# Sioux Falls Regional Sanitary Landfill 2019 Annual Groundwater Monitoring Report

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# 1.0 INTRODUCTION

## 1.1 SITE DESCRIPTION AND BACKGROUND

The Sioux Falls Regional Sanitary Landfill (SFRSL) is owned and operated by the City of Sioux Falls, South Dakota (City), pursuant to a Permit to Operate a Solid Waste Disposal Facility Permit Number 15-05 (Solid Waste Permit), issued by the South Dakota Department of Environment and Natural Resources (DENR). The SFRSL is located approximately 5 miles west of the City of Sioux Falls, near the intersection of 267th Street and 464th Avenue in Sections 34 and 35, Township 101 North, Range 51 West, Minnehaha County, South Dakota, and Section 12, Township 100 North, Range 52 West, Turner County, South Dakota, and Section 7, Township 100 North, Range 51 West, Lincoln County, South Dakota. The SFRSL location is shown on Figure 1.

Operations at the SFRSL began in 1979 and currently the facility has a total permitted area of 709 acres which includes a municipal solid waste (MSW) disposal area, construction and demolition (C&D) disposal area, a composting operation, an asbestos disposal area, and a wood/tree/brush pile area.

## 1.2 PURPOSE AND SCOPE

The purpose of this report is to describe and submit results from the 2019 groundwater and methane monitoring events conducted at the SFRSL.

Groundwater monitoring is completed semi-annually and methane monitoring is completed quarterly in general accordance with the Comprehensive Monitoring Plan (CMP).

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# 2.0 FIELD ACTIVITIES

## 2.1 GROUNDWATER MONITORING ACTIVITIES

The second quarter groundwater monitoring event was completed May 13th through 15th, 2019. The fourth quarter groundwater monitoring event was completed November 18th through 20th, 2019. Groundwater samples and depth to water measurements were obtained during the second quarter and fourth quarter events from State monitoring wells. Additionally, depth to water measurements were obtained at City monitoring wells and piezometer locations. Samples were collected from State monitoring wells using low-flow sampling techniques and submitted to TestAmerica Laboratories, Inc. (TestAmerica) in Cedar Falls, Iowa for analysis of required parameters. Table A-1 summarizes the monitoring network and sampling schedule. Table A-2 details the analytical parameters. Figure 2 shows the location of groundwater wells at the SFRSL.

## 2.2 METHANE MONITORING

Methane gas monitoring was completed during the first, second, third, and fourth quarters. A Landtec GEM5000 portable landfill gas analyzer was used to measure the concentration of methane found in the well headspace of State monitoring network groundwater wells. Additionally, seven buildings and structures were monitored to measure the concentration of methane.

## 2.3 CHANGES TO MONITORING NETWORK

No changes to the groundwater or methane monitoring network were noted during the 2019 sampling year.

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# 3.0 HYDROGEOLOGY

## 3.1 SITE SPECIFIC INFORMATION

The physical setting for Site is in the Coteau des Prairies division of the Central Lowland Physiographic Province. The Coteau des Prairies consists of a highland or plateau of thick glacial deposits underlain by a small ridge of resistant shale and quartzite. The topography near the landfill is characterized by poorly drained uplands. An unnamed intermittent stream that carries drainage from Wall Lake (located about 2 miles northwest of the site) crosses the southwestern corner of the site and continues drainage toward the east along the southern boundary of the landfill.

The geologic setting for Site consists of approximately 150 to 200 feet of glacial deposits overlying 30 to 50 feet of interbedded sands, siltstone, claystone, sandstone, bentonite, and lignite of the Split Rock Creek Formation. Below the Split Rock Creek Formation is the Sioux Quartzite with an unknown thickness exceeding 1,000 feet.

The glacial deposits are primarily pre-Illinois and late Wisconsin-aged till consisting of a very dense clay-rich matrix with silt, sand, and pebbles and occasional sand seams. It is difficult to distinguish the pre-Illinoisan till from the Wisconsinan till. The surficial late Wisconsin-aged till in the area of Site occurs in three distinct zones: a weathered, highly-fractured, oxidized yellowish-brown to reddish-brown zone; an intermediate transition zone represented by varying degrees of mottling and decreasing fracture density with depth; and, an unweathered, unfractured, unoxidized gray to gray-blue zone.

The hydrogeology at Site consists of a shallow, unconfined, low permeability, low flow groundwater zone within the Wisconsin-aged glacial till. The water table typically ranges from 5 to 15 feet below ground surface (bgs) and exhibits a predominantly southern gradient. This is the uppermost groundwater encountered and is the groundwater zone that is monitored for the landfill. Near the bottom of the glacial deposits and on top of the Split Rock Creek Formation, is a pre-Illinoisan outwash deposit, designated the Wall Lake Aquifer, consisting of fine to coarse-grained sand and fine pebble gravel. The Wall Lake Aquifer is confined by the overlying low permeability clay till and the underlying Split Rock Creek Formation. Below the Split Rock Creek Formation is the Sioux Quartzite Aquifer. The Sioux Quartzite Aquifer is confined and is locally well-fractured and jointed. The confining and artesian conditions of the Sioux Quartzite and the Wall Lake Aquifers, locally protects them from near surface impacts in the vicinity of Site.

## 3.2 GROUNDWATER LEVEL MEASUREMENT

Depth to groundwater was measured and recorded on the field data sheets which are included in Appendix B. The water level data obtained during the monitoring events are presented in Table A-3. Groundwater elevations were determined by subtracting the depth to groundwater measurement from the surveyed top of casing elevation.

Using the groundwater elevations from the groundwater wells, piezometric surface maps were created for the May 2019 (Figure 3) and November 2019 (Figure 4) monitoring events. Based on these piezometric surface maps, groundwater generally flows to the south at an average hydraulic gradient of approximately 0.01 foot/foot over the two sampling events.

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# 4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Laboratory quality assurance/quality control (QA/QC) results were reported by the analytical laboratory and are included in **Appendix C**. The wide range of parameters and variety of matrices incorporated by most EPA methods make it common for some compounds to fall outside of established ranges. Laboratory QC measures included analysis of method blanks, duplicates, spiked blanks, and spike matrices. During groundwater data quality assurance and quality control review, pertinent laboratory results that were outside established control limits, if any, are noted below. Based on the evaluation completed on the data, sample results are determined to be valid and useable as qualified, if needed, for their intended purposes.

- May 2019 Monitoring Event –
  - The relative percent difference between the laboratory control sample (LCS) and LCS duplicate for select wells and parameters was outside the upper control limits.
  - The continuing calibration verification (CCV) for select wells and parameters was outside the control limits. However the affected parameters were non-detect and the data was reported.
- November 2019 Monitoring Event -
  - The CCV and LCS for select wells and parameters were outside the control limits. However, the affected parameters were non-detect and the data was reported.
  - Due a sample delivery delay, biochemical oxygen demand was not analyzed within the 48 hour holding time for upgradient wells MW-21ox and MW-23ox. Both of these results have been qualified as analyzed outside of holding time using the notation "H".

Trip blank and duplicate samples were collected to provide field quality control during each sampling event as appropriate. The trip blanks were used to evaluate potential VOC impact to samples during shipment. Duplicate samples were used to evaluate the precision of the sampling and analytical methods. No VOCs were detected in the trip and field blanks.

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# 5.0 ANALYTICAL AND MONITORING RESULTS

## 5.1 GROUNDWATER ANALYTICAL RESULTS

### 5.1.1 Field Water Quality Parameters

Field water quality parameters measured during the purging and sampling stabilization process included pH, temperature, specific conductance, dissolved oxygen (DO), and oxidation/reduction potential (ORP). In general, pH, specific conductance, DO, and ORP were consistent with historical measurements for each well. A field water quality parameter summary is presented on Table A-4.

### 5.1.2 Required Inorganic and Metals Parameters

Required inorganic and metal parameters detected in the groundwater samples included total alkalinity, ammonia, biological oxygen demand (BOD), calcium, chemical oxygen demand (COD), chloride, total and dissolved iron, total and dissolved manganese, nitrate+nitrite, potassium, sodium, sulfate, and total organic carbon. Detected concentrations were generally similar to historical results. The table below summarizes detections that are at or exceed an ARSD 74:54:01:04 groundwater standard.

Table 1. Monitoring Results Exceeding Groundwater Standard

| Well | Parameter | May 2019 Detected Concentration | November 2019 Detected Concentration | ARSD 74:54:01:04 Groundwater Standard |
|---|---|---|---|---|
| MW-11 (upgradient) | Sulfate | 2610 mg/L | 2380 mg/L | 500 mg/L |
| MW-13R | Sulfate | 1750 mg/L | 1500 mg/L | |
| MW-21ox (upgradient) | Iron | 0.563 mg/L | n/a | 0.3 mg/L |
| | Sulfate | 719 mg/L | 714 mg/L | 500 mg/L |
| MW-23ox (upgradient) | Nitrate + Nitrite | 11.2 mg/L | 14.2 mg/L | 10 mg/L |
| | Sulfate | 2090 mg/L | 1880 mg/L | 500 mg/L |
| MW-25ox (upgradient) | Sulfate | 1290 mg/L | 1140 mg/L | |
| MW-39ox | Sulfate | 580 mg/L | 1430 mg/L | |
| MW-42ox | Sulfate | 2240 mg/L | 2510 mg/L | |
| MW-44ox | Sulfate | 668 mg/L | 627 mg/L | |
| MW-45ox | Sulfate | 976 mg/L | 2400 mg/L | |
| MW-47ox | Sulfate | 1600 mg/L | 1080 mg/L | |
| MW-48ox | Sulfate | 2120 mg/L | 1860 mg/L | |
| MW-53ox | Iron | n/a | 2.17 mg/L | 0.3 mg/L |
| | Nitrate + Nitrite | 33.6 mg/L | 32.7 mg/L | 10 mg/L |
| | Sulfate | 1400 mg/L | 2210 mg/L | 500 mg/L |
| MW-54ox | Sulfate | 847 mg/L | 817 mg/L | |
| MW-56ox | Sulfate | 1090 mg/L | 1140 mg/L | 500 mg/L |
| MW-57ox | Sulfate | 1600 mg/L | 1920 mg/L | |
| MW-58Rox | Sulfate | 1520 mg/L | 1200 mg/L | |
| MW-59ox | Sulfate | 2050 mg/L | 1830 mg/L | |

| Well | Parameter | May 2019 Detected Concentration | November 2019 Detected Concentration | ARSD 74:54:01:04 Groundwater Standard |
|---|---|---|---|---|
| MW-60ox | Sulfate | 2180 mg/L | 1970 mg/L | |
| MW-61ox (upgradient) | Sulfate | 1940 mg/L | 1490 mg/L | |

Chloride concentrations in samples collected from upgradient well MW-11 have and continue to show increased concentrations. This well is designated as upgradient and the well is located close to the landfill. Possible reasons for the increase in chloride concentration at MW-11 may range from a non-landfill source (e.g. road salt since well is close to roads or off-site source) to a possible landfill source. Based on the data that has been collected, it is difficult to definitively pinpoint the specific cause(s). Since this well is designated upgradient, the assumption at this time is that the increased chloride concentration is likely from a non-landfill source.

A summary of the second quarter and fourth quarter laboratory results are presented on Table A-5, Table A-6 and Table A-7. Laboratory reports are provided in **Appendix C.**

### 5.1.3 Required Volatile Organic Compounds (VOCs)

1,1-Dichloroethane (1,1-DCA) was detected at monitoring well MW-13R during the May event at 1.05 micrograms per liter (ug/L). The VOC detected and VOC concentration are generally consistent with results from the previous four years. Analytical results are summarized on Table A-6. The laboratory reports are provided in **Appendix C.**

### 5.1.4 Required Appendix II Parameters

Required RCRA Appendix II parameters are analyzed during the second quarter in samples collected from monitoring well MW-13R. RCRA Appendix II only (not also listed in Appendix I) parameters were not detected at or above laboratory reporting limits in the monitoring well samples collected during the second quarter sampling event. This is the thirteenth consecutive sampling event from sampling years 2013 through 2019 where Appendix II only parameters were not detected above laboratory reporting limits in monitoring well MW-13R. A summary of the second quarter laboratory results for well MW-13R is presented on Table A-6.

### 5.1.5 Supplemental Parameters

As supplemental information, geochemical parameters were analyzed during the second and fourth quarters at well MW-54ox, west stormwater pond, and the leachate collection system proximate MW-54ox (wet wells 9 and 10). One geochemical parameter, total dissolved solids at well MW-54ox, was detected above the ARSD 74:54:01:04 limit of 500 mg/L. The second and fourth quarter concentrations at well MW-54ox show a decrease from previous concentrations. Geochemical parameters were analyzed to further evaluate the increased chloride concentrations at well MW-54ox. Using the geochemical parameter results, Stiff and Piper diagrams were prepared. Stiff and Piper diagrams are used to visually compare the chemical composition of water quality and ion concentration of water across wells or other sources sampled. The results from these diagrams show that it is unlikely that the increased chloride concentration at MW-54ox is from the leachate collection system. However, evidence from the Stiff and Piper diagrams indicate that the water chemistries from well MW-54ox and the stormwater are similar which may indicate the west stormwater discharge as the possible influence and cause for the chloride concentrations. The Stiff

and Piper diagrams are provided in **Appendix D** and the laboratory reports which include the geochemical parameter results are provided in **Appendix C**.

## 5.2 METHANE MONITORING RESULTS

Methane was detected above the lower explosive limit (5% by volume) as summarized in the table below. There was no methane detected at the building and structure sampling locations during the quarterly monitoring events. Complete results of the methane monitoring are included in Table A-8. Notification required by ARSD 74.27.13.26 was not required since there are other wells closer to the property line that did not have a methane exceedance during this event.

Table 2. Methane Detections

| Location | March 2019 | May 2019 | August 2019 | November 2019 |
|---|---|---|---|---|
| MW-17 | 19.5% | 15.7% | 0.4% | 0.0% |
| MW-19 | 0.0% | 0.0% | 20.0% | 20.8% |

* * * * *

# 6.0 STATISTICAL ANALYSIS

The objective of detection monitoring is to evaluate potential changes in groundwater quality and assess if these changes are the result of an impact by the SFRSL. Evaluation of groundwater monitoring data is accomplished by selecting sample locations and identifying an appropriate "background" to which compliance (new) data will be statistically compared. The background data is data from a location or period determined to not be affected by the Site and, in this case, is designated as the upgradient well data. The compliance data is the data that is being evaluated to identify any potential statistical significant increases, which may be an indication of Site impact. The compliance data for this Site is designated as the downgradient well data.

## 6.1 UPGRADIENT DATA REVIEW

### 6.1.1 Background Data Update

In accordance to the Comprehensive Monitoring Plan, updated February 2016, the background data set was evaluated to determine if background could be updated through December 2017. Sixteen outliers were identified from the outlier analysis performed on upgradient data through December 2017 for the background update. Following EPA Unified Guidance, the only data points that were marked as outliers were due to a high non-detect value or a detection of a magnitude or more greater than the rest of the data. The following data points were marked as outliers:

- chloride at MW-23ox on 5/3/2016 and
- chloride at MW-61ox on 10/17/2016 and 5/8/2017.

Box and whisker analysis was performed on data from the upgradient wells through December 2017 for the background update. The results from the box and whisker data analysis showed some variability between the upgradient wells for biochemical oxygen demand, calcium, chemical oxygen demand, chloride, dissolved iron, manganese, dissolved manganese, nitrate+nitrite, potassium, sodium, and sulfate. However, this variability may indicate natural changes occurring in the groundwater quality.

Sen's Slope trend analysis was performed on data from the upgradient wells through December 2017 for the background update. The trend analysis results for data through December 2017 with no significant increasing trends were determined to be eligible for background update. The trend analysis results for data through December 2017 with significant increasing trends are summarized below in **Table 3**. A rationale for inclusion in the background update was provided for the parameter/well pairs with the significant increasing trends, with the exception of chloride at MW-11. Consistent with communication with DENR, chloride data at MW-11 was not used as background data for the statistical analyses. Based on the results of the background evaluation through December 2017, the upgradient well background data set will be updated through December 2017, with the exception of chloride at MW-11.

The statistical results from the background data update are included in **Appendix D**.

Table 3. Background Update Evaluation Summary

| Upgradient Well | Constituent | Significant Increasing Trend Slope | Rationale for inclusion |
|---|---|---|---|
| MW-11 | Chloride | Yes | None |
| | Sulfide | None | Note 1 |
| MW-21ox | Alkalinity | Yes | Note 1 |
| | Iron | Yes | Note 1 |
| | Iron, Dissolved | Yes | Similar to concentration range from MW-61ox. Dissolved iron at MW-61ox did not have a significant trend. |
| | Manganese | Yes | Concentrations are within the concentration ranges of the other upgradient wells. |
| | Sulfide | None | Note 1 |
| MW-23ox | Chloride | Yes | Note 1 |
| | Sulfide | None | Note 1 |
| MW-25ox | Calcium | Yes | |
| | Potassium | Yes | Concentration range is similar to MW-61ox potassium concentration range with no identified significant trend. |
| | Sulfate | Yes | Concentration range is similar to MW-21ox sulfate concentration range with no identified significant trend. |
| | Sulfide | None | Note 1 |

None – Indicates the numerical slope is zero.
Note 1 – Based on observations from the box & whisker plots, this range is similar to the other upgradient concentration ranges.

### 6.1.2 Current Upgradient Data Evaluation

The current upgradient data is from 2018 and 2019. This current data is evaluated to determine if the data exhibits any obvious spikes in concentrations or trends that could clarify potential exceedances identified in downgradient (compliance) wells. Outlier analysis, box and whiskers plots, and Sen's Slope trend analysis were used to evaluate the current upgradient data.

Outliers were identified for dissolved iron at MW-11, MW-23ox, and MW-25ox during 2018 and 2019; however, the outliers are due to a change in the reporting limit and not for a detection. The dissolved iron data at these three wells were not marked as outliers. No other outliers were identified for the upgradient compliance analysis in either the 2018 or 2019 sampling events.

The results from the box and whisker data analysis through December 2019 showed some variability between the upgradient wells for biochemical oxygen demand, calcium, chemical oxygen demand, chloride, manganese, dissolved manganese, nitrate+nitrite, potassium, sodium, and sulfate. However, this variability may indicate natural changes occurring in the groundwater quality.

Seventeen statistical significant increasing trends were identified in the Sen's Slope trend analysis of the current upgradient data. However, eight of the seventeen statistically significant increasing trends identified had a slope of zero and were a result of changes in reporting limits. The slope trend

listed for these eight constituent/well pairs are denoted as none in **Table 4**.The current upgradient statistically significant increasing trends are summarized below in **Table 4**.

Table 4. Current Upgradient Statistically Significant Increasing Trends

| Upgradient Well | Constituent | Significant Increasing Trend Slope |
|---|---|---|
| MW-11 | Iron, Dissolved | None |
| | Sulfide | None |
| MW-21ox | Alkalinity | Yes |
| | Iron | Yes |
| | Iron, Dissolved | Yes |
| | Manganese | Yes |
| | Sulfide | None |
| MW-23ox | Iron, Dissolved | None |
| | Sulfide | None |
| MW-25ox | Calcium | Yes |
| | Iron | None |
| | Iron, Dissolved | None |
| | Potassium | Yes |
| | Sodium | Yes |
| | Sulfate | Yes |
| | Sulfide | None |
| MW-61ox | Iron, Dissolved | Yes |

None – Indicates the numerical slope is zero.

## 6.2 COMPLIANCE STATISTICAL ANALYSIS

### 6.2.1 Inorganic Statistical Analysis

Data from upgradient monitoring wells (as shown in Table A-1) were used to establish the background data set for inorganic statistical analysis. Since interwell statistical analysis is performed for this facility, the background data set is the pooled data from the upgradient wells through December 2017. A test for outliers (Dixon's or Rosner's using EPA screening to identify possible outliers) was completed on the background dataset. While EPA Unified Guidance states that unless a likely error can be identified that outliers should not be removed; however, subsequent communication from the DENR indicates that identified outliers should be removed. Therefore, statistical analysis was performed with outliers removed. As per the EPA Unified Guidance, a normally distributed dataset "has a symmetric 'bell-shape,' the normal mean and median coincide and random observations drawn from a normal population are just as likely to occur below the mean as above it. More generally, in any symmetric distribution the distributional pattern below the mean is a mirror-image of the pattern above the mean. By definition, such distributions have no degree of skewness or asymmetry." In order to determine normality, the Shapiro-Wilk/Francia methods using ladder of powers transformations were used. Statistical analysis output data for these two tests are included in **Appendix D**. If the background dataset for a parameter was noted to be non-normally distributed using the ladder of powers transformations, interwell statistical analysis was performed

using non-parametric interwell statistical testing. Parameters with normally distributed datasets were evaluated using parametric interwell statistical testing. For non-parametric statistical evaluations, non-detect values were replaced with the laboratory reporting limit. For parametric tests, with less than 15 percent non-detect values, non-detect values were replaced with ½-the reporting limit. For parametric tests with 15 percent to 50 percent non-detect values, Aitchison's adjustment was used to evaluate non-detect values. If a parameter had more than 50% non-detect values, non-parametric analysis was performed.

Following each sampling event, inorganic parameters were analyzed using interwell statistical analysis. The noted interwell exceedances were analyzed using an intrawell statistical trend analysis to evaluate whether a significant trend was present and to estimate the magnitude of that trend, if present. A trend is the general increase or decrease in observed values of a parameter over time. The interwell exceedances were further analyzed using confidence intervals. Confidence interval analysis is a test that compares the compliance data to a fixed numerical limit (compliance limit). The confidence interval is bound by an upper and lower limit which defines the most probable range where either the average or median concentration is expected. For this analysis, the compliance data for each well consisted of that well's historical data including the current sampling event. The numerical limit for each parameter was derived from the average concentration of the upgradient well data through the current sampling event except for alkalinity and pH. The average maximum and average minimum values from the upgradient wells were used as the compliance limit range for alkalinity and pH. A potential confidence interval exceedance is indicated when the lower limit of the confidence interval is above the upper compliance limit. Additionally, for alkalinity and pH only, a potential confidence interval exceedance can occur when the upper limit of the confidence interval is below the lower compliance limit. Finally, each interwell exceedance was compared to the concentration standard from ARSD 74:54:01:04 "Standards For Groundwater", (ARSD Standard) if a standard concentration has been established.

The second and fourth quarter groundwater sampling event statistical exceedances are summarized in the May 2019 Statistical Summary and November 2019 Statistical Summary **Tables 5** and **6**, respectively. Statistical analysis output data are provided in **Appendix D**.

Table 5. May 2019 Statistical Summary

| Well | Parameter[1] | Significant Trend? | Exceeded Confidence Interval? | Exceeds Standard?[2] |
|---|---|---|---|---|
| MW-13R | Alkalinity | Increasing | No | No[3] |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-39ox | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-42ox | Alkalinity | No | No | No[3] |
| | Total Organic Carbon | Increasing | Yes | No[3] |
| MW-44ox | Alkalinity | No | No | No[3] |
| MW-47ox | Alkalinity | No | No | No[3] |
| | Chloride | No | Yes | No |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-48ox | Alkalinity | Decreasing | No | No[3] |
| MW-53ox | Alkalinity | Increasing | No | No[3] |
| | Nitrate Nitrite as N | Increasing | Yes | Yes |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-54ox | Alkalinity | Increasing | No | No[3] |
| | Chemical Oxygen Demand | Increasing | Yes | No[3] |
| | Chloride | Increasing | Yes | No |
| | Manganese, Dissolved | Increasing | Yes | No |
| | Total Organic Carbon | No | No | No[3] |
| MW-57ox | Alkalinity | Decreasing | No | No[3] |
| | Chloride | Increasing | Yes | No |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-58Rox | Manganese, Dissolved | Decreasing | Yes | No |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-60ox | Calcium | No | Yes | No[3] |
| | Total Organic Carbon | No | Yes | No[3] |

[1] Parameters detected and having an interwell exceedance only; please see **Appendix D** for additional results

[2] Standards from ARSD 74:54:01:04 Standards for groundwater.

[3] Parameters that do not have an established ARSD standard for groundwater.

Seven previously identified interwell exceedances (alkalinity for MW-39ox, dissolved manganese at MW-59ox, sodium at MW-42ox and MW-54ox, sulfate at MW-42ox and MW-45ox, and total organic carbon at MW-45ox) were not identified as interwell exceedances during the second quarter 2019. Second quarter 2019 statistical interwell exceedances that do not have a statistically increasing trend, exceed the confidence interval, and exceed the ARSD Standard do not warrant changes to the sampling schedule since the concentrations are within acceptable levels and do no show evidence of dramatic increase. Six of the interwell exceedances identified with statistically increasing trends (MW-42ox for total organic carbon, MW-53ox for nitrate + nitrite, MW-54ox for chemical oxygen demand, chloride, and dissolved manganese, and MW-57ox for chloride) also exceeded the confidence interval limit but did not exceed the ARSD Standard, with the exception of MW-53ox for

nitrate + nitrite. Upgradient well MW-23ox also exceeded the nitrate + nitrite ARSD Standard, which may indicate a naturally occurring change in the groundwater quality. The concentrations of total organic carbon at MW-42ox and dissolved manganese at MW-54ox have decreased since the last monitoring event. Additionally, chemical oxygen demand at MW-54ox is a newly identified exceedance. These three constituent/well pairs (MW-42ox for total organic carbon and MW-54ox for chemical oxygen demand and dissolved manganese) will be monitored closely to identify if the concentrations continue to decrease. Three of the interwell exceedances identified with statistically increasing trends (MW-13R, MW-53ox, and MW-54ox for alkalinity) did not have a confidence interval exceedance and did not exceed the ARSD Standard. Additionally, as noted in **Table 4**, a statistically significant increasing trend for alkalinity was also identified at upgradient well MW-21ox. This may indicate a natural change in the background water quality and be the reason for the alkalinity exceedances identified in downgradient wells. No ARSD Standard has been established for alkalinity. The other interwell exceedances that were identified with confidence interval limit exceedances but were not identified with a significant increasing trend do not show a dramatic increase in concentrations and will continued to be monitored during the next sampling event.

Table 6. November 2019 Statistical Summary

| Well | Parameter[1] | Significant Trend? | Exceeded Confidence Interval? | Exceeds Standard?[2] |
|---|---|---|---|---|
| MW-13R | Alkalinity | No | No | No[3] |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-39ox | Alkalinity | No | No | No[3] |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-42ox | Chemical Oxygen Demand | No | Yes | No[3] |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-44ox | Alkalinity | No | No | No[3] |
| MW-47ox | Alkalinity | No | No | No[3] |
| | Chloride | No | Yes | No |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-48ox | Alkalinity | Decreasing | No | No[3] |
| MW-53ox | Alkalinity | Increasing | No | No[3] |
| | Calcium | No | Yes | No[3] |
| | Nitrate Nitrite as N | Increasing | Yes | Yes |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-54ox | Alkalinity | Increasing | No | No[3] |
| | Chloride | Increasing | Yes | No |
| | Manganese | Increasing | Yes | No |
| | Manganese, Dissolved | Increasing | Yes | No |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-56ox | Alkalinity | No | No | No[3] |
| MW-57ox | Calcium | No | Yes | No[3] |
| | Chloride | Increasing | Yes | No |
| | Total Organic Carbon | Decreasing | Yes | No[3] |
| MW-58Rox | Manganese | Decreasing | Yes | No |
| | Manganese, Dissolved | Decreasing | Yes | No |
| | Total Organic Carbon | No | Yes | No[3] |
| MW-59ox | Calcium | No | Yes | No[3] |
| | Manganese, Dissolved | No | No | No |
| MW-60ox | Calcium | No | Yes | No[3] |

[1] Parameters detected and having an interwell exceedance only; please see **Appendix D** for additional results
[2] Standards from ARSD 74:54:01:04 Standards for groundwater. N/A notes for parameters that do not have an established concentration.
[3] Parameters that do not have an established ARSD standard for groundwater.

