedicated Equipment: Yes

Casing Diameter (inches): 2

One Casing Volume (gal): 2.0 ~~6.3~~

Total Volume Purged (gal): ~~6.0~~

Purged Dry?: Yes (No) (circle)

Water Level After Purge (ft): 61.07'

Date/Time Completed: 12/3/21 10:45

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 10:10 | 1000 | 0.1 | 10.37 | 6.92 | 1,690 | 260 | 0.00 | 5 |
| 10:20 | 1000 | 2.0 | 9.87 | 6.31 | 1,690 | 671 | 0.00 | -52 |
| 10:30 | 1000 | 4.0 | 9.77 | 6.34 | 1,690 | 444 | 0.00 | -63 |
| 10:40 | 1000 | 6.0 | 9.77 | 6.37 | 1,670 | 172 | 0.00 | -67 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-5R

Water Lever @ Sampling (ft): 61.07' Well Collection Sequence 4 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 11/3/21 10:44 | VOCs: 100<br>Other: 1000 | 9.79 | 8.57 | 1,670 | 156 | 0.05 | -67 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 32°F, cloudy, S - 10 mph W

Sampling Characteristics: Clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 21 / 5 / 1 MPLA CCR FS

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: 856522

Date: 11/2/21 By: N. Schlagel Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-6

Duplicate Collected: No

Location: Cloquet, MN

Sampler(s): N. Schlegel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 36.2

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 12/2/21 11:20

Casing Diameter (inches): 2

Initial Water Level (feet): 31.40' ~~29.9~~

One Casing Volume (gal): 0.8 ~~1.1~~

Ground Water Elevation (ft, msl): ~~1125.53~~

Total Volume Purged (gal): 2.5

Top of Casing (ft, msl) 1155.43

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 31.42'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 12/2/21 11:40

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 11:20 | 1000 | 0.1 | 8.23 | 6.95 | 1,150 | 52.6 | 0.46 | 142 |
| 11:25 | 1000 | 1.0 | 8.74 | 6.40 | 970 | 14.1 | 0.00 | 157 |
| 11:30 | 1000 | 2.0 | 8.74 | 6.25 | 969 | 10.7 | 0.05 | 166 |
| 11:35 | 1000 | 2.5 | 8.74 | 6.26 | 979 | 9.1 | 0.03 | 169 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-6

Water Lever @ Sampling (ft): 31.47' Well Collection Sequence 5 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 12/2/21 11:54 | VOCs: 100<br>Other: 1000 | 9.74 | 6.26 | 980 | 9.5 | 0.00 | 169 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 34°F, partly cloudy, 5-10 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: MW CCR FS 21/5/1

Well Closed and Locked: Yes No (circle)

Notes: _____

Minnesota Unique Well ID: 772803

Date: 12/2/21 By: N. Schlegel Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-7

Duplicate Collected: No

Location: Cloquet, MN

Sampler(s): N. Schlagel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 19.6

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 12/3/21 12:20

Casing Diameter (inches): 2

Initial Water Level (feet): 16.38 ~~16.12~~

One Casing Volume (gal): 0.5 ~~0.6~~

Ground Water Elevation (ft, msl): ~~1123.27~~

Total Volume Purged (gal): 1.0 slow recharge

Top of Casing (ft, msl) 1139.39

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 18.26

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 12/3/21 12:40

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 12:20 | 1000 | 0.1 | 7.67 | 6.85 | 1,320 | 149 | 7.35 | 185 |
| 12:25 | 1000 | 0.5 | 8.25 | 6.47 | 1,340 | 173 | 2.25 | 194 |
| 12:30 | 1000 | 0.75 | 8.34 | 6.43 | 1,350 | 167 | 1.43 | 193 |
| 12:35 | 1000 | 1.0 | 8.41 | 6.41 | 1,350 | 164 | 1.16 | 193 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-7

Water Lever @ Sampling (ft): 19.86' Well Collection Sequence 6 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 12/2/21 12:40 | VOCs: 100<br>Other: 1000 | 8.44 | 6.42 | 1,360 | 152 | 0.84 | 142 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 36°F, partly cloud, 5-10 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: MPLS LCL2 FS 2 1 / 5 / 1

Well Closed and Locked: (Yes) No (circle

Notes: _____

Minnesota Unique Well ID: 772607

Date: 12/2/21 By: N. Schlagel Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-8

Duplicate Collected: Yes

Location: Cloquet, MN

Sampler(s): N. Schlegel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft) 89.05

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 12/3/21 8:10

Casing Diameter (inches): 2

Initial Water Level (feet): 58.59'

One Casing Volume (gal): 5.0 ~~2.2~~

Ground Water Elevation (ft, msl): ~~0~~

Total Volume Purged (gal): 15.0

Top of Casing (ft, msl)

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 58.61'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 12/3/21 9:15

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 8:10 | 1000 | 0.1 | 10.01 | 7.12 | 795 | 57.6 | 12.07 | -14 |
| 8:30 | 1000 | 5.0 | 9.39 | 7.43 | 794 | 37.3 | 0.00 | -84 |
| 8:50 | 1000 | 10.0 | 9.20 | 7.55 | 797 | 11.7 | 0.05 | -76 |
| 9:10 | 1000 | 15.0 | 9.15 | 7.63 | 801 | 12.4 | 0.00 | -71 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-8

Water Lever @ Sampling (ft): 58.61 Well Collection Sequence 2 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 12/2/21 9:15 | VOCs: 100<br>Other: 1000 | 9.15 | 7.63 | 401 | 13.1 | 0.00 | -72 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 36°F, partly cloudy, 15-20 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

Full Bottle Set Collected: (Yes) No (circle) # of Bottles Collected: MPLR CCR FS 21/5/1

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

Notes: _____

Minnesota Unique Well ID: 856321

Date: 12/2/21 By: M. Schlegel Title: Staff Env. Scientist

Company: Groundwater and Environmental Services, Inc.

# FIELD INFORMATION LOG Part 1

Facility: Cloquet Landfill

Sample Location: P-9

Duplicate Collected: No

Location: Cloquet, MN

Sampler(s): N. Schlagel

Sample Matrix: Groundwater

PURGE INFORMATION

Casing Length (ft): 59.15

Method of Well Purge: Dedicated Bladder Pump

Dedicated Equipment: Yes

Date/Time Initiated: 12/3/21 9:20

Casing Diameter (inches): 2

Initial Water Level (feet): 49.65'

One Casing Volume (gal): 1.5 ~~2.2~~

Ground Water Elevation (ft, msl): 0

Total Volume Purged (gal): 45

Top of Casing (ft, msl)

Purged Dry?: Yes (No) (circle)

PID (Background) 0.0 (PPM)

Water Level After Purge (ft): 49.67'

PID (Headspace) 0.0 (PPM)

Date/Time Completed: 12/3/21 9:40

**PURGE DATA**

| Time | Purge Rate (mL/min) | Cumulative Volume (gal) | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Disolved Oxygen (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| 9:20 | 1000 | 0.1 | 12.62 | 8.07 | 949 | 176 | 5.91 | 90 |
| 9:25 | 1000 | 1.5 | 12.99 | 7.51 | 907 | 26.0 | 0.00 | -97 |
| 9:30 | 1000 | 3.0 | 12.82 | 7.44 | 910 | 13.8 | 0.00 | -91 |
| 9:35 | 1000 | 4.5 | 12.90 | 7.43 | 911 | 10.3 | 0.00 | -86 |
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# FIELD INFORMATION LOG Part 2

SAMPLING INFORMATION: Sample Point ID: P-9

Water Lever @ Sampling (ft): 49.67' Well Collection Sequence 3 of 7

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

SAMPLE DATA:

| Time & Date | Sample Rate | Temp (°C) | pH (std units) | Specific Conductance (uS - umhos/cm) | Turbidity (NTU) | Dissolved $O_2$ (mg/L) | $O_2$ Reduction Potential (mV) |
|---|---|---|---|---|---|---|---|
| 12/2/21 5:40 | VOCs: 100<br>Other: 1000 | 12.90 | 7.41 | 910 | 9.7 | 0.00 | -8.7 |

YSI Serial Number: _____

YSI Sonde Serial Number: _____

GENERAL INFORMATION:

Weather Conditions @ sampling: 31°F, clear, 5 - 10 mph W

Sampling Characteristics: clear

COMMENTS AND OBSERVATIONS:

MVL CLR FS

Full Bottle Set Collected: Yes No (circle) # of Bottles Collected: 21/5/1

Well Closed and Locked: Yes No (circle

Notes: _____

Minnesota Unique Well ID: The Tip yet

Date: 12/2/21 By: N. Schlagel Title: staff env. scientist

Company: Groundwater and Environmental Services, Inc.

# Appendix B – Laboratory Analytical Reports

eurofins | Environment Testing America

# ANALYTICAL REPORT

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

Laboratory Job ID: 480-182956-1
Client Project/Site: SKB Cloquet - CCR Groundwater App III
Sampling Event: CCR Groundwater

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

Attn: Nathaniel Beinemann

*Authorized for release by:*
*4/16/2021 11:40:23 AM*
Joshua Velez, Project Management Assistant I
joshua.velez@eurofinset.com

Designee for

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

# Table of Contents

# Definitions/Glossary

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## 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 |
|---|---|
| F3 | Duplicate RPD exceeds the control limit |
| 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: 480-182956-1

### Laboratory: Eurofins TestAmerica, Buffalo

**Narrative**

**Job Narrative**
**480-182956-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 4/7/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.5º C and 2.8º C.

**HPLC/IC**
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: P-4R (480-182956-5), P-5 (480-182956-6) and P-6 (480-182956-7). Elevated reporting limits (RLs) are provided.

Method 300.0: The following sample was diluted due to the nature of the sample matrix: P-7 (480-182956-8). 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: DUP-1 (480-182956-1), P-1 (480-182956-2), P-2 (480-182956-3) and P-3R (480-182956-4). 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: DUP-1 (480-182956-1), P-1 (480-182956-2), P-2 (480-182956-3), P-3R (480-182956-4), P-4R (480-182956-5), P-5 (480-182956-6), P-6 (480-182956-7), P-7 (480-182956-8), FIELD BLANK (480-182956-9) and EQUIPMENT BLANK (480-182956-10).

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.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: DUP-1 — Lab Sample ID: 480-182956-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 111 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 185 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 44.6 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 621 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.5 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 18.1 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-1 — Lab Sample ID: 480-182956-2

| 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 | 139 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 208 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 30.2 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 807 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.7 | 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-2 — Lab Sample ID: 480-182956-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.030 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 96.2 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 150 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 24.5 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 535 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.6 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 17.2 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-3R — Lab Sample ID: 480-182956-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 113 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 183 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 43.1 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 643 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.6 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 17.4 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-4R — Lab Sample ID: 480-182956-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.38 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 97.7 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 19.3 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 334 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 532 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.4 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 17.5 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

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

Job ID: 480-182956-1

## Client Sample ID: P-5 — Lab Sample ID: 480-182956-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.063 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 142 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 223 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 21.6 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 926 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.7 | 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-6 — Lab Sample ID: 480-182956-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.22 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 159 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 85.6 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 91.6 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 704 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.9 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 18.7 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-7 — Lab Sample ID: 480-182956-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.12 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 153 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 77.6 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 38.6 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 685 | | 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 |

## Client Sample ID: FIELD BLANK — Lab Sample ID: 480-182956-9

| Analyte | Result | Qualifier | RL | RL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.6 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 19.0 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: EQUIPMENT BLANK — Lab Sample ID: 480-182956-10

| Analyte | Result | Qualifier | RL | RL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.4 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 18.3 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

This Detection Summary does not include radiochemical test results.