Four previously identified interwell exceedances (alkalinity for MW-42ox and MW-57ox, chemical oxygen demand for MW-54ox, and total organic carbon for MW-60ox) were not identified as interwell exceedances during the fourth quarter 2019. Fourth quarter 2019 statistical interwell exceedances

that do not have a statistically increasing trend, exceed the confidence interval, and exceed the ARSD Standard do not warrant changes to the sampling schedule since the concentrations are within acceptable levels and do no show evidence of dramatic increase. Five interwell exceedances (MW-53ox for nitrate + nitrite, MW-54ox for chloride, manganese, and dissolved manganese, and MW-57ox for chloride) identified with confidence interval exceedances were also identified with a significant increasing trend. However, of these five interwell exceedances, only nitrate + nitrite at well MW-53ox exceeded the ARSD Standard. Additionally, the nitrate + nitrite concentration at upgradient well MW-23ox also exceeded the ARSD Standard which may indicate a naturally occurring change in the groundwater quality. Alkalinity at wells MW-53ox and MW-54ox exceeded interwell prediction limits and were both identified with a statistically significant increasing trends; however, these parameter/well pairs were not identified with a confidence interval exceedance. Additionally, as noted in **Table 4**, a statistically significant increasing trend for alkalinity was also identified at upgradient well MW-21ox. This may indicate a natural change in the background water quality and be the reason for the alkalinity exceedances identified in downgradient wells. No ARSD Standard has been established for alkalinity. Calcium at wells MW-53ox, MW-57ox, MW-59ox, and MW-60ox exceeded the interwell prediction limit and exceeded the confidence interval limit but were not identified with a statistically significant increasing trend. However, a statistically significant increasing trend for calcium was identified at upgradient well MW-25ox, which may indicate a naturally occurring change in the groundwater quality. The other interwell exceedances that were identified with confidence interval limit exceedances but were not identified with a significant increasing trend do not show a dramatic increase in concentrations and will continued to be monitored during the next sampling event. Based on the results from this statistical evaluation no additional sampling is recommended at this time for the parameter/well pairs discussed above.

### 6.2.2 Organic Statistical Analysis

The 1,1-DCA concentration detected at MW-13R during the second quarter 2019 was within historical ranges. No detectable concentrations of 1,1-DCA was identified at MW-13R during the fourth quarter 2019. The second quarter 2019 detection was analyzed utilizing intrawell statistics (Mann-Kendall trend analysis) to evaluate whether the concentrations of VOCs were statistically increasing or decreasing. Although the results of the trend analysis indicate a statistically significant increasing trend since the first 1,1-DCA detection (12/2001), a trend analysis over the most recent five years shows a decreasing trend. Additionally, the 1,1-DCA detection at MW-13R was analyzed using confidence intervals at a 99% confidence level. The laboratory reporting limit for 1,1-DCA was used as the compliance limit since a ARSD Standard has not been established and no upgradient well had a 1,1-DCA detection above the reporting limit. Using the laboratory reporting limit as the compliance limit compares the 1,1-DCA confidence interval at well MW-13R to the limit at which the laboratory can confidently identify a 1,1-DCA detect in a sample. The confidence interval for 1,1-DCA at MW-13R did not exceed the compliance limit since a portion of the confidence interval is below the compliance limit. Therefore, it is possible that the future results for 1,1-DCA at well MW-13R may continue to be identified as a non-detect value. Since this well is already part of a corrective action program, no additional monitoring is recommended at this time. Statistical analysis output data are provided in **Appendix D**.

* * * * *

# 7.0 CONCLUSION

Environmental compliance monitoring at the Sioux Falls Regional Sanitary Landfill consisted of collecting methane concentration data from State Monitoring Network Wells and piezometers and seven building locations. Methane was detected above the lower explosive limit at MW-17 during the first and second quarters and at MW-19 during the third and fourth quarters. However, methane was not detected above the lower explosive limit at monitoring well locations that are closer to the property line. Additionally, methane was not detected at building locations.

Groundwater samples were collected from State monitoring network groundwater wells on a semi-annual basis for purposes of determining whether there was a potential impact to the groundwater quality by the Sioux Falls Regional Sanitary Landfill. The laboratory analytical data was received and determined to be acceptable with qualification based on the data validation review process.

Statistical analysis was performed on inorganic data from May and November sampling events. Each statistical exceedance was evaluated for significance and, based on this review, no additional sampling in excess of the regularly scheduled sampling and no change in monitoring status (e.g. place well in assessment monitoring) is warranted at this time. The next regular monitoring event is scheduled for second quarter 2020.

* * * * *

# 8.0 REFERENCES

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South Dakota DENR, Administrative Rules of South Dakota Section 74:54:01:04: Standards for groundwater of 10,000 mg/L TDS concentration or less.

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# 9.0 GENERAL COMMENTS

SCS Engineers does not warrant the work of third parties supplying information used in the assimilation of this document. This document has been prepared using the level of care and skill ordinarily exercised, under similar circumstances, by environmental professionals currently practicing in this locality. No other representation, express or implied, and no warranty or guarantee is included or intended.

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# Appendix A

# Tables and Figures

**Table A-1**
**Groundwater Well Summary**
**Sioux Falls Regional Sanitary Landfill**

| Well Name | Monitoring Network and Purpose | | Gradient Location | Top of Casing Elevation[1] | Well Depth[2] | Pump Type | Sampling Parameters[3] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Non-preserved Inorganics | Preserved Inorganics | Total Metals | Dissolved Metals | RCRA App I VOCs | RCRA App II Inorganics | RCRA App II VOCs | RCRA App II SVOCs | RCRA App II Pesticides | RCRA App II PCBs | RCRA App II Herbicides |
| MW-11 | State | Monitored | Upgradient | 1568.75 | 35.00 | Peristaltic[5] | X | X | X | X | X | | | | | | |
| MW-13R | State | Monitored | Downgradient | 1537.37 | 20.00 | Peristaltic | X | X | X | X | X | X[6] | X[6] | X[6] | X[6] | X[6] | X[6] |
| MW-20 | State[4] | Abandoned | Downgradient | 1558.27 | 52.40 | Bladder | X | X | X | X | X | | | | | | |
| MW-21ox | State | Monitored | Upgradient | 1561.23 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-23ox | State | Monitored | Upgradient | 1541.56 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-25ox | State | Monitored | Upgradient | 1564.25 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-39ox | State | Monitored | Downgradient | 1528.50 | 15.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-42ox | State | Monitored | Downgradient | 1534.09 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-44ox | State | Monitored | Downgradient | 1533.09 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-45ox | State | Monitored | Downgradient | 1535.52 | 25.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-47ox | State | Monitored | Downgradient | 1547.08 | 20.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-48ox | State | Monitored | Downgradient | 1561.53 | 26.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-53ox | State | Monitored | Downgradient | 1531.91 | 24.50 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-54ox | State | Monitored | Downgradient | 1526.71 | 16.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-56ox | State | Monitored | Downgradient | 1528.00 | 25.00 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-57ox | State | Monitored | Downgradient | 1551.15 | 22.33[7] | Peristaltic | X | X | X | X | X | | | | | | |
| MW-58Rox[8] | State | Monitored | Downgradient | 1522.71[8] | 33.00[8] | Peristaltic[5] | X | X | X | X | X | | | | | | |
| MW-59ox[9] | State | Monitored | Downgradient | 1528.22[9] | 41.00[9] | Peristaltic[5] | X | X | X | X | X | | | | | | |
| MW-60ox[9] | State | Monitored | Downgradient | 1531.67[9] | 42.05 | Peristaltic[5] | X | X | X | X | X | | | | | | |
| MW-61ox[9] | State | Monitored | Upgradient | 1563.52[9] | 22.50 | Peristaltic | X | X | X | X | X | | | | | | |
| MW-1 | State | Water Level Only | Downgradient | 1564.54 | 50.00 | NA | | | | | | | | | | | |
| MW-5 | State[4] | Water Level Only | Downgradient | 1533.71 | 30.00 | NA | | | | | | | | | | | |
| MW-7R | State[4] | Water Level Only | Downgradient | 1530.80 | 25.00 | NA | | | | | | | | | | | |
| MW-17 | State[4] | Water Level Only | Upgradient | 1567.20 | 19.50 | NA | | | | | | | | | | | |
| MW-19 | State | Water Level Only | Downgradient | 1558.18 | 55.00 | NA | | | | | | | | | | | |
| MW-46ox | State | Water Level Only | Downgradient | 1551.95 | 30.00 | NA | | | | | | | | | | | |
| P-1S | State | Water Level Only | Downgradient | 1554.04 | 15.00 | NA | | | | | | | | | | | |
| SDGS-28 | State | Water Level Only | Downgradient | 1563.52 | 16.50 | NA | | | | | | | | | | | |
| SDGS-45 | State | Water Level Only | Downgradient | 1548.08 | 17.50 | NA | | | | | | | | | | | |
| SDGS-57 | State | Water Level Only | Downgradient | 1547.76 | 17.00 | NA | | | | | | | | | | | |
| SDGS-68 | State | Water Level Only | Downgradient | 1555.00 | 18.00 | NA | | | | | | | | | | | |
| SDGS-77 | State | Water Level Only | Downgradient | 1546.38 | 13.50 | NA | | | | | | | | | | | |
| MW-15 | City | Water Level Only | Downgradient | 1558.15 | 15.00 | NA | | | | | | | | | | | |
| MW-18R | City | Water Level Only | Downgradient | 1551.18 | 18.00 | NA | | | | | | | | | | | |
| MW-19i | City | Water Level Only | Downgradient | 1558.05 | 16.00 | NA | | | | | | | | | | | |
| MW-43ox | City | Water Level Only | Downgradient | 1538.52 | 25.00 | NA | | | | | | | | | | | |

[1]From 2013 permit renewal (88 Datum) except where noted

[2]From 2011 annual groundwater monitoring and statistical report field sheets except where noted

[3]Sampled during the spring and fall except where noted

[4]MW-5, MW-7R, and MW-11 replaced with MW-59ox, MW-60ox, and MW-61ox, respectively, during second half 2014. No longer sampled; to be abandoned after background data collected on new wells. MW-20 abandoned during second half 2014.

[5]Peristaltic pump unless water level is too low, then a bladder pump should be used

[6]Sampled during the spring only

[7]From 2011 annual groundwater monitoring and statistical report field geologist log

[8]Installed April 3, 2013; TOC elevation from City survey; total depth from log of monitoring well construction

[9]Installed October 2, 2014; TOC elevation from City survey; total depth from log of monitoring well construction

NA - not applicable

**Table A-2**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Method | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **Non-Preserved Inorganics - 2-1 Liter Plastic** | | | | |
| Alkalinity | Cool < 4°C | SM 2320B | 5.0 mg/L | 14 Days |
| Chloride | Cool < 4°C | SW 9056A | 1.0 mg/L | 28 Days |
| Sulfate | Cool < 4°C | SW 9056A | 1.0 mg/L | 28 Days |
| Biochemical Oxygen Demand (BOD) | Cool < 4°C | SM 5210B | 3.0 mg/L | 48 Hours |
| **Preserved Inorganics - 1-500 mL Plastic** | | | | |
| Nitrate+Nitrite | $H_2SO_4$, Cool < 4ºC | EPA 353.2 | 0.1 mg/L | 28 Days |
| Ammonia | $H_2SO_4$, Cool < 4ºC | EPA 350.1 | 0.2 mg/L | 28 Days |
| Total Organic Carbon (TOC) | $H_2SO_4$, Cool < 4ºC | SM 5310B | 1.0 mg/L | 28 Days |
| Chemical Oxygen Demand (COD) | $H_2SO_4$, Cool < 4ºC | SM 5220D LL | 5.0 mg/L | 28 Days |
| **Preserved Inorganics - 1-500 mL Plastic** | | | | |
| Sulfide | NaOH & Zn Acetate, Cool < 4ºC | SM 4500 S2 F | 2.0 mg/L | 7 Days |
| **Total Metals - 1-500 mL Plastic** | | | | |
| Iron | $HNO_3$, Cool < 4ºC | SW 6010C | 0.1 mg/L | 6 Months |
| Manganese | $HNO_3$, Cool < 4ºC | SW 6010C | 0.01 mg/L | 6 Months |
| Calcium | $HNO_3$, Cool < 4ºC | SW 6010C | 1.0 mg/L | 6 Months |
| Potassium | $HNO_3$, Cool < 4ºC | SW 6010C | 1.0 mg/L | 6 Months |
| Sodium | $HNO_3$, Cool < 4ºC | SW 6010C | 1.0 mg/L | 6 Months |
| **Dissolved Metals - 1-250 mL Plastic** | | | | |
| Iron | $HNO_3$, Cool < 4ºC | SW 6010C | 0.1 mg/L | 6 Months |
| Manganese | $HNO_3$, Cool < 4ºC | SW 6010C | 0.01 mg/L | 6 Months |
| **RCRA App I VOCs - 3-40 mL VOA Vials** | | | | |
| Acetone | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Acrylonitrile | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Benzene | HCl, Cool < 4ºC | SW 8260C | 0.5 ug/L | 14 Days |
| Bromochloromethane | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Bromodichloromethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Bromoform | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Bromomethane | HCl, Cool < 4ºC | SW 8260C | 4.0 ug/L | 14 Days |
| 2-Butanone (MEK) | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Carbon disulfide | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Carbon tetrachloride | HCl, Cool < 4ºC | SW 8260C | 2.0 ug/L | 14 Days |
| Chlorobenzene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Chlorodibromomethane | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Chloroethane | HCl, Cool < 4ºC | SW 8260C | 4.0 ug/L | 14 Days |
| Chloroform | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Chloromethane | HCl, Cool < 4ºC | SW 8260C | 3.0 ug/L | 14 Days |
| 1,2-Dibromo-3-chloropropane | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| 1,2-Dibromoethane | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Dibromomethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,2-Dichlorobenzene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,4-Dichlorobenzene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1-Dichloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,2-Dichloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1-Dichloroethene | HCl, Cool < 4ºC | SW 8260C | 2.0 ug/L | 14 Days |
| cis-1,2-Dichloroethene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| trans-1,2-Dichloroethene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| trans-1,4-Dichloro-2-butene | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |

**Table A-2 (cont)**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Methods | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **RCRA App I VOCs - 3-40 mL VOA Vials** | | | | |
| 1,2-Dichloropropane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| cis-1,3-Dichloropropene | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| trans-1,3-Dichloropropene | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Ethylbenzene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 2-Hexanone | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Iodomethane | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| 4-Methyl-2-pentanone (MIBK) | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Methylene chloride | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Styrene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1,1,2-Tetrachloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1,2,2-Tetrachloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Tetrachloroethene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Toluene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1,1-Trichloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,1,2-Trichloroethane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Trichloroethene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Trichlorofluoromethane | HCl, Cool < 4ºC | SW 8260C | 4.0 ug/L | 14 Days |
| 1,2,3-Trichloropropane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Vinyl Acetate | HCl, Cool < 4ºC | SW 8260C | 2.0 ug/L | 14 Days |
| Vinyl Chloride | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Xylenes, Total | HCl, Cool < 4ºC | SW 8260C | 3.0 ug/L | 14 Days |
| **RCRA App II Inorganics - 1-500 mL Plastic** | | | | |
| Cyanide | NaOH, Cool < 4ºC | SW 9012B | 0.01 mg/L | 14 Days |
| **RCRA App II VOCs - 3-40mL VOA Vials** | | | | |
| Acetonitrile | Cool < 4ºC | SW 8015B | 10.0 mg/L | 14 Days |
| Acrolein | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |
| Ally chloride | HCl, Cool < 4ºC | SW 8260C | 2.0 ug/L | 14 Days |
| Chloroprene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 1,3-Dichlorobenzene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Dichlorodifluoromethane | HCl, Cool < 4ºC | SW 8260C | 3.0 ug/L | 14 Days |
| 1,3-Dichloropropane | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| 2,2-Dichlororpropane | HCl, Cool < 4ºC | SW 8260C | 4.0 ug/L | 14 Days |
| 1,1-Dichloropropene | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Ethyl methacrylate | HCl, Cool < 4ºC | SW 8260C | 2.0 ug/L | 14 Days |
| Hexachlorobutadiene | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Isobutanol | Cool < 4ºC | SW 8015B | 10.0 ug/L | 14 Days |
| Methacrylonitrile | HCl, Cool < 4ºC | SW 8260C | 1.0 ug/L | 14 Days |
| Methyl methacrylate | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Naphthalene | HCl, Cool < 4ºC | SW 8260C | 5.0 ug/L | 14 Days |
| Propionitrile | HCl, Cool < 4ºC | SW 8260C | 10.0 ug/L | 14 Days |

**Table A-2 (cont)**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Methods | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **RCRA App II SVOCs - 2-1 Liter Glass** | | | | |
| Acenaphthene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Acenaphthylene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Acetophenone | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Acetylaminofluorene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Aminobiphenyl | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Anthracene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzo(a)anthracene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzo(b)fluoranthene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzo(k)fluoranthene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzo(g,h,i)perylene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzo(a)pyrene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Benzyl alcohol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| bis(-2-chloroethoxy)Methane | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| bis(-2-chloroethyl)Ether | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| bis(2-chloroisopropyl)Ether | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| bis(2-ethylhexyl)Phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Bromophenyl phenyl ether | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Butyl benzyl phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Chloroaniline (p-Chloroaniline) | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Chlorobenzilate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Chloro-3-methylphenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Chloronaphthalene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Chlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Chlorophenyl phenyl ether | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Chrysene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 3/4-Methylphenol (m+p-Cresols) | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Methylphenol (o-Cresol) | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Diallate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Dibenzo(a,h)anthracene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Dibenzofuran | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Di-n-butyl phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 3,3'-Dichlorobenzidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,4-Dichlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,6-Dichlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Diethyl phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Thionazin | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 7,12-Dimethylbenz(a)anthracene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Dimethoate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| p-(dimethylamino)Azobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 3,3'-Dimethylbenzidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,4-Dimethylphenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Dimethyl phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,3-Dinitrobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4,6-Dinitro-2-methylphenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,4-Dinitrophenol | Cool < 4ºC | SW 8270D | 20.0 ug/L | 7 Days |
| 2,4-Dinitrotoluene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,6-Dinitrotoluene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |

**Table A-2 (cont)**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Methods | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **RCRA App II SVOCs - 2-1 Liter Glass** | | | | |
| Di-n-octyl phthalate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Diphenylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Disulfoton | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Ethyl methanesulfonate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Famphur | Cool < 4ºC | SW 8270D | 20.0 ug/L | 7 Days |
| Fluoranthene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Fluorene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Hexachlorobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Hexachlorocyclopentadiene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Hexachloroethane | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Hexachloropropene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Indeno(1,2,3-cd)pyrene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Isodrin | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Isophorone | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Isosafrole | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Kepone | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Methapyrilene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 3-Methylcholanthrene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Methyl methanesulfonate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Methylnaphthalene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Methyl parathion | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,4-Naphthoquinone | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1-Naphthylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Naphthylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Nitroaniline | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 3-Nitroaniline | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Nitroaniline | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Nitrobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2-Nitrophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 4-Nitrophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitroso-di-n-butylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitrosodiethylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitrosodimethylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitrosodiphenylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitroso-di-n-propylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitrosomethylethylamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitrosopiperidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| n-Nitorospyrrolidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 5-Nitro-o-toluidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Parathion | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Pentachlorobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Pentachloronitrobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Pentachlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Phenacetin | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Phenanthrene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Phenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,4-Phenylenediamine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |

**Table A-2 (cont)**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Methods | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **RCRA App II SVOCs - 2-1 Liter Glass** | | | | |
| Phorate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Pronamide | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Pyrene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Safrole | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,2,4,5-Tetrachlorobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,3,4,6-Tetrachlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| o-Toluidine | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,2,4-Trichlorobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,4,5-Trichlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 2,4,6-Trichlorophenol | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| o,o,o-Triethyl phosphorothioate | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| 1,3,5-Trinitrobenzene | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| Dinoseb | Cool < 4ºC | SW 8270D | 10.0 ug/L | 7 Days |
| **RCRA App II Pesticides - 2-1 Liter Glass** | | | | |
| Aldrin | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| alpha-BHC | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| beta-BHC | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| delta-BHC | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| gamma-BHC (Lindane) | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Chlordane | Cool < 4ºC | SW 8081B | 2.00 ug/L | 7 Days |
| Dieldrin | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| 4,4'-DDD | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| 4,4'-DDE | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| 4,4'-DDT | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Endosulfan I | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Endosulfan II | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Endosulfan sulfate | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Endrin | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Endrin aldehyde | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Heptachlor | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Heptachlor epoxide | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Methoxychlor | Cool < 4ºC | SW 8081B | 0.032 ug/L | 7 Days |
| Toxaphene | Cool < 4ºC | SW 8081B | 2.0 ug/L | 7 Days |

**Table A-2 (cont)**
**Groundwater Analytical Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**

| Parameters & Bottles Used | Preservatives | Methods | Laboratory Reporting Limits[1] | Holding Time |
|---|---|---|---|---|
| **RCRA App II PCBs - 1-1 Liter Glass** | | | | |
| PCB 1016 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1221 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1232 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1242 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1248 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1254 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| PCB 1260 | Cool < 4ºC | SW 8082A | 0.8 ug/L | 7 Days |
| **RCRA App II Herbicides - 2-1 Liter Glass** | | | | |
| 2,4-D | Cool < 4ºC | SW 8151A | 1.0 ug/L | 7 Days |
| 2,4,5-T | Cool < 4ºC | SW 8151A | 1.0 ug/L | 7 Days |
| 2,4,5-TP (Silvex) | Cool < 4ºC | SW 8151A | 1.0 ug/L | 7 Days |

Parameters adapted from Sioux Falls Regional Sanitary Landfill Comprehensive Monitoring Plan, September and November 2011
mg/L - milligrams per liter
ug/L - micrograms per liter
S.U. - standard units
[1]Laboratory reporting limit with no dilutions

# Table A-3
# Groundwater Elevation Summary
# Sioux Falls Regional Sanitary Landfill

| Well Name | Date of Installation | Monitoring Network | Gradient Location | Top of Casing Elevation[1] | Depth to Groundwater (May 2019) | Groundwater Elevation (May 2019) | Depth to Groundwater (Nov 2019) | Groundwater Elevation (Nov 2019) |
|---|---|---|---|---|---|---|---|---|
| MW-5 | 11/7/1991 | Water Level | Downgradient | 1533.71 | 5.01 | 1528.70 | 7.36 | 1526.35 |
| MW-7R | 11/8/1991 | Water Level | Downgradient | 1530.80 | 4.45 | 1526.35 | 7.31 | 1523.49 |
| MW-11 | 11/12/1991 | State | Upgradient | 1568.75 | 9.34 | 1559.41 | 11.71 | 1557.04 |
| MW-13R | 9/8/1997 | State | Downgradient | 1537.37 | 4.35 | 1533.02 | 7.30 | 1530.07 |
| MW-17 | 1/30/1992 | Water Level | Upgradient | 1567.20 | 8.89 | 1558.31 | 10.98 | 1556.22 |
| MW-21ox | 6/14/1994 | State | Upgradient | 1561.23 | 3.58 | 1557.65 | 8.73 | 1552.50 |
| MW-23ox | 6/16/1994 | State | Upgradient | 1541.56 | 4.96 | 1536.60 | 9.18 | 1532.38 |
| MW-25ox | 6/17/1994 | State | Upgradient | 1564.25 | 5.87 | 1558.38 | 6.52 | 1557.73 |
| MW-39ox | 6/27/1994 | State | Downgradient | 1528.50 | 1.92 | 1526.58 | 3.06 | 1525.44 |
| MW-42ox | 6/19/1995 | State | Downgradient | 1534.09 | 2.82 | 1531.27 | 4.30 | 1529.79 |
| MW-44ox | 10/6/1999 | State | Downgradient | 1533.09 | 3.42 | 1529.67 | 6.64 | 1526.45 |
| MW-45ox | 10/6/1999 | State | Downgradient | 1535.52 | 5.44 | 1530.08 | 8.22 | 1527.30 |
| MW-47ox | 12/16/2002 | State | Downgradient | 1547.08 | 3.65 | 1543.43 | 3.72 | 1543.36 |
| MW-48ox | 12/16/2002 | State | Downgradient | 1561.53 | 6.59 | 1554.94 | 9.93 | 1551.60 |
| MW-53ox | 7/25/2005 | State | Downgradient | 1531.91 | 15.18 | 1516.73 | 17.55 | 1514.36 |
| MW-54ox | 7/24/2006 | State | Downgradient | 1526.71 | 2.53 | 1524.18 | 3.61 | 1523.10 |
| MW-56ox | 7/8/2008 | State | Downgradient | 1528.00 | 3.58 | 1524.42 | 4.02 | 1523.98 |
| MW-57ox | 10/19/2011 | State | Downgradient | 1551.15 | 3.65 | 1547.50 | 3.90 | 1547.25 |
| MW-58Rox | 4/2/2013 | State | Downgradient | 1522.71 | 4.30 | 1518.41 | 7.10 | 1515.61 |
| MW-59ox[2] | 10/1/2014 | State | Downgradient | 1528.22 | 4.75 | 1523.47 | 7.52 | 1520.70 |
| MW-60ox[2] | 10/2/2014 | State | Downgradient | 1531.67 | 4.23 | 1527.44 | 5.42 | 1526.25 |
| MW-61ox[2,4] | 10/1/2014 | State | Upgradient | 1563.42 | 3.20 | 1560.32 | 3.49 | 1559.93 |
| MW-15 | 1/29/1992 | City | Downgradient | 1558.15 | 11.16 | 1546.99 | 11.47 | 1546.68 |
| MW-18R | 10/19/2011 | City | Downgradient | 1551.18 | 2.70 | 1548.48 | 2.93 | 1548.25 |
| MW-19i | 6/29/1994 | City | Downgradient | 1558.05 | 3.51 | 1554.54 | 6.72 | 1551.33 |
| MW-43ox | 7/19/1995 | City | Downgradient | 1538.52 | 7.77 | 1530.75 | 11.31 | 1527.21 |
| MW-1 | 10/14/1991 | Water Level | Downgradient | 1564.54 | 14.83 | 1549.71 | 15.54 | 1549.00 |
| MW-19 | 6/10/1994 | Water Level | Downgradient | 1558.18 | 12.70 | 1545.48 | 12.84 | 1545.34 |
| MW-46ox | 7/12/2001 | Water Level | Downgradient | 1551.95 | 4.80 | 1547.15 | 8.96 | 1542.99 |
| P-1S | 10/4/1989 | Water Level | Downgradient | 1554.04 | N/A[3] | N/A[3] | N/A[3] | N/A[3] |
| SDGS-28 | 7/19/1984 | Water Level | Downgradient | 1563.52 | 5.00 | 1558.52 | 9.69 | 1553.83 |
| SDGS-45 | 7/18/1984 | Water Level | Downgradient | 1548.08 | 13.50 | 1534.58 | 15.35 | 1532.73 |
| SDGS-57 | 7/17/1984 | Water Level | Downgradient | 1547.76 | 8.51 | 1539.25 | 11.35 | 1536.41 |
| SDGS-68 | 7/25/1984 | Water Level | Downgradient | 1555.00 | 2.97 | 1552.03 | 7.60 | 1547.40 |
| SDGS-77 | 7/25/1984 | Water Level | Downgradient | 1546.38 | 1.42 | 1544.96 | 1.46 | 1544.92 |

[1]From 2013 permit renewal or City survey (88 Datum) or October 2014 survey

[2]Installed October 2014; TOC elevation from City survey

[3]P-1S inaccessible at time of sampling event due to being surrounded by standing water

[4]MW-61ox TOC elevation during May 2019 was 1563.52; TOC was shortened to 1563.42 before November 2019 event

**Table A-4**
**Field Parameter Summary**
**Sioux Falls Regional Sanitary Landfill**
**2019**

| Well Name | Date | Temp (°C) | pH (S.U.) | ORP (mV) | Specific Conductivity (mS/cm) | Dissolved Oxygen (mg/L) |
|---|---|---|---|---|---|---|
| MW-11 | 5/13/2019 | 14.23 | 7.65 | 94 | 3.34 | 0.00 |
| MW-11 | 11/18/2019 | 11.93 | 7.61 | 59 | 4.00 | 0.00 |
| MW-13R | 5/15/2019 | 11.23 | 7.47 | 217 | 2.70 | 0.00 |
| MW-13R | 11/20/2019 | 11.06 | 7.57 | 55 | 3.10 | 0.71 |
| MW-21ox | 5/13/2019 | 10.13 | 7.75 | -77 | 2.82 | 0.00 |
| MW-21ox | 11/18/2019 | 10.91 | 7.50 | -120 | 3.36 | 0.18 |
| MW-23ox | 5/13/2019 | 9.89 | 7.89 | 144 | 3.53 | 0.00 |
| MW-23ox | 11/18/2019 | 11.92 | 7.61 | 123 | 4.00 | 0.22 |
| MW-25ox | 5/13/2019 | 10.80 | 7.87 | 51 | 2.08 | 0.00 |
| MW-25ox | 11/18/2019 | 11.08 | 8.01 | -68 | 2.32 | 4.09 |
| MW-39ox | 5/14/2019 | 21.48 | 7.77 | 37 | 1.96 | 0.00 |
| MW-39ox | 11/19/2019 | 10.17 | 7.47 | -35 | 3.01 | 0.00 |
| MW-42ox | 5/14/2019 | 15.71 | 7.72 | 112 | 3.28 | 0.00 |
| MW-42ox | 11/19/2019 | 9.39 | 7.55 | -44 | 4.72 | 0.00 |
| MW-44ox | 5/14/2019 | 14.22 | 7.52 | 74 | 2.39 | 0.00 |
| MW-44ox | 11/20/2019 | 10.03 | 7.47 | -71 | 3.12 | 0.00 |
| MW-45ox | 5/14/2019 | 14.14 | 7.45 | 71 | 3.09 | 0.00 |
| MW-45ox | 11/19/2019 | 10.59 | 7.52 | -89 | 4.92 | 0.00 |
| MW-47ox | 5/14/2019 | 12.80 | 7.62 | 201 | 2.58 | 0.00 |
| MW-47ox | 11/19/2019 | 7.84 | 7.47 | 138 | 2.72 | 0.07 |
| MW-48ox | 5/13/2019 | 10.81 | 7.77 | 159 | 2.81 | 0.51 |
| MW-48ox | 11/18/2019 | 10.26 | 7.66 | -39 | 3.23 | 0.00 |
| MW-53ox | 5/13/2019 | 11.26 | 7.87 | 231 | 2.49 | 9.37 |
| MW-53ox | 11/20/2019 | 9.86 | 7.57 | 61 | 4.26 | 5.68 |
| MW-54ox | 5/14/2019 | 11.83 | 7.47 | 119 | 1.67 | 0.00 |
| MW-54ox | 11/19/2019 | 9.90 | 7.53 | 32 | 2.51 | 0.00 |
| MW-56ox | 5/15/2019 | 14.61 | 7.85 | 227 | 1.61 | 0.70 |
| MW-56ox | 11/19/2019 | 11.30 | 7.78 | 48 | 2.29 | 0.12 |
| MW-57ox | 5/14/2019 | 8.52 | 7.76 | 237 | 3.27 | 0.00 |
| MW-57ox | 11/19/2019 | 8.25 | 7.93 | 133 | 3.65 | 5.23 |
| MW-58Rox | 5/15/2019 | 17.01 | 7.90 | 222 | 2.02 | 0.00 |
| MW-58Rox | 11/20/2019 | 9.15 | 7.92 | -21 | 2.59 | 0.19 |
| MW-59ox | 5/14/2019 | 10.96 | 7.74 | 178 | 2.88 | 0.00 |
| MW-59ox | 11/19/2019 | 10.27 | 7.65 | -23 | 3.36 | 0.00 |
| MW-60ox | 5/14/2019 | 15.17 | 7.72 | 155 | 2.79 | 0.00 |
| MW-60ox | 11/19/2019 | 10.16 | 7.76 | 58 | 3.58 | 0.31 |
| MW-61ox | 5/14/2019 | 13.99 | 7.83 | 89 | 2.49 | 0.00 |
| MW-61ox | 11/18/2019 | 9.84 | 7.76 | 76 | 2.88 | 1.08 |

Shaded cells indicated an exceedance of the standard from ARSD 74:54:01:04 standards for groundwater.

**Table A-5**
**Laboratory Analytical Summary - Detection Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-11 5/13/19 | MW-21ox 5/13/19 | MW-23ox 5/13/19 | MW-25ox 5/13/19 | MW-39ox 5/14/19 | MW-42ox 5/14/19 | MW-44ox 5/14/19 | MW-45ox 5/14/19 | MW-47ox 5/14/19 | MW-48ox 5/13/19 | MW-53ox 5/15/19 | MW-54ox 5/14/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganics** | | | | | | | | | | | | | |
| Alkalinity | mg/L | **243** | **460** | **337** | **327** | **302** | **426** | **421** | **366** | **470** | **238** | **428** | **420** |
| Ammonia | mg/L | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 |
| Bicarbonate Alkalinity as CaCO3 | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **420** |
| Biochemical Oxygen Demand (BOD) | mg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Carbonate Alkalinity as CaCO3 | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <5.00 |
| Chemical Oxygen Demand (COD) | mg/L | **5.89** | <5.00 | <5.00 | <5.00 | <5.00 | **7.50** | <5.00 | <5.00 | **9.12** | <5.00 | <5.00 | **14.0** |
| Chloride | mg/L | **116** | <5.00 | **10.9** | <5.00 | **5.81** | **29.5** | **11.5** | **5.63** | **93.3** | <5.00 | **27.5** | **119** |
| Nitrate+Nitrite | mg/L | **3.67** | **0.133** | **11.2** | <0.100 | <0.100 | **1.03** | **3.36** | <0.100 | <0.100 | <0.100 | **33.6** | <0.100 |
| Nitrogen, Kjeldahl | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.00 |
| Sulfate | mg/L | **2610** | **719** | **2090** | **1290** | **580** | **2240** | **668** | **976** | **1600** | **2120** | **1400** | **847** |
| Sulfide | mg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Total Dissovled Solids (TDS) | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **2140** |
| Total Organic Carbon (TOC) | mg/L | **2.09** | **2.03** | **2.55** | **2.22** | **3.31** | **3.64** | **2.04** | **2.00** | **4.26** | **2.15** | **3.29** | **5.13** |
| Total Suspended Solids (TSS) | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.88 |
| **Metals** | | | | | | | | | | | | | |
| Calcium | mg/L | **491** | **313** | **375** | **297** | **183** | **371** | **222** | **343** | **444** | **448** | **277** | **255** |
| Iron | mg/L | <0.500 | **0.563** | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 |
| Magnesium | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | **105** |
| Manganese | mg/L | <0.0100 | **0.142** | <0.0100 | <0.0100 | **0.0114** | **0.0114** | **0.172** | **0.0306** | <0.0100 | <0.0100 | <0.0100 | **1.07** |
| Potassium | mg/L | **20.7** | **5.38** | **9.57** | **4.81** | **3.60** | **8.18** | **2.75** | **6.66** | **7.19** | **11.2** | **6.13** | <1.00 |
| Sodium | mg/L | **81.3** | **19.8** | **65.6** | **49.6** | **15.3** | **75.0** | **15.3** | **33.9** | **33.0** | **69.8** | **70.4** | **104.0** |
| Iron, Dissolved | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 |
| Manganese, Dissolved | mg/L | <0.0100 | **0.167** | <0.0100 | <0.0100 | <0.0100 | <0.0100 | **0.132** | <0.0100 | <0.0100 | <0.0100 | <0.0100 | **1.35** |
| **RCRA Appendix I VOCs** | | | | | | | | | | | | | |
| Acetone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Acrylonitrile | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Benzene | µg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 |
| Bromochloromethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromodichloromethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Bromoform | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromomethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 2-Butanone (MEK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Carbon disulfide | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Carbon tetrachloride | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Chlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

mg/l - milligram per liter

µg/l - microgram per liter

J - estimated

**50** - detection at or above reporting limit

NA- not analyzed

Shaded - above concentration listed in ARSD 74:54:01:04 (Table 2)

**Table A-5 (Continued)**
**Laboratory Analytical Summary - Detection Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-11 5/13/19 | MW-21ox 5/13/19 | MW-23ox 5/13/19 | MW-25ox 5/13/19 | MW-39ox 5/14/19 | MW-42ox 5/14/19 | MW-44ox 5/14/19 | MW-45ox 5/14/19 | MW-47ox 5/14/19 | MW-48ox 5/13/19 | MW-53ox 5/15/19 | MW-54ox 5/14/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RCRA Appendix I VOCs (continued)** | | | | | | | | | | | | | |
| Chlorodibromomethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Chloroethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| Chloroform | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Chloromethane | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| cis-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| cis-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromo-3-Chloropropane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromoethane (EDB) | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Dibromomethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,4-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| 1,2-Dichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Ethylbenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 2-Hexanone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Iodomethane | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Methylene Chloride | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 4-Methyl-2-pentanone (MIBK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| m,p-Xylene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| o-Xylene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Styrene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,1,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Tetrachloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Toluene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,4-Dichloro-2-butene | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| trans-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,1,1-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichlorofluoromethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 1,2,3-Trichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Vinyl acetate | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Vinyl chloride | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

µg/l - microgram per liter

**50** - detection at or above reporting limit

**Table A-5 (Continued)**
**Laboratory Analytical Summary - Detection Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-56ox 5/15/19 | MW-57ox 5/14/19 | MW-58Rox 5/15/19 | Duplicate 5/15/19 | MW-59ox 5/14/19 | MW-60ox 5/14/19 | MW-61ox 5/13/19 | TB-1 5/13/19 | TB-2 5/14/19 | TB-3 5/15/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganics** | | | | | | | | | | | |
| Alkalinity | mg/L | **298** | **210** | **339** | **326** | **273** | **273** | **292** | NA | NA | NA |
| Ammonia | mg/L | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | NA | NA | NA |
| Biochemical Oxygen Demand (BOD) | mg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | NA | NA | NA |
| Chemical Oxygen Demand (COD) | mg/L | <5.00 | **8.15** | <5.00 | **5.89** | **8.48** | <5.00 | <5.00 | NA | NA | NA |
| Chloride | mg/L | <5.00 | **50.9** | **18.0** | **19.0** | **7.50** | **30.7** | **31.8** | NA | NA | NA |
| Nitrate+Nitrite | mg/L | **0.232** | <0.100 | <0.100 | <0.100 | <0.100 | **0.138** | **0.261** | NA | NA | NA |
| Sulfate | mg/L | **1090** | **1600** | **1520** | **1600** | **2050** | **2180** | **1940** | NA | NA | NA |
| Sulfide | mg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | NA | NA | NA |
| Total Organic Carbon (TOC) | mg/L | **1.76** | **2.95** | **2.47** | **2.60** | **1.95** | **2.28** | **2.12** | NA | NA | NA |
| **Metals** | | | | | | | | | | | |
| Calcium | mg/L | **172** | **491** | **315** | **265** | **460** | **495** | **392** | NA | NA | NA |
| Iron | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | NA | NA | NA |
| Manganese | mg/L | **0.0128** | <0.0100 | **1.66** | **1.44** | **0.0449** | **0.163** | **0.192** | NA | NA | NA |
| Potassium | mg/L | **1.63** | **8.76** | **7.16** | **6.06** | **18.7** | **17.5** | **5.56** | NA | NA | NA |
| Sodium | mg/L | **26.8** | **98.6** | **95.8** | **81.1** | **81.1** | **106** | **75.1** | NA | NA | NA |
| Iron, Dissolved | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | NA | NA | NA |
| Manganese, Dissolved | mg/L | <0.0100 | <0.0100 | **1.39** | **1.38** | **0.0285** | **0.130** | **0.101** | NA | NA | NA |
| **RCRA Appendix I VOCs** | | | | | | | | | | | |
| Acetone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Acrylonitrile | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Benzene | µg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 |
| Bromochloromethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromodichloromethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Bromoform | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromomethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 2-Butanone (MEK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Carbon disulfide | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Carbon tetrachloride | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Chlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

mg/l - milligram per liter

µg/l - microgram per liter

TB - Trip Blank

FB - Field Blank

J - estimated

**50** - detection at or above reporting limit

NA- not analyzed

Shaded - above concentration listed in ARSD 74:54:01:04 (Table 2)

**Table A-5 (Continued)**
**Laboratory Analytical Summary - Detection Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-56ox 5/15/19 | MW-57ox 5/14/19 | MW-58Rox 5/15/19 | Duplicate 5/15/19 | MW-59ox 5/14/19 | MW-60ox 5/14/19 | MW-61ox 5/13/19 | TB-1 5/13/19 | TB-2 5/14/19 | TB-3 5/15/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RCRA Appendix I VOCs (continued)** | | | | | | | | | | | |
| Chlorodibromomethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Chloroethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| Chloroform | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Chloromethane | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| cis-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| cis-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromo-3-Chloropropane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromoethane (EDB) | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Dibromomethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,4-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| 1,2-Dichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Ethylbenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 2-Hexanone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Iodomethane | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Methylene Chloride | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 4-Methyl-2-pentanone (MIBK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| m,p-Xylene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| o-Xylene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Styrene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,1,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Tetrachloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Toluene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,4-Dichloro-2-butene | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| trans-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,1,1-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichlorofluoromethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 1,2,3-Trichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Vinyl acetate | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Vinyl chloride | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

µg/l - microgram per liter

**50** - detection at or above reporting limit

TB - Trip Blank

FB - Field Blank

**Table A-6**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **Inorganics** | | | |
| Alkalinity | mg/L | **435** | NA |
| Ammonia | mg/L | <0.200 | NA |
| Biochemical Oxygen Demand (BOD) | mg/L | <3.00 | NA |
| Chemical Oxygen Demand (COD) | mg/L | <5.00 | NA |
| Chloride | mg/L | **15.8** | NA |
| Nitrate+Nitrite | mg/L | **0.429** | NA |
| Sulfate | mg/L | **1750** | NA |
| Sulfide | mg/L | <2.00 | NA |
| Total Organic Carbon (TOC) | mg/L | **2.69** | NA |
| **Metals** | | | |
| Calcium | mg/L | **387** | NA |
| Iron | mg/L | <0.500 | NA |
| Manganese | mg/L | <0.0100 | NA |
| Potassium | mg/L | **10.3** | NA |
| Sodium | mg/L | **68.5** | NA |
| Iron, Dissolved | mg/L | <0.500 | NA |
| Manganese, Dissolved | mg/L | <0.0100 | NA |
| **RCRA Appendix I & II VOCs** | | | |
| 1,1,1,2-Tetrachloroethane | µg/L | <1.00 | <1.00 |
| 1,1,1-Trichloroethane | µg/L | <1.00 | <1.00 |
| 1,1,2,2-Tetrachloroethane | µg/L | <1.00 | <1.00 |
| 1,1,2-Trichloroethane | µg/L | <1.00 | <1.00 |
| 1,1-Dichloroethane | µg/L | **1.05** | <1.00 |
| 1,1-Dichloroethene | µg/L | <2.00 | <2.00 |
| 1,1-Dichloropropene | µg/L | <1.00 | <1.00 |
| 1,2,3-Trichloropropane | µg/L | <1.00 | <1.00 |
| 1,2,4-Trichlorobenzene | µg/L | <5.00 | <5.00 |
| 1,2-Dibromo-3-Chloropropane | µg/L | <5.00 | <5.00 |
| 1,2-Dibromoethane (EDB) | µg/L | <1.00 | <1.00 |
| 1,2-Dichlorobenzene | µg/L | <1.00 | <1.00 |

mg/l - milligram per liter

µg/l - microgram per liter

**50** - detection at or above reporting limit

Shaded - above concentration listed in ARSD 74:54:01:04 (Table 2)

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix I & II VOCs (continued)** | | | |
| 1,2-Dichloroethane | µg/L | <1.00 | <1.00 |
| 1,2-Dichloropropane | µg/L | <1.00 | <1.00 |
| 1,3-Dichlorobenzene | µg/L | <1.00 | <1.00 |
| 1,3-Dichloropropane | µg/L | <1.00 | <1.00 |
| 1,4-Dichlorobenzene | µg/L | <1.00 | <1.00 |
| 2,2-Dichloropropane | µg/L | <4.00 | <4.00 |
| 2-Butanone (MEK) | µg/L | <10.0 | <10.0 |
| 2-Hexanone | µg/L | <10.0 | <10.0 |
| 4-Methyl-2-pentanone (MIBK) | µg/L | <10.0 | <10.0 |
| Acetone | µg/L | <10.0 | <10.0 |
| Acetonitrile | mg/L | <10.0 | NA |
| Acrolein | µg/L | <10.0 | <10.0 |
| Acrylonitrile | µg/L | <5.00 | <5.00 |
| Allyl chloride | µg/L | <2.00 | <2.00 |
| Benzene | µg/L | <0.500 | <0.500 |
| Bromochloromethane | µg/L | <5.00 | <5.00 |
| Bromodichloromethane | µg/L | <1.00 | <1.00 |
| Bromoform | µg/L | <5.00 | <5.00 |
| Bromomethane | µg/L | <4.00 | <4.00 |
| Carbon disulfide | µg/L | <1.00 | <1.00 |
| Carbon tetrachloride | µg/L | <2.00 | <2.00 |
| Chlorobenzene | µg/L | <1.00 | <1.00 |
| Chlorodibromomethane | µg/L | <5.00 | <5.00 |
| Chloroethane | µg/L | <4.00 | <4.00 |
| Chloroform | µg/L | <3.00 | <3.00 |
| Chloromethane | µg/L | <3.00 | <3.00 |
| Chloroprene | µg/L | <1.00 | <1.00 |
| cis-1,2-Dichloroethene | µg/L | <1.00 | <1.00 |
| cis-1,3-Dichloropropene | µg/L | <5.00 | <5.00 |
| Dibromomethane | µg/L | <1.00 | <1.00 |
| Dichlorodifluoromethane | µg/L | <3.00 | <3.00 |
| Ethyl methacrylate | µg/L | <2.00 | <2.00 |
| Ethylbenzene | µg/L | <1.00 | <1.00 |
| Iodomethane | µg/L | <10.0 | <10.0 |
| Isobutanol | mg/L | <10.0 | NA |
| Methacrylonitrile | ug/L | <10.0 | <10.0 |

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix I & II VOCs (continued)** | | | |
| Methyl methacrylate | ug/L | <2.00 | <2.00 |
| Methylene Chloride | ug/L | <5.00 | <5.00 |
| Naphthalene | ug/L | <5.00 | <5.00 |
| Propionitrile | ug/L | <10.0 | <10.0 |
| Styrene | ug/L | <1.00 | <1.00 |
| Tetrachloroethene | ug/L | <1.00 | <1.00 |
| Toluene | ug/L | <1.00 | <1.00 |
| trans-1,2-Dichloroethene | ug/L | <1.00 | <1.00 |
| trans-1,3-Dichloropropene | ug/L | <5.00 | <5.00 |
| trans-1,4-Dichloro-2-butene | ug/L | <10.0 | <10.0 |
| Trichloroethene | ug/L | <1.00 | <1.00 |
| Trichlorofluoromethane | ug/L | <4.00 | <4.00 |
| Vinyl acetate | ug/L | <10.0 | <10.0 |
| Vinyl chloride | ug/L | <1.00 | <1.00 |
| Xylenes, Total | ug/L | <3.00 | <3.00 |
| **RCRA Appendix II SVOCs** | | | |
| 1,2,4,5-Tetrachlorobenzene | ug/L | <10.2 | NA |
| 1,3,5-Trinitrobenzene | ug/L | <10.2 | NA |
| 1,3-Dinitrobenzene | ug/L | <10.2 | NA |
| 1,4-Naphthoquinone | ug/L | <10.2 | NA |
| 1,4-phenylenediamine | ug/L | <10.2 | NA |
| 1-Naphthylamine | ug/L | <10.2 | NA |
| 2,3,4,6-Tetrachlorophenol | ug/L | <10.2 | NA |
| 2,4,5-Trichlorophenol | ug/L | <10.2 | NA |
| 2,4,6-Trichlorophenol | ug/L | <10.2 | NA |
| 2,4-Dichlorophenol | ug/L | <10.2 | NA |
| 2,4-Dimethylphenol | ug/L | <10.2 | NA |
| 2,4-Dinitrophenol | ug/L | <20.4 | NA |
| 2,4-Dinitrotoluene | ug/L | <10.2 | NA |
| 2,6-Dichlorophenol | ug/L | <10.2 | NA |
| 2,6-Dinitrotoluene | ug/L | <10.2 | NA |
| 2-Acetylaminofluorene | ug/L | <10.2 | NA |
| 2-Chloronaphthalene | ug/L | <10.2 | NA |
| 2-Chlorophenol | ug/L | <10.2 | NA |
| 2-Methylnaphthalene | ug/L | <10.2 | NA |
| 2-Methylphenol | ug/L | <10.2 | NA |
| 2-Naphthylamine | ug/L | <10.2 | NA |
| 2-Nitroaniline | ug/L | <10.2 | NA |
| 2-Nitrophenol | ug/L | <10.2 | NA |
| 3,3'-Dichlorobenzidine | ug/L | <10.2 | NA |

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix II SVOCs (continued)** | | | |
| 3,3'-Dimethylbenzidine | ug/L | <10.2 | NA |
| 3-Methylcholanthrene | ug/L | <10.2 | NA |
| 3-Nitroaniline | ug/L | <10.2 | NA |
| 4,6-Dinitro-2-methylphenol | ug/L | <10.2 | NA |
| 4-Aminobiphenyl | ug/L | <10.2 | NA |
| 4-Bromophenyl phenyl ether | ug/L | <10.2 | NA |
| 4-Chloro-3-methylphenol | ug/L | <10.2 | NA |
| 4-Chloroaniline | ug/L | <10.2 | NA |
| 4-Chlorophenyl phenyl ether | mg/L | <10.2 | NA |
| 4-Nitroaniline | ug/L | <10.2 | NA |
| 4-Nitrophenol | ug/L | <10.2 | NA |
| 5-Nitro-o-toluidine | ug/L | <10.2 | NA |
| 7,12-Dimethylbenz(a)anthracene | ug/L | <10.2 | NA |
| Acenaphthene | ug/L | <10.2 | NA |
| Acenaphthylene | ug/L | <10.2 | NA |
| Acetophenone | ug/L | <10.2 | NA |
| Anthracene | ug/L | <10.2 | NA |
| Benzo[a]anthracene | ug/L | <10.2 | NA |
| Benzo[a]pyrene | ug/L | <10.2 | NA |
| Benzo[b]fluoranthene | ug/L | <10.2 | NA |
| Benzo[g,h,i]perylene | ug/L | <10.2 | NA |
| Benzo[k]fluoranthene | ug/L | <10.2 | NA |
| Benzyl alcohol | ug/L | <10.2 | NA |
| bis (2-chloroisopropyl) ether | ug/L | <10.2 | NA |
| Bis(2-chloroethoxy)methane | ug/L | <10.2 | NA |
| Bis(2-chloroethyl)ether | ug/L | <10.2 | NA |
| Bis(2-ethylhexyl) phthalate | ug/L | <10.2 | NA |
| Butyl benzyl phthalate | ug/L | <10.2 | NA |
| Chlorobenzilate | ug/L | <10.2 | NA |
| Chrysene | ug/L | <10.2 | NA |
| Diallate | ug/L | <10.2 | NA |
| Dibenzo(a,h)anthracene | mg/L | <10.2 | NA |
| Dibenzofuran | ug/L | <10.2 | NA |
| Diethyl phthalate | ug/L | <10.2 | NA |
| Dimethoate | ug/L | <10.2 | NA |
| Dimethyl phthalate | ug/L | <10.2 | NA |
| Di-n-butyl phthalate | ug/L | <10.2 | NA |
| Di-n-octyl phthalate | ug/L | <20.4 | NA |
| Dinoseb | ug/L | <10.2 | NA |

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix II SVOCs (continued)** | | | |
| Diphenylamine | ug/L | <10.2 | NA |
| Disulfoton | ug/L | <10.2 | NA |
| Ethyl methanesulfonate | ug/L | <10.2 | NA |
| Ethyl Parathion | ug/L | <10.2 | NA |
| Famphur | ug/L | <10.2 | NA |
| Fluoranthene | ug/L | <10.2 | NA |
| Fluorene | ug/L | <10.2 | NA |
| Hexachlorobenzene | ug/L | <10.2 | NA |
| Hexachlorobutadiene | ug/L | <10.2 | NA |
| Hexachlorocyclopentadiene | ug/L | <10.2 | NA |
| Hexachloroethane | ug/L | <10.2 | NA |
| Hexachloropropene | ug/L | <10.2 | NA |
| Indeno[1,2,3-cd]pyrene | ug/L | <10.2 | NA |
| Isodrin | ug/L | <10.2 | NA |
| Isophorone | ug/L | <10.2 | NA |
| Isosafrole | ug/L | <10.2 | NA |
| Kepone | ug/L | <10.2 | NA |
| Methapyrilene | ug/L | <10.2 | NA |
| Methyl methanesulfonate | ug/L | <10.2 | NA |
| Methyl parathion | ug/L | <10.2 | NA |
| Methylphenol, 3 & 4 | ug/L | <10.2 | NA |
| Nitrobenzene | ug/L | <10.2 | NA |
| N-Nitrosodiethylamine | ug/L | <10.2 | NA |
| N-Nitrosodimethylamine | ug/L | <10.2 | NA |
| N-Nitrosodi-n-butylamine | ug/L | <10.2 | NA |
| N-Nitrosodi-n-propylamine | ug/L | <10.2 | NA |
| N-Nitrosodiphenylamine | ug/L | <10.2 | NA |
| N-Nitrosomethylethylamine | mg/L | <10.2 | NA |
| N-Nitrosopiperidine | ug/L | <10.2 | NA |
| N-Nitrosopyrrolidine | ug/L | <10.2 | NA |
| o,o',o''-Triethylphosphorothioate | ug/L | <10.2 | NA |
| o-Toluidine | ug/L | <10.2 | NA |
| p-Dimethylamino azobenzene | ug/L | <10.2 | NA |
| Pentachlorobenzene | ug/L | <10.2 | NA |
| Pentachloronitrobenzene | ug/L | <10.2 | NA |
| Pentachlorophenol | ug/L | <10.2 | NA |
| Phenacetin | ug/L | <10.2 | NA |
| Phenanthrene | ug/L | <10.2 | NA |
| Phenol | ug/L | <10.2 | NA |