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

**Client Sample ID: DUP-1**
**Lab Sample ID: 480-182956-1**
**Date Collected: 04/05/21 00:00**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:22 | 1 |
| Calcium | 111 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:22 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 185 | | 2.5 | | mg/L | | | 04/09/21 04:05 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/09/21 04:05 | 5 |
| Sulfate | 44.6 | | 10.0 | | mg/L | | | 04/09/21 04:05 | 5 |
| Total Dissolved Solids | 621 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.5 | HF | 0.1 | | SU | | | 04/11/21 10:43 | 1 |
| Temperature | 18.1 | HF | 0.001 | | Degrees C | | | 04/11/21 10:43 | 1 |

# Client Sample Results

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

Job ID: 480-182956-1

## Client Sample ID: P-1

**Date Collected: 04/05/21 11:10**
**Date Received: 04/07/21 10:00**

## Lab Sample ID: 480-182956-2

**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 | | 04/09/21 08:20 | 04/13/21 00:51 | 1 |
| Calcium | 139 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:51 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 208 | | 2.5 | | mg/L | | | 04/09/21 04:19 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/09/21 04:19 | 5 |
| Sulfate | 30.2 | | 10.0 | | mg/L | | | 04/09/21 04:19 | 5 |
| Total Dissolved Solids | 807 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.7 | HF | 0.1 | | SU | | | 04/11/21 10:44 | 1 |
| Temperature | 17.3 | HF | 0.001 | | Degrees C | | | 04/11/21 10:44 | 1 |

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

**Client Sample ID: P-2**
**Lab Sample ID: 480-182956-3**
**Date Collected: 04/06/21 09:05**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.030 | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:55 | 1 |
| Calcium | 96.2 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:55 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 150 | | 2.5 | | mg/L | | | 04/09/21 04:34 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/09/21 04:34 | 5 |
| Sulfate | 24.5 | | 10.0 | | mg/L | | | 04/09/21 04:34 | 5 |
| Total Dissolved Solids | 535 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.6 | HF | 0.1 | | SU | | | 04/11/21 10:45 | 1 |
| Temperature | 17.2 | HF | 0.001 | | Degrees C | | | 04/11/21 10:45 | 1 |

# Client Sample Results

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

Job ID: 480-182956-1

## Client Sample ID: P-3R

**Date Collected: 04/05/21 11:55**
**Date Received: 04/07/21 10:00**

## Lab Sample ID: 480-182956-4

**Matrix: Water**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:59 | 1 |
| Calcium | 113 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:59 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 183 | | 2.5 | | mg/L | | | 04/09/21 04:48 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/09/21 04:48 | 5 |
| Sulfate | 43.1 | | 10.0 | | mg/L | | | 04/09/21 04:48 | 5 |
| Total Dissolved Solids | 643 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.6 | HF | 0.1 | | SU | | | 04/11/21 10:47 | 1 |
| Temperature | 17.4 | HF | 0.001 | | Degrees C | | | 04/11/21 10:47 | 1 |

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

Job ID: 480-182956-1

## Client Sample ID: P-4R

**Date Collected: 04/05/21 13:05**
**Date Received: 04/07/21 10:00**

## Lab Sample ID: 480-182956-5

**Matrix: Water**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.38 | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:02 | 1 |
| Calcium | 97.7 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.3 | | 2.5 | | mg/L | | | 04/12/21 15:52 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/12/21 15:52 | 5 |
| Sulfate | 334 | | 10.0 | | mg/L | | | 04/12/21 15:52 | 5 |
| Total Dissolved Solids | 532 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.4 | HF | 0.1 | | SU | | | 04/11/21 10:48 | 1 |
| Temperature | 17.5 | HF | 0.001 | | Degrees C | | | 04/11/21 10:48 | 1 |

# Client Sample Results

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: P-5
**Lab Sample ID: 480-182956-6**
**Date Collected: 04/05/21 13:40**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Boron** | **0.063** | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/14/21 22:17 | 1 |
| **Calcium** | **142** | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/14/21 22:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **223** | | 2.5 | | mg/L | | | 04/12/21 16:06 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/12/21 16:06 | 5 |
| **Sulfate** | **21.6** | | 10.0 | | mg/L | | | 04/12/21 16:06 | 5 |
| **Total Dissolved Solids** | **926** | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **6.7** | **HF** | 0.1 | | SU | | | 04/11/21 10:49 | 1 |
| **Temperature** | **18.3** | **HF** | 0.001 | | Degrees C | | | 04/11/21 10:49 | 1 |

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

**Client Sample ID: P-6**
**Lab Sample ID: 480-182956-7**
**Date Collected: 04/05/21 15:00**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.22 | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:21 | 1 |
| Calcium | 159 | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 85.6 | | 2.5 | | mg/L | | | 04/12/21 16:21 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/12/21 16:21 | 5 |
| Sulfate | 91.6 | | 10.0 | | mg/L | | | 04/12/21 16:21 | 5 |
| Total Dissolved Solids | 704 | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.9 | HF | 0.1 | | SU | | | 04/11/21 10:51 | 1 |
| Temperature | 18.7 | HF | 0.001 | | Degrees C | | | 04/11/21 10:51 | 1 |

## Client Sample ID: P-7
**Lab Sample ID: 480-182956-8**

**Date Collected: 04/06/21 08:25**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Boron** | **0.12** | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:25 | 1 |
| **Calcium** | **153** | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:25 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **77.6** | | 2.5 | | mg/L | | | 04/12/21 16:35 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 04/12/21 16:35 | 5 |
| **Sulfate** | **38.6** | | 10.0 | | mg/L | | | 04/12/21 16:35 | 5 |
| **Total Dissolved Solids** | **685** | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **7.0** | **HF** | 0.1 | | SU | | | 04/11/21 10:52 | 1 |
| **Temperature** | **18.5** | **HF** | 0.001 | | Degrees C | | | 04/11/21 10:52 | 1 |

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: FIELD BLANK
**Lab Sample ID: 480-182956-9**
**Date Collected: 04/06/21 09:35**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### 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 | | 04/09/21 08:20 | 04/13/21 01:29 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:29 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 0.50 | | mg/L | | | 04/12/21 17:48 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 04/12/21 17:48 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 04/12/21 17:48 | 1 |
| Total Dissolved Solids | ND | | 10.0 | | mg/L | | | 04/09/21 13:08 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **6.6** | **HF** | 0.1 | | SU | | | 04/11/21 10:55 | 1 |
| **Temperature** | **19.0** | **HF** | 0.001 | | Degrees C | | | 04/11/21 10:55 | 1 |

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: EQUIPMENT BLANK
**Lab Sample ID: 480-182956-10**
**Date Collected: 04/06/21 09:40**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

### 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 | | 04/09/21 08:20 | 04/13/21 01:32 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 01:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 0.50 | | mg/L | | | 04/12/21 18:03 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 04/12/21 18:03 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 04/12/21 18:03 | 1 |
| Total Dissolved Solids | ND | | 10.0 | | mg/L | | | 04/08/21 13:51 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **6.4** | **HF** | 0.1 | | SU | | | 04/11/21 10:57 | 1 |
| **Temperature** | **18.3** | **HF** | 0.001 | | Degrees C | | | 04/11/21 10:57 | 1 |

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 480-575636/1-A**
**Matrix: Water**
**Analysis Batch: 576115**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 575636**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | ND | | 0.020 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:15 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 04/09/21 08:20 | 04/13/21 00:15 | 1 |

**Lab Sample ID: LCS 480-575636/2-A**
**Matrix: Water**
**Analysis Batch: 576115**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 575636**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Boron | 0.200 | 0.200 | | mg/L | | 100 | 85 - 115 |
| Calcium | 10.0 | 9.96 | | mg/L | | 100 | 85 - 115 |

**Lab Sample ID: 480-182956-1 MS**
**Matrix: Water**
**Analysis Batch: 576115**

**Client Sample ID: DUP-1**
**Prep Type: Total/NA**
**Prep Batch: 575636**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.200 | 0.231 | | mg/L | | 102 | 70 - 130 |
| Calcium | 111 | | 10.0 | 121.8 | 4 | mg/L | | 104 | 70 - 130 |

**Lab Sample ID: 480-182956-1 MSD**
**Matrix: Water**
**Analysis Batch: 576115**

**Client Sample ID: DUP-1**
**Prep Type: Total/NA**
**Prep Batch: 575636**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.027 | | 0.200 | 0.228 | | mg/L | | 100 | 70 - 130 | 2 | 20 |
| Calcium | 111 | | 10.0 | 120.2 | 4 | mg/L | | 88 | 70 - 130 | 1 | 20 |

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 480-575647/4**
**Matrix: Water**
**Analysis Batch: 575647**

**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 | | | 04/09/21 00:19 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 04/09/21 00:19 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 04/09/21 00:19 | 1 |

**Lab Sample ID: LCS 480-575647/3**
**Matrix: Water**
**Analysis Batch: 575647**

**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 | 54.44 | | mg/L | | 109 | 90 - 110 |
| Fluoride | 5.00 | 5.16 | | mg/L | | 103 | 90 - 110 |
| Sulfate | 50.0 | 53.87 | | mg/L | | 108 | 90 - 110 |

## Method: 300.0 - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 480-182956-4 MS**
**Matrix: Water**
**Analysis Batch: 575647**

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 183 | | 250 | 449.9 | | mg/L | | 107 | 81 - 120 |
| Fluoride | ND | | 25.0 | 25.97 | | mg/L | | 104 | 82 - 120 |
| Sulfate | 43.1 | | 250 | 313.3 | | mg/L | | 108 | 80 - 120 |

**Lab Sample ID: MB 480-575983/4**
**Matrix: Water**
**Analysis Batch: 575983**

**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 | | | 04/12/21 15:08 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 04/12/21 15:08 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 04/12/21 15:08 | 1 |

**Lab Sample ID: LCS 480-575983/3**
**Matrix: Water**
**Analysis Batch: 575983**

**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 | 45.76 | | mg/L | | 92 | 90 - 110 |
| Fluoride | 5.00 | 4.95 | | mg/L | | 99 | 90 - 110 |
| Sulfate | 50.0 | 48.23 | | mg/L | | 96 | 90 - 110 |

**Lab Sample ID: 480-182956-8 MS**
**Matrix: Water**
**Analysis Batch: 575983**

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 77.6 | | 250 | 306.8 | | mg/L | | 92 | 81 - 120 |
| Fluoride | ND | | 25.0 | 23.97 | | mg/L | | 96 | 82 - 120 |
| Sulfate | 38.6 | | 250 | 271.4 | | mg/L | | 93 | 80 - 120 |

**Lab Sample ID: 480-182956-8 MSD**
**Matrix: Water**
**Analysis Batch: 575983**

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 77.6 | | 250 | 311.4 | | mg/L | | 94 | 81 - 120 | 1 | 15 |
| Fluoride | ND | | 25.0 | 24.55 | | mg/L | | 98 | 82 - 120 | 2 | 15 |
| Sulfate | 38.6 | | 250 | 275.5 | | mg/L | | 95 | 80 - 120 | 1 | 15 |

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

**Lab Sample ID: MB 480-575616/1**
**Matrix: Water**
**Analysis Batch: 575616**

**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 | | | 04/08/21 13:51 | 1 |

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

**Lab Sample ID: LCS 480-575616/2**
**Matrix: Water**
**Analysis Batch: 575616**

**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 | | | 501 | 499.0 | | mg/L | | 100 | 85 - 115 | | |

**Lab Sample ID: MB 480-575790/1**
**Matrix: Water**
**Analysis Batch: 575790**

**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 | | | 04/09/21 13:08 | 1 |

**Lab Sample ID: LCS 480-575790/2**
**Matrix: Water**
**Analysis Batch: 575790**

**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 | | | 501 | 498.0 | | mg/L | | 100 | 85 - 115 | | |

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 480-575899/1**
**Matrix: Water**
**Analysis Batch: 575899**

**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: LCS 480-575899/22**
**Matrix: Water**
**Analysis Batch: 575899**

**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: 480-182956-10 DU**
**Matrix: Water**
**Analysis Batch: 575899**

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

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | 6.4 | HF | | 6.0 | F3 | SU | | | | 7 | 5 |
| Temperature | 18.3 | HF | | 18.2 | | Degrees C | | | | 0.5 | 10 |

## Metals

### Prep Batch: 575636

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Total/NA | Water | 200.7 | |
| 480-182956-2 | P-1 | Total/NA | Water | 200.7 | |
| 480-182956-3 | P-2 | Total/NA | Water | 200.7 | |
| 480-182956-4 | P-3R | Total/NA | Water | 200.7 | |
| 480-182956-5 | P-4R | Total/NA | Water | 200.7 | |
| 480-182956-6 | P-5 | Total/NA | Water | 200.7 | |
| 480-182956-7 | P-6 | Total/NA | Water | 200.7 | |
| 480-182956-8 | P-7 | Total/NA | Water | 200.7 | |
| 480-182956-9 | FIELD BLANK | Total/NA | Water | 200.7 | |
| 480-182956-10 | EQUIPMENT BLANK | Total/NA | Water | 200.7 | |
| MB 480-575636/1-A | Method Blank | Total/NA | Water | 200.7 | |
| LCS 480-575636/2-A | Lab Control Sample | Total/NA | Water | 200.7 | |
| 480-182956-1 MS | DUP-1 | Total/NA | Water | 200.7 | |
| 480-182956-1 MSD | DUP-1 | Total/NA | Water | 200.7 | |

### Analysis Batch: 576115

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-2 | P-1 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-3 | P-2 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-4 | P-3R | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-5 | P-4R | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-7 | P-6 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-8 | P-7 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-9 | FIELD BLANK | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-10 | EQUIPMENT BLANK | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| MB 480-575636/1-A | Method Blank | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| LCS 480-575636/2-A | Lab Control Sample | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-1 MS | DUP-1 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |
| 480-182956-1 MSD | DUP-1 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |

### Analysis Batch: 576442

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-6 | P-5 | Total/NA | Water | 200.7 Rev 4.4 | 575636 |

## General Chemistry

### Analysis Batch: 575616

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Total/NA | Water | SM 2540C | |
| 480-182956-2 | P-1 | Total/NA | Water | SM 2540C | |
| 480-182956-3 | P-2 | Total/NA | Water | SM 2540C | |
| 480-182956-4 | P-3R | Total/NA | Water | SM 2540C | |
| 480-182956-5 | P-4R | Total/NA | Water | SM 2540C | |
| 480-182956-6 | P-5 | Total/NA | Water | SM 2540C | |
| 480-182956-7 | P-6 | Total/NA | Water | SM 2540C | |
| 480-182956-8 | P-7 | Total/NA | Water | SM 2540C | |
| 480-182956-10 | EQUIPMENT BLANK | Total/NA | Water | SM 2540C | |
| MB 480-575616/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 480-575616/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |

## General Chemistry

### Analysis Batch: 575647

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Total/NA | Water | 300.0 | |
| 480-182956-2 | P-1 | Total/NA | Water | 300.0 | |
| 480-182956-3 | P-2 | Total/NA | Water | 300.0 | |
| 480-182956-4 | P-3R | Total/NA | Water | 300.0 | |
| MB 480-575647/4 | Method Blank | Total/NA | Water | 300.0 | |
| LCS 480-575647/3 | Lab Control Sample | Total/NA | Water | 300.0 | |
| 480-182956-4 MS | P-3R | Total/NA | Water | 300.0 | |

### Analysis Batch: 575790

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-9 | FIELD BLANK | Total/NA | Water | SM 2540C | |
| MB 480-575790/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 480-575790/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |

### Analysis Batch: 575899

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-2 | P-1 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-3 | P-2 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-4 | P-3R | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-5 | P-4R | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-6 | P-5 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-7 | P-6 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-8 | P-7 | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-9 | FIELD BLANK | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-10 | EQUIPMENT BLANK | Total/NA | Water | SM 4500 H+ B | |
| LCS 480-575899/1 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |
| LCS 480-575899/22 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |
| 480-182956-10 DU | EQUIPMENT BLANK | Total/NA | Water | SM 4500 H+ B | |

### Analysis Batch: 575983

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-182956-5 | P-4R | Total/NA | Water | 300.0 | |
| 480-182956-6 | P-5 | Total/NA | Water | 300.0 | |
| 480-182956-7 | P-6 | Total/NA | Water | 300.0 | |
| 480-182956-8 | P-7 | Total/NA | Water | 300.0 | |
| 480-182956-9 | FIELD BLANK | Total/NA | Water | 300.0 | |
| 480-182956-10 | EQUIPMENT BLANK | Total/NA | Water | 300.0 | |
| MB 480-575983/4 | Method Blank | Total/NA | Water | 300.0 | |
| LCS 480-575983/3 | Lab Control Sample | Total/NA | Water | 300.0 | |
| 480-182956-8 MS | P-7 | Total/NA | Water | 300.0 | |
| 480-182956-8 MSD | P-7 | Total/NA | Water | 300.0 | |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: DUP-1
**Lab Sample ID: 480-182956-1**
**Date Collected: 04/05/21 00:00**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 00:22 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575647 | 04/09/21 04:05 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:43 | KEB | TAL BUF |

## Client Sample ID: P-1
**Lab Sample ID: 480-182956-2**
**Date Collected: 04/05/21 11:10**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 00:51 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575647 | 04/09/21 04:19 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:44 | KEB | TAL BUF |

## Client Sample ID: P-2
**Lab Sample ID: 480-182956-3**
**Date Collected: 04/06/21 09:05**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 00:55 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575647 | 04/09/21 04:34 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:45 | KEB | TAL BUF |

## Client Sample ID: P-3R
**Lab Sample ID: 480-182956-4**
**Date Collected: 04/05/21 11:55**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 00:59 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575647 | 04/09/21 04:48 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:47 | KEB | TAL BUF |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: P-4R
**Lab Sample ID: 480-182956-5**
**Date Collected: 04/05/21 13:05**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 01:02 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575983 | 04/12/21 15:52 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:48 | KEB | TAL BUF |

## Client Sample ID: P-5
**Lab Sample ID: 480-182956-6**
**Date Collected: 04/05/21 13:40**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576442 | 04/14/21 22:17 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575983 | 04/12/21 16:06 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:49 | KEB | TAL BUF |

## Client Sample ID: P-6
**Lab Sample ID: 480-182956-7**
**Date Collected: 04/05/21 15:00**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 01:21 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575983 | 04/12/21 16:21 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:51 | KEB | TAL BUF |

## Client Sample ID: P-7
**Lab Sample ID: 480-182956-8**
**Date Collected: 04/06/21 08:25**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 01:25 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 575983 | 04/12/21 16:35 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:52 | KEB | TAL BUF |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## Client Sample ID: FIELD BLANK
**Lab Sample ID: 480-182956-9**
**Date Collected: 04/06/21 09:35**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 01:29 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 1 | 575983 | 04/12/21 17:48 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575790 | 04/09/21 13:08 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:55 | KEB | TAL BUF |

## Client Sample ID: EQUIPMENT BLANK
**Lab Sample ID: 480-182956-10**
**Date Collected: 04/06/21 09:40**
**Matrix: Water**
**Date Received: 04/07/21 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 575636 | 04/09/21 08:20 | KMP | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 576115 | 04/13/21 01:32 | LMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 1 | 575983 | 04/12/21 18:03 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 575616 | 04/08/21 13:51 | CSS | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 575899 | 04/11/21 10:57 | KEB | 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: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

## 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 | 01-01-22 |

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.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

| 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.
Job ID: 480-182956-1
Project/Site: SKB Cloquet - CCR Groundwater App III

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 480-182956-1 | DUP-1 | Water | 04/05/21 00:00 | 04/07/21 10:00 | |
| 480-182956-2 | P-1 | Water | 04/05/21 11:10 | 04/07/21 10:00 | |
| 480-182956-3 | P-2 | Water | 04/06/21 09:05 | 04/07/21 10:00 | |
| 480-182956-4 | P-3R | Water | 04/05/21 11:55 | 04/07/21 10:00 | |
| 480-182956-5 | P-4R | Water | 04/05/21 13:05 | 04/07/21 10:00 | |
| 480-182956-6 | P-5 | Water | 04/05/21 13:40 | 04/07/21 10:00 | |
| 480-182956-7 | P-6 | Water | 04/05/21 15:00 | 04/07/21 10:00 | |
| 480-182956-8 | P-7 | Water | 04/06/21 08:25 | 04/07/21 10:00 | |
| 480-182956-9 | FIELD BLANK | Water | 04/06/21 09:35 | 04/07/21 10:00 | |
| 480-182956-10 | EQUIPMENT BLANK | Water | 04/06/21 09:40 | 04/07/21 10:00 | |

**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: M. Schlegel | Lab PM: VanDette, Ryan T | Carrier Tracking No(s): | COC No: 480-157914-25622.1 |
|---|---|---|---|---|
| Client Contact: Nathaniel Beinemann | Phone: 651-792-6065 | E-Mail: Ryan.VanDette@Eurofinset.com | State of Origin: | Page: Page 1 of 1 |
| Company: Waste Connections, Inc. | PWSID: | | | Job #: |
| Address: 13425 Courthouse Blvd | Due Date Requested: | | | |
| City: Rosemount | TAT Requested (days): | | | |
| State, Zip: MN, 55068 | Compliance Project: Δ Yes Δ No | | | |
| 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, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

480-182956 Chain of Custody

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 300.0_28D - Cl/F/SO4 | 2540C_Calcd - Total Dissolved Solids | SM4500_H+ - pH | 200.7 - B,Ca | ers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | N | N | N | D | | |
| P-1 | 4/5/21 | 11:10 | 6 | Water | | | X | X | X | X | | |
| P-2 | 4/6/21 | 9:05 | 6 | Water | | | X | X | X | X | | |
| P-3R | 4/5/21 | 11:55 | 6 | Water | | | X | X | X | X | | |
| P-4R | 4/5/21 | 13:05 | 6 | Water | | | X | X | X | X | | |
| P-5 | 4/5/21 | 13:40 | 6 | Water | | | X | X | X | X | | |
| P-6 | 4/5/21 | 15:00 | 6 | Water | | | X | X | X | X | | |
| P-7 | 4/6/21 | 8:25 | 6 | Water | | | X | X | X | X | | |
| Duplicate | 4/5/21 | - | 6 | Water | | | X | X | X | X | | |
| Field Blank | 4/6/21 | 9:35 | 6 | Water | | | X | X | X | X | | |
| Equip Blank | 4/6/21 | 9:40 | 6 | Water | | | X | X | X | X | | |

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

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

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

Special Instructions/QC Requirements:

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

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | Michael Zell | 4/7/21 1320 | GES | | 4-6-21 1320 | |
| 2 | | 4-6-21 1700 | | | 4/7/21 1000 | TAB |
| 3 | | Date/Time: | Company | Received by: | Date/Time: | Company |

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

Cooler Temperature(s) °C and Other Remarks: #1 2.5, 2.8

Ver: 11/01/2020

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4/16/2021

# Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-182956-1

**Login Number: 182956**
**List Number: 1**
**Creator: Stopa, Erik S**

**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. | N/A | |
| Chlorine Residual checked. | N/A | |

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# ANALYTICAL REPORT

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

Laboratory Job ID: 480-193066-1
Client Project/Site: SKB Cloquet - CCR Groundwater
Sampling Event: CCR Groundwater

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

Attn: Megan Lindstrom

*Authorized for release by:*
*12/17/2021 10:52:17 AM*
Joshua Velez, Project Management Assistant I
joshua.velez@eurofinset.com

Designee for

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

LINKS

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# Table of Contents

# Definitions/Glossary

Client: Waste Connections, Inc.
Job ID: 480-193066-1
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: 480-193066-1

### Laboratory: Eurofins TestAmerica, Buffalo

**Narrative**

**Job Narrative**
**480-193066-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 12/4/2021 11:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.7º C and 3.1º C.

**HPLC/IC**
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: DUPLICATE (480-193066-1), P-1-CCR (480-193066-2), P-8-CCR (480-193066-5), P-9-CCR (480-193066-6) and P-5R-CCR (480-193066-7). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were diluted due to the nature of the sample matrix: P-6-CCR (480-193066-3) and P-7-CCR (480-193066-4). 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-5R-CCR (480-193066-7) and (480-193066-A-7 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: DUPLICATE (480-193066-1), P-1-CCR (480-193066-2), P-6-CCR (480-193066-3), P-7-CCR (480-193066-4), P-8-CCR (480-193066-5), P-9-CCR (480-193066-6), P-5R-CCR (480-193066-7), FIELD BLANK (480-193066-8) and EQUIP BLANK (480-193066-9).

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

# Detection Summary

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

Job ID: 480-193066-1

## Client Sample ID: DUPLICATE — Lab Sample ID: 480-193066-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 92.9 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 98.6 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 28.5 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 443 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.8 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.6 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-1-CCR — Lab Sample ID: 480-193066-2

| 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 | 166 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 213 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 28.0 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 693 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.6 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.1 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-6-CCR — Lab Sample ID: 480-193066-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.17 | | 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 | 54.1 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 85.8 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 569 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.9 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.3 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-7-CCR — Lab Sample ID: 480-193066-4

| 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 | 168 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 65.9 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 53.7 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 701 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.9 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.5 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-8-CCR — Lab Sample ID: 480-193066-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 93.4 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 98.2 | | 1.0 | | mg/L | 2 | | 300.0 | Total/NA |
| Sulfate | 28.9 | | 4.0 | | mg/L | 2 | | 300.0 | Total/NA |
| Total Dissolved Solids | 456 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.8 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 22.0 | 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: 480-193066-1

## Client Sample ID: P-9-CCR — Lab Sample ID: 480-193066-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.035 | | 0.020 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Calcium | 82.8 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 117 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 28.3 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 425 | | 10.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.7 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 22.2 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: P-5R-CCR — Lab Sample ID: 480-193066-7

| 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 | 158 | | 0.50 | | mg/L | 1 | | 200.7 Rev 4.4 | Total/NA |
| Chloride | 245 | | 2.5 | | mg/L | 5 | | 300.0 | Total/NA |
| Sulfate | 22.8 | | 10.0 | | mg/L | 5 | | 300.0 | Total/NA |
| Total Dissolved Solids | 764 | | 20.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.7 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.7 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: FIELD BLANK — Lab Sample ID: 480-193066-8

| Analyte | Result | Qualifier | RL | RL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| pH | 5.5 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.5 | HF | 0.001 | | Degrees C | 1 | | SM 4500 H+ B | Total/NA |

## Client Sample ID: EQUIP BLANK — Lab Sample ID: 480-193066-9

| Analyte | Result | Qualifier | RL | RL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| pH | 5.3 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Temperature | 21.4 | 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: 480-193066-1