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix II SVOCs (continued)** | | | |
| Phorate | ug/L | <10.2 | NA |
| Pronamide | ug/L | <10.2 | NA |
| Pyrene | ug/L | <10.2 | NA |
| Safrole | ug/L | <10.2 | NA |
| Thionazin | ug/L | <10.2 | NA |
| **RCRA Appendix II Pesticides** | | | |
| 4,4'-DDD | ug/L | <0.0327 | NA |
| 4,4'-DDE | ug/L | <0.0327 | NA |
| 4,4'-DDT | ug/L | <0.0327 | NA |
| Aldrin | ug/L | <0.0327 | NA |
| alpha-BHC | ug/L | <0.0327 | NA |
| beta-BHC | ug/L | <0.0327 | NA |
| Chlordane (technical) | ug/L | <2.04 | NA |
| delta-BHC | ug/L | <0.0327 | NA |
| Dieldrin | ug/L | <0.0327 | NA |
| Endosulfan I | ug/L | <0.0327 | NA |
| Endosulfan II | ug/L | <0.0327 | NA |
| Endosulfan sulfate | ug/L | <0.0327 | NA |
| Endrin | ug/L | <0.0327 | NA |
| Endrin aldehyde | ug/L | <0.0327 | NA |
| gamma-BHC (Lindane) | ug/L | <0.0327 | NA |
| Heptachlor | ug/L | <0.0327 | NA |
| Heptachlor epoxide | ug/L | <0.0327 | NA |
| Methoxychlor | ug/L | <0.0327 | NA |
| Toxaphene | ug/L | <2.04 | NA |
| **RCRA Appendix II PCBs** | | | |
| PCB-1016 | ug/L | <0.816 | NA |
| PCB-1221 | ug/L | <0.816 | NA |
| PCB-1232 | ug/L | <0.816 | NA |
| PCB-1242 | ug/L | <0.816 | NA |
| PCB-1248 | ug/L | <0.816 | NA |
| PCB-1254 | ug/L | <0.816 | NA |
| PCB-1260 | ug/L | <0.816 | NA |

mg/l - milligram per liter

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-6 (Continued)**
**Laboratory Analytical Summary - Assessment Monitoring**
**Sioux Falls Regional Sanitary Landfill**
**First Half 2019**

| Parameter | Units | MW-13R 5/15/19 | TB (App II) 5/15/19 |
|---|---|---|---|
| **RCRA Appendix II Herbicides** | | | |
| 2,4-D | ug/L | <5.11 | NA |
| 2,4,5-T | ug/L | <2.05 | NA |
| Silvex (2,4,5-TP) | ug/L | <2.05 | NA |
| **RCRA Appendix II Inorganics** | | | |
| Cyanide, Total | mg/L | <0.0100 | NA |

mg/l - milligram per liter

µg/l - microgram per liter

**50** - detection at or above reporting limit

NA- not analyzed

**Table A-7**
**Laboratory Analytical Summary**
**Sioux Falls Regional Sanitary Landfill**
**Second Half 2019**

| Parameter | Units | MW-11 11/18/19 | MW-13R 11/20/19 | MW-21ox 11/18/19 | MW-23ox 11/18/19 | MW-25ox 11/18/19 | MW-39ox 11/19/19 | MW-42ox 11/19/19 | MW-44ox 11/20/19 | MW-45ox 11/19/19 | MW-47ox 11/19/19 | MW-48ox 11/18/19 | MW-53ox 11/19/19 | MW-54ox 11/19/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganics** | | | | | | | | | | | | | | |
| Alkalinity | mg/L | **258** | **397** | **438** | **350** | **324** | **453** | **371** | **443** | **371** | **417** | **242** | **412** | **500** |
| Ammonia | mg/L | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 |
| Bicarbonate Alkalinity as CaCO3 | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | **500** |
| Biochemical Oxygen Demand (BOD) | mg/L | <3.00 | <3.00 | <3.00 H | <3.00 H | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Carbonate Alkalinity as CaCO3 | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <5.00 | <5.00 |
| Chemical Oxygen Demand (COD) | mg/L | **6.70** | <5.00 | <5.00 | <5.00 | <5.00 | **8.36** | **12.6** | **6.05** | **10.1** | **7.29** | **6.04** | **5.41** | **5.71** |
| Chloride | mg/L | **95.4** | **14.9** | <5.00 | **8.67** | <5.00 | **31.7** | **17.2** | **11.2** | **6.61** | **67.0** | <5.00 | **14.5** | **107** |
| Nitrate+Nitrite | mg/L | **3.61** | **0.328** | <0.100 | **14.2** | <0.100 | <0.100 | **0.602** | **2.46** | <0.100 | <0.100 | <0.100 | **32.7** | <0.100 |
| Nitrogen, Kjeldahl | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.00 | <1.00 |
| Sulfate | mg/L | **2380** | **1500** | **714** | **1880** | **1140** | **1430** | **2510** | **627** | **2400** | **1080** | **1860** | **2210** | **817** |
| Sulfide | mg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Total Dissolved Solids (TDS) | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | **1880** |
| Total Organic Carbon (TOC) | mg/L | **2.13** | **2.44** | **1.63** | **2.19** | **1.84** | **2.59** | **3.39** | **1.50** | **2.17** | **2.81** | **2.09** | **3.35** | **3.14** |
| Total Suspended Solids (TSS) | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | **2.50** |
| **Metals** | | | | | | | | | | | | | | |
| Calcium | mg/L | **504** | **408** | **400** | **363** | **284** | **368** | **487** | **385** | **477** | **389** | **426** | **493** | **294** |
| Iron | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <1.00 | <0.500 | <1.00 | <0.500 | <0.500 | **2.17** | <0.500 |
| Magnesium | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | **154** |
| Manganese | mg/L | **0.0736** | <0.0100 | **0.165** | <0.0100 | <0.0100 | **0.0934** | **0.142** | **1.31** | **0.184** | <0.0100 | <0.0100 | **0.119** | **1.92** |
| Potassium | mg/L | **22.0** | **10.3** | **8.87** | **11.6** | **5.48** | **7.36** | **15.5** | **7.00** | **17.3** | **9.10** | **11.4** | **14.1** | **1.49** |
| Sodium | mg/L | **89.9** | **63.3** | **29.6** | **73.0** | **53.2** | **84.9** | **127** | **23.8** | **113** | **36.2** | **70.2** | **121** | **87.9** |
| Iron, Dissolved | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 |
| Manganese, Dissolved | mg/L | **0.0769** | <0.0100 | **0.110** | <0.0100 | <0.0100 | **0.0462** | **0.0485** | **0.232** | **0.120** | <0.0100 | <0.0100 | <0.0100 | **2.00** |
| **RCRA Appendix I VOCs** | | | | | | | | | | | | | | |
| Acetone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Acrylonitrile | µg/L | <5.00 | <5.00 | <5.00 | <10.0 | <10.0 | <10.0 | <10.0 | <5.00 | <10.0 | <10.0 | <10.0 | <5.00 | <10.0 |
| Benzene | µg/L | <0.500 | <0.500 | <0.500 | <1.00 | <1.00 | <1.00 | <1.00 | <0.500 | <1.00 | <1.00 | <1.00 | <0.500 | <1.00 |
| Bromochloromethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromodichloromethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Bromoform | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromomethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 2-Butanone (MEK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Carbon disulfide | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Carbon tetrachloride | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Chlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

mg/l - milligram per liter

µg/l - microgram per liter

J - estimated

H - sample was prepped or analyzed beyond the specified hold time

**50** - detection at or above reporting limit

Shaded - above concentration listed in ARSD 74:54:01:04 (Table 2)

**Table A-7 (Continued)**
**Laboratory Analytical Summary**
**Sioux Falls Regional Sanitary Landfill**
**Second Half 2019**

| Parameter | Units | MW-11 11/18/19 | MW-13R 11/20/19 | MW-21ox 11/18/19 | MW-23ox 11/18/19 | MW-25ox 11/18/19 | MW-39ox 11/19/19 | MW-42ox 11/19/19 | MW-44ox 11/20/19 | MW-45ox 11/19/19 | MW-47ox 11/19/19 | MW-48ox 11/18/19 | MW-53ox 11/19/19 | MW-54ox 11/19/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RCRA Appendix I VOCs (continued)** | | | | | | | | | | | | | | |
| Chlorodibromomethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Chloroethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| Chloroform | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Chloromethane | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| cis-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| cis-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromo-3-Chloropropane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromoethane (EDB) | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Dibromomethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,4-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| 1,2-Dichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Ethylbenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 2-Hexanone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Iodomethane | µg/L | <10.0 | <10.0 | <10.0 | <100 | <100 | <100 | <100 | <10.0 | <100 | <100 | <100 | <10.0 | <100 |
| Methylene Chloride | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 4-Methyl-2-pentanone (MIBK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| m,p-Xylene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| o-Xylene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Styrene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,1,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <2.00 | <2.00 | <2.00 | <2.00 | <1.00 | <2.00 | <2.00 | <2.00 | <1.00 | <2.00 |
| 1,1,2,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Tetrachloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Toluene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,4-Dichloro-2-butene | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| trans-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,1,1-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichlorofluoromethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 1,2,3-Trichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Vinyl acetate | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Vinyl chloride | µg/L | <1.00 | <1.00 | <1.00 | <2.00 | <2.00 | <2.00 | <2.00 | <1.00 | <2.00 | <2.00 | <2.00 | <1.00 | <2.00 |

µg/l - microgram per liter

**50** - detection at or above reporting limit

**Table A-7 (Continued)**
**Laboratory Analytical Summary**
**Sioux Falls Regional Sanitary Landfill**
**Second Half 2019**

| Parameter | Units | MW-56ox 11/19/19 | MW-57ox 11/19/19 | MW-58Rox 11/20/19 | Duplicate 11/20/19 | MW-59ox 11/19/19 | MW-60ox 11/19/19 | MW-61ox 11/18/19 | TB-1 11/18/19 | TB-2 11/19/19 | TB-3 11/20/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inorganics** | | | | | | | | | | | |
| Alkalinity | mg/L | **386** | **299** | **299** | **304** | **330** | **273** | **299** | N/A | N/A | N/A |
| Ammonia | mg/L | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | N/A | N/A | N/A |
| Biochemical Oxygen Demand (BOD) | mg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | N/A | N/A | N/A |
| Chemical Oxygen Demand (COD) | mg/L | <5.00 | **10.5** | **11.2** | **9.58** | <5.00 | **5.15** | **6.93** | N/A | N/A | N/A |
| Chloride | mg/L | **7.75** | **72.3** | **16.7** | **15.5** | **6.85** | **29.1** | **29.3** | N/A | N/A | N/A |
| Nitrate+Nitrite | mg/L | **2.09** | <0.100 | **0.509** | **0.423** | <0.100 | <0.100 | <0.100 | N/A | N/A | N/A |
| Sulfate | mg/L | **1140** | **1920** | **1200** | **1180** | **1830** | **1970** | **1490** | N/A | N/A | N/A |
| Sulfide | mg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | N/A | N/A | N/A |
| Total Organic Carbon (TOC) | mg/L | **1.49** | **3.29** | **2.87** | **2.76** | **1.84** | **2.23** | **1.69** | N/A | N/A | N/A |
| **Metals** | | | | | | | | | | | |
| Calcium | mg/L | **263** | **517** | **225** | **259** | **513** | **498** | **348** | N/A | N/A | N/A |
| Iron | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | N/A | N/A | N/A |
| Manganese | mg/L | <0.0100 | **0.0100** | **2.08** | **1.63** | **0.890** | **0.301** | **0.0464** | N/A | N/A | N/A |
| Potassium | mg/L | **2.43** | **10.1** | **5.54** | **6.17** | **20.6** | **18.2** | **4.73** | N/A | N/A | N/A |
| Sodium | mg/L | **37.5** | **108** | **71.9** | **81.3** | **80.8** | **111** | **69.2** | N/A | N/A | N/A |
| Iron, Dissolved | mg/L | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | N/A | N/A | N/A |
| Manganese, Dissolved | mg/L | <0.0100 | **0.0122** | **1.36** | **1.17** | **0.864** | **0.392** | <0.0100 | N/A | N/A | N/A |
| **RCRA Appendix I VOCs** | | | | | | | | | | | |
| Acetone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Acrylonitrile | µg/L | <10.0 | <10.0 | <5.00 | <5.00 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <5.00 |
| Benzene | µg/L | <1.00 | <1.00 | <0.500 | <0.500 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <0.500 |
| Bromochloromethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromodichloromethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Bromoform | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Bromomethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 2-Butanone (MEK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Carbon disulfide | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Carbon tetrachloride | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Chlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |

mg/l - milligram per liter

µg/l - microgram per liter

J - estimated

**50** - detection at or above reporting limit

TB - Trip Blank

Duplicate taken from MW-58Rox

Shaded - above concentration listed in ARSD 74:54:01:04 (Table 2)

**Table A-7 (Continued)**
**Laboratory Analytical Summary**
**Sioux Falls Regional Sanitary Landfill**
**Second Half 2019**

| Parameter | Units | MW-56ox 11/19/19 | MW-57ox 11/19/19 | MW-58Rox 11/20/19 | Duplicate 11/20/19 | MW-59ox 11/19/19 | MW-60ox 11/19/19 | MW-61ox 11/18/19 | TB-1 11/18/19 | TB-2 11/19/19 | TB-3 11/20/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RCRA Appendix I VOCs (continued)** | | | | | | | | | | | |
| Chlorodibromomethane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| Chloroethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| Chloroform | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| Chloromethane | µg/L | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| cis-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| cis-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromo-3-Chloropropane | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,2-Dibromoethane (EDB) | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Dibromomethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,4-Dichlorobenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,2-Dichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1-Dichloroethene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| 1,2-Dichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Ethylbenzene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 2-Hexanone | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Iodomethane | µg/L | <100 | <100 | <10.0 | <10.0 | <100 | <100 | <100 | <100 | <100 | <10.0 |
| Methylene Chloride | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 4-Methyl-2-pentanone (MIBK) | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| m,p-Xylene | µg/L | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| o-Xylene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Styrene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,1,2-Tetrachloroethane | µg/L | <2.00 | <2.00 | <1.00 | <1.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <1.00 |
| 1,1,2,2-Tetrachloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Tetrachloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Toluene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,4-Dichloro-2-butene | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| trans-1,2-Dichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| trans-1,3-Dichloropropene | µg/L | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 1,1,1-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| 1,1,2-Trichloroethane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichloroethene | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Trichlorofluoromethane | µg/L | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 | <4.00 |
| 1,2,3-Trichloropropane | µg/L | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Vinyl acetate | µg/L | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Vinyl chloride | µg/L | <2.00 | <2.00 | <1.00 | <1.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <1.00 |

µg/l - microgram per liter

**50** - detection at or above reporting limit

TB - Trip Blank

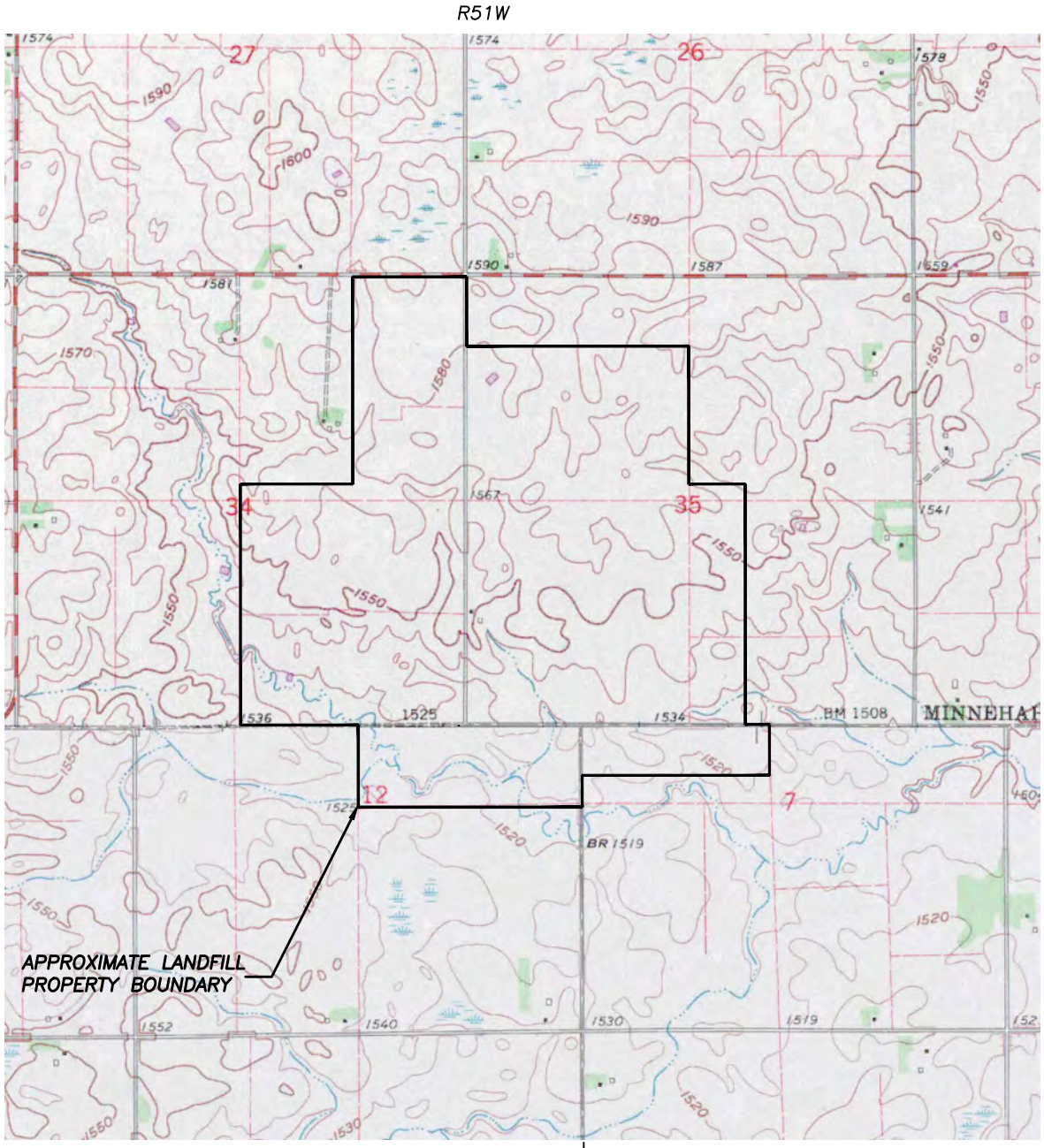
Duplicate taken from MW-58Rox

# Table A-8
# Methane Monitoring Data
# Sioux Falls Regional Sanitary Landfill
# 2019

| Measurement Location | $CH_4$ (% by Vol.) | Bar. Pres. (in Hg) | $CH_4$ (% by Vol.) | Bar. Pres. (in Hg) | $CH_4$ (% by Vol.) | Bar. Pres. (in Hg) | $CH_4$ (% by Vol.) | Bar. Pres. (in Hg) |
|---|---|---|---|---|---|---|---|---|
| **Buildings & Structures** | **March 2019** | | **May 2019** | | **August 2019** | | **November 2019** | |
| Landfill Gas Building (East) | 0.0% | 28.53 | 0.0% | 28.26 | 0.0% | 28.36 | 0.0% | 28.27 |
| Landfill Gas Building (North) | 0.0% | 28.53 | 0.0% | 28.20 | 0.0% | 28.35 | 0.0% | 28.26 |
| Scale House (South) | 0.0% | 28.52 | 0.0% | 28.26 | 0.0% | 28.35 | 0.0% | 28.24 |
| Scale House (North) | 0.0% | 28.51 | 0.0% | 28.26 | 0.0% | 28.35 | 0.0% | 28.24 |
| Public Storage Building (South) | 0.0% | 28.51 | 0.0% | 28.25 | 0.0% | 28.35 | 0.0% | 28.23 |
| Public Storage Building (North) | 0.0% | 28.51 | 0.0% | 28.26 | 0.0% | 28.34 | 0.0% | 28.23 |
| N. Storage Shed | 0.0% | 28.52 | 0.0% | 28.28 | 0.0% | 28.33 | 0.0% | 28.25 |
| Shop Building (NE) | 0.0% | 28.52 | 0.0% | 28.27 | 0.0% | 28.35 | 0.0% | 28.26 |
| Shop Building (S) | 0.0% | 28.53 | 0.0% | 28.27 | 0.0% | 28.36 | 0.0% | 28.25 |
| S. Storage (NW) | 0.0% | 28.54 | 0.0% | 28.29 | 0.0% | 28.35 | 0.0% | 28.26 |
| S. Storage (SW) | 0.0% | 28.54 | 0.0% | 28.28 | 0.0% | 28.35 | 0.0% | 28.26 |
| Leachate Pond Building (Middle) | 0.0% | 28.56 | 0.0% | 28.28 | 0.0% | 28.38 | 0.0% | 28.28 |
| **Monitoring Wells and Piezometers** | | | | | | | | |
| MW-1 | 0.0% | 28.53 | 0.0% | 28.24 | 0.0% | 28.37 | 0.0% | 28.22 |
| MW-5 | 0.0% | 28.55 | 0.0% | 28.29 | 0.0% | 28.38 | 0.0% | 28.28 |
| MW-7R | 0.0% | 28.56 | 0.0% | 28.29 | 0.0% | 28.39 | 0.0% | 28.29 |
| MW-11 | 0.0% | 28.52 | 0.0% | 28.26 | 0.0% | 28.35 | 0.0% | 28.24 |
| MW-13R | 0.0% | 28.55 | 0.0% | 28.28 | 0.0% | 28.38 | 0.0% | 28.27 |
| MW-15 (City) | 0.0% | 28.53 | 0.0% | 28.26 | 0.0% | 28.36 | 0.0% | 28.25 |
| MW-17 | **19.5%** | 28.52 | **15.7%** | 28.22 | 0.4% | 28.35 | 0.0% | 28.21 |
| MW-18R (City) | 0.0% | 28.55 | 0.0% | 28.25 | 0.0% | 28.36 | 0.0% | 28.24 |
| MW-19 | 0.0% | 28.54 | 0.0% | 28.24 | **20.0%** | 28.36 | **20.8%** | 28.23 |
| MW-19i (City) | 0.0% | 28.54 | 0.0% | 28.25 | 0.2% | 28.36 | 0.0% | 28.23 |
| MW-21ox | Not Monitored[1] | | 0.0% | 28.28 | 0.0% | 28.36 | 0.0% | 28.25 |
| MW-23ox | 0.0% | 28.56 | 0.0% | 28.29 | 0.0% | 28.38 | 0.0% | 28.28 |
| MW-25ox | 0.0% | 28.53 | 0.0% | 28.29 | 0.0% | 28.35 | 0.0% | 28.25 |
| MW-39ox | 0.0% | 28.55 | 0.0% | 28.30 | 0.0% | 28.38 | 0.0% | 28.30 |
| MW-42ox | 0.0% | 28.56 | 0.0% | 28.28 | 0.0% | 28.39 | 0.0% | 28.27 |
| MW-43ox (City) | 0.0% | 28.56 | 0.0% | 28.28 | 0.0% | 28.38 | 0.0% | 28.28 |
| MW-44ox | 0.0% | 28.56 | 0.0% | 28.30 | 0.0% | 28.38 | 0.0% | 28.29 |
| MW-45ox | 0.0% | 28.55 | 0.0% | 28.30 | 0.0% | 28.38 | 0.0% | 28.29 |
| MW-46ox | 0.0% | 28.55 | 0.0% | 28.25 | 0.0% | 28.36 | 0.0% | 28.25 |
| MW-47ox | 0.0% | 28.55 | 0.0% | 28.25 | 0.0% | 28.36 | 0.0% | 28.25 |
| MW-48ox | 0.0% | 28.53 | 0.0% | 28.24 | 0.0% | 28.36 | 0.0% | 28.22 |
| MW-53ox | 0.0% | 28.57 | 0.0% | 28.29 | 0.0% | 28.38 | 0.0% | 28.29 |
| MW-54ox | 0.0% | 28.57 | 0.0% | 28.30 | 0.0% | 28.38 | 0.0% | 28.29 |
| MW-56ox | 0.0% | 28.56 | 0.0% | 28.28 | 0.0% | 28.38 | 0.0% | 28.29 |
| MW-57ox | 0.0% | 28.55 | 0.0% | 28.26 | 0.0% | 28.36 | 0.0% | 28.24 |
| MW-58ox | 0.0% | 28.57 | 0.0% | 28.30 | 0.0% | 28.39 | 0.0% | 28.30 |
| MW-59ox | 0.0% | 28.56 | 0.0% | 28.46 | 0.0% | 28.38 | 0.0% | 28.28 |
| MW-60ox | 0.0% | 28.56 | 0.0% | 28.30 | 0.0% | 28.38 | 0.0% | 28.30 |
| MW-61ox | 0.0% | 28.53 | 0.0% | 28.24 | 0.0% | 28.36 | 0.0% | 28.25 |
| P-1S | Not Monitored[1] | | Not Monitored[1] | | 0.0% | 28.37 | Not Monitored[1] | |
| SDGS-28 | 0.0% | 28.52 | 0.0% | 28.27 | 0.0% | 28.36 | 0.0% | 28.26 |
| SDGS-45 | 0.1% | 28.55 | 1.0% | 28.29 | 3.1% | 28.37 | 1.0% | 28.27 |
| SDGS-57 | 0.0% | 28.54 | 0.0% | 28.27 | 0.0% | 28.37 | 0.0% | 28.26 |
| SDGS-68 | 0.0% | 28.55 | 0.0% | 28.25 | 0.0% | 28.36 | 0.0% | 28.24 |
| SDGS-77 | 0.0% | 28.56 | 0.0% | 28.25 | 0.0% | 28.36 | 0.0% | 28.24 |

Methane lower explosive level is 5% by Volume; Upper explosive level is 15% by Volume

[1]Not monitored due to standing water.




# SCS ENGINEERS

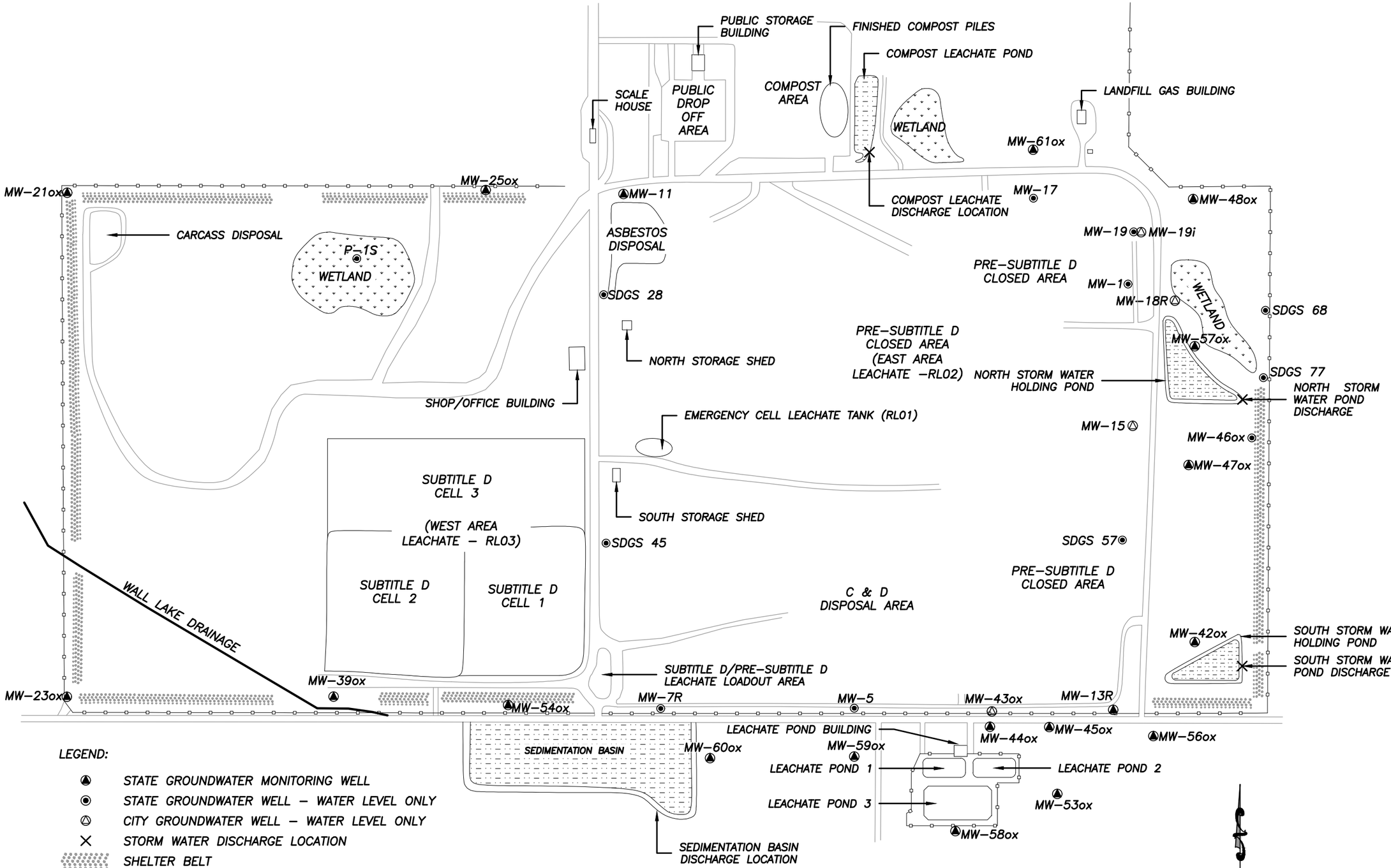
14755 Grover Street
Omaha, Nebraska 68144
PH. (402) 884-6202 eFAX. (913) 681-0012

## SITE LOCATION MAP

**SIOUX FALLS REGIONAL SANITARY LANDFILL**

**SIOUX FALLS, SOUTH DAKOTA**

| | | | |
|---|---|---|---|
| CHK. BY: JDS | DWN. BY: JDS | PROJ. MGR: JDS | PROJ. NO. 27219377.00 |
| SCALE: NTS | DATE: 1/20/20 | CADD FILE: FIG 1_SITE LOCATION MAP.DWG | FIGURE NO. 1 |




LEGEND:

- STATE GROUNDWATER MONITORING WELL
- STATE GROUNDWATER WELL – WATER LEVEL ONLY
- CITY GROUNDWATER WELL – WATER LEVEL ONLY
- STORM WATER DISCHARGE LOCATION
- SHELTER BELT
- FENCE
- ROAD

NOTES:

1. BASE MAP FROM SIOUX FALLS REGIONAL SANITARY LANDFILL COMPREHENSIVE MONITORING PLAN, SEPTEMBER 2011 AND NOVEMBER 2011.
2. LEACHATE POND 3 ADAPTED FROM CELL 3 AND POND 3 CONSTRUCTION PLANS SHEET C-7 DATED NOVEMBER 16, 2012.