## Client Sample ID: DUPLICATE

**Date Collected: 12/03/21 00:00**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-1

**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 | | 12/08/21 08:27 | 12/08/21 19:02 | 1 |
| **Calcium** | **92.9** | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **98.6** | | 2.5 | | mg/L | | | 12/09/21 17:44 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 17:44 | 5 |
| **Sulfate** | **28.5** | | 10.0 | | mg/L | | | 12/09/21 17:44 | 5 |
| **Total Dissolved Solids** | **443** | | 10.0 | | mg/L | | | 12/07/21 10:30 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **7.8** | **HF** | 0.1 | | SU | | | 12/09/21 16:27 | 1 |
| **Temperature** | **21.6** | **HF** | 0.001 | | Degrees C | | | 12/09/21 16:27 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-1-CCR

**Date Collected: 12/02/21 08:05**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-2

**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 | | 12/08/21 08:27 | 12/08/21 19:17 | 1 |
| Calcium | 166 | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 213 | | 2.5 | | mg/L | | | 12/09/21 18:02 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 18:02 | 5 |
| Sulfate | 28.0 | | 10.0 | | mg/L | | | 12/09/21 18:02 | 5 |
| Total Dissolved Solids | 693 | | 10.0 | | mg/L | | | 12/07/21 10:18 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.6 | HF | 0.1 | | SU | | | 12/09/21 16:33 | 1 |
| Temperature | 21.1 | HF | 0.001 | | Degrees C | | | 12/09/21 16:33 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-6-CCR

**Date Collected: 12/03/21 11:40**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-3

**Matrix: Water**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.17 | | 0.020 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:35 | 1 |
| Calcium | 118 | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 54.1 | | 2.5 | | mg/L | | | 12/09/21 18:21 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 18:21 | 5 |
| Sulfate | 85.8 | | 10.0 | | mg/L | | | 12/09/21 18:21 | 5 |
| Total Dissolved Solids | 569 | | 10.0 | | mg/L | | | 12/07/21 10:30 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.9 | HF | 0.1 | | SU | | | 12/09/21 16:38 | 1 |
| Temperature | 21.3 | HF | 0.001 | | Degrees C | | | 12/09/21 16:38 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-7-CCR

**Date Collected: 12/03/21 12:40**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-4

**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 | | 12/08/21 08:27 | 12/08/21 19:39 | 1 |
| Calcium | 168 | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 65.9 | | 2.5 | | mg/L | | | 12/09/21 19:53 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 19:53 | 5 |
| Sulfate | 53.7 | | 10.0 | | mg/L | | | 12/09/21 19:53 | 5 |
| Total Dissolved Solids | 701 | | 10.0 | | mg/L | | | 12/07/21 10:30 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.9 | HF | 0.1 | | SU | | | 12/09/21 16:40 | 1 |
| Temperature | 21.5 | HF | 0.001 | | Degrees C | | | 12/09/21 16:40 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-8-CCR

**Date Collected: 12/03/21 09:15**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-5

**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 | | 12/08/21 08:27 | 12/08/21 19:43 | 1 |
| **Calcium** | **93.4** | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 19:43 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **98.2** | | 1.0 | | mg/L | | | 12/09/21 20:12 | 2 |
| Fluoride | ND | | 0.10 | | mg/L | | | 12/09/21 20:12 | 2 |
| **Sulfate** | **28.9** | | 4.0 | | mg/L | | | 12/09/21 20:12 | 2 |
| **Total Dissolved Solids** | **456** | | 10.0 | | mg/L | | | 12/07/21 10:30 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **7.8** | **HF** | 0.1 | | SU | | | 12/09/21 16:43 | 1 |
| **Temperature** | **22.0** | **HF** | 0.001 | | Degrees C | | | 12/09/21 16:43 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-9-CCR

**Date Collected: 12/03/21 09:40**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-6

**Matrix: Water**

### Method: 200.7 Rev 4.4 - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Boron** | **0.035** | | 0.020 | | mg/L | | 12/08/21 08:27 | 12/08/21 20:11 | 1 |
| **Calcium** | **82.8** | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 20:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **117** | | 2.5 | | mg/L | | | 12/09/21 20:30 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 20:30 | 5 |
| **Sulfate** | **28.3** | | 10.0 | | mg/L | | | 12/09/21 20:30 | 5 |
| **Total Dissolved Solids** | **425** | | 10.0 | | mg/L | | | 12/09/21 08:56 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **7.7** | **HF** | 0.1 | | SU | | | 12/09/21 16:45 | 1 |
| **Temperature** | **22.2** | **HF** | 0.001 | | Degrees C | | | 12/09/21 16:45 | 1 |

# Client Sample Results

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

Job ID: 480-193066-1

## Client Sample ID: P-5R-CCR

**Date Collected: 12/03/21 10:45**
**Date Received: 12/04/21 11:30**

## Lab Sample ID: 480-193066-7

**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 | | 12/08/21 08:27 | 12/08/21 20:15 | 1 |
| Calcium | 158 | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 20:15 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 245 | | 2.5 | | mg/L | | | 12/09/21 20:49 | 5 |
| Fluoride | ND | | 0.25 | | mg/L | | | 12/09/21 20:49 | 5 |
| Sulfate | 22.8 | | 10.0 | | mg/L | | | 12/09/21 20:49 | 5 |
| Total Dissolved Solids | 764 | | 20.0 | | mg/L | | | 12/09/21 08:56 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.7 | HF | 0.1 | | SU | | | 12/09/21 16:48 | 1 |
| Temperature | 21.7 | HF | 0.001 | | Degrees C | | | 12/09/21 16:48 | 1 |

Client: Waste Connections, Inc.
Job ID: 480-193066-1
Project/Site: SKB Cloquet - CCR Groundwater

## Client Sample ID: FIELD BLANK
**Lab Sample ID: 480-193066-8**
**Date Collected: 12/03/21 13:15**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

### 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 | | 12/08/21 08:27 | 12/08/21 20:19 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 20:19 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 0.50 | | mg/L | | | 12/09/21 21:07 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 12/09/21 21:07 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 12/09/21 21:07 | 1 |
| Total Dissolved Solids | ND | | 10.0 | | mg/L | | | 12/09/21 08:56 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **5.5** | **HF** | 0.1 | | SU | | | 12/09/21 16:51 | 1 |
| **Temperature** | **21.5** | **HF** | 0.001 | | Degrees C | | | 12/09/21 16:51 | 1 |

## Client Sample ID: EQUIP BLANK
**Lab Sample ID: 480-193066-9**

**Date Collected: 12/03/21 13:20**
**Matrix: Water**

**Date Received: 12/04/21 11:30**

### 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 | | 12/08/21 08:27 | 12/08/21 20:22 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 20:22 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 0.50 | | mg/L | | | 12/09/21 21:26 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 12/09/21 21:26 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 12/09/21 21:26 | 1 |
| Total Dissolved Solids | ND | | 10.0 | | mg/L | | | 12/09/21 08:56 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **5.3** | **HF** | 0.1 | | SU | | | 12/09/21 16:53 | 1 |
| **Temperature** | **21.4** | **HF** | 0.001 | | Degrees C | | | 12/09/21 16:53 | 1 |

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 480-607882/1-A**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | ND | | 0.020 | | mg/L | | 12/08/21 08:27 | 12/08/21 18:55 | 1 |
| Calcium | ND | | 0.50 | | mg/L | | 12/08/21 08:27 | 12/08/21 18:55 | 1 |

**Lab Sample ID: LCS 480-607882/2-A**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Boron | 0.200 | 0.206 | | mg/L | | 103 | 85 - 115 |
| Calcium | 10.0 | 9.71 | | mg/L | | 97 | 85 - 115 |

**Lab Sample ID: 480-193066-2 MS**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: P-1-CCR**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.039 | | 0.200 | 0.248 | | mg/L | | 104 | 70 - 130 |
| Calcium | 166 | | 10.0 | 171.6 | 4 | mg/L | | 58 | 70 - 130 |

**Lab Sample ID: 480-193066-2 MSD**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: P-1-CCR**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 0.039 | | 0.200 | 0.248 | | mg/L | | 104 | 70 - 130 | 0 | 20 |
| Calcium | 166 | | 10.0 | 170.1 | 4 | mg/L | | 43 | 70 - 130 | 1 | 20 |

**Lab Sample ID: 480-193066-5 MS**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: P-8-CCR**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 0.229 | | mg/L | | 106 | 70 - 130 |
| Calcium | 93.4 | | 10.0 | 104.2 | 4 | mg/L | | 108 | 70 - 130 |

**Lab Sample ID: 480-193066-5 MSD**
**Matrix: Water**
**Analysis Batch: 608172**

**Client Sample ID: P-8-CCR**
**Prep Type: Total/NA**
**Prep Batch: 607882**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 0.222 | | mg/L | | 102 | 70 - 130 | 3 | 20 |
| Calcium | 93.4 | | 10.0 | 101.0 | 4 | mg/L | | 76 | 70 - 130 | 3 | 20 |

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 480-608244/4**
**Matrix: Water**
**Analysis Batch: 608244**

**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 | | | 12/09/21 16:30 | 1 |
| Fluoride | ND | | 0.050 | | mg/L | | | 12/09/21 16:30 | 1 |
| Sulfate | ND | | 2.0 | | mg/L | | | 12/09/21 16:30 | 1 |

**Lab Sample ID: LCS 480-608244/3**
**Matrix: Water**
**Analysis Batch: 608244**

**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 | 49.70 | | mg/L | | 99 | 90 - 110 |
| Fluoride | 5.00 | 5.10 | | mg/L | | 102 | 90 - 110 |
| Sulfate | 50.0 | 49.59 | | mg/L | | 99 | 90 - 110 |

**Lab Sample ID: 480-193066-3 MS**
**Matrix: Water**
**Analysis Batch: 608244**

**Client Sample ID: P-6-CCR**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 54.1 | | 250 | 293.5 | | mg/L | | 96 | 81 - 120 |
| Fluoride | ND | | 25.0 | 24.76 | | mg/L | | 99 | 82 - 120 |
| Sulfate | 85.8 | | 250 | 323.3 | | mg/L | | 95 | 80 - 120 |

**Lab Sample ID: 480-193066-3 MSD**
**Matrix: Water**
**Analysis Batch: 608244**

**Client Sample ID: P-6-CCR**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 54.1 | | 250 | 293.6 | | mg/L | | 96 | 81 - 120 | 0 | 15 |
| Fluoride | ND | | 25.0 | 24.74 | | mg/L | | 99 | 82 - 120 | 0 | 15 |
| Sulfate | 85.8 | | 250 | 323.0 | | mg/L | | 95 | 80 - 120 | 0 | 15 |

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

**Lab Sample ID: MB 480-607813/1**
**Matrix: Water**
**Analysis Batch: 607813**

**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 | | | 12/07/21 10:18 | 1 |

**Lab Sample ID: LCS 480-607813/2**
**Matrix: Water**
**Analysis Batch: 607813**

**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 | 446.0 | | mg/L | | 89 | 85 - 115 |

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

**Lab Sample ID: MB 480-607816/1**
**Matrix: Water**
**Analysis Batch: 607816**

**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 | | | 12/07/21 10:30 | 1 |

**Lab Sample ID: LCS 480-607816/2**
**Matrix: Water**
**Analysis Batch: 607816**

**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 | 467.0 | | mg/L | | 93 | 85 - 115 | | |

**Lab Sample ID: 480-193066-5 DU**
**Matrix: Water**
**Analysis Batch: 607816**

**Client Sample ID: P-8-CCR**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 456 | | | 456.0 | | mg/L | | | | 0 | 10 |

**Lab Sample ID: MB 480-608139/1**
**Matrix: Water**
**Analysis Batch: 608139**

**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 | | | 12/09/21 08:56 | 1 |

**Lab Sample ID: LCS 480-608139/2**
**Matrix: Water**
**Analysis Batch: 608139**

**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 | 455.0 | | mg/L | | 91 | 85 - 115 | | |

**Lab Sample ID: 480-193066-7 DU**
**Matrix: Water**
**Analysis Batch: 608139**

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

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 764 | | | 830.0 | | mg/L | | | | 8 | 10 |

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 480-608298/1**
**Matrix: Water**
**Analysis Batch: 608298**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | | | 7.00 | 7.1 | | SU | | 101 | 99 - 101 | | |

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

**Lab Sample ID: LCS 480-608298/23**
**Matrix: Water**
**Analysis Batch: 608298**

**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: 480-193066-2 DU**
**Matrix: Water**
**Analysis Batch: 608298**

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

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | 6.6 | HF | | 6.6 | | SU | | | | 0.5 | 5 |
| Temperature | 21.1 | HF | | 21.1 | | Degrees C | | | | 0.2 | 10 |

## Metals

### Prep Batch: 607882

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Total/NA | Water | 200.7 | |
| 480-193066-2 | P-1-CCR | Total/NA | Water | 200.7 | |
| 480-193066-3 | P-6-CCR | Total/NA | Water | 200.7 | |
| 480-193066-4 | P-7-CCR | Total/NA | Water | 200.7 | |
| 480-193066-5 | P-8-CCR | Total/NA | Water | 200.7 | |
| 480-193066-6 | P-9-CCR | Total/NA | Water | 200.7 | |
| 480-193066-7 | P-5R-CCR | Total/NA | Water | 200.7 | |
| 480-193066-8 | FIELD BLANK | Total/NA | Water | 200.7 | |
| 480-193066-9 | EQUIP BLANK | Total/NA | Water | 200.7 | |
| MB 480-607882/1-A | Method Blank | Total/NA | Water | 200.7 | |
| LCS 480-607882/2-A | Lab Control Sample | Total/NA | Water | 200.7 | |
| 480-193066-2 MS | P-1-CCR | Total/NA | Water | 200.7 | |
| 480-193066-2 MSD | P-1-CCR | Total/NA | Water | 200.7 | |
| 480-193066-5 MS | P-8-CCR | Total/NA | Water | 200.7 | |
| 480-193066-5 MSD | P-8-CCR | Total/NA | Water | 200.7 | |

### Analysis Batch: 608172

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-2 | P-1-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-3 | P-6-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-4 | P-7-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-5 | P-8-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-6 | P-9-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-7 | P-5R-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-8 | FIELD BLANK | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-9 | EQUIP BLANK | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| MB 480-607882/1-A | Method Blank | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| LCS 480-607882/2-A | Lab Control Sample | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-2 MS | P-1-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-2 MSD | P-1-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-5 MS | P-8-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |
| 480-193066-5 MSD | P-8-CCR | Total/NA | Water | 200.7 Rev 4.4 | 607882 |

## General Chemistry

### Analysis Batch: 607813

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-2 | P-1-CCR | Total/NA | Water | SM 2540C | |
| MB 480-607813/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 480-607813/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |

### Analysis Batch: 607816

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Total/NA | Water | SM 2540C | |
| 480-193066-3 | P-6-CCR | Total/NA | Water | SM 2540C | |
| 480-193066-4 | P-7-CCR | Total/NA | Water | SM 2540C | |
| 480-193066-5 | P-8-CCR | Total/NA | Water | SM 2540C | |
| MB 480-607816/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 480-607816/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| 480-193066-5 DU | P-8-CCR | Total/NA | Water | SM 2540C | |

# QC Association Summary

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

Job ID: 480-193066-1

## General Chemistry

### Analysis Batch: 608139

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-6 | P-9-CCR | Total/NA | Water | SM 2540C | |
| 480-193066-7 | P-5R-CCR | Total/NA | Water | SM 2540C | |
| 480-193066-8 | FIELD BLANK | Total/NA | Water | SM 2540C | |
| 480-193066-9 | EQUIP BLANK | Total/NA | Water | SM 2540C | |
| MB 480-608139/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 480-608139/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| 480-193066-7 DU | P-5R-CCR | Total/NA | Water | SM 2540C | |

### Analysis Batch: 608244

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Total/NA | Water | 300.0 | |
| 480-193066-2 | P-1-CCR | Total/NA | Water | 300.0 | |
| 480-193066-3 | P-6-CCR | Total/NA | Water | 300.0 | |
| 480-193066-4 | P-7-CCR | Total/NA | Water | 300.0 | |
| 480-193066-5 | P-8-CCR | Total/NA | Water | 300.0 | |
| 480-193066-6 | P-9-CCR | Total/NA | Water | 300.0 | |
| 480-193066-7 | P-5R-CCR | Total/NA | Water | 300.0 | |
| 480-193066-8 | FIELD BLANK | Total/NA | Water | 300.0 | |
| 480-193066-9 | EQUIP BLANK | Total/NA | Water | 300.0 | |
| MB 480-608244/4 | Method Blank | Total/NA | Water | 300.0 | |
| LCS 480-608244/3 | Lab Control Sample | Total/NA | Water | 300.0 | |
| 480-193066-3 MS | P-6-CCR | Total/NA | Water | 300.0 | |
| 480-193066-3 MSD | P-6-CCR | Total/NA | Water | 300.0 | |

### Analysis Batch: 608298

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-2 | P-1-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-3 | P-6-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-4 | P-7-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-5 | P-8-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-6 | P-9-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-7 | P-5R-CCR | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-8 | FIELD BLANK | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-9 | EQUIP BLANK | Total/NA | Water | SM 4500 H+ B | |
| LCS 480-608298/1 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |
| LCS 480-608298/23 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |
| 480-193066-2 DU | P-1-CCR | Total/NA | Water | SM 4500 H+ B | |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-193066-1
Project/Site: SKB Cloquet - CCR Groundwater

## Client Sample ID: DUPLICATE
**Lab Sample ID: 480-193066-1**
**Date Collected: 12/03/21 00:00**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 19:02 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 17:44 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 607816 | 12/07/21 10:30 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:27 | KEB | TAL BUF |

## Client Sample ID: P-1-CCR
**Lab Sample ID: 480-193066-2**
**Date Collected: 12/02/21 08:05**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 19:17 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 18:02 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 607813 | 12/07/21 10:18 | JGO | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:33 | KEB | TAL BUF |

## Client Sample ID: P-6-CCR
**Lab Sample ID: 480-193066-3**
**Date Collected: 12/03/21 11:40**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 19:35 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 18:21 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 607816 | 12/07/21 10:30 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:38 | KEB | TAL BUF |

## Client Sample ID: P-7-CCR
**Lab Sample ID: 480-193066-4**
**Date Collected: 12/03/21 12:40**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 19:39 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 19:53 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 607816 | 12/07/21 10:30 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:40 | KEB | TAL BUF |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-193066-1
Project/Site: SKB Cloquet - CCR Groundwater

## Client Sample ID: P-8-CCR
**Lab Sample ID: 480-193066-5**
**Date Collected: 12/03/21 09:15**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 19:43 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 2 | 608244 | 12/09/21 20:12 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 607816 | 12/07/21 10:30 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:43 | KEB | TAL BUF |

## Client Sample ID: P-9-CCR
**Lab Sample ID: 480-193066-6**
**Date Collected: 12/03/21 09:40**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 20:11 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 20:30 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 608139 | 12/09/21 08:56 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:45 | KEB | TAL BUF |

## Client Sample ID: P-5R-CCR
**Lab Sample ID: 480-193066-7**
**Date Collected: 12/03/21 10:45**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 20:15 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 5 | 608244 | 12/09/21 20:49 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 608139 | 12/09/21 08:56 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:48 | KEB | TAL BUF |

## Client Sample ID: FIELD BLANK
**Lab Sample ID: 480-193066-8**
**Date Collected: 12/03/21 13:15**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 20:19 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 1 | 608244 | 12/09/21 21:07 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 608139 | 12/09/21 08:56 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:51 | KEB | TAL BUF |

# Lab Chronicle

Client: Waste Connections, Inc.
Job ID: 480-193066-1
Project/Site: SKB Cloquet - CCR Groundwater

## Client Sample ID: EQUIP BLANK
**Lab Sample ID: 480-193066-9**
**Date Collected: 12/03/21 13:20**
**Matrix: Water**
**Date Received: 12/04/21 11:30**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 200.7 | | | 607882 | 12/08/21 08:27 | NBS | TAL BUF |
| Total/NA | Analysis | 200.7 Rev 4.4 | | 1 | 608172 | 12/08/21 20:22 | AMH | TAL BUF |
| Total/NA | Analysis | 300.0 | | 1 | 608244 | 12/09/21 21:26 | IMZ | TAL BUF |
| Total/NA | Analysis | SM 2540C | | 1 | 608139 | 12/09/21 08:56 | EJL | TAL BUF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 608298 | 12/09/21 16:53 | KEB | 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: 480-193066-1
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 | 01-01-22 |

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: 480-193066-1

| 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: 480-193066-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 480-193066-1 | DUPLICATE | Water | 12/03/21 00:00 | 12/04/21 11:30 |
| 480-193066-2 | P-1-CCR | Water | 12/02/21 08:05 | 12/04/21 11:30 |
| 480-193066-3 | P-6-CCR | Water | 12/03/21 11:40 | 12/04/21 11:30 |
| 480-193066-4 | P-7-CCR | Water | 12/03/21 12:40 | 12/04/21 11:30 |
| 480-193066-5 | P-8-CCR | Water | 12/03/21 09:15 | 12/04/21 11:30 |
| 480-193066-6 | P-9-CCR | Water | 12/03/21 09:40 | 12/04/21 11:30 |
| 480-193066-7 | P-5R-CCR | Water | 12/03/21 10:45 | 12/04/21 11:30 |
| 480-193066-8 | FIELD BLANK | Water | 12/03/21 13:15 | 12/04/21 11:30 |
| 480-193066-9 | EQUIP BLANK | Water | 12/03/21 13:20 | 12/04/21 11:30 |

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

# Chain of Custody Record

eurofins | Environment Testing America

| Client Information | Sampler: N. Schlegel | Lab PM: VanDette, Ryan T | Carrier Tracking No(s): | COC No: 480-165187-25622.1 |
|---|---|---|---|---|
| Client Contact: Nathaniel Beinemann | Phone: 651-792-6065 | E-Mail: Ryan.VanDette@Eurofinset.com | State of Origin: MN | Page: Page 1 of 1 |
| Company: Waste Connections, Inc. | PWSID: | | | Job #: |
| Address: 13425 Courthouse Blvd | Due Date Requested: | | | |
| City: Rosemount | TAT Requested (days): Standard | | | |
| State, Zip: MN, 55068 | Compliance Project: Δ Yes Δ No | | | |
| 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 | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2O3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - pH 4-5 |
| L - EDA | Z - other (specify) |

Other:

| Sample Identification | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/ | 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-CCR | 12/2/21 | 8:05 | 6 | Water | | | X | X | X | X | | |
| P-2-CCR | — | — | — | Water | | | — | — | — | — | | |
| P-3-CCR MS P-8-CLR | 12/3/21 | 9:15 | 6 | Water | | | X | X | X | X | | |
| P-4-CCR MS P-9-CLR | 12/3/21 | 9:40 | 6 | Water | | | X | X | X | X | | |
| P-5-CCR MS P-5R-CLR | 12/3/21 | 11:45 | 6 | Water | | | X | X | X | X | | |
| P-6-CCR | 12/3/21 | 11:40 | 6 | Water | | | X | X | X | X | | |
| P-7-CCR | 12/3/21 | 12:40 | 6 | Water | | | X | X | X | X | | |
| Duplicate | 12/3/21 | — | 6 | Water | | | X | X | X | X | | |
| Field Blank | 12/3/21 | 13:15 | 6 | Water | | | X | X | X | X | | |
| Equip Blank | 12/3/21 | 13:20 | 6 | Water | | | X | X | X | X | | |
| | | | | | | | | | | | | |

480-193066 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
| Relinquished by: | Date/Time: 12/3/21 16:00 | Company: GES | Received by: | Date/Time: 12/4/21 1130 | Company: TAB |
| Relinquished by: | Date/Time: | Company: | Received by: | Date/Time: | Company: |
| Relinquished by: | Date/Time: | Company: | Received by: | Date/Time: | Company: |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: #1 2.7, 3.1 |
|---|---|---|

Ver: 06/08/2021

# Login Sample Receipt Checklist

Client: Waste Connections, Inc.