REV. | DATE | DESCRIPTION | BY | CK

SHEET TITLE: SITE LAYOUT MAP

PROJECT TITLE: ANNUAL GROUNDWATER MONITORING REPORT

CLIENT: SIOUX FALLS REGIONAL SANITARY LANDFILL
SIOUX FALLS, SOUTH DAKOTA

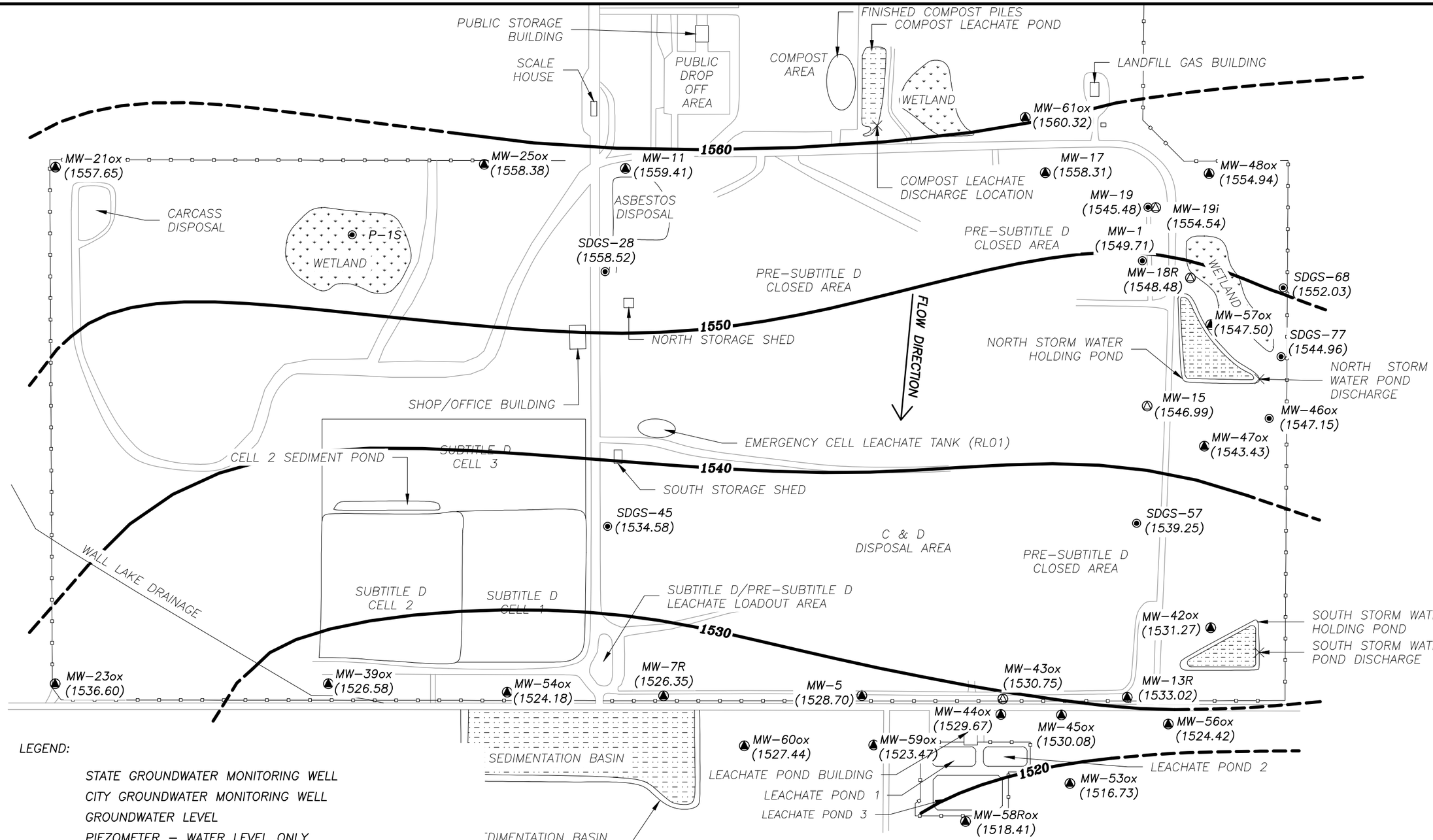
SCS ENGINEERS
14755 Grover Street
Omaha, Nebraska 68144
PH. (402) 884-6202 FAX. (402) 884-6202

| PROJ. NO. | DWN. BY: | CHK. BY: | O/A RVW BY: | PROJ. MGR. |
|---|---|---|---|---|
| 27213377.00 | RLS | JDS | JDS | JDS |
| SCALE: AS NOTED | | | | |

CADD FILE: FIG 2_SITE LAYOUT MAP.DWG

DATE: 1/20/2020

FIGURE NO. 2




LEGEND:

- STATE GROUNDWATER MONITORING WELL
- CITY GROUNDWATER MONITORING WELL
- GROUNDWATER LEVEL
- PIEZOMETER – WATER LEVEL ONLY
- STORM WATER DISCHARGE LOCATION
- FENCE
- ROAD
- GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR
- GROUNDWATER FLOW DIRECTION
- ESTIMATED GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR

NOTES:

1. BASE MAP FROM SIOUX FALLS REGIONAL SANITARY LANDFILL COMPREHENSIVE MONITORING PLAN, SEPTEMBER 2011 AND NOVEMBER 2011.
2. LEACHATE POND 3 ADAPTED FROM CELL 3 AND POND 3 CONSTRUCTION PLANS SHEET C-7 DATED NOVEMBER 16, 2012.
3. GROUNDWATER POTENTIOMETIC SURFACE CONTOURS ARE BASED ON INTERPOLATION BETWEEN GROUNDWATER ELEVATIONS AT MONITORING WELLS AND PIEZOMETERS. ACTUAL CONDITIONS MAY VARY.
4. P-1S WAS INACCESSIBLE DURING SAMPLING EVENT AND WAS NOT MONITORED.

| REV. | DATE | CK. BY |
|---|---|---|
| 1 | - | - |
| 2 | - | - |
| 3 | - | - |
| 4 | - | - |
| 5 | - | - |
| 6 | - | - |

SHEET TITLE
**PIEZOMETRIC SURFACE CONTOUR MAP - MAY 2019**

PROJECT TITLE
**ANNUAL GROUNDWATER MONITORING REPORT**

CLIENT
**SIOUX FALLS REGIONAL SANITARY LANDFILL**
SIOUX FALLS, SOUTH DAKOTA


**SCS ENGINEERS**
14755 Grover Street
Omaha, NE 68144
PH. (402) 884-6202 FAX: (402) 884-6203

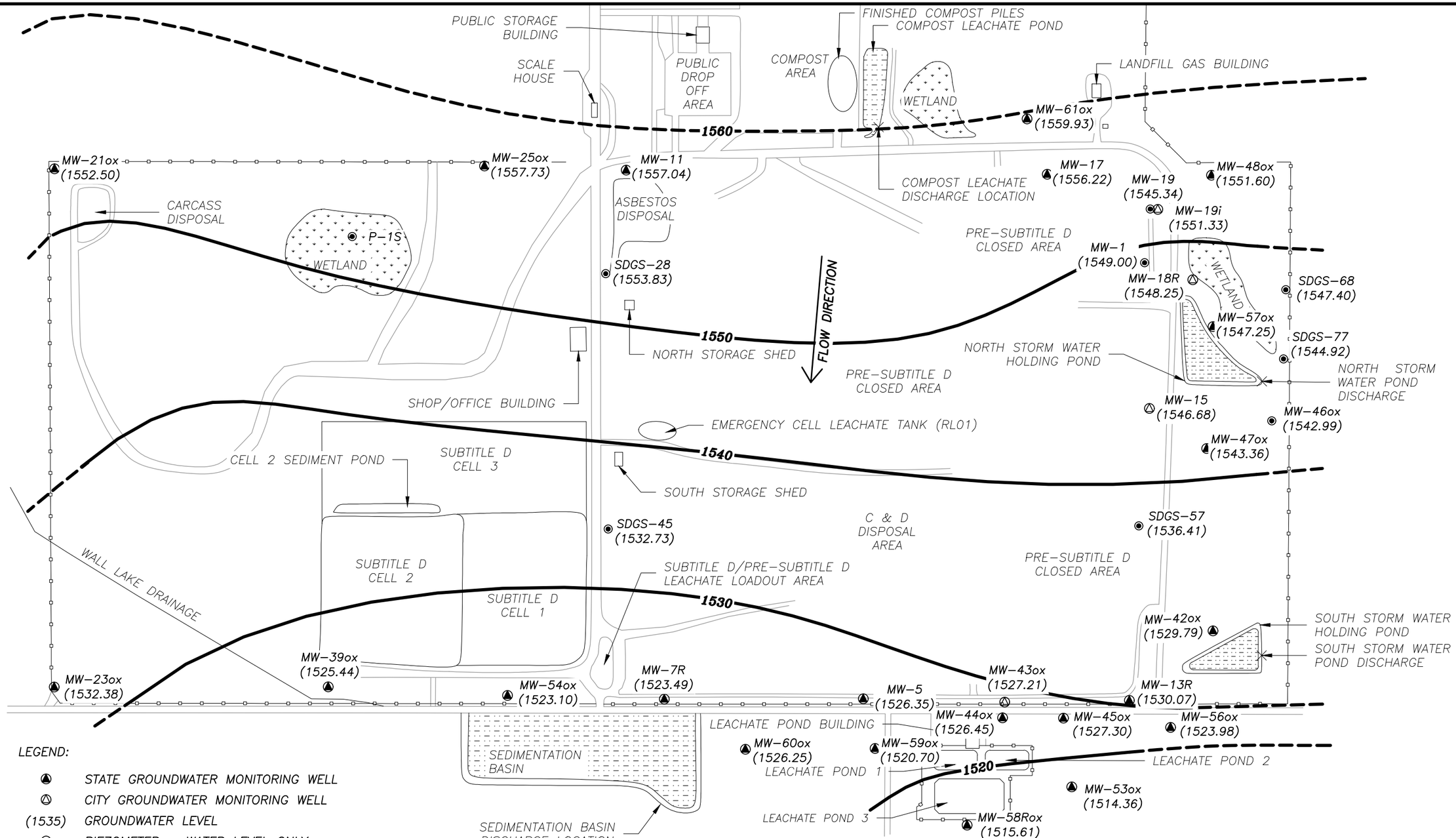

| PROJ. NO. | DSN. BY: | DWN. BY: | CHK. BY: | G/A RVW BY: | PROJ. MGR |
|---|---|---|---|---|---|
| 27219337.00 | ZEM | ZEM | CGJ | JDS | JDS |

CADD FILE: FIG 3_MAY-2019 MAP.DWG

DATE: 1/22/2020

FIGURE NO.
**3**

T:\27219377.00\Data and Calculations\DENR Annual Report (2019)\DWG\FIG 3_MAY-2019 MAP.dwg Jan 22, 2020 - 11:05am Layout Name: FIG 3 By: 4277zem




LEGEND:

- STATE GROUNDWATER MONITORING WELL
- CITY GROUNDWATER MONITORING WELL
- (1535) GROUNDWATER LEVEL
- PIEZOMETER – WATER LEVEL ONLY
- STORM WATER DISCHARGE LOCATION
- FENCE
- ROAD
- 1535 GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR
- GROUNDWATER FLOW DIRECTION
- ESTIMATED GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR

500 0 500 1000

SCALE FEET

NOTES:

1. BASE MAP FROM SIOUX FALLS REGIONAL SANITARY LANDFILL COMPREHENSIVE MONITORING PLAN, SEPTEMBER 2011 AND NOVEMBER 2011.
2. LEACHATE POND 3 ADAPTED FROM CELL 3 AND POND 3 CONSTRUCTION PLANS SHEET C-7 DATED NOVEMBER 16, 2012.
3. GROUNDWATER POTENTIOMETIC SURFACE CONTOURS ARE BASED ON INTERPOLATION BETWEEN GROUNDWATER ELEVATIONS AT MONITORING WELLS AND PIEZOMETERS. ACTUAL CONDITIONS MAY VARY.
4. P-1S WAS INACCESSIBLE DURING SAMPLING EVENT AND WAS NOT MONITORED.

| REV. | DATE | CK. BY |
|---|---|---|
| 1 | - | - |
| 2 | - | - |
| 3 | - | - |
| 4 | - | - |
| 5 | - | - |
| 6 | - | - |

SHEET TITLE
**PIEZOMETRIC SURFACE CONTOUR MAP - NOVEMBER 2019**

PROJECT TITLE
**ANNUAL GROUNDWATER MONITORING REPORT**

CLIENT
**SIOUX FALLS REGIONAL SANITARY LANDFILL**
SIOUX FALLS, SOUTH DAKOTA


**SCS ENGINEERS**
14755 Grover Street
Omaha, NE 68144
PH. (402) 884-8202 FAX. (402) 884-6203


| PROJ. NO. | DSN. BY: | CHK. BY: | QA/A R/W BY: | PROJ. MGR |
|---|---|---|---|---|
| 27219377.00 | ZEM | CGJ | JDS | JDS |
| DSN. BY: ZEM | | | | |

CADD FILE:
FIG 4_NOV-2019 MAP.DWG

DATE:
1/22/2020

FIGURE NO.
**4**

T:\27219377.00\Data and Calculations\DENR Annual Report (2019)\DWG\FIG 4_NOV-2019 MAP.dwg Jan 22, 2020 - 11:05am Layout Name: FIG 4 By: 4277zem

# Appendix B

## Field Data Sheets

(Refer to the enclosed CD)

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-11
**Date(s):** 5.13.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 68 °F (Mean) Wind Direction: N (S) (E) W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: None
Casing: Ground
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19 / 14:28
Total Depth: 37.12 feet below TOC
Static Water Level: 9.34 feet below TOC
TD - SWL: 27.78 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 27.78 x 10 = 277.8 Min Purge Volume: 300 mL
Initial Parameter Readings: Temp (°C) 20.36 pH 8.23 ORP 112
Sp. Cond. 2.90 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 14:35 | 400 | 200 | 18.84 | 7.95 | 115 | 3.00 | 0.0 | 0.00 | 10.24 |
| 14:38 | 1000 | 200 | 16.72 | 7.78 | 111 | 3.14 | 0.0 | 0.00 | 10.58 |
| 14:41 | 1600 | 200 | 15.02 | 7.71 | 104 | 3.26 | 0.0 | 0.00 | 10.85 |
| 14:44 | 2200 | 200 | 14.59 | 7.69 | 99 | 3.32 | 0.0 | 0.00 | 11.05 |
| 14:47 | 2800 | 200 | 14.23 | 7.65 | 94 | 3.34 | 0.0 | 0.00 | 11.17 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.13.19 / 14.47
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 14.23 pH 7.65 ORP 94
Sp. Cond. 3.34 Turbidity 0.00 DO 0.00
Water Level 11.17 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-13R
**Date(s):** 5.15.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 65 °F (Mean) Wind Direction: N S (E) W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.15.19 / 10:25
Total Depth: 27.88 feet below TOC
Static Water Level: 4.35 feet below TOC
TD - SWL: 23.53 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.15.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 23.53 x 10 = 235.3 Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 13.59 pH 8.04 ORP 201
Sp. Cond. 2.59 Turbidity 0.0 DO 0.00
Physical appearance of purge water: B. Clear with black specks

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1032 | 500 | 200 | 11.75 | 7.80 | 209 | 2.69 | 0.0 | 0.00 | 5.98 |
| 1035 | 1100 | 200 | 11.20 | 7.62 | 215 | 2.71 | 0.0 | 0.00 | 6.85 |
| 1038 | 1700 | 200 | 11.20 | 7.53 | 217 | 2.71 | 0.0 | 0.00 | 7.62 |
| 1041 | 2300 | 200 | 11.23 | 7.47 | 217 | 2.70 | 0.0 | 0.00 | 8.46 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.15.19 / 1041
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 11.23 pH 7.47 ORP 2.70
Sp. Cond. 2.70 Turbidity 0.0 DO 0.00
Water Level 8.46 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
Sampled for appendix II parameters

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00

**Monitoring Point:** MW-21ox
**Date(s):** 5.13.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 61 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Buried
Casing: Good
Protective Casing: ↓
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | ✓ | |
| Well | | ✓ |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19 / 12:44
Total Depth: 20.00 feet below TOC
Static Water Level: 3.58 feet below TOC
TD - SWL: 17.42 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 17.42 x 10 = 174.2 Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 15.31 pH 8.34 ORP 407
Sp. Cond. 2.84 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 12:50 | 300 | 200 | 10.05 | 8.15 | -110 | 3.04 | 0.0 | 0.00 | 4.54 |
| 12:53 | 900 | 200 | 10.54 | 7.88 | -88 | 3.06 | 0.0 | 0.00 | 5.05 |
| 12:56 | 1500 | 200 | 10.42 | 7.79 | -81 | 2.90 | 0.0 | 0.00 | 5.52 |
| 12:59 | 2100 | 200 | 10.13 | 7.75 | -77 | 2.82 | 0.0 | 0.00 | 5.89 |
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**Sampling Activities**
Sampled By: D Tangeman Sample Date/Time: 5.13.19 / 12:59
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 10.13 pH 7.75 ORP -77
Sp. Cond. 2.82 Turbidity 0.0 DO 0.00
Water Level 5.89 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00

**Monitoring Point:** MW-230x
**Date(s):** 5.13.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tangeman — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 61 °F (Mean) — Wind Direction: (N) S E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Buried
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19 / 11:12
Total Depth: 22.41 feet below TOC
Static Water Level: 4.96 feet below TOC
TD - SWL: 17.45 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman — Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 17.45 x 10 = 174.5 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 13.24 — pH 8.72 — ORP 158
Sp. Cond. 3.52 — Turbidity 0.0 — DO 0.24
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| | | to.5 | 0.2 | 10 | 10% | | | 10% | |
| 11:19 | 300 | 200 | 10.64 | 8.32 | 153 | 3.58 | 0.0 | 0.00 | 5.58 |
| 11:22 | 900 | 200 | 10.03 | 8.07 | 151 | 3.57 | 0.0 | 0.00 | 5.70 |
| 11:25 | 1500 | 200 | 9.94 | 7.94 | 149 | 3.50 | 0.0 | 0.00 | 5.75 |
| 11:28 | 2100 | 200 | 9.89 | 7.89 | 144 | 3.53 | 0.0 | 0.00 | 5.79 |
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**Sampling Activities**
Sampled By: D. Tangeman — Sample Date/Time: 5.13.19 / 11:28
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 9.89 — pH 7.89 — ORP 144
Sp. Cond. 3.53 — Turbidity 0.00 — DO 0.00
Water Level 5.79 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-25ox
**Date(s):** 5.13.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 67 °F (Mean) Wind Direction: N (S) E (W) (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Buried
Casing: Good
Protective Casing: —
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19/13:37
Total Depth: 28.65 feet below TOC
Static Water Level: 5.87 feet below TOC
TD - SWL: 22.78 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 22.78 x 10 = 227.8 Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 12.39 pH 8.36 ORP 53
Sp. Cond. 2.07 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 13:45 | 400 | 200 | 11.28 | 8.17 | 53 | 2.08 | 0.0 | 0.00 | 6.86 |
| 13:48 | 1000 | 200 | 10.96 | 7.97 | 50 | 2.08 | 0.0 | 0.00 | 7.26 |
| 13:51 | 1600 | 200 | 10.83 | 7.91 | 50 | 2.07 | 0.0 | 0.00 | 7.56 |
| 13:54 | 2200 | 200 | 10.80 | 7.87 | 51 | 2.08 | 0.0 | 0.00 | 7.85 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.13.19/13:54
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 10.80 pH 7.87 ORP 51
Sp. Cond. 2.08 Turbidity 0.0 DO 0.00
Water Level 7.85 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-39dc
**Date(s):** 5/14/19

**Field Team Members**
Name: B Stephens Affiliation: SCS Engineers
Name: D. Tomczak Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 74 °F (Mean) Wind Direction: N S E W (circle two if needed)
Precipitation: None Light Heavy Sky: Cloudy Sunny Partly

**Well Observations**
Well Pad: None
Casing: Steel
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5/14/19 / 12:05
Total Depth: 15.00 feet below TOC
Static Water Level: 1.92 feet below TOC
TD - SWL: 13.08 water column (ft.)

**Purging Activities**
Purged By: D. Tomczak Purge Date: 5/14/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Well Diameter: 1-inch 2-inch 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 13.08 x 4 = 52.3 Min Purge Volume: 150 mL
Initial Parameter Readings: Temp (°C) 23.85 pH 8.59 ORP 118
Sp. Cond. 1.98 Turbidity 6.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 12:17 | 400 | 200 | 23.62 | 8.11 | 74 | 1.94 | 0.0 | 0.00 | 1.95 |
| 12:20 | 1000 | 200 | 23.08 | 7.90 | 55 | 1.93 | 0.0 | 0.00 | 1.95 |
| 12:23 | 1600 | 200 | 22.31 | 7.83 | 47 | 1.94 | 0.0 | 0.00 | 1.95 |
| 12:26 | 2200 | 200 | 21.88 | 7.80 | 42 | 1.97 | 0.0 | 0.00 | 1.96 |
| 12:29 | 2800 | 200 | 21.48 | 7.77 | 37 | 1.96 | 0.0 | 0.00 | 1.94 |
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**Sampling Activities**
Sampled By: D. Tomczak Sample Date/Time: 5/14/19 / 12:29
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Sample Parameters: Temp (°C) 21.48 pH 7.77 ORP 37
Sp. Cond. 1.96 Turbidity 0.0 DO 0.00
Water Level 1.94 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-420A
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 68 °F (Mean) Wind Direction: N S E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Buried
Casing: Covered
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19/10:24
Total Depth: 22.26 feet below TOC
Static Water Level: 2.82 feet below TOC
TD - SWL: 19.44 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 19.44 x 10 = 194.4 Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 18.27 pH 8.05 ORP 155
Sp. Cond. 3.23 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 10:27 | 300 | 200 | 18.15 | 7.88 | 128 | 3.28 | 0.0 | 0.00 | 3.61 |
| 10:30 | 900 | 200 | 15.96 | 7.70 | 120 | 3.36 | 0.0 | 0.00 | 3.96 |
| 10:33 | 1500 | 200 | 16.05 | 7.71 | 114 | 3.28 | 0.0 | 0.00 | 4.025 |
| 10:36 | 2100 | 200 | 15.71 | 7.72 | 112 | 3.28 | 0.0 | 0.00 | 4.16 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.14.19 / 10:36
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 15.71 pH 7.72 ORP 112
Sp. Cond. 3.28 Turbidity 0.0 DO 0.00
Water Level 4.16 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00

**Monitoring Point:** MW-44 DR
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tangeman — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 76 °F (Mean) — Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing: ↓
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19 / 15:22
Total Depth: 22.60 feet below TOC
Static Water Level: 3.42 feet below TOC
TD - SWL: 19.18 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman — Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 19.18 x 10 = 191.8 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 22.77 — pH 8.20 — ORP 98
Sp. Cond. 2.21 — Turbidity 0.0 — DO 0.14
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 15:32 | 400 | 200 | 20.23 | 7.86 | 87 | 2.33 | 0.0 | 0.00 | 3.61 |
| 15:35 | 1000 | 200 | 16.60 | 7.68 | 81 | 2.44 | 0.0 | 0.00 | 3.61 |
| 15:38 | 1600 | 200 | 15.01 | 7.59 | 71 | 2.56 | 0.0 | 0.00 | 3.63 |
| 15:41 | 2200 | 200 | 14.67 | 7.57 | 68 | 2.46 | 0.0 | 0.00 | 3.63 |
| 15:44 | 2800 | 200 | 14.22 | 7.52 | 74 | 2.39 | 0.0 | 0.00 | 3.64 |
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**Sampling Activities**
Sampled By: D. Tangeman — Sample Date/Time: 5.14.19 / 15:44
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 14.22 — pH 7.52 — ORP 74
Sp. Cond. 2.39 — Turbidity 0.0 — DO 0.00
Water Level 3.64 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-45a
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 77 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy Sunny (Partly)

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing: ↓
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19/16:07
Total Depth: 28.28 feet below TOC
Static Water Level: 5.44 feet below TOC
TD - SWL: 22.84 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 22.84 x 10 = 228.4 Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 20.66 pH 7.95 ORP 21
Sp. Cond. 2.94 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 16:14 | 500 | 100 | 19.33 | 7.76 | 13 | 2.96 | 0.0 | 0.00 | 6.24 |
| 16:17 | 1100 | 100 | 16.22 | 7.60 | 39 | 3.16 | 0.0 | 0.00 | 6.42 |
| 16:20 | 1700 | 200 | 16.14 | 7.53 | 55 | 3.18 | 0.0 | 0.00 | 6.51 |
| 16:23 | 2300 | 200 | 14.47 | 7.51 | 62 | 3.15 | 0.0 | 0.00 | 6.56 |
| 16:26 | 2900 | 200 | 14.27 | 7.48 | 67 | 3.10 | 0.0 | 0.00 | 6.60 |
| 16:29 | 3500 | 200 | 14.14 | 7.45 | 71 | 3.09 | 0.0 | 0.00 | 6.62 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.14.19 / 16:29
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 14.14 pH 7.45 ORP 71
Sp. Cond. 3.09 Turbidity 0.0 DO 0.00
Water Level 6.62 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-47 (D)
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tenneson — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 63 °F (Mean) — Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Gravel settling/cracked around well pad
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19 / 9:32
Total Depth: 20.89 feet below TOC
Static Water Level: 3.65 feet below TOC
TD - SWL: 17.24 water column (ft.)