Job Number: 480-193066-1

**Login Number: 193066**
**List Number: 1**
**Creator: Sabuda, Brendan D**

**List Source: Eurofins TestAmerica, Buffalo**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity either was not measured or, if measured, is at or below background | True | |
| The cooler's custody seal, if present, is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 2.7 3.1 #1 ICE |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the sample IDs on the containers and the COC. | True | |
| Samples are received within Holding Time (Excluding tests with immediate HTs).. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter. | True | |
| If necessary, staff have been informed of any short hold time or quick TAT needs | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Sampling Company provided. | True | |
| Samples received within 48 hours of sampling. | True | |
| Samples requiring field filtration have been filtered in the field. | True | |
| Chlorine Residual checked. | True | |

# Appendix C – Statistical Evaluation Data

| | | |
|---|---|---|
| | **Background Statistics for Uncensored Full Data Sets** | |
| | **User Selected Options** | |
| Date/Time of Computation | ProUCL 5.18/11/2021 3:57:34 PM | |
| From File | C:\Users\bjanowiak\Documents\My EQuIS Work\GES\SKB - Shamrock Environmental Landfill_SW-399\Cloquet | |
| Full Precision | OFF | |
| Confidence Coefficient | 95% | |
| Coverage | 95% | |
| New or Future K Observations | 1 | |
| Number of Bootstrap Operations | 2000 | |

**Boron**

**General Statistics**

| | | | |
|---|---|---|---|
| Total Number of Observations | 129 | Number of Distinct Observations | 62 |
| Minimum | 0.02 | First Quartile | 0.041 |
| Second Largest | 0.39 | Median | 0.058 |
| Maximum | 0.41 | Third Quartile | 0.13 |
| Mean | 0.107 | SD | 0.1 |
| Coefficient of Variation | 0.931 | Skewness | 1.592 |
| Mean of logged Data | -2.57 | SD of logged Data | 0.787 |

**Critical Values for Background Threshold Values (BTVs)**

| | | | |
|---|---|---|---|
| Tolerance Factor K (For UTL) | 1.887 | d2max (for USL) | 3.294 |

**Normal GOF Test**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.733 | **Normal GOF Test** |
| 5% Shapiro Wilk P Value | 0 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.224 | **Lilliefors GOF Test** |
| 5% Lilliefors Critical Value | 0.0784 | Data Not Normal at 5% Significance Level |

**Data Not Normal at 5% Significance Level**

**Background Statistics Assuming Normal Distribution**

| | | | |
|---|---|---|---|
| 95% UTL with 95% Coverage | 0.296 | 90% Percentile (z) | 0.236 |
| 95% UPL (t) | 0.274 | 95% Percentile (z) | 0.272 |
| 95% USL | 0.437 | 99% Percentile (z) | 0.34 |

**Gamma GOF Test**

| | | |
|---|---|---|
| A-D Test Statistic | 6.251 | **Anderson-Darling Gamma GOF Test** |
| 5% A-D Critical Value | 0.769 | Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.183 | **Kolmogorov-Smirnov Gamma GOF Test** |
| 5% K-S Critical Value | 0.0834 | Data Not Gamma Distributed at 5% Significance Level |

**Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

| | | | |
|---|---|---|---|
| k hat (MLE) | 1.621 | k star (bias corrected MLE) | 1.588 |
| Theta hat (MLE) | 0.0663 | Theta star (bias corrected MLE) | 0.0676 |
| nu hat (MLE) | 418.2 | nu star (bias corrected) | 409.8 |
| MLE Mean (bias corrected) | 0.107 | MLE Sd (bias corrected) | 0.0852 |

**Background Statistics Assuming Gamma Distribution**

| | | | |
|---|---|---|---|
| 95% Wilson Hilferty (WH) Approx. Gamma UPL | 0.271 | 90% Percentile | 0.221 |
| 95% Hawkins Wixley (HW) Approx. Gamma UPL | 0.273 | 95% Percentile | 0.274 |
| 95% WH Approx. Gamma UTL with 95% Coverage | 0.308 | 99% Percentile | 0.395 |
| 95% HW Approx. Gamma UTL with 95% Coverage | 0.313 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | | | | | 95% WH USL | 0.615 | | | | | 95% HW USL | 0.672 |
| 56 | | | | | | | | | | | | |
| 57 | | | | | **Lognormal GOF Test** | | | | | | | |
| 58 | | | | | Shapiro Wilk Test Statistic | 0.904 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 59 | | | | | 5% Shapiro Wilk P Value | 1.660E-11 | Data Not Lognormal at 5% Significance Level | | | | | |
| 60 | | | | | Lilliefors Test Statistic | 0.148 | **Lilliefors Lognormal GOF Test** | | | | | |
| 61 | | | | | 5% Lilliefors Critical Value | 0.0784 | Data Not Lognormal at 5% Significance Level | | | | | |
| 62 | | | | | **Data Not Lognormal at 5% Significance Level** | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | | **Background Statistics assuming Lognormal Distribution** | | | | | | | |
| 65 | | | | | 95% UTL with 95% Coverage | 0.338 | 90% Percentile (z) | 0.21 | | | | |
| 66 | | | | | 95% UPL (t) | 0.283 | 95% Percentile (z) | 0.279 | | | | |
| 67 | | | | | 95% USL | 1.024 | 99% Percentile (z) | 0.478 | | | | |
| 68 | | | | | | | | | | | | |
| 69 | | | | | **Nonparametric Distribution Free Background Statistics** | | | | | | | |
| 70 | | | | | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | **Nonparametric Upper Limits for Background Threshold Values** | | | | | | | |
| 73 | | | | | Order of Statistic, r | 126 | 95% UTL with 95% Coverage | 0.38 | | | | |
| 74 | | | | | Approx, f used to compute achieved CC | 1.658 | Approximate Actual Confidence Coefficient achieved by UTL | 0.891 | | | | |
| 75 | | | | | | | Approximate Sample Size needed to achieve specified CC | 153 | | | | |
| 76 | | | | | 95% Percentile Bootstrap UTL with 95% Coverage | 0.38 | 95% BCA Bootstrap UTL with 95% Coverage | 0.376 | | | | |
| 77 | | | | | 95% UPL | 0.365 | 90% Percentile | 0.282 | | | | |
| 78 | | | | | 90% Chebyshev UPL | 0.409 | 95% Percentile | 0.348 | | | | |
| 79 | | | | | 95% Chebyshev UPL | 0.545 | 99% Percentile | 0.387 | | | | |
| 80 | | | | | 95% USL | 0.41 | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | |
| 83 | | | | | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | |
| 84 | | | | | and consists of observations collected from clean unimpacted locations. | | | | | | | |
| 85 | | | | | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | |
| 86 | | | | | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | |
| 87 | | | | | | | | | | | | |
| 88 | **Calcium** | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | **General Statistics** | | | | | | | | | | | |
| 91 | | | | | Total Number of Observations | 127 | Number of Distinct Observations | 82 | | | | |
| 92 | | | | | | | Number of Missing Observations | 2 | | | | |
| 93 | | | | | Minimum | 0.5 | First Quartile | 116.5 | | | | |
| 94 | | | | | Second Largest | 207 | Median | 142 | | | | |
| 95 | | | | | Maximum | 235 | Third Quartile | 160.5 | | | | |
| 96 | | | | | Mean | 136 | SD | 36.09 | | | | |
| 97 | | | | | Coefficient of Variation | 0.265 | Skewness | -0.822 | | | | |
| 98 | | | | | Mean of logged Data | 4.837 | SD of logged Data | 0.584 | | | | |
| 99 | | | | | | | | | | | | |
| 100 | | | | | **Critical Values for Background Threshold Values (BTVs)** | | | | | | | |
| 101 | | | | | Tolerance Factor K (For UTL) | 1.889 | d2max (for USL) | 3.289 | | | | |
| 102 | | | | | | | | | | | | |
| 103 | | | | | **Normal GOF Test** | | | | | | | |
| 104 | | | | | Shapiro Wilk Test Statistic | 0.958 | **Normal GOF Test** | | | | | |
| 105 | | | | | 5% Shapiro Wilk P Value | 0.00491 | Data Not Normal at 5% Significance Level | | | | | |
| 106 | | | | | Lilliefors Test Statistic | 0.0917 | **Lilliefors GOF Test** | | | | | |
| 107 | | | | | 5% Lilliefors Critical Value | 0.079 | Data Not Normal at 5% Significance Level | | | | | |
| 108 | | | | | **Data Not Normal at 5% Significance Level** | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 109 | | | | | | | | | | | | |
| 110 | **Background Statistics Assuming Normal Distribution** | | | | | | | | | | | |
| 111 | | | | 95% UTL with | 95% Coverage | 204.2 | | | | 90% Percentile (z) | 182.3 | |
| 112 | | | | | 95% UPL (t) | 196.1 | | | | 95% Percentile (z) | 195.4 | |
| 113 | | | | | 95% USL | 254.7 | | | | 99% Percentile (z) | 220 | |
| 114 | | | | | | | | | | | | |
| 115 | **Gamma GOF Test** | | | | | | | | | | | |
| 116 | | | | | A-D Test Statistic | 7.234 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 117 | | | | | 5% A-D Critical Value | 0.754 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 118 | | | | | K-S Test Statistic | 0.157 | **Kolmogorov-Smirnov Gamma GOF Test** | | | | | |
| 119 | | | | | 5% K-S Critical Value | 0.0826 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 120 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | **Gamma Statistics** | | | | | | | | | | | |
| 123 | | | | | k hat (MLE) | 6.715 | | | | k star (bias corrected MLE) | 6.562 | |
| 124 | | | | | Theta hat (MLE) | 20.26 | | | | Theta star (bias corrected MLE) | 20.73 | |
| 125 | | | | | nu hat (MLE) | 1706 | | | | nu star (bias corrected) | 1667 | |
| 126 | | | | | MLE Mean (bias corrected) | 136 | | | | MLE Sd (bias corrected) | 53.11 | |
| 127 | | | | | | | | | | | | |
| 128 | **Background Statistics Assuming Gamma Distribution** | | | | | | | | | | | |
| 129 | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | 227.5 | | | | 90% Percentile | 207 | |
| 130 | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | 239.4 | | | | 95% Percentile | 233.5 | |
| 131 | | | | 95% WH Approx. Gamma UTL with | 95% Coverage | 243.4 | | | | 99% Percentile | 288.9 | |
| 132 | | | | 95% HW Approx. Gamma UTL with | 95% Coverage | 258.3 | | | | | | |
| 133 | | | | | 95% WH USL | 358.9 | | | | 95% HW USL | 401.8 | |
| 134 | | | | | | | | | | | | |
| 135 | **Lognormal GOF Test** | | | | | | | | | | | |
| 136 | | | | | Shapiro Wilk Test Statistic | 0.5 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 137 | | | | | 5% Shapiro Wilk P Value | 0 | Data Not Lognormal at 5% Significance Level | | | | | |
| 138 | | | | | Lilliefors Test Statistic | 0.226 | **Lilliefors Lognormal GOF Test** | | | | | |
| 139 | | | | | 5% Lilliefors Critical Value | 0.079 | Data Not Lognormal at 5% Significance Level | | | | | |
| 140 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | **Background Statistics assuming Lognormal Distribution** | | | | | | | | | | | |
| 143 | | | | | 95% UTL with | 95% Coverage | 380.2 | | | 90% Percentile (z) | 266.6 | |
| 144 | | | | | | 95% UPL (t) | 333.2 | | | 95% Percentile (z) | 329.6 | |
| 145 | | | | | | 95% USL | 861.7 | | | 99% Percentile (z) | 490.9 | |
| 146 | | | | | | | | | | | | |
| 147 | **Nonparametric Distribution Free Background Statistics** | | | | | | | | | | | |
| 148 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | **Nonparametric Upper Limits for Background Threshold Values** | | | | | | | | | | | |
| 151 | | | | | Order of Statistic, r | 124 | | | | 95% UTL with | 95% Coverage | 187 |
| 152 | | | | | Approx, f used to compute achieved CC | 1.632 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.884 |
| 153 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | 153 |
| 154 | | | | 95% Percentile Bootstrap UTL with | 95% Coverage | 187 | | | | 95% BCA Bootstrap UTL with | 95% Coverage | 187 |
| 155 | | | | | 95% UPL | 183.6 | | | | 90% Percentile | 171.4 | |
| 156 | | | | | 90% Chebyshev UPL | 244.7 | | | | 95% Percentile | 182.4 | |
| 157 | | | | | 95% Chebyshev UPL | 294 | | | | 99% Percentile | 203.4 | |
| 158 | | | | | 95% USL | 235 | | | | | | |
| 159 | | | | | | | | | | | | |
| 160 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 161 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 162 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 163 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 164 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | **chloride** | | | | | | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | **General Statistics** | | | | | | | | | | | |
| 169 | | | | | | Total Number of Observations | 104 | | | | Number of Distinct Observations | 88 | |
| 170 | | | | | | | | | | | Number of Missing Observations | 3 | |
| 171 | | | | | | Minimum | 4 | | | | First Quartile | 62.88 | |
| 172 | | | | | | Second Largest | 232 | | | | Median | 89.4 | |
| 173 | | | | | | Maximum | 232 | | | | Third Quartile | 133.5 | |
| 174 | | | | | | Mean | 102.8 | | | | SD | 55 | |
| 175 | | | | | | Coefficient of Variation | 0.535 | | | | Skewness | 0.724 | |
| 176 | | | | | | Mean of logged Data | 4.462 | | | | SD of logged Data | 0.661 | |
| 177 | | | | | | | | | | | | | |
| 178 | **Critical Values for Background Threshold Values (BTVs)** | | | | | | | | | | | |
| 179 | | | | | | Tolerance Factor K (For UTL) | 1.917 | | | | d2max (for USL) | 3.223 | |
| 180 | | | | | | | | | | | | | |
| 181 | **Normal GOF Test** | | | | | | | | | | | |
| 182 | | | | | | Shapiro Wilk Test Statistic | 0.928 | | | | **Normal GOF Test** | | |
| 183 | | | | | | 5% Shapiro Wilk P Value | 6.4806E-6 | | | | Data Not Normal at 5% Significance Level | | |
| 184 | | | | | | Lilliefors Test Statistic | 0.109 | | | | **Lilliefors GOF Test** | | |
| 185 | | | | | | 5% Lilliefors Critical Value | 0.0872 | | | | Data Not Normal at 5% Significance Level | | |
| 186 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 187 | | | | | | | | | | | | | |
| 188 | **Background Statistics Assuming Normal Distribution** | | | | | | | | | | | |
| 189 | | | | | | 95% UTL with 95% Coverage | 208.3 | | | | 90% Percentile (z) | 173.3 | |
| 190 | | | | | | 95% UPL (t) | 194.5 | | | | 95% Percentile (z) | 193.3 | |
| 191 | | | | | | 95% USL | 280 | | | | 99% Percentile (z) | 230.7 | |
| 192 | | | | | | | | | | | | | |
| 193 | **Gamma GOF Test** | | | | | | | | | | | |
| 194 | | | | | | A-D Test Statistic | 0.434 | | | | **Anderson-Darling Gamma GOF Test** | | |
| 195 | | | | | | 5% A-D Critical Value | 0.758 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 196 | | | | | | K-S Test Statistic | 0.0537 | | | | **Kolmogorov-Smirnov Gamma GOF Test** | | |
| 197 | | | | | | 5% K-S Critical Value | 0.089 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 198 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 199 | | | | | | | | | | | | | |
| 200 | **Gamma Statistics** | | | | | | | | | | | |
| 201 | | | | | | k hat (MLE) | 3.08 | | | | k star (bias corrected MLE) | 2.998 | |
| 202 | | | | | | Theta hat (MLE) | 33.38 | | | | Theta star (bias corrected MLE) | 34.29 | |
| 203 | | | | | | nu hat (MLE) | 640.7 | | | | nu star (bias corrected) | 623.5 | |
| 204 | | | | | | MLE Mean (bias corrected) | 102.8 | | | | MLE Sd (bias corrected) | 59.38 | |
| 205 | | | | | | | | | | | | | |
| 206 | **Background Statistics Assuming Gamma Distribution** | | | | | | | | | | | |
| 207 | | | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | 215.9 | | | | 90% Percentile | 182.4 | |
| 208 | | | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | 222.8 | | | | 95% Percentile | 215.8 | |
| 209 | | | | | | 95% WH Approx. Gamma UTL with 95% Coverage | 240.7 | | | | 99% Percentile | 288.1 | |
| 210 | | | | | | 95% HW Approx. Gamma UTL with 95% Coverage | 250.8 | | | | | | |
| 211 | | | | | | 95% WH USL | 401.4 | | | | 95% HW USL | 442 | |
| 212 | | | | | | | | | | | | | |
| 213 | **Lognormal GOF Test** | | | | | | | | | | | |
| 214 | | | | | | Shapiro Wilk Test Statistic | 0.907 | | | | **Shapiro Wilk Lognormal GOF Test** | | |
| 215 | | | | | | 5% Shapiro Wilk P Value | 1.9659E-8 | | | | Data Not Lognormal at 5% Significance Level | | |
| 216 | | | | | | Lilliefors Test Statistic | 0.0963 | | | | **Lilliefors Lognormal GOF Test** | | |