**Purging Activities**
Purged By: D. Tenneson — Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 17.24 x 10 = 172.4 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 18.31 — pH 8.51 — ORP 212
Sp. Cond. 2.37 — Turbidity 0.0 — DO 0.06
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 9:37 | 300 | 200 | 16.24 | 8.01 | 212 | 2.38 | 0.0 | 0.00 | 3.73 |
| 9:40 | 900 | 200 | 14.76 | 7.78 | 212 | 2.42 | 0.0 | 0.00 | 3.73 |
| 9:43 | 1500 | 200 | 13.50 | 7.70 | 209 | 2.51 | 0.0 | 0.00 | 3.73 |
| 9:46 | 2100 | 200 | 13.15 | 7.64 | 209 | 2.55 | 0.0 | 0.00 | 3.73 |
| 9:49 | 2700 | 200 | 12.80 | 7.62 | 201 | 2.58 | 0.0 | 0.00 | 3.73 |
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**Sampling Activities**
Sampled By: D. Tenneson — Sample Date/Time: 5.14.19 / 9:49
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 12.80 — pH 7.62 — ORP 201
Sp. Cond. 2.58 — Turbidity 0.0 — DO 0.00
Water Level 3.73 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-48 on
**Date(s):** 5.13.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tangeman — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 66 °F (Mean) — Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19 / 16:08
Total Depth: 28.66 feet below TOC
Static Water Level: 6.59 feet below TOC
TD - SWL: 22.07 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman — Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 22.07 x 10 = 220.7 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 17.19 — pH 8.42 — ORP 147
Sp. Cond. 2.64 — Turbidity 0.0 — DO 1.72
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1614 | 400 | 200 | 11.38 | 8.10 | 155 | 2.81 | 0.0 | 0.70 | 7.90 |
| 1617 | 1000 | 200 | 10.97 | 7.88 | 160 | 2.83 | 0.0 | 0.33 | 8.49 |
| 1620 | 1600 | 200 | 10.89 | 7.81 | 160 | 2.82 | 0.0 | 0.51 | 9.26 |
| 1623 | 2200 | 200 | 10.81 | 7.77 | 159 | 2.81 | 0.0 | 0.51 | 9.93 |
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**Sampling Activities**
Sampled By: D. Tangeman — Sample Date/Time: 5.13.19 / 16:23
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 10.81 — pH 7.77 — ORP 159
Sp. Cond. 2.81 — Turbidity 0.0 — DO 0.51
Water Level 9.93 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00

**Monitoring Point:** MW-53ox
**Date(s):** 5.15.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tangeman — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 57 °F (Mean) — Wind Direction: (N) S (E) W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: None
Casing: Dwgd
Protective Casing: ↓
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | 2 |

**Groundwater Level Measurements**
Date/Time Measured: 5.15.19 / 0859
Total Depth: 24.45 feet below TOC
Static Water Level: 15.18 feet below TOC
TD - SWL: 9.27 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman — Purge Date: 5.15.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 9.27 x 10 = 92.7 — Min Purge Volume: 100 mL
Initial Parameter Readings: Temp (°C) 13.62 — pH 8.07 — ORP 224
Sp. Cond. 2.54 — Turbidity 0.0 — DO 10.16
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 905 | 200 | 200 | 11.39 | 7.96 | 227 | 2.59 | 0.0 | 9.89 | 15.54 |
| 908 | 800 | 200 | 11.32 | 7.89 | 230 | 2.56 | 0.0 | 9.36 | 15.69 |
| 911 | 1400 | 200 | 11.26 | 7.87 | 231 | 2.49 | 0.0 | 9.37 | 15.84 |
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**Sampling Activities**
Sampled By: D. Tangeman — Sample Date/Time: 5.15.19 / 0911
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 11.26 — pH 7.87 — ORP 231
Sp. Cond. 2.49 — Turbidity 0.0 — DO 9.37
Water Level 15.84 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-54R
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tenyenon Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 77 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Non
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19/12:55
Total Depth: 17.80 feet below TOC
Static Water Level: 2.53 feet below TOC
TD - SWL: 15.27 water column (ft.)

**Purging Activities**
Purged By: D. Tenyenon Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 15.27 x 10 = 152.7 Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 20.62 pH 8.48 ORP 115
Sp. Cond. 1.47 Turbidity 0.0 DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 13:00 | 200 | 200 | 16.08 | 8.06 | 120 | 1.52 | 0.0 | 0.00 | 2.61 |
| 13:03 | 800 | 200 | 13.20 | 7.71 | 124 | 1.59 | 0.0 | 0.00 | 2.61 |
| 13:06 | 1400 | 200 | 11.83 | 7.56 | 123 | 1.62 | 0.0 | 0.00 | 2.61 |
| 13:09 | 2000 | 200 | 11.69 | 7.54 | 112 | 1.62 | 0.0 | 0.00 | 2.61 |
| 13:12 | 2600 | 200 | 11.83 | 7.47 | 119 | 1.67 | 0.0 | 0.00 | 2.61 |
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**Sampling Activities**
Sampled By: D. Tenyenon Sample Date/Time: 5.14.19 / 13:12
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 11.83 pH 7.47 ORP 119
Sp. Cond. 1.67 Turbidity 0.0 DO 0.00
Water Level 2.61 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-56U
**Date(s):** 5.15.19

**Field Team Members**
Name: B. Stephens — Affiliation: SCS Engineers
Name: D. Tamerman — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 58 °F (Mean) — Wind Direction: (N) S (E) W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Adequate
Casing: Capped
Protective Casing: /
Reference Mark/Identification: V

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.15.19 / 8:12
Total Depth: 27.55 feet below TOC
Static Water Level: 3.58 feet below TOC
TD - SWL: 23.97 water column (ft.)

**Purging Activities**
Purged By: D. Tamerman — Purge Date: 5.15.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 23.97 × 10 = 239.7 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 18.68 — pH 8.61 — ORP 203
Sp. Cond. 1.32 — Turbidity 38.0 — DO 2.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 8:18 | 400 | 200 | 18.16 | 8.47 | 210 | 1.31 | 52.7 | 1.28 | 3.70 |
| 8:21 | 1000 | 200 | 16.72 | 8.21 | 216 | 1.40 | 16.5 | 0.89 | 3.73 |
| 8:24 | 1600 | 200 | 15.63 | 8.07 | 220 | 1.46 | 6.3 | 0.78 | 3.73 |
| 8:27 | 2200 | 200 | 15.08 | 7.98 | 223 | 1.51 | 0.0 | 0.68 | 3.73 |
| 8:30 | 2800 | 200 | 14.69 | 7.93 | 224 | 1.55 | 0.0 | 0.70 | 3.73 |
| 8:33 | 3400 | 200 | 14.51 | 7.85 | 227 | 1.61 | 0.0 | 0.70 | 3.73 |
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**Sampling Activities**
Sampled By: D. Tamerman — Sample Date/Time: 5.15.19 / 8:33
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 14.61 — pH 7.85 — ORP 227
Sp. Cond. 1.61 — Turbidity 0.0 — DO 0.70
Water Level 3.73 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-57R
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 62 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Ok
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19 / 8:21
Total Depth: 22.07 feet below TOC
Static Water Level: 3.65 feet below TOC
TD - SWL: 18.42 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 18.42 x 10 = 184.2 Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 12.81 pH 8.61 ORP 217
Sp. Cond. 3.09 Turbidity 0.0 DO 0.41
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 8:27 | 300 | 200 | 9.76 | 8.28 | 222 | 3.26 | 0.0 | 0.00 | 4.24 |
| 8:30 | 900 | 200 | 8.91 | 7.98 | 231 | 3.27 | 0.0 | 0.00 | 5.60 |
| 8:33 | 1500 | 200 | 8.68 | 7.82 | 236 | 3.29 | 0.0 | 0.00 | 6.35 |
| 8:36 | 2100 | 200 | 8.52 | 7.76 | 237 | 3.27 | 0.0 | 0.00 | 7.11 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.14.19 / 8:36
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 8.52 pH 7.76 ORP 237
Sp. Cond. 3.27 Turbidity 0.0 DO 0.00
Water Level 7.11 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
W.L. Dropped outside 10% but all other parameters within purging requirements

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-58R ox
**Date(s):** 5.15.19

**Field Team Members**
Name: D. Tangeman — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 60 °F (Mean) — Wind Direction: N S E W (circle two if needed)
Precipitation: None Light Heavy — Sky: Cloudy Sunny Partly

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing: —
Reference Mark/Identification: —

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.15.19 / 0939
Total Depth: 34.75 feet below TOC
Static Water Level: 4.30 feet below TOC
TD - SWL: 30.45 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman — Purge Date: 5.15.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Well Diameter: 1-inch 2-inch 3-inch 4-inch Other ____ (circle one)
Purge Volume Calculation: 30.45 x 10 = 304.5 — Min Purge Volume: 350 mL
Initial Parameter Readings: Temp (°C) 17.85 — pH 8.36 — ORP 217
Sp. Cond. 1.98 — Turbidity 0.0 — DO 0.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 0944 | 400 | 200 | 17.67 | 8.12 | 219 | 1.99 | 0.0 | 0.00 | 5.57 |
| 0947 | 1000 | 200 | 17.34 | 7.97 | 222 | 2.01 | 0.0 | 0.00 | 5.97 |
| 0950 | 1600 | 200 | 17.01 | 7.90 | 222 | 2.02 | 0.0 | 0.00 | 6.35 |
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**Sampling Activities**
Sampled By: D. Tangeman — Sample Date/Time: 5.15.19 / 0950
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Sample Parameters: Temp (°C) 17.01 — pH 7.90 — ORP 222
Sp. Cond. 2.02 — Turbidity 0.0 — DO 0.00
Water Level 6.35 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

Dup. taken here at 2354

**Electronic Form Completed By:** ____ **Date:** ____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-59 DR
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 79 °F (Mean) Wind Direction: N S E W (circle two if needed)
Precipitation: None Light Heavy Sky: Cloudy Sunny Partly

**Well Observations**
Well Pad: Good
Casing: ✓
Protective Casing: ✓
Reference Mark/Identification: ✓

| Locks | Yes | No |
|---|---|---|
| Protective Casing | ✓ | |
| Well | | ✓ |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19 / 14:35
Total Depth: 41.00 feet below TOC
Static Water Level: 4.75 feet below TOC
TD - SWL: 46.25 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Well Diameter: 1-inch 2-inch 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 46.25 x 10 = 462.5 Min Purge Volume: 500 mL
Initial Parameter Readings: Temp (°C) 12.70 pH 8.24 ORP 166
Sp. Cond. 2.85 Turbidity 0.0 DO 2.00
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 14:42 | 500 | 200 | 11.24 | 7.97 | 174 | 2.89 | 0.0 | 0.00 | 6.51 |
| 14:45 | 1100 | 200 | 11.43 | 7.81 | 178 | 2.89 | 0.0 | 0.00 | 7.00 |
| 14:49 | 1700 | 200 | 10.96 | 7.74 | 178 | 2.88 | 0.0 | 0.00 | 7.61 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.14.19 / 14:48
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Sample Parameters: Temp (°C) 10.96 pH 7.74 ORP 178
Sp. Cond. 2.88 Turbidity 0.0 DO 0.00
Water Level 7.61 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-60dr
**Date(s):** 5.14.19

**Field Team Members**
Name: B. Stephens Affiliation: SCS Engineers
Name: D. Tangeman Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 80 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**

| | | Locks | Yes | No |
|---|---|---|---|---|
| Well Pad | Good | Protective Casing | X | |
| Casing | ✓ | Well | | X |
| Protective Casing | ✓ | | | |
| Reference Mark/Identification | ✓ | | | |

**Groundwater Level Measurements**
Date/Time Measured: 5.14.19 / 13.50
Total Depth: 42.05 feet below TOC
Static Water Level: 4.23 feet below TOC
TD - SWL: 37.82 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.14.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 37.82 x 10 = 378.2 Min Purge Volume: 400 mL
Initial Parameter Readings: Temp (°C) 19.18 pH 8.33 ORP 148
Sp. Cond. 2.64 Turbidity 0.0 DO 0.21
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1400 | 400 | 200 | 17.40 | 8.01 | 154 | 2.67 | 0.0 | 0.00 | 5.75 |
| 1403 | 1000 | 200 | 15.67 | 7.83 | 156 | 2.79 | 0.0 | 0.00 | 6.40 |
| 1406 | 1600 | 200 | 15.27 | 7.76 | 156 | 2.84 | 0.0 | 0.00 | 7.10 |
| 1409 | 2200 | 200 | 15.17 | 7.72 | 155 | 2.79 | 0.0 | 0.00 | 7.75 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.14.19 / 1409
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 15.17 pH 7.72 ORP 155
Sp. Cond. 2.79 Turbidity 0.0 DO 0.00
Water Level 7.75 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Regional Sanitary Landfill
**Project Location:** Sioux Falls, SD
**Project Number:** 27218345.00
**Monitoring Point:** MW-61ox
**Date(s):** 5.13.18

**Field Team Members**
Name: D. Tangeman Affiliation: SCS Engineers
Name: B. Stephens Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 68 °F (Mean) Wind Direction: N (S) E W (circle two if needed)
Precipitation: (None) Light Heavy Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: Good
Casing: PVC casing needs cut down ~0.1'
Protective Casing: Good
Reference Mark/Identification: "

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 5.13.19/15:24
Total Depth: 22.50 feet below TOC
Static Water Level: 3.20 feet below TOC
TD - SWL: 19.30 water column (ft.)

**Purging Activities**
Purged By: D. Tangeman Purge Date: 5.13.19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 19.30 x 10 = 193.0 Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 18.87 pH 8.55 ORP 108
Sp. Cond. 2.31 Turbidity 0.0 DO 0.00
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1530 | 200 | 200 | 18.75 | 8.25 | 97 | 2.30 | 0.0 | 0.00 | 3.55 |
| 1533 | 800 | 200 | 16.42 | 8.03 | 93 | 2.37 | 0.4 | 0.00 | 3.59 |
| 1536 | 1400 | 200 | 14.33 | 7.94 | 91 | 2.50 | 14.5 | 0.00 | 3.61 |
| 1539 | 2000 | 200 | 14.19 | 7.87 | 89 | 2.49 | 14.1 | 0.00 | 3.61 |
| 1542 | 2600 | 200 | 13.99 | 7.83 | 89 | 2.49 | 9.3 | 0.00 | 3.63 |
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**Sampling Activities**
Sampled By: D. Tangeman Sample Date/Time: 5.13.19/15:42
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Sample Parameters: Temp (°C) 13.99 pH 7.83 ORP 89
Sp. Cond. 2.49 Turbidity 9.3 DO 0.00
Water Level 3.63 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
Cut down well casing by 0.1 ft after taking water level & sampling.

**Electronic Form Completed By:** _____ **Date:** _____

Water Level

| Well | Date/Time | W.L. |
|---|---|---|
| MW-17 | 5.13.19/15:09 | 8.89 |
| MW-19 | 5.14.19/8:11 | 12.78 |
| MW-19i | 5.14.19/8:12 | 3.51 |
| MW-1 | 5.14.19/8:14 | 14.83 |
| MW-18R | 5.14.19/8:18 | 2.70 |
| SDGS 68 | 5.14.19/9:10 | 2.97 |
| SDGS 77 | 5.14.19/9:08 | 1.42 |
| MW-46 ox | 5.14.19/9:45 | 4.80 |
| MW-15 | 5.14.19/10:10 | 11.16 |
| SDGS 57 | 5.14.19/10:12 | 8.51 |
| MW-43 ox | 5.14.19/10:59 | 7.77 |
| MW-5 | 5.14.19/11:02 | 5.01 |
| MW-7R | 5.14.19/11:08 | 4.45 |
| SDGS-45 | 5.14.19/11:25 | 13.50 |
| SDGS-28 | 5.14.19/11:29 | 5.00 |

P-15 inaccessible at time of sampling event due to being surrounded by standing water

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-11
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 52 °F (Mean) — Wind Direction: N S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19 / 13:38
Total Depth: 37.12 feet below TOC
Static Water Level: 11.71 feet below TOC
TD - SWL: 25.41 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 25.41 x 10 = 254.1 — Min Purge Volume: 300 mL
Initial Parameter Readings: Temp (°C) 12.31 — pH 7.83 — ORP 34
Sp. Cond. 3.97 — Turbidity 0.0 — DO 1.27
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1342 | 300 | 150 | 12.15 | 7.69 | 39 | 3.99 | 0.0 | 0.65 | 12.56 |
| 1345 | 750 | | 11.96 | 7.62 | 47 | 4.01 | 0.0 | 0.23 | 12.89 |
| 1348 | 1200 | | 11.86 | 7.61 | 54 | 4.01 | 0.0 | 0.05 | 13.21 |
| 1351 | 1650 | | 11.93 | 7.61 | 59 | 4.00 | 0.0 | 0.00 | 13.40 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/18/19 / 1351
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 11.93 — pH 7.61 — ORP 59
Sp. Cond. 4.00 — Turbidity 0.0 — DO 0.00
Water Level 13.40 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-13R
**Date(s):** 11/20/19

**Field Team Members**
Name: J.Worth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 38 °F (Mean) — Wind Direction: N S E W (circle two if needed)
Precipitation: None Light Heavy — Sky: Cloudy Sunny Partly

**Well Observations**

| | Locks | Yes | No |
|---|---|---|---|
| Well Pad: None | Protective Casing | X | |
| Casing: | Well | | X |
| Protective Casing: | | | |
| Reference Mark/Identification: | | | |

**Groundwater Level Measurements**
Date/Time Measured: 11/20/19 / 10:34
Total Depth: 27.88 feet below TOC
Static Water Level: 7.90 feet below TOC
TD - SWL: 20.58 water column (ft.)

**Purging Activities**
Purged By: J.Worth — Purge Date: 11/20/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump (circle one)
Well Diameter: 1-inch 2-inch 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 20.58 x 10 = 205.8 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 9.96 — pH 8.03 — ORP (-21)
Sp. Cond. 3.08 — Turbidity 0.0 — DO 1.71
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 10:39 | 700 | 150 | 10.87 | 7.42 | 54 | 3.15 | 1.9 | 0.84 | 9.11 |
| 10:42 | 750 | 1 | 11.02 | 7.46 | 54 | 3.10 | 1.1 | 0.74 | 9.52 |
| 10:45 | 1200 | | 11.06 | 7.57 | 55 | 3.10 | 1.5 | 0.71 | 9.87 |
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**Sampling Activities**
Sampled By: J.Worth — Sample Date/Time: 11/20/19 / 1045
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump Peristaltic Pump Hand (circle one)
Sample Parameters: Temp (°C) 11.06 — pH 7.57 — ORP 55
Sp. Cond. 3.10 — Turbidity 1.5 — DO 0.71
Water Level 9.87 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-210
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 48 °F (Mean) — Wind Direction: N (S) E (W) (circle two if needed)
Precipitation: None (Light) Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**
Well Pad: OK
Casing: |
Protective Casing: |
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19 / 11:59
Total Depth: 20.00 feet below TOC
Static Water Level: 8.73 feet below TOC
TD - SWL: 11.27 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 11.27 x 10 = 112.7 — Min Purge Volume: 150 mL
Initial Parameter Readings: Temp (°C) 12.70 — pH 7.85 — ORP (-118)
Sp. Cond. 3.38 — Turbidity 0.0 — DO 0.72
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1205 | 200 | 150 | 11.02 | 7.54 | (-118) | 3.57 | 0.0 | 0.50 | 9.12 |
| 1208 | 650 | \| | 10.80 | 7.50 | (-126) | 3.50 | 0.0 | 0.27 | 10.20 |
| 1211 | 1100 | \| | 10.91 | 7.50 | (-120) | 3.36 | 0.0 | 0.18 | 10.71 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/18/19 / 1211
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.91 — pH 7.50 — ORP (-120)
Sp. Cond. 3.36 — Turbidity 0.0 — DO 0.18
Water Level 10.71 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
D.O. outside ±10% or ± 0.2 mg/L, but less than 1.0 mg/L.

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-23 ox
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 45 °F (Mean) — Wind Direction: N (S) E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: (Cloudy) Sunny (Partly)

**Well Observations**
Well Pad: OK
Casing:
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19 / 10:48
Total Depth: 22.41 feet below TOC
Static Water Level: 9.18 feet below TOC
TD - SWL: 13.23 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other ____ (circle one)
Purge Volume Calculation: 13.23 x 10 = 132.3 — Min Purge Volume: 150 mL
Initial Parameter Readings: Temp (°C) 12.14 — pH 7.75 — ORP 108
Sp. Cond. 4.08 — Turbidity 0.0 — DO 0.74
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1056 | 200 | 150 | 11.90 | 7.64 | 112 | 4.10 | 0.0 | 0.64 | 9.71 |
| 1059 | 650 | \| | 11.69 | 7.60 | 118 | 4.10 | 0.0 | 0.39 | 9.79 |
| 1102 | 1100 | \| | 11.76 | 7.60 | 122 | 4.07 | 0.0 | 0.25 | 9.84 |
| 1105 | 1550 | | 11.92 | 7.61 | 123 | 4.00 | 0.0 | 0.22 | 9.86 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/18/19 / 1105
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 11.92 — pH 7.61 — ORP 123
Sp. Cond. 4.00 — Turbidity 0.0 — DO 0.22
Water Level 9.86 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-25 DR
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 50 °F (Mean) — Wind Direction: N S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19 / 1246
Total Depth: 28.65 feet below TOC
Static Water Level: 6.52 feet below TOC
TD - SWL: 22.13 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other ____ (circle one)
Purge Volume Calculation: 22.13 x 10 = 221.3 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 11.19 — pH 8.18 — ORP (-103)
Sp. Cond. 2.34 — Turbidity 0.0 — DO 4.89
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 12:52 | 200 | 150 | 10.88 | 8.07 | (-97) | 2.34 | 0.0 | 5.00 | 7.51 |
| 12:55 | 650 | \| | 10.88 | 8.06 | (-79) | 2.34 | 0.0 | 4.75 | 7.96 |
| 12:58 | 1100 | \| | 10.88 | 8.04 | (-66) | 2.33 | 0.0 | 4.69 | 8.35 |
| 13:02 | 1550 | \| | 10.97 | 8.03 | (-69) | 2.33 | 0.0 | 4.30 | 8.74 |
| 13:05 | 2000 | \| | 11.08 | 8.01 | (-68) | 2.32 | 0.0 | 4.09 | 8.96 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/18/19 / 13:05
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 11.08 — pH 8.01 — ORP (-68)
Sp. Cond. 2.32 — Turbidity 0.0 — DO 4.09
Water Level 8.96 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

MW-3908

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00

**Monitoring Point:** MW-3908
**Date(s):** 11/19/19

**Field Team Members**

Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**

Mean Temp: 45 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**

Date/Time Measured: 11/19/19 / 1216
Total Depth: 15.00 feet below TOC
Static Water Level: 3.06 feet below TOC
TD - SWL: 11.94 water column (ft.)

**Purging Activities**

Purged By: J. Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 11.94 x 10 = 119.4 — Min Purge Volume: 150 mL
Initial Parameter Readings: Temp (°C) 10.03 — pH 7.79 — ORP (-103)
Sp. Cond. 2.98 — Turbidity 99.4 — DO 1.11
Physical appearance of purge water: Cloudy

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 12:21 | 200 | 150 | 10.02 | 7.58 | (-99) | 3.01 | 44.8 | 0.60 | 3.10 |
| 12:24 | 650 | | 10.11 | 7.55 | (-79) | 3.02 | 21.4 | 0.29 | 3.13 |
| 12:27 | 1100 | | 10.19 | 7.51 | (-59) | 3.01 | 0.0 | 0.08 | 3.15 |
| 12:30 | 1550 | | 10.22 | 7.49 | (-48) | 3.01 | 0.0 | 0.00 | 3.17 |
| 12:33 | 2000 | | 10.17 | 7.47 | (-35) | 3.01 | 0.0 | 0.00 | 3.20 |
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**Sampling Activities**

Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 1233
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.17 — pH 7.47 — ORP (-35)
Sp. Cond. 3.01 — Turbidity 0.0 — DO 0.00
Water Level 3.20 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
ORP outside ±10 MV; All other parameters stabilized.

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-420
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 38 °F (Mean) — Wind Direction: (N) S E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 10:38
Total Depth: 22.26 feet below TOC
Static Water Level: 4.30 feet below TOC
TD - SWL: 17.96 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 17.96 x 10 = 179.6 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 7.41 — pH 7.91 — ORP (-31)
Sp. Cond. 5.16 — Turbidity 7.2 — DO 0.87
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 10:40 | 200 | 150 | 7.22 | 7.73 | (-58) | 5.05 | 7.2 | 0.63 | 4.97 |
| 10:43 | 650 | \| | 8.06 | 7.55 | (-68) | 4.95 | 9.6 | 0.05 | 5.31 |
| 10:46 | 1100 | \| | 8.94 | 7.54 | (-69) | 4.81 | 7.4 | 0.00 | 5.59 |
| 10:49 | 1550 | \| | 9.24 | 7.54 | (-52) | 4.76 | 3.6 | 0.00 | 5.69 |
| 10:52 | 2000 | \| | 9.39 | 7.55 | (-44) | 4.72 | 0.0 | 0.00 | 5.78 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 1052
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 9.39 — pH 7.55 — ORP (-44)
Sp. Cond. 4.72 — Turbidity 0.0 — DO 0.00
Water Level 5.78 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
ORP outside ±10 MV; all other parameters stabilized

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00

**Monitoring Point:** MW-446X
**Date(s):** 11/20/19

**Field Team Members**
Name: T. Wurtz — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 37 °F (Mean) — Wind Direction: N S (E) W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) (Partly)

**Well Observations**
Well Pad: None
Casing: OK
Protective Casing: _____
Reference Mark/Identification: _____

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/20/19 / 0802
Total Depth: 22.10 feet below TOC
Static Water Level: 6.64 feet below TOC
TD - SWL: 15.96 water column (ft.)

**Purging Activities**
Purged By: T. Wurtz — Purge Date: 11/20/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 15.96 x 10 = 159.6 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 12.14 — pH 8.22 — ORP (-65)
Sp. Cond. 3.01 — Turbidity 0.0 — DO 0.98
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 0807 | 200 | 150 | 10.85 | 7.65 | (-89) | 3.24 | 0.0 | 0.60 | 6.84 |
| 0810 | 650 | \| | 10.27 | 7.49 | (-84) | 3.27 | 0.0 | 0.25 | 6.87 |
| 0813 | 1100 | \| | 10.17 | 7.47 | (-76) | 3.21 | 0.0 | 0.07 | 6.88 |
| 0816 | 1550 | \| | 10.03 | 7.47 | (-71) | 3.12 | 0.0 | 0.00 | 6.90 |
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**Sampling Activities**
Sampled By: T. Wurtz — Sample Date/Time: 11/20/19 / 0816
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.03 — pH 7.47 — ORP (-71)
Sp. Cond. 3.12 — Turbidity 0.0 — DO 0.00
Water Level 6.90 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-450x
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 47 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 1613
Total Depth: 28.28 feet below TOC
Static Water Level: 8.22 feet below TOC
TD - SWL: 20.06 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 20.06 x 10 = 200.6 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 11.31 — pH 7.79 — ORP (-115)
Sp. Cond. 4.70 — Turbidity 0.0 — DO 0.78
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1619 | 300 | 150 | 11.13 | 7.59 | (-101) | 4.97 | 0.0 | 0.00 | 8.37 |
| 1622 | 750 | | 10.57 | 7.53 | (-92) | 4.94 | 0.0 | 0.00 | 8.49 |
| 1625 | 1200 | | 10.62 | 7.53 | (-89) | 4.94 | 0.0 | 0.00 | 8.69 |
| 1628 | 1650 | | 10.59 | 7.52 | (-89) | 4.92 | 0.0 | 0.00 | 8.71 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 1628
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.59 — pH 7.52 — ORP (-89)
Sp. Cond. 4.92 — Turbidity 0.0 — DO 0.00
Water Level 8.71 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00

**Monitoring Point:** MW-47 (2)
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 37 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | Locks | Yes | No |
|---|---|---|---|
| Well Pad: OK | Protective Casing | X | |
| Casing: | Well | | X |
| Protective Casing: | | | |
| Reference Mark/Identification: | | | |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 0940
Total Depth: 20.89 feet below TOC
Static Water Level: 3.72 feet below TOC
TD - SWL: 17.17 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 17.17 x 10 = 171.7 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 6.41 — pH 7.67 — ORP 134
Sp. Cond. 2.90 — Turbidity ~~3.96~~ 9.1 — DO 1.59
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 0945 | 300 | 150 | 6.89 | 7.54 | 137 | 2.83 | 13.1 | 0.83 | 3.80 |
| 0948 | 750 | 1 | 7.52 | 7.48 | 139 | 2.75 | 15.2 | 0.25 | 3.82 |
| 0951 | 1200 | 1 | 7.69 | 7.47 | 138 | 2.72 | 13.4 | 0.18 | 3.85 |
| 0954 | 1650 | 1 | 7.84 | 7.47 | 138 | 2.72 | 12.5 | 0.07 | 3.85 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 0954
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 7.84 — pH 7.47 — ORP 138
Sp. Cond. 2.72 — Turbidity 12.5 — DO 0.07
Water Level 3.85 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-3 OK
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Worth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 50 °F (Mean) — Wind Direction: N S E (W) (circle two if needed)
Precipitation: None (Light) Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**
Well Pad: OK
Casing:
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19 / 1513
Total Depth: 28.66 feet below TOC
Static Water Level: 9.93 feet below TOC
TD - SWL: 18.73 water column (ft.)

**Purging Activities**
Purged By: J. Worth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other ____ (circle one)
Purge Volume Calculation: 18.73 x 10 = 187.3 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 10.51 — pH 8.21 — ORP (-18)
Sp. Cond. 3.22 — Turbidity 0.0 — DO 1.04
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1518 | 200 | 150 | 10.40 | 7.80 | (-49) | 3.23 | 0.0 | 0.63 | 10.73 |
| 1521 | 650 | \| | 10.32 | 7.69 | (-66) | 3.23 | 9.3 | 0.21 | 11.35 |
| 1524 | 1100 | \| | 10.30 | 7.66 | (-44) | 3.23 | 0.0 | 0.06 | 11.95 |
| 1527 | 1550 | \| | 10.27 | 7.66 | (-37) | 3.23 | 0.0 | 0.00 | 12.53 |
| 1530 | 2000 | \| | 10.26 | 7.66 | (-39) | 3.23 | 0.0 | 0.00 | 13.07 |
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**Sampling Activities**
Sampled By: J. Worth — Sample Date/Time: 11/18/19 / 1530
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.26 — pH 7.66 — ORP (-39)
Sp. Cond. 3.23 — Turbidity 0.0 — DO 0.00
Water Level 13.07 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-53nx
**Date(s):** 11/20/19

**Field Team Members**
Name: J Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 37 °F (Mean) — Wind Direction: N S E W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) (Partly)

**Well Observations**
Well Pad: Poor
Casing:
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | | X |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/20/19 / 0848
Total Depth: 24.45 feet below TOC
Static Water Level: 17.55 feet below TOC
TD - SWL: 6.90 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/20/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 6.90 X 10 = 69.0 — Min Purge Volume: 140 mL
Initial Parameter Readings: Temp (°C) 9.62 — pH 7.65 — ORP 50
Sp. Cond. 4.62 — Turbidity 89.5 — DO 6.08
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 0853 | 150 | 150 | 9.59 | 7.62 | 53 | 4.26 | 89.2 | 5.99 | 17.88 |
| 0856 | 600 | 1 | 9.66 | 7.58 | 58 | 4.33 | 89.0 | 5.81 | 17.96 |
| 0859 | 1050 | 1 | 9.86 | 7.57 | 61 | 4.26 | 88.7 | 5.68 | 18.10 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/20/19 / 0859
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 9.86 — pH 7.57 — ORP 61
Sp. Cond. 4.26 — Turbidity 88.7 — DO 5.68
Water Level 18.10 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
Protective casing and bollards observed to be damaged on 11/19/19. SCS had to remove protective casing to reach the PVC casing in order to sample.

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-540X
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 46 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | Locks | Yes | No |
|---|---|---|---|
| Well Pad: OK | Protective Casing | X | |
| Casing: | Well | | X |
| Protective Casing: | | | |
| Reference Mark/Identification: | | | |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 1309
Total Depth: 17.80 feet below TOC
Static Water Level: 3.61 feet below TOC
TD - SWL: 14.19 water column (ft.)

**Purging Activities**
Purged By: J Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 14.19 x 10 = 141.9 — Min Purge Volume: 150 mL
Initial Parameter Readings: Temp (°C) 9.80 — pH 7.89 — ORP 5
Sp. Cond. 2.49 — Turbidity 0.0 — DO 0.83
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 13:10 | 200 | 150 | 9.59 | 7.63 | 15 | 2.50 | 0.0 | 0.57 | 3.61 |
| 13:13 | 650 | \| | 9.74 | 7.56 | 28 | 2.51 | 0.0 | 0.23 | 3.61 |
| 13:16 | 1100 | \| | 9.84 | 7.54 | 38 | 2.51 | 0.0 | 0.07 | 3.61 |
| 13:19 | 1550 | \| | 9.90 | 7.53 | 32 | 2.51 | 0.0 | 0.00 | 3.61 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 1319
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 9.90 — pH 7.53 — ORP 32
Sp. Cond. 2.61 — Turbidity 0.0 — DO 0.00
Water Level 3.61 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-56R
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 46 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | |
|---|---|
| Well Pad | None |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 1533
Total Depth: 27.55 feet below TOC
Static Water Level: 4.02 feet below TOC
TD - SWL: 23.53 water column (ft.)

**Purging Activities**
Purged By: J Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 23.53 x 10 = 235.3 — Min Purge Volume: 250 mL
Initial Parameter Readings: Temp (°C) 11.15 — pH 7.74 — ORP 39
Sp. Cond. 3.65 — Turbidity 0.0 — DO 0.44
Physical appearance of purge water: cloudy

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1540 | 300 | 150 | 11.17 | 7.73 | 40 | 3.10 | 1.4 | 0.29 | 4.05 |
| 1543 | 750 | \| | 11.16 | 7.79 | 41 | 2.67 | 0.0 | 0.17 | 4.07 |
| 1546 | 1200 | \| | 11.29 | 7.80 | 47 | 2.48 | 0.0 | 0.14 | 4.09 |
| 1549 | 1650 | \| | 11.30 | 7.78 | 48 | 2.29 | 0.0 | 0.12 | 4.10 |
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**Sampling Activities**
Sampled By: J Warth — Sample Date/Time: 11/19/19 / 1549
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 11.30 — pH 7.78 — ORP 48
Sp. Cond. 2.29 — Turbidity 0.0 — DO 0.12
Water Level 4.10 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
Water turned clear after one minute.

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-57 ox
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 34 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy Sunny (Partly)

**Well Observations**
Well Pad: OK
Casing:
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 08:29
Total Depth: 22.07 feet below TOC
Static Water Level: 3.90 feet below TOC
TD - SWL: 18.17 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 18.17 x 10 = 181.7 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 9.32 — pH 8.31 — ORP 123 — Sp. Cond. 3.51 — Turbidity 0.0 — DO 5.95
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 08:35 | 300 | 150 | 8.47 | 8.01 | 129 | 3.63 | 0.0 | 5.72 | 4.88 |
| 08:38 | 750 | " | 8.32 | 7.94 | 132 | 3.65 | 0.0 | 5.39 | 5.49 |
| 08:41 | 1200 | " | 8.25 | 7.93 | 139 | 3.65 | 0.0 | 5.23 | 6.13 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 08:41
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 8.25 — pH 7.93 — ORP 139 — Sp. Cond. 3.65 — Turbidity 0.0 — DO 5.23 — Water Level 6.13 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-58R or
**Date(s):** 11/20/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 38 °F (Mean) — Wind Direction: N S (E) W (circle two if needed)
Precipitation: (None) Light Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**
Well Pad: None
Casing: Good
Protective Casing:
Reference Mark/Identification:

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/20/19 / 0925
Total Depth: 34.75 feet below TOC
Static Water Level: 7.10 feet below TOC
TD - SWL: 27.65 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/20/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 27.65 * 10 = 276.5 — Min Purge Volume: 300 mL
Initial Parameter Readings: Temp (°C) 8.70 — pH 8.05 — ORP 30
Sp. Cond. 2.82 — Turbidity 2.4 — DO 0.59
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conductivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 0937 | 300 | 150 | 8.90 | 7.89 | 0 | 2.78 | 0.0 | 0.21 | 8.29 |
| 0940 | 750 | \| | 9.02 | 7.87 | (-22) | 2.72 | 0.0 | 0.16 | 8.62 |
| 0943 | 1200 | \| | 9.07 | 7.88 | (-20) | 2.63 | 0.0 | 0.12 | 8.91 |
| 0946 | 1650 | \| | 9.15 | 7.92 | (-21) | 2.59 | 0.0 | 0.19 | 9.19 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/20/19 / 0946
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 9.15 — pH 7.92 — ORP (-21)
Sp. Cond. 2.59 — Turbidity 0.0 — DO 0.19
Water Level 9.19 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)
Duplicate collected here @ 23.59

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-59D
**Date(s):** 11/19/19

**Field Team Members**
Name: J Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 46 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**
Well Pad: OK
Casing: _____
Protective Casing: _____
Reference Mark/Identification: _____

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19 / 1451
Total Depth: 41.00 feet below TOC
Static Water Level: 7.52 feet below TOC
TD - SWL: 33.48 water column (ft.)

**Purging Activities**
Purged By: J Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 33.48 x 10 = 334.8 — Min Purge Volume: 350 mL
Initial Parameter Readings: Temp (°C) 10.35 — pH 8.05 — ORP 15
Sp. Cond. 3.41 — Turbidity 0.0 — DO 0.79
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1458 | 400 | 150 | 10.32 | 7.74 | (-7) | 3.42 | 0.0 | 0.46 | 8.60 |
| 1501 | 850 | \| | 10.27 | 7.65 | (-25) | 3.40 | 0.0 | 0.00 | 9.49 |
| 1504 | 1300 | \| | 10.26 | 7.65 | (-29) | 3.37 | 0.0 | 0.00 | 10.19 |
| 1507 | 1750 | \| | 10.27 | 7.65 | (-23) | 3.36 | 0.0 | 0.00 | 10.71 |
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**Sampling Activities**
Sampled By: J Warth — Sample Date/Time: 11/19/19 / 1507
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.27 — pH 7.65 — ORP (-23)
Sp. Cond. 3.36 — Turbidity 0.0 — DO 0.00
Water Level 10.71 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-60dx
**Date(s):** 11/19/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: _____ — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 46 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: Cloudy (Sunny) Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | |
| Protective Casing | |
| Reference Mark/Identification | |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/19/19/1402
Total Depth: 42.05 feet below TOC
Static Water Level: 5.42 feet below TOC
TD - SWL: 36.63 water column (ft.)

**Purging Activities**
Purged By: J Warth — Purge Date: 11/19/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: 36.63 x 10 = 366.3 — Min Purge Volume: 400 mL
Initial Parameter Readings: Temp (°C) 10.14 — pH 8.16 — ORP 39
Sp. Cond. 3.57 — Turbidity 0.0 — DO 1.59
Physical appearance of purge water: clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1409 | 400 | 150 | 10.08 | 7.72 | 48 | 3.59 | 0.0 | 0.55 | 6.89 |
| 1412 | 850 | | 10.09 | 7.69 | 53 | 3.59 | 0.0 | 0.22 | 7.55 |
| 1415 | 1300 | | 10.14 | 7.68 | 56 | 3.58 | 0.0 | 0.27 | 8.08 |
| 1418 | 1750 | | 10.16 | 7.76 | 58 | 3.58 | 0.0 | 0.31 | 8.71 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/19/19 / 1418
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 10.16 — pH 7.76 — ORP 58
Sp. Cond. 3.58 — Turbidity 0.0 — DO 0.31
Water Level 8.71 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

# Field Data Sheet

**Project Name:** Sioux Falls Landfill Environmental Monitoring
**Project Location:** Sioux Falls, SD
**Project Number:** 27219377.00
**Monitoring Point:** MW-6/ox
**Date(s):** 11/18/19

**Field Team Members**
Name: J. Warth — Affiliation: SCS Engineers
Name: B. Stephens — Affiliation: SCS Engineers

**Weather Conditions**
Mean Temp: 52 °F (Mean) — Wind Direction: (N) S E (W) (circle two if needed)
Precipitation: (None) Light Heavy — Sky: (Cloudy) Sunny Partly

**Well Observations**

| | |
|---|---|
| Well Pad | OK |
| Casing | \| |
| Protective Casing | \| |
| Reference Mark/Identification | \| |

| Locks | Yes | No |
|---|---|---|
| Protective Casing | X | |
| Well | | X |

**Groundwater Level Measurements**
Date/Time Measured: 11/18/19/1428
Total Depth: 22.50 feet below TOC
Static Water Level: 3.49 feet below TOC
TD - SWL: 19.01 water column (ft.)

**Purging Activities**
Purged By: J. Warth — Purge Date: 11/18/19
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) (circle one)
Well Diameter: 1-inch (2-inch) 3-inch 4-inch Other ____ (circle one)
Purge Volume Calculation: 19.01 X 10 = 190.1 — Min Purge Volume: 200 mL
Initial Parameter Readings: Temp (°C) 10.15 — pH 8.01 — ORP 67
Sp. Cond. 2.89 — Turbidity 0.0 — DO 1.93
Physical appearance of purge water: Clear

| Purge Time | Cumulative Purge Vol. (mL) | Purge Rate (ml/m) | Temp (°C) | pH | ORP (mV) | Specific Conduct-ivity (mS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Water Level (ft below TOC) |
|---|---|---|---|---|---|---|---|---|---|
| 1437 | 300 | 150 | 9.92 | 7.80 | 70 | 2.88 | 0.0 | 1.64 | 3.84 |
| 1440 | 750 | \| | 9.87 | 7.77 | 73 | 2.87 | 0.0 | 1.34 | 3.88 |
| 1443 | 1200 | \| | 9.84 | 7.76 | 75 | 2.88 | 0.0 | 1.20 | 3.91 |
| 1446 | 1650 | \| | 9.84 | 7.76 | 76 | 2.88 | 0.0 | 1.08 | 3.92 |
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**Sampling Activities**
Sampled By: J. Warth — Sample Date/Time: 11/18/19 / 1446
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (Peristaltic Pump) Hand (circle one)
Sample Parameters: Temp (°C) 9.84 — pH 7.76 — ORP 76
Sp. Cond. 2.88 — Turbidity 0.0 — DO 1.08
Water Level 3.92 (feet below TOC)

**Observations/Comments:** (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

**Electronic Form Completed By:** _____ **Date:** _____

Sioux Falls 4Q 2019 GW Sampling

| Well ID | Water Level | Date | Time |
|---|---|---|---|
| P-15 | Inaccessible | 11/18/19 | 11:46 |
| SDGS-28 | 09.69 | 11/19/19 | 07:43 |
| MW-17 | 10.98 | 11/19/19 | 08:02 |
| MW-19 | 12.84 | 11/19/19 | 08:14 |
| MW-19I | 06.72 | 11/19/19 | 08:12 |
| MW-1 | 15.54 | 11/19/19 | 08:18 |
| MW-18R | 02.93 | 11/19/19 | 08:23 |
| SDGS-68 | 07.60 | 11/19/19 | 09:15 |
| SDGS-77 | 01.46 | 11/19/19 | 09:12 |
| MW-460x | 08.96 | 11/19/19 | 09:22 |
| MW-15 | 11.47 | 11/19/19 | 10:24 |
| SDGS-57 | 11.35 | 11/19/19 | 10:29 |
| MW-430x | 11.31 | 11/19/19 | 11:18 |
| MW-5 | 07.36 | 11/19/19 | 11:25 |
| MW-7R | 07.31 | 11/19/19 | 11:32 |
| SDGS-45 | 15.35 | 11/19/19 | 11:48 |

# Appendix C

## Laboratory Analytical Reports

(Refer to the enclosed CD)

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-155507-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*5/30/2019 4:31:22 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 310-155507-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-155507-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 5/14/2019 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.5º C and 0.9º C.

**GC/MS VOA**
Method(s) 8260C: The surrogate recovery for the method blank associated with analytical batch 310-240040 was outside the upper control limits.

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

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

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

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

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Ground Water | 05/13/19 14:47 | 05/14/19 09:50 | |
| 310-155507-2 | MW-21ox | Ground Water | 05/13/19 12:59 | 05/14/19 09:50 | |
| 310-155507-3 | MW-23ox | Ground Water | 05/13/19 11:28 | 05/14/19 09:50 | |
| 310-155507-4 | MW-25ox | Ground Water | 05/13/19 13:54 | 05/14/19 09:50 | |
| 310-155507-5 | MW-48ox | Ground Water | 05/13/19 16:23 | 05/14/19 09:50 | |
| 310-155507-6 | MW-61ox | Ground Water | 05/13/19 15:42 | 05/14/19 09:50 | |
| 310-155507-7 | Trip Blank - 1 | Water | 05/13/19 00:00 | 05/14/19 09:50 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Client Sample ID: MW-11 — Lab Sample ID: 310-155507-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 116 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2610 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 491 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 20.7 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 81.3 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 3.67 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 5.89 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 243 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.09 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-21ox — Lab Sample ID: 310-155507-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 719 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 313 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Iron | 0.563 | | 0.500 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.142 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 5.38 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 19.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.167 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.133 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 460 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.03 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-23ox — Lab Sample ID: 310-155507-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.9 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2090 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 375 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 9.57 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 65.6 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 11.2 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 337 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.55 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-25ox — Lab Sample ID: 310-155507-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1290 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 297 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 4.81 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 49.6 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 327 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.22 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-48ox — Lab Sample ID: 310-155507-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 2120 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 448 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 11.2 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 69.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Client Sample ID: MW-48ox (Continued) — Lab Sample ID: 310-155507-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 238 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.15 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-61ox — Lab Sample ID: 310-155507-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31.8 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1940 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 392 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.192 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 5.56 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 75.1 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.101 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.261 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 292 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.12 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank - 1 — Lab Sample ID: 310-155507-7

No Detections.

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-11**
**Date Collected: 05/13/19 14:47**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-1**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 19:19 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:19 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:19 | 1 |

## Client Sample ID: MW-11

**Date Collected: 05/13/19 14:47**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *97* | | *80 - 120* | | *05/20/19 19:19* | *1* |
| *Dibromofluoromethane (Surr)* | *116* | | *80 - 120* | | *05/20/19 19:19* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *05/20/19 19:19* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **116** | | 5.00 | | mg/L | | | 05/18/19 05:26 | 5 |
| **Sulfate** | **2610** | | 100 | | mg/L | | | 05/18/19 05:43 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **491** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:07 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:07 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:07 | 1 |
| **Potassium** | **20.7** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:07 | 1 |
| **Sodium** | **81.3** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:33 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/28/19 14:33 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:25 | 1 |
| **Nitrate Nitrite as N** | **3.67** | | 1.00 | | mg/L | | | 05/21/19 02:12 | 10 |
| **Chemical Oxygen Demand** | **5.89** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **243** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 09:05 | 1 |
| **Total Organic Carbon** | **2.09** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-21ox**
**Date Collected: 05/13/19 12:59**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-2**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 19:41 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 19:41 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 19:41 | 1 |

## Client Sample ID: MW-21ox

**Date Collected: 05/13/19 12:59**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-2

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *98* | | *80 - 120* | | *05/20/19 19:41* | *1* |
| *Dibromofluoromethane (Surr)* | *117* | | *80 - 120* | | *05/20/19 19:41* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *05/20/19 19:41* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 05/18/19 05:59 | 5 |
| **Sulfate** | **719** | | 100 | | mg/L | | | 05/18/19 06:12 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **313** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:09 | 1 |
| **Iron** | **0.563** | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:09 | 1 |
| **Manganese** | **0.142** | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:09 | 1 |
| **Potassium** | **5.38** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:09 | 1 |
| **Sodium** | **19.8** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:37 | 1 |
| **Manganese** | **0.167** | | 0.0100 | | mg/L | | | 05/28/19 14:37 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:29 | 1 |
| **Nitrate Nitrite as N** | **0.133** | | 0.100 | | mg/L | | | 05/21/19 02:18 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **460** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 09:00 | 1 |
| **Total Organic Carbon** | **2.03** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-23ox**
**Date Collected: 05/13/19 11:28**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-3**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 20:03 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:03 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:03 | 1 |

## Client Sample ID: MW-23ox

**Date Collected: 05/13/19 11:28**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *05/20/19 20:03* | *1* |
| *Dibromofluoromethane (Surr)* | *111* | | *80 - 120* | | *05/20/19 20:03* | *1* |
| *Toluene-d8 (Surr)* | *95* | | *80 - 120* | | *05/20/19 20:03* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **10.9** | | 5.00 | | mg/L | | | 05/18/19 07:04 | 5 |
| **Sulfate** | **2090** | | 100 | | mg/L | | | 05/18/19 07:21 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **375** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:10 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:10 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:10 | 1 |
| **Potassium** | **9.57** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:10 | 1 |
| **Sodium** | **65.6** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:10 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:40 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/28/19 14:40 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:39 | 1 |
| **Nitrate Nitrite as N** | **11.2** | | 1.00 | | mg/L | | | 05/21/19 01:56 | 10 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **337** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 08:57 | 1 |
| **Total Organic Carbon** | **2.55** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-25ox**
**Date Collected: 05/13/19 13:54**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-4**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 20:25 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:25 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:25 | 1 |

## Client Sample ID: MW-25ox

**Date Collected: 05/13/19 13:54**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-4

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *05/20/19 20:25* | *1* |
| *Dibromofluoromethane (Surr)* | *117* | | *80 - 120* | | *05/20/19 20:25* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *05/20/19 20:25* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 05/18/19 07:37 | 5 |
| **Sulfate** | **1290** | | 100 | | mg/L | | | 05/18/19 07:53 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **297** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:12 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:12 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:12 | 1 |
| **Potassium** | **4.81** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:12 | 1 |
| **Sodium** | **49.6** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:12 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:42 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/28/19 14:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:40 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/21/19 02:30 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **327** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 09:02 | 1 |
| **Total Organic Carbon** | **2.22** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-48ox**
**Date Collected: 05/13/19 16:23**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-5**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 20:47 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 20:47 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 20:47 | 1 |

## Client Sample ID: MW-48ox

**Date Collected: 05/13/19 16:23**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-5

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *05/20/19 20:47* | *1* |
| *Dibromofluoromethane (Surr)* | *114* | | *80 - 120* | | *05/20/19 20:47* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *05/20/19 20:47* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 05/18/19 08:10 | 5 |
| **Sulfate** | **2120** | | 100 | | mg/L | | | 05/18/19 08:26 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **448** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:14 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:14 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:14 | 1 |
| **Potassium** | **11.2** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:14 | 1 |
| **Sodium** | **69.8** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:14 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:43 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/28/19 14:43 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:41 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/21/19 02:33 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **238** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 09:11 | 1 |
| **Total Organic Carbon** | **2.15** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: MW-61ox**
**Date Collected: 05/13/19 15:42**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-6**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 21:09 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:09 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:09 | 1 |

## Client Sample ID: MW-61ox

**Date Collected: 05/13/19 15:42**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-6

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *98* | | *80 - 120* | | *05/20/19 21:09* | *1* |
| *Dibromofluoromethane (Surr)* | *116* | | *80 - 120* | | *05/20/19 21:09* | *1* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* | | *05/20/19 21:09* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **31.8** | | 5.00 | | mg/L | | | 05/18/19 08:42 | 5 |
| **Sulfate** | **1940** | | 100 | | mg/L | | | 05/18/19 08:59 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **392** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:17 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:17 | 1 |
| **Manganese** | **0.192** | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:17 | 1 |
| **Potassium** | **5.56** | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:17 | 1 |
| **Sodium** | **75.1** | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 19:17 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:45 | 1 |
| **Manganese** | **0.101** | | 0.0100 | | mg/L | | | 05/28/19 14:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:43 | 1 |
| **Nitrate Nitrite as N** | **0.261** | | 0.100 | | mg/L | | | 05/21/19 02:35 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **292** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 09:08 | 1 |
| **Total Organic Carbon** | **2.12** | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

## Client Sample ID: Trip Blank - 1

**Date Collected: 05/13/19 00:00**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-7

**Matrix: Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 14:17 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 14:17 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 14:17 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

**Client Sample ID: Trip Blank - 1**
**Date Collected: 05/13/19 00:00**
**Date Received: 05/14/19 09:50**

**Lab Sample ID: 310-155507-7**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 108 | | 80 - 120 | | 05/21/19 14:17 | 1 |
| Dibromofluoromethane (Surr) | 107 | | 80 - 120 | | 05/21/19 14:17 | 1 |
| Toluene-d8 (Surr) | 99 | | 80 - 120 | | 05/21/19 14:17 | 1 |

# Definitions/Glossary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| X | Surrogate is outside control limits |

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155507-1 | MW-11 | 97 | 116 | 97 |
| 310-155507-2 | MW-21ox | 98 | 117 | 98 |
| 310-155507-3 | MW-23ox | 101 | 111 | 95 |
| 310-155507-4 | MW-25ox | 99 | 117 | 97 |
| 310-155507-5 | MW-48ox | 101 | 114 | 97 |
| 310-155507-6 | MW-61ox | 98 | 116 | 99 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155507-7 | Trip Blank - 1 | 108 | 107 | 99 |
| LCS 310-240025/6 | Lab Control Sample | 96 | 103 | 96 |
| LCS 310-240025/7 | Lab Control Sample | 107 | 104 | 101 |
| LCS 310-240040/5 | Lab Control Sample | 96 | 103 | 100 |
| LCS 310-240040/6 | Lab Control Sample | 97 | 116 | 97 |
| MB 310-240025/8 | Method Blank | 102 | 102 | 98 |
| MB 310-240040/7 | Method Blank | 98 | 121 X | 98 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-240025/8**
**Matrix: Water**
**Analysis Batch: 240025**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 06:55 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 06:55 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 06:55 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240025/8**
**Matrix: Water**
**Analysis Batch: 240025**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *102* | | *80 - 120* | | *05/21/19 06:55* | *1* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* | | *05/21/19 06:55* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *05/21/19 06:55* | *1* |

**Lab Sample ID: LCS 310-240025/6**
**Matrix: Water**
**Analysis Batch: 240025**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 43.90 | | ug/L | | 110 | 50 - 150 |
| Acrylonitrile | 200 | 223.0 | | ug/L | | 111 | 50 - 150 |
| Benzene | 20.0 | 20.09 | | ug/L | | 100 | 77 - 120 |
| Bromochloromethane | 20.0 | 22.40 | | ug/L | | 112 | 73 - 132 |
| Bromodichloromethane | 20.0 | 18.67 | | ug/L | | 93 | 73 - 120 |
| Bromoform | 20.0 | 14.52 | | ug/L | | 73 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 45.74 | | ug/L | | 114 | 50 - 150 |
| Carbon disulfide | 20.0 | 19.02 | | ug/L | | 95 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 19.86 | | ug/L | | 99 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.69 | | ug/L | | 98 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 16.85 | | ug/L | | 84 | 66 - 120 |
| Chloroform | 20.0 | 20.69 | | ug/L | | 103 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 20.39 | | ug/L | | 102 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.35 | | ug/L | | 87 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 15.82 | | ug/L | | 79 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.48 | | ug/L | | 97 | 71 - 125 |
| Dibromomethane | 20.0 | 20.35 | | ug/L | | 102 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 18.91 | | ug/L | | 95 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 20.00 | | ug/L | | 100 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 21.26 | | ug/L | | 106 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 22.27 | | ug/L | | 111 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 19.77 | | ug/L | | 99 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 20.55 | | ug/L | | 103 | 75 - 123 |
| Ethylbenzene | 20.0 | 19.00 | | ug/L | | 95 | 73 - 120 |
| 2-Hexanone | 40.0 | 43.56 | | ug/L | | 109 | 57 - 128 |
| Iodomethane | 20.0 | 25.36 | | ug/L | | 127 | 20 - 150 |
| Methylene Chloride | 20.0 | 20.51 | | ug/L | | 103 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 43.12 | | ug/L | | 108 | 59 - 126 |
| m,p-Xylene | 20.0 | 18.13 | | ug/L | | 91 | 70 - 120 |
| o-Xylene | 20.0 | 18.29 | | ug/L | | 91 | 67 - 120 |
| Styrene | 20.0 | 18.54 | | ug/L | | 93 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 19.13 | | ug/L | | 96 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 19.17 | | ug/L | | 96 | 63 - 122 |
| Tetrachloroethene | 20.0 | 19.59 | | ug/L | | 98 | 72 - 129 |
| Toluene | 20.0 | 19.58 | | ug/L | | 98 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 11.25 | | ug/L | | 56 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 19.77 | | ug/L | | 99 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 16.87 | | ug/L | | 84 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 21.03 | | ug/L | | 105 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240025/6**
**Matrix: Water**
**Analysis Batch: 240025**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 21.01 | | ug/L | | 105 | 69 - 127 |
| Trichloroethene | 20.0 | 20.01 | | ug/L | | 100 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 19.94 | | ug/L | | 100 | 66 - 120 |
| Vinyl acetate | 40.0 | 39.02 | | ug/L | | 98 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *96* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* |