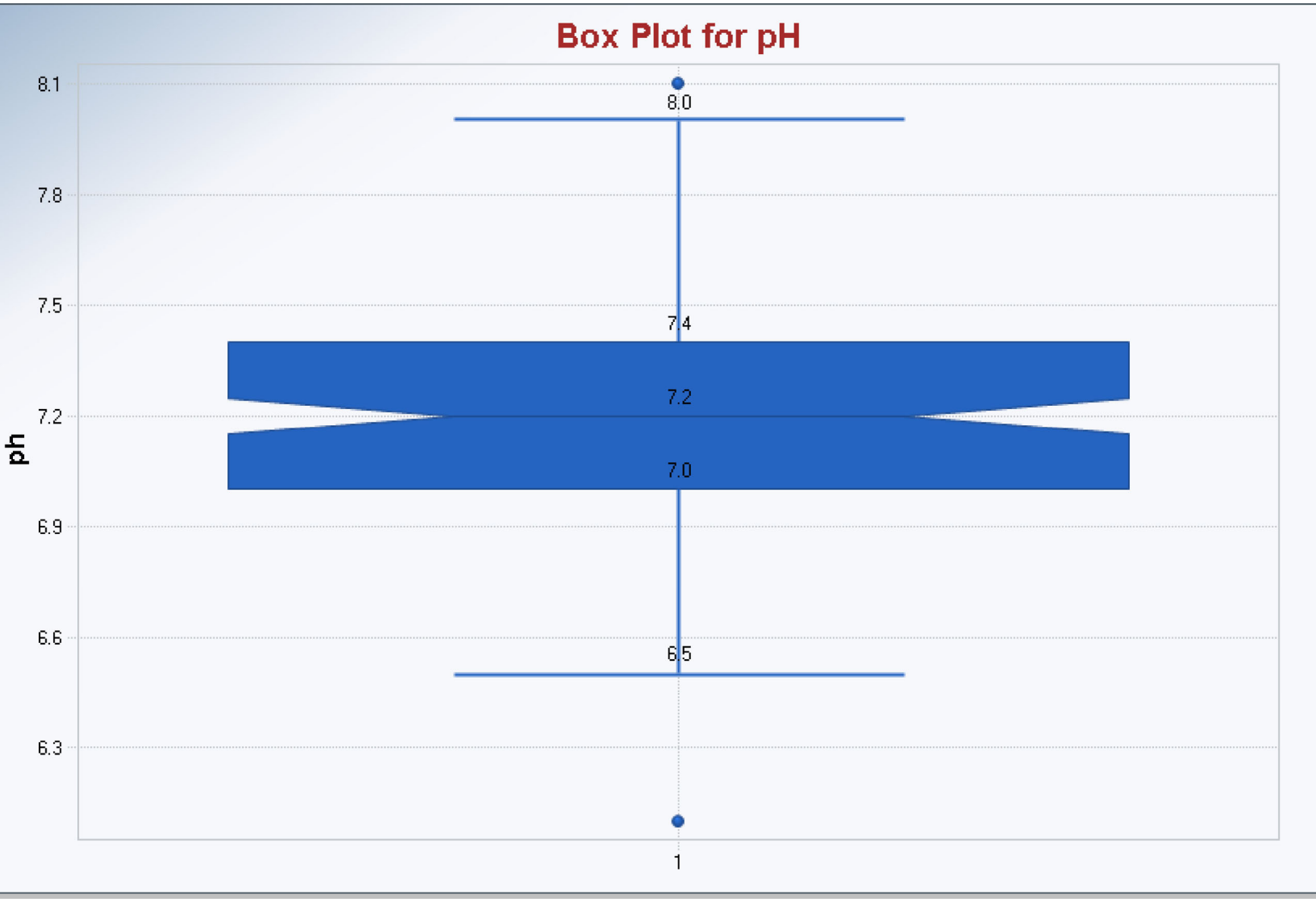
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 217 | | | | 5% Lilliefors Critical Value | | 0.0872 | Data Not Lognormal at 5% Significance Level | | | | | |
| 218 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | **Background Statistics assuming Lognormal Distribution** | | | | | | | | | | | |
| 221 | | | | 95% UTL with | 95% Coverage | 307.9 | | | | 90% Percentile (z) | 202.2 | |
| 222 | | | | | 95% UPL (t) | 261 | | | | 95% Percentile (z) | 257.1 | |
| 223 | | | | | 95% USL | 729.9 | | | | 99% Percentile (z) | 403.5 | |
| 224 | | | | | | | | | | | | |
| 225 | **Nonparametric Distribution Free Background Statistics** | | | | | | | | | | | |
| 226 | **Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | **Nonparametric Upper Limits for Background Threshold Values** | | | | | | | | | | | |
| 229 | | | | Order of Statistic, r | | 102 | | | | 95% UTL with | 95% Coverage | 229 |
| 230 | | | | Approx, f used to compute achieved CC | | 1.789 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.897 |
| 231 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 124 |
| 232 | | | | 95% Percentile Bootstrap UTL with | 95% Coverage | 228.7 | | | | 95% BCA Bootstrap UTL with | 95% Coverage | 228.7 |
| 233 | | | | | 95% UPL | 221.8 | | | | 90% Percentile | | 186.4 |
| 234 | | | | | 90% Chebyshev UPL | 268.6 | | | | 95% Percentile | | 217.9 |
| 235 | | | | | 95% Chebyshev UPL | 343.7 | | | | 99% Percentile | | 231.9 |
| 236 | | | | | 95% USL | 232 | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 239 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 240 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 241 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 242 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 243 | | | | | | | | | | | | |
| 244 | **fluoride** | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | **General Statistics** | | | | | | | | | | | |
| 247 | | | | Total Number of Observations | | 111 | | | | Number of Distinct Observations | | 9 |
| 248 | | | | Minimum | | 0.05 | | | | First Quartile | | 0.25 |
| 249 | | | | Second Largest | | 0.5 | | | | Median | | 0.25 |
| 250 | | | | Maximum | | 0.5 | | | | Third Quartile | | 0.25 |
| 251 | | | | Mean | | 0.271 | | | | SD | | 0.122 |
| 252 | | | | Coefficient of Variation | | 0.451 | | | | Skewness | | 0.675 |
| 253 | | | | Mean of logged Data | | -1.424 | | | | SD of logged Data | | 0.529 |
| 254 | | | | | | | | | | | | |
| 255 | **Critical Values for Background Threshold Values (BTVs)** | | | | | | | | | | | |
| 256 | | | | Tolerance Factor K (For UTL) | | 1.908 | | | | d2max (for USL) | | 3.245 |
| 257 | | | | | | | | | | | | |
| 258 | **Normal GOF Test** | | | | | | | | | | | |
| 259 | | | | Shapiro Wilk Test Statistic | | 0.728 | **Normal GOF Test** | | | | | |
| 260 | | | | 5% Shapiro Wilk P Value | | 0 | Data Not Normal at 5% Significance Level | | | | | |
| 261 | | | | Lilliefors Test Statistic | | 0.388 | **Lilliefors GOF Test** | | | | | |
| 262 | | | | 5% Lilliefors Critical Value | | 0.0844 | Data Not Normal at 5% Significance Level | | | | | |
| 263 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | **Background Statistics Assuming Normal Distribution** | | | | | | | | | | | |
| 266 | | | | 95% UTL with | 95% Coverage | 0.504 | | | | 90% Percentile (z) | | 0.428 |
| 267 | | | | | 95% UPL (t) | 0.475 | | | | 95% Percentile (z) | | 0.472 |
| 268 | | | | | 95% USL | 0.668 | | | | 99% Percentile (z) | | 0.555 |
| 269 | | | | | | | | | | | | |
| 270 | **Gamma GOF Test** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 271 | | | | | A-D Test Statistic | 13.26 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 272 | | | | | 5% A-D Critical Value | 0.756 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 273 | | | | | K-S Test Statistic | 0.345 | **Kolmogorov-Smirnov Gamma GOF Test** | | | | | |
| 274 | | | | | 5% K-S Critical Value | 0.0869 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 275 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 276 | | | | | | | | | | | | |
| 277 | **Gamma Statistics** | | | | | | | | | | | |
| 278 | | | | | k hat (MLE) | 4.401 | | | | k star (bias corrected MLE) | | 4.288 |
| 279 | | | | | Theta hat (MLE) | 0.0616 | | | | Theta star (bias corrected MLE) | | 0.0632 |
| 280 | | | | | nu hat (MLE) | 976.9 | | | | nu star (bias corrected) | | 951.9 |
| 281 | | | | | MLE Mean (bias corrected) | 0.271 | | | | MLE Sd (bias corrected) | | 0.131 |
| 282 | | | | | | | | | | | | |
| 283 | **Background Statistics Assuming Gamma Distribution** | | | | | | | | | | | |
| 284 | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | 0.517 | | | | 90% Percentile | | 0.446 |
| 285 | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | 0.529 | | | | 95% Percentile | | 0.516 |
| 286 | | | | 95% WH Approx. Gamma UTL with 95% Coverage | | 0.566 | | | | 99% Percentile | | 0.663 |
| 287 | | | | 95% HW Approx. Gamma UTL with 95% Coverage | | 0.583 | | | | | | |
| 288 | | | | | 95% WH USL | 0.898 | | | | 95% HW USL | | 0.966 |
| 289 | | | | | | | | | | | | |
| 290 | **Lognormal GOF Test** | | | | | | | | | | | |
| 291 | | | | | Shapiro Wilk Test Statistic | 0.736 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 292 | | | | | 5% Shapiro Wilk P Value | 0 | Data Not Lognormal at 5% Significance Level | | | | | |
| 293 | | | | | Lilliefors Test Statistic | 0.375 | **Lilliefors Lognormal GOF Test** | | | | | |
| 294 | | | | | 5% Lilliefors Critical Value | 0.0844 | Data Not Lognormal at 5% Significance Level | | | | | |
| 295 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | **Background Statistics assuming Lognormal Distribution** | | | | | | | | | | | |
| 298 | | | | | 95% UTL with 95% Coverage | 0.661 | | | | 90% Percentile (z) | | 0.475 |
| 299 | | | | | 95% UPL (t) | 0.582 | | | | 95% Percentile (z) | | 0.575 |
| 300 | | | | | 95% USL | 1.342 | | | | 99% Percentile (z) | | 0.825 |
| 301 | | | | | | | | | | | | |
| 302 | **Nonparametric Distribution Free Background Statistics** | | | | | | | | | | | |
| 303 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | **Nonparametric Upper Limits for Background Threshold Values** | | | | | | | | | | | |
| 306 | | | | | Order of Statistic, r | 109 | | | | 95% UTL with 95% Coverage | | 0.5 |
| 307 | | | | | Approx, f used to compute achieved CC | 1.912 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.92 |
| 308 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | 124 |
| 309 | | | | 95% Percentile Bootstrap UTL with 95% Coverage | | 0.5 | | | | 95% BCA Bootstrap UTL with 95% Coverage | | 0.5 |
| 310 | | | | | 95% UPL | 0.5 | | | | 90% Percentile | | 0.5 |
| 311 | | | | | 90% Chebyshev UPL | 0.639 | | | | 95% Percentile | | 0.5 |
| 312 | | | | | 95% Chebyshev UPL | 0.806 | | | | 99% Percentile | | 0.5 |
| 313 | | | | | 95% USL | 0.5 | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 316 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 317 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 318 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 319 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | **Sulfate** | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | **General Statistics** | | | | | | | | | | | |
| 324 | | | | | Total Number of Observations | 112 | | | | Number of Distinct Observations | | 100 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 325 | | | | | | | | | | | Number of Missing Observations | 9 |
| 326 | | | | | Minimum | 5 | | | | | First Quartile | 34.23 |
| 327 | | | | | Second Largest | 160 | | | | | Median | 45.6 |
| 328 | | | | | Maximum | 161 | | | | | Third Quartile | 65.9 |
| 329 | | | | | Mean | 55.65 | | | | | SD | 35.95 |
| 330 | | | | | Coefficient of Variation | 0.646 | | | | | Skewness | 1.332 |
| 331 | | | | | Mean of logged Data | 3.819 | | | | | SD of logged Data | 0.667 |
| 332 | | | | | | | | | | | | |
| 333 | | | | | **Critical Values for Background Threshold Values (BTVs)** | | | | | | | |
| 334 | | | | | Tolerance Factor K (For UTL) | 1.906 | | | | | d2max (for USL) | 3.248 |
| 335 | | | | | | | | | | | | |
| 336 | | | | | **Normal GOF Test** | | | | | | | |
| 337 | | | | | Shapiro Wilk Test Statistic | 0.852 | **Normal GOF Test** | | | | | |
| 338 | | | | | 5% Shapiro Wilk P Value | 0 | Data Not Normal at 5% Significance Level | | | | | |
| 339 | | | | | Lilliefors Test Statistic | 0.178 | **Lilliefors GOF Test** | | | | | |
| 340 | | | | | 5% Lilliefors Critical Value | 0.084 | 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 | 124.2 | | | | | 90% Percentile (z) | 101.7 |
| 345 | | | | | 95% UPL (t) | 115.5 | | | | | 95% Percentile (z) | 114.8 |
| 346 | | | | | 95% USL | 172.4 | | | | | 99% Percentile (z) | 139.3 |
| 347 | | | | | | | | | | | | |
| 348 | | | | | **Gamma GOF Test** | | | | | | | |
| 349 | | | | | A-D Test Statistic | 1.209 | **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 | 0.0972 | **Kolmogorov-Smirnov Gamma GOF Test** | | | | | |
| 352 | | | | | 5% K-S Critical Value | 0.0871 | 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) | 2.648 | | | | | k star (bias corrected MLE) | 2.583 |
| 357 | | | | | Theta hat (MLE) | 21.01 | | | | | Theta star (bias corrected MLE) | 21.54 |
| 358 | | | | | nu hat (MLE) | 593.2 | | | | | nu star (bias corrected) | 578.7 |
| 359 | | | | | MLE Mean (bias corrected) | 55.65 | | | | | MLE Sd (bias corrected) | 34.63 |
| 360 | | | | | | | | | | | | |
| 361 | | | | | **Background Statistics Assuming Gamma Distribution** | | | | | | | |
| 362 | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | 122 | | | | | 90% Percentile | 102.1 |
| 363 | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | 124.5 | | | | | 95% Percentile | 122 |
| 364 | | | | 95% WH Approx. Gamma UTL with | 95% Coverage | 136.4 | | | | | 99% Percentile | 165.7 |
| 365 | | | | 95% HW Approx. Gamma UTL with | 95% Coverage | 140.4 | | | | | | |
| 366 | | | | | 95% WH USL | 237.9 | | | | | 95% HW USL | 259.1 |
| 367 | | | | | | | | | | | | |
| 368 | | | | | **Lognormal GOF Test** | | | | | | | |
| 369 | | | | | Shapiro Wilk Test Statistic | 0.954 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 370 | | | | | 5% Shapiro Wilk P Value | 0.00297 | Data Not Lognormal at 5% Significance Level | | | | | |
| 371 | | | | | Lilliefors Test Statistic | 0.0948 | **Lilliefors Lognormal GOF Test** | | | | | |
| 372 | | | | | 5% Lilliefors Critical Value | 0.084 | 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 | 162.3 | | | | | 90% Percentile (z) | 107 |
| 377 | | | | | 95% UPL (t) | 138.3 | | | | | 95% Percentile (z) | 136.3 |
| 378 | | | | | 95% USL | 396.8 | | | | | 99% Percentile (z) | 214.7 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 109 | | | | 95% UTL with 95% Coverage | 147 | |
| 385 | | | | | Approx, f used to compute achieved CC | 1.434 | | | | Approximate Actual Confidence Coefficient achieved by UTL | 0.817 | |
| 386 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | 153 | |
| 387 | | | | | 95% Percentile Bootstrap UTL with 95% Coverage | 148.8 | | | | 95% BCA Bootstrap UTL with 95% Coverage | 147 | |
| 388 | | | | | 95% UPL | 140.4 | | | | 90% Percentile | 109 | |
| 389 | | | | | 90% Chebyshev UPL | 164 | | | | 95% Percentile | 139 | |
| 390 | | | | | 95% Chebyshev UPL | 213 | | | | 99% Percentile | 159 | |
| 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 | **tDS** | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |
| 401 | **General Statistics** | | | | | | | | | | | |
| 402 | | | | | Total Number of Observations | 90 | | | | Number of Distinct Observations | 88 | |
| 403 | | | | | | | | | | Number of Missing Observations | 21 | |
| 404 | | | | | Minimum | 90 | | | | First Quartile | 502.3 | |
| 405 | | | | | Second Largest | 942 | | | | Median | 647.5 | |
| 406 | | | | | Maximum | 969 | | | | Third Quartile | 779.8 | |
| 407 | | | | | Mean | 630.2 | | | | SD | 194.8 | |
| 408 | | | | | Coefficient of Variation | 0.309 | | | | Skewness | -0.608 | |
| 409 | | | | | Mean of logged Data | 6.379 | | | | SD of logged Data | 0.414 | |
| 410 | | | | | | | | | | | | |
| 411 | **Critical Values for Background Threshold Values (BTVs)** | | | | | | | | | | | |
| 412 | | | | | Tolerance Factor K (For UTL) | 1.94 | | | | d2max (for USL) | 3.173 | |
| 413 | | | | | | | | | | | | |
| 414 | **Normal GOF Test** | | | | | | | | | | | |
| 415 | | | | | Shapiro Wilk Test Statistic | 0.953 | | | | **Normal GOF Test** | | |
| 416 | | | | | 5% Shapiro Wilk P Value | 0.00828 | | | | Data Not Normal at 5% Significance Level | | |
| 417 | | | | | Lilliefors Test Statistic | 0.116 | | | | **Lilliefors GOF Test** | | |
| 418 | | | | | 5% Lilliefors Critical Value | 0.0936 | | | | Data Not Normal at 5% Significance Level | | |
| 419 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 420 | | | | | | | | | | | | |
| 421 | **Background Statistics Assuming Normal Distribution** | | | | | | | | | | | |
| 422 | | | | | 95% UTL with 95% Coverage | 1008 | | | | 90% Percentile (z) | 879.9 | |
| 423 | | | | | 95% UPL (t) | 955.9 | | | | 95% Percentile (z) | 950.7 | |
| 424 | | | | | 95% USL | 1249 | | | | 99% Percentile (z) | 1084 | |
| 425 | | | | | | | | | | | | |
| 426 | **Gamma GOF Test** | | | | | | | | | | | |
| 427 | | | | | A-D Test Statistic | 2.527 | | | | **Anderson-Darling Gamma GOF Test** | | |
| 428 | | | | | 5% A-D Critical Value | 0.753 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 429 | | | | | K-S Test Statistic | 0.127 | | | | **Kolmogorov-Smirnov Gamma GOF Test** | | |
| 430 | | | | | 5% K-S Critical Value | 0.0943 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 431 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 432 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 433 | **Gamma Statistics** | | | | | | | | | | | |
| 434 | | | | | k hat (MLE) | 7.596 | | | | k star (bias corrected MLE) | | 7.351 |
| 435 | | | | | Theta hat (MLE) | 82.96 | | | | Theta star (bias corrected MLE) | | 85.74 |
| 436 | | | | | nu hat (MLE) | 1367 | | | | nu star (bias corrected) | | 1323 |
| 437 | | | | | MLE Mean (bias corrected) | 630.2 | | | | MLE Sd (bias corrected) | | 232.5 |
| 438 | | | | | | | | | | | | |
| 439 | **Background Statistics Assuming Gamma Distribution** | | | | | | | | | | | |
| 440 | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | 1058 | | | | 90% Percentile | | 940.4 |
| 441 | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | 1081 | | | | 95% Percentile | | 1055 |
| 442 | | | | 95% WH Approx. Gamma UTL with | 95% Coverage | 1147 | | | | 99% Percentile | | 1293 |
| 443 | | | | 95% HW Approx. Gamma UTL with | 95% Coverage | 1179 | | | | | | |
| 444 | | | | | 95% WH USL | 1621 | | | | 95% HW USL | | 1716 |
| 445 | | | | | | | | | | | | |
| 446 | **Lognormal GOF Test** | | | | | | | | | | | |
| 447 | | | | | Shapiro Wilk Test Statistic | 0.835 | | **Shapiro Wilk Lognormal GOF Test** | | | | |
| 448 | | | | | 5% Shapiro Wilk P Value | 1.743E-14 | | Data Not Lognormal at 5% Significance Level | | | | |
| 449 | | | | | Lilliefors Test Statistic | 0.128 | | **Lilliefors Lognormal GOF Test** | | | | |
| 450 | | | | | 5% Lilliefors Critical Value | 0.0936 | | 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 | 1316 | | | 90% Percentile (z) | | 1002 |
| 455 | | | | | 95% UPL (t) | | 1177 | | | 95% Percentile (z) | | 1164 |
| 456 | | | | | 95% USL | | 2192 | | | 99% Percentile (z) | | 1543 |
| 457 | | | | | | | | | | | | |
| 458 | **Nonparametric Distribution Free Background Statistics** | | | | | | | | | | | |
| 459 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 460 | | | | | | | | | | | | |
| 461 | **Nonparametric Upper Limits for Background Threshold Values** | | | | | | | | | | | |
| 462 | | | | | Order of Statistic, r | 88 | | | | 95% UTL with | 95% Coverage | 930 |
| 463 | | | | | Approx, f used to compute achieved CC | 1.544 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.834 |
| 464 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | 124 |
| 465 | | | | 95% Percentile Bootstrap UTL with | 95% Coverage | 930 | | | | 95% BCA Bootstrap UTL with | 95% Coverage | 930 |
| 466 | | | | | 95% UPL | 918.9 | | | | 90% Percentile | | 852.5 |
| 467 | | | | | 90% Chebyshev UPL | 1218 | | | | 95% Percentile | | 904.5 |
| 468 | | | | | 95% Chebyshev UPL | 1484 | | | | 99% Percentile | | 945 |
| 469 | | | | | 95% USL | 969 | | | | | | |
| 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
8.1
7.8
7.5
7.2
6.9
6.6
6.3
ph
8.0
7.4
7.2
7.0
6.5
1