**Lab Sample ID: LCS 310-240025/7**
**Matrix: Water**
**Analysis Batch: 240025**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 16.11 | | ug/L | | 81 | 38 - 150 |
| Chloroethane | 20.0 | 22.07 | | ug/L | | 110 | 69 - 129 |
| Chloromethane | 20.0 | 22.49 | | ug/L | | 112 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 22.03 | | ug/L | | 110 | 68 - 146 |
| Vinyl chloride | 20.0 | 21.03 | | ug/L | | 105 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *107* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *101* | | *80 - 120* |

**Lab Sample ID: MB 310-240040/7**
**Matrix: Water**
**Analysis Batch: 240040**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 16:46 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240040/7**
**Matrix: Water**
**Analysis Batch: 240040**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 16:46 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 16:46 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *98* | | *80 - 120* | | *05/20/19 16:46* | *1* |
| *Dibromofluoromethane (Surr)* | *121* | *X* | *80 - 120* | | *05/20/19 16:46* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *05/20/19 16:46* | *1* |

**Lab Sample ID: LCS 310-240040/5**
**Matrix: Water**
**Analysis Batch: 240040**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 38.24 | | ug/L | | 96 | 50 - 150 |
| Acrylonitrile | 200 | 196.1 | | ug/L | | 98 | 50 - 150 |
| Benzene | 20.0 | 19.22 | | ug/L | | 96 | 77 - 120 |
| Bromochloromethane | 20.0 | 19.42 | | ug/L | | 97 | 73 - 132 |
| Bromodichloromethane | 20.0 | 17.48 | | ug/L | | 87 | 73 - 120 |
| Bromoform | 20.0 | 14.67 | | ug/L | | 73 | 57 - 120 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240040/5**
**Matrix: Water**
**Analysis Batch: 240040**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | 40.0 | 37.56 | | ug/L | | 94 | 50 - 150 |
| Carbon disulfide | 20.0 | 18.10 | | ug/L | | 90 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 21.54 | | ug/L | | 108 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.54 | | ug/L | | 98 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 16.23 | | ug/L | | 81 | 66 - 120 |
| Chloroform | 20.0 | 19.19 | | ug/L | | 96 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 18.97 | | ug/L | | 95 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.19 | | ug/L | | 86 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 14.19 | | ug/L | | 71 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.73 | | ug/L | | 99 | 71 - 125 |
| Dibromomethane | 20.0 | 19.39 | | ug/L | | 97 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 18.60 | | ug/L | | 93 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 19.30 | | ug/L | | 96 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 19.24 | | ug/L | | 96 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 19.90 | | ug/L | | 100 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 19.51 | | ug/L | | 98 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 19.57 | | ug/L | | 98 | 75 - 123 |
| Ethylbenzene | 20.0 | 18.70 | | ug/L | | 93 | 73 - 120 |
| 2-Hexanone | 40.0 | 36.56 | | ug/L | | 91 | 57 - 128 |
| Iodomethane | 20.0 | 25.05 | | ug/L | | 125 | 20 - 150 |
| Methylene Chloride | 20.0 | 19.43 | | ug/L | | 97 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 37.88 | | ug/L | | 95 | 59 - 126 |
| m,p-Xylene | 20.0 | 19.02 | | ug/L | | 95 | 70 - 120 |
| o-Xylene | 20.0 | 18.46 | | ug/L | | 92 | 67 - 120 |
| Styrene | 20.0 | 18.32 | | ug/L | | 92 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 17.96 | | ug/L | | 90 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 18.50 | | ug/L | | 93 | 63 - 122 |
| Tetrachloroethene | 20.0 | 19.73 | | ug/L | | 99 | 72 - 129 |
| Toluene | 20.0 | 18.73 | | ug/L | | 94 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 14.86 | | ug/L | | 74 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 18.78 | | ug/L | | 94 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 16.00 | | ug/L | | 80 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 19.08 | | ug/L | | 95 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 19.37 | | ug/L | | 97 | 69 - 127 |
| Trichloroethene | 20.0 | 19.19 | | ug/L | | 96 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 18.87 | | ug/L | | 94 | 66 - 120 |
| Vinyl acetate | 40.0 | 33.21 | | ug/L | | 83 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *96* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240040/6**
**Matrix: Water**
**Analysis Batch: 240040**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 16.13 | | ug/L | | 81 | 38 - 150 |
| Chloroethane | 20.0 | 18.42 | | ug/L | | 92 | 69 - 129 |
| Chloromethane | 20.0 | 11.72 | | ug/L | | 59 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 19.25 | | ug/L | | 96 | 68 - 146 |
| Vinyl chloride | 20.0 | 18.43 | | ug/L | | 92 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *97* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *116* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-240072/3**
**Matrix: Water**
**Analysis Batch: 240072**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 05/18/19 00:15 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 05/18/19 00:15 | 1 |

**Lab Sample ID: LCS 310-240072/4**
**Matrix: Water**
**Analysis Batch: 240072**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.28 | | mg/L | | 103 | 90 - 110 |
| Sulfate | 10.0 | 10.42 | | mg/L | | 104 | 90 - 110 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-239501/1-A**
**Matrix: Water**
**Analysis Batch: 239679**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239501**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 18:44 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/15/19 08:20 | 05/15/19 18:44 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/15/19 08:20 | 05/15/19 18:44 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 18:44 | 1 |
| Sodium | <2.00 | | 2.00 | | mg/L | | 05/15/19 08:20 | 05/15/19 18:44 | 1 |

**Lab Sample ID: LCS 310-239501/2-A**
**Matrix: Water**
**Analysis Batch: 239679**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 20.18 | | mg/L | | 101 | 80 - 120 |
| Iron | 2.00 | 2.050 | | mg/L | | 102 | 80 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 310-239501/2-A**
**Matrix: Water**
**Analysis Batch: 239679**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Manganese | 1.00 | 0.9690 | | mg/L | | 97 | 80 - 120 |
| Potassium | 20.0 | 19.28 | | mg/L | | 96 | 80 - 120 |
| Sodium | 20.0 | 18.91 | | mg/L | | 95 | 80 - 120 |

**Lab Sample ID: 310-155507-5 DU**
**Matrix: Ground Water**
**Analysis Batch: 239679**

**Client Sample ID: MW-48ox**
**Prep Type: Total/NA**
**Prep Batch: 239501**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Calcium | 448 | | 455.5 | | mg/L | | 2 | 20 |
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | <0.0100 | | <0.0100 | | mg/L | | NC | 20 |
| Potassium | 11.2 | | 11.51 | | mg/L | | 3 | 20 |
| Sodium | 69.8 | | 70.98 | | mg/L | | 2 | 20 |

**Lab Sample ID: MB 310-240998/16**
**Matrix: Water**
**Analysis Batch: 240998**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/28/19 14:30 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/28/19 14:30 | 1 |

**Lab Sample ID: LCS 310-240998/17**
**Matrix: Water**
**Analysis Batch: 240998**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 2.00 | 1.842 | | mg/L | | 92 | 80 - 120 |
| Manganese | 2.00 | 1.871 | | mg/L | | 94 | 80 - 120 |

**Lab Sample ID: 310-155507-1 DU**
**Matrix: Ground Water**
**Analysis Batch: 240998**

**Client Sample ID: MW-11**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | <0.0100 | | <0.0100 | | mg/L | | NC | 20 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-239447/103**
**Matrix: Water**
**Analysis Batch: 239447**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/14/19 21:23 | 1 |

## Method: 350.1 - Nitrogen, Ammonia (Continued)

**Lab Sample ID: LCS 310-239447/104**
**Matrix: Water**
**Analysis Batch: 239447**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | | | 3.11 | 3.228 | | mg/L | | 104 | 90 - 110 | | |

**Lab Sample ID: 310-155507-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 239447**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 2.50 | 2.392 | | mg/L | | 96 | 90 - 110 | | |

**Lab Sample ID: 310-155507-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 239447**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 2.50 | 2.384 | | mg/L | | 95 | 90 - 110 | 0 | 10 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-240169/45**
**Matrix: Water**
**Analysis Batch: 240169**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/21/19 01:18 | 1 |

**Lab Sample ID: MB 310-240169/89**
**Matrix: Water**
**Analysis Batch: 240169**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/21/19 02:28 | 1 |

**Lab Sample ID: LCS 310-240169/11 ^10**
**Matrix: Water**
**Analysis Batch: 240169**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | | | 18.6 | 18.72 | | mg/L | | 101 | 90 - 110 | | |

**Lab Sample ID: LCS 310-240169/46 ^10**
**Matrix: Water**
**Analysis Batch: 240169**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | | | 18.6 | 18.56 | | mg/L | | 100 | 90 - 110 | | |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

**Lab Sample ID: LCS 310-240169/90 ^10**
**Matrix: Water**
**Analysis Batch: 240169**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | | | 18.6 | 19.01 | | mg/L | | 102 | 90 - 110 | | |

**Lab Sample ID: 310-155507-4 MS**
**Matrix: Ground Water**
**Analysis Batch: 240169**

**Client Sample ID: MW-25ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.500 | 0.6085 | | mg/L | | 107 | 90 - 110 | | |

**Lab Sample ID: 310-155507-4 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240169**

**Client Sample ID: MW-25ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.500 | 0.5320 | | mg/L | | 92 | 90 - 110 | 13 | 20 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-240097/5**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |

**Lab Sample ID: LCS 310-240097/3**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | | | 125 | 118.8 | | mg/L | | 95 | 85 - 115 | | |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-239846/1**
**Matrix: Water**
**Analysis Batch: 239846**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |

**Lab Sample ID: LCS 310-239846/2**
**Matrix: Water**
**Analysis Batch: 239846**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | | | 1060 | 965.3 | | mg/L | | 91 | 90 - 110 | | |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: 310-155507-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 239846**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 243 | | 106 | 341.6 | | mg/L | | 93 | 66 - 124 |

**Lab Sample ID: 310-155507-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 239846**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 243 | | 106 | 341.6 | | mg/L | | 93 | 66 - 124 | 0 | 17 |

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-239943/1-A**
**Matrix: Water**
**Analysis Batch: 239945**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239943**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/18/19 10:30 | 05/18/19 11:03 | 1 |

**Lab Sample ID: LCS 310-239943/2-A**
**Matrix: Water**
**Analysis Batch: 239945**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239943**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 2.176 | | mg/L | | 44 | 33 - 117 |

**Lab Sample ID: 310-155507-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 239945**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**
**Prep Batch: 239943**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 3.840 | | mg/L | | 54 | 10 - 142 |

**Lab Sample ID: 310-155507-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 239945**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**
**Prep Batch: 239943**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 3.632 | | mg/L | | 50 | 10 - 142 | 6 | 33 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-239518/2**
**Matrix: Water**
**Analysis Batch: 239518**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 08:13 | 1 |

## Method: SM 5210B - BOD, 5-Day (Continued)

**Lab Sample ID: LCS 310-239518/3**
**Matrix: Water**
**Analysis Batch: 239518**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | | | 198 | 200.5 | | mg/L | | 101 | 85 - 115 | | |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 490-595749/1**
**Matrix: Water**
**Analysis Batch: 595749**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | <1.00 | | 1.00 | | mg/L | | | 05/16/19 14:00 | 1 |

**Lab Sample ID: LCS 490-595749/5**
**Matrix: Water**
**Analysis Batch: 595749**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | | | 10.0 | 9.534 | | mg/L | | 95 | 90 - 110 | | |

**Lab Sample ID: LCSD 490-595749/6**
**Matrix: Water**
**Analysis Batch: 595749**

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

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | | | 10.0 | 9.461 | | mg/L | | 95 | 90 - 110 | 1 | 20 |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## GC/MS VOA

### Analysis Batch: 240025

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-7 | Trip Blank - 1 | Total/NA | Water | 8260C | |
| MB 310-240025/8 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240025/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240025/7 | Lab Control Sample | Total/NA | Water | 8260C | |

### Analysis Batch: 240040

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 8260C | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 8260C | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 8260C | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 8260C | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 8260C | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 8260C | |
| MB 310-240040/7 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240040/5 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240040/6 | Lab Control Sample | Total/NA | Water | 8260C | |

## HPLC/IC

### Analysis Batch: 240072

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 9056A | |
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 9056A | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 9056A | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 9056A | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 9056A | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 9056A | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 9056A | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 9056A | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 9056A | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 9056A | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 9056A | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 9056A | |
| MB 310-240072/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-240072/4 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 239501

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 3010A | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 3010A | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 3010A | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 3010A | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 3010A | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 3010A | |
| MB 310-239501/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-239501/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| 310-155507-5 DU | MW-48ox | Total/NA | Ground Water | 3010A | |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Metals

### Analysis Batch: 239679

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 6010C | 239501 |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 6010C | 239501 |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 6010C | 239501 |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 6010C | 239501 |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 6010C | 239501 |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 6010C | 239501 |
| MB 310-239501/1-A | Method Blank | Total/NA | Water | 6010C | 239501 |
| LCS 310-239501/2-A | Lab Control Sample | Total/NA | Water | 6010C | 239501 |
| 310-155507-5 DU | MW-48ox | Total/NA | Ground Water | 6010C | 239501 |

### Analysis Batch: 240998

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Dissolved | Ground Water | 6010C | |
| 310-155507-2 | MW-21ox | Dissolved | Ground Water | 6010C | |
| 310-155507-3 | MW-23ox | Dissolved | Ground Water | 6010C | |
| 310-155507-4 | MW-25ox | Dissolved | Ground Water | 6010C | |
| 310-155507-5 | MW-48ox | Dissolved | Ground Water | 6010C | |
| 310-155507-6 | MW-61ox | Dissolved | Ground Water | 6010C | |
| MB 310-240998/16 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-240998/17 | Lab Control Sample | Total/NA | Water | 6010C | |
| 310-155507-1 DU | MW-11 | Dissolved | Ground Water | 6010C | |

## General Chemistry

### Analysis Batch: 239447

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 350.1 | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 350.1 | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 350.1 | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 350.1 | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 350.1 | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 350.1 | |
| MB 310-239447/103 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-239447/104 | Lab Control Sample | Total/NA | Water | 350.1 | |
| 310-155507-1 MS | MW-11 | Total/NA | Ground Water | 350.1 | |
| 310-155507-1 MSD | MW-11 | Total/NA | Ground Water | 350.1 | |

### Analysis Batch: 239518

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | SM 5210B | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | SM 5210B | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | SM 5210B | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | SM 5210B | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | SM 5210B | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-239518/2 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-239518/3 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 239846

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 239846 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | SM 2320B | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | SM 2320B | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | SM 2320B | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | SM 2320B | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-239846/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-239846/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 310-155507-1 MS | MW-11 | Total/NA | Ground Water | SM 2320B | |
| 310-155507-1 MSD | MW-11 | Total/NA | Ground Water | SM 2320B | |

### Prep Batch: 239943

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-239943/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-239943/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |
| 310-155507-1 MS | MW-11 | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155507-1 MSD | MW-11 | Total/NA | Ground Water | SM 4500 S2 C | |

### Analysis Batch: 239945

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| MB 310-239943/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 239943 |
| LCS 310-239943/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 239943 |
| 310-155507-1 MS | MW-11 | Total/NA | Ground Water | SM 4500 S2 F | 239943 |
| 310-155507-1 MSD | MW-11 | Total/NA | Ground Water | SM 4500 S2 F | 239943 |

### Analysis Batch: 240097

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 5220D LL | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 5220D LL | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 5220D LL | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 5220D LL | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 5220D LL | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-240097/5 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-240097/3 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Analysis Batch: 240169

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | 353.2 | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | 353.2 | |

## General Chemistry (Continued)

### Analysis Batch: 240169 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | 353.2 | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | 353.2 | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | 353.2 | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | 353.2 | |
| MB 310-240169/45 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-240169/89 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-240169/11 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-240169/46 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-240169/90 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |
| 310-155507-4 MS | MW-25ox | Total/NA | Ground Water | 353.2 | |
| 310-155507-4 MSD | MW-25ox | Total/NA | Ground Water | 353.2 | |

### Analysis Batch: 595749

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155507-1 | MW-11 | Total/NA | Ground Water | SM 5310C | |
| 310-155507-2 | MW-21ox | Total/NA | Ground Water | SM 5310C | |
| 310-155507-3 | MW-23ox | Total/NA | Ground Water | SM 5310C | |
| 310-155507-4 | MW-25ox | Total/NA | Ground Water | SM 5310C | |
| 310-155507-5 | MW-48ox | Total/NA | Ground Water | SM 5310C | |
| 310-155507-6 | MW-61ox | Total/NA | Ground Water | SM 5310C | |
| MB 490-595749/1 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 490-595749/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |
| LCSD 490-595749/6 | Lab Control Sample Dup | Total/NA | Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Client Sample ID: MW-11

**Date Collected: 05/13/19 14:47**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 19:19 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 05:26 | CJT | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 05:43 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:33 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:07 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:25 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 240169 | 05/21/19 02:12 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 09:05 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: MW-21ox

**Date Collected: 05/13/19 12:59**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-2

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 19:41 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 05:59 | CJT | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 06:12 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:37 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:09 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:29 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240169 | 05/21/19 02:18 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 09:00 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: MW-23ox

**Date Collected: 05/13/19 11:28**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-3

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 20:03 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 07:04 | CJT | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Client Sample ID: MW-23ox
**Date Collected: 05/13/19 11:28**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-3
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 07:21 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:40 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:10 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:39 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 240169 | 05/21/19 01:56 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 08:57 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: MW-25ox
**Date Collected: 05/13/19 13:54**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-4
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 20:25 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 07:37 | CJT | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 07:53 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:42 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:12 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:40 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240169 | 05/21/19 02:30 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 09:02 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: MW-48ox
**Date Collected: 05/13/19 16:23**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-5
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 20:47 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 08:10 | CJT | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 08:26 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:43 | CTB | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Client Sample ID: MW-48ox
**Date Collected: 05/13/19 16:23**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-5
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:14 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:41 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240169 | 05/21/19 02:33 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 09:11 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: MW-61ox
**Date Collected: 05/13/19 15:42**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-6
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240040 | 05/20/19 21:09 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240072 | 05/18/19 08:42 | CJT | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240072 | 05/18/19 08:59 | CJT | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240998 | 05/28/19 14:45 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239501 | 05/15/19 08:20 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 239679 | 05/15/19 19:17 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239447 | 05/14/19 21:43 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240169 | 05/21/19 02:35 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 239943 | 05/18/19 10:30 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 239945 | 05/18/19 11:03 | SAS | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239518 | 05/15/19 09:08 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 595749 | 05/16/19 14:00 | MPH | TAL NSH |

## Client Sample ID: Trip Blank - 1
**Date Collected: 05/13/19 00:00**
**Date Received: 05/14/19 09:50**

## Lab Sample ID: 310-155507-7
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240025 | 05/21/19 14:17 | SJN | TAL CF |

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

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

## Laboratory: Eurofins TestAmerica, Nashville

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-19 |
| Alaska (UST) | State Program | 10 | UST-087 | 06-30-19 |
| Arizona | State Program | 9 | AZ0473 | 05-05-20 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-20 |
| California | State Program | 9 | 2938 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0220 | 12-31-19 |
| Florida | NELAP | 4 | E87358 | 06-30-19 |
| Georgia | State Program | 4 | NA: NELAP & A2LA | 12-31-19 |
| Illinois | NELAP | 5 | 200010 | 12-09-19 |
| Iowa | State Program | 7 | 131 | 04-01-20 |
| Kansas | NELAP | 7 | E-10229 | 10-31-19 |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-19 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-19 |
| Louisiana | NELAP | 6 | 30613 | 06-30-19 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-20 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-19 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-19 |
| Mississippi | State Program | 4 | N/A | 06-30-19 |
| Nevada | State Program | 9 | TN00032 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-19 |
| New Jersey | NELAP | 2 | TN965 | 06-30-19 |
| New York | NELAP | 2 | 11342 | 03-31-20 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-19 |
| North Dakota | State Program | 8 | R-146 | 06-30-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-19 |
| Oregon | NELAP | 10 | TN200001 | 04-26-19 * |
| Pennsylvania | NELAP | 3 | 68-00585 | 07-31-19 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-19 |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-19 * |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-19 |
| USDA | Federal | | P330-13-00306 | 04-10-20 |
| Utah | NELAP | 8 | TN00032 | 07-31-19 |
| Virginia | NELAP | 3 | 460152 | 06-14-19 |

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

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Nashville (Continued)

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Washington | State Program | 10 | C789 | 07-19-19 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-20 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-19 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155507-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL NSH |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401
TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

310-155507 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE | Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 05/14/19 TIME 0950 | Received By: [signature]

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

**Condition of Cooler/Containers**

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID: C-02

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

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

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

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

SCS 14.19
MW-11, -210x, -230x, -250x, -[illegible], -480x, -610x; Trip Blank-1

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.5 | Corrected Temp (°C): 0.5

• **Sample Container Temperature**

| Container type(s) used: | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Uncorrected Temp (°C): | TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2 |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE | Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 5/14/19 TIME 0950 | Received By: [signature]

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes | ☐ No | *If yes:* Cooler ID: C-01 |
| Multiple Coolers? | ☒ Yes | ☐ No | *If yes:* Cooler # 1 of 2 |
| Cooler Custody Seals Present? | ☒ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☒ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.9 | Corrected Temp (°C): 0.9

• **Sample Container Temperature**

Container type(s) used: CONTAINER 1 | CONTAINER 2

Uncorrected Temp (°C): TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Doug Tongeman
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead!) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-11 | 5.13.19 | 14:47 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | x | | x |
| MW-21ox | 5.13.19 | 12:59 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | x | | x |
| MW-23ox | 5.13.19 | 11:28 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | x | | x |
| MW-25ox | 5.13.19 | 13:54 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | x | | x |
| ~~MW-39ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |
| ~~MW-42ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |
| ~~MW-44ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |
| ~~MW-45ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |
| ~~MW-47ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |
| MW-48ox | 5.13.19 | 16:23 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | x | | x |
| ~~MW-53ox~~ BS | | | | ~~x~~ | | | | | | | | | | | ~~x~~ | | | | | | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | ~~x~~ | | | | ~~x~~ | ~~x~~ | ~~x~~ |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 5.13.19 | 17:30 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 5/14/19 | 0950 | | | | | | |



5/30/2019

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Doug Tageman
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH (Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other (Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | pH, TSS, TDS, Alkalinities | TKN, Magnesium | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-54ox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| ~~MW-56ox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| ~~MW-57ox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| ~~MW-58Rox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| ~~MW-59ox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| ~~MW-60ox~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| MW-61ox | 5.13.19 | 15:42 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| ~~Duplicate~~ BS | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | | x |
| Trip Blank - 1 | — | — | 3 | x | | | X | | X | | | | | | x | | | | | | x | | | | | | | | | | | x | x | | x |
| | | | | | | | | | | X | | BS | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 5.13.19 | 17:30 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 5-14-19 | 0950 | | | | | | |

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-11 | 310-155507-A-1 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-11 | 310-155507-B-1 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-11 | 310-155507-C-1 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-11 | 310-155507-D-1 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-11 | 310-155507-F-1 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-21ox | 310-155507-A-2 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-21ox | 310-155507-B-2 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-21ox | 310-155507-C-2 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-21ox | 310-155507-D-2 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-21ox | 310-155507-F-2 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-23ox | 310-155507-A-3 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-23ox | 310-155507-B-3 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-23ox | 310-155507-C-3 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-23ox | 310-155507-D-3 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-23ox | 310-155507-F-3 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-25ox | 310-155507-A-4 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-25ox | 310-155507-B-4 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-25ox | 310-155507-C-4 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-25ox | 310-155507-D-4 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-25ox | 310-155507-F-4 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-48ox | 310-155507-A-5 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-48ox | 310-155507-B-5 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-48ox | 310-155507-C-5 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-48ox | 310-155507-D-5 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-48ox | 310-155507-F-5 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-61ox | 310-155507-A-6 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-61ox | 310-155507-B-6 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-61ox | 310-155507-C-6 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-61ox | 310-155507-D-6 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-61ox | 310-155507-F-6 | Amber Glass 250ml - Sulfuric Acid | | | |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

310-155507 Chain of Custody

Cooler Received/Opened On 05-15-2019 @ 09:45

Time Samples Removed From Cooler 13:41 Time Samples Placed In Storage 13:43 (2 Hour Window)

1. Tracking # 6820 (last 4 digits, FedEx) Courier: _FedEx_

IR Gun ID 14740456 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 5.1 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) KI

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

● ← Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #

I certify that I unloaded the cooler and answered questions 7-14 (intial) KI

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KI

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KI

I certify that I attached a label with the unique LIMS number to each container (intial) KI

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#

BIS = Broken in shipment

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

# Chain of Custody Record

Loc: 310
155507

eurofins

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Hayes, Shawn M | COC No: 310-16484 1 |
|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc | | Accreditations Required (See note) | Job #: 310-155507-1 |
| Address: 2960 Foster Creighton Drive, | Due Date Requested: 5/24/2019 | | |
| City: Nashville | TAT Requested (days): | | |
| State, Zip: TN, 37204 | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | |
| Email: | WO #: | | |
| Project Name: Sioux Falls LF State Wells | Project #: 31001962 | | |
| Site: | SSOW#: | | |

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-11 (310-155507-1) | 5/13/19 | 14:47 Central | | Water | | | X | 1 | |
| MW-21ox (310-155507-2) | 5/13/19 | 12:59 Central | | Water | | | X | 1 | |
| MW-23ox (310-155507-3) | 5/13/19 | 11:28 Central | | Water | | | X | 1 | |
| MW-25ox (310-155507-4) | 5/13/19 | 13:54 Central | | Water | | | X | 1 | |
| MW-48ox (310-155507-5) | 5/13/19 | 16:23 Central | | Water | | | X | 1 | |
| MW-61ox (310-155507-6) | 5/13/19 | 15:42 Central | | Water | | | X | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

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

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

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

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | [signature] | 5/14/19 1625 | | [signature] | 05-15-2019 09:45 | TAMAS |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 5.8 |
|---|---|---|

Ver: 01/16/2019



5/30/2019

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

310-155507 Chain of Custody

Cooler Received/Opened On 05-15-2019 @ 09:45

Time Samples Removed From Cooler 13:41 Time Samples Placed In Storage 13:43 (2 Hour Window)

1. Tracking # 6820 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 14740456 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 5.1 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) KJ

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

● ← Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # A

I certify that I unloaded the cooler and answered questions 7-14 (intial) KJ

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KJ

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KJ

I certify that I attached a label with the unique LIMS number to each container (intial) KJ

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#

BIS = Broken in shipment

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

# Chain of Custody Record

Loc: 310
**155507**

eurofins

5/30/2019

| | | | |
|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Hayes, Shawn M | COC No: 310-16484 1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc | | Accreditations Required (See note): | Job #: 310-155507-1 |
| Address: 2960 Foster Creighton Drive, , | Due Date Requested: 5/24/2019 | | |
| City: Nashville | TAT Requested (days): | | |
| State, Zip: TN, 37204 | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | |
| Email | WO #: | | |
| Project Name: Sioux Falls LF State Wells | Project #: 31001962 | | |
| Site: | SSOW#: | | |

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-11 (310-155507-1) | 5/13/19 | 14:47 Central | | Water | | | X | 1 | |
| MW-21ox (310-155507-2) | 5/13/19 | 12:59 Central | | Water | | | X | 1 | |
| MW-23ox (310-155507-3) | 5/13/19 | 11:28 Central | | Water | | | X | 1 | |
| MW-25ox (310-155507-4) | 5/13/19 | 13:54 Central | | Water | | | X | 1 | |
| MW-48ox (310-155507-5) | 5/13/19 | 16:23 Central | | Water | | | X | 1 | |
| MW-61ox (310-155507-6) | 5/13/19 | 15:42 Central | | Water | | | X | 1 | |

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

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***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) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | | |
|---|---|---|---|---|---|---|
| Empty Kit Relinquished by: | | Date: | Time: | Method of Shipment: | | |
| Relinquished by: | Date/Time: 5/14/19 1625 | Company | Received by: | Date/Time: 05-15-2019 09:45 | Company TA-WAS | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company | |

| | | |
|---|---|---|
| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 5.8 |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-155507-1
SDG Number: 27218345.00

**Login Number: 155507**
**List Number: 1**
**Creator: Bovy, Lorrainna L**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

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# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-155636-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*5/30/2019 4:37:06 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Job ID: 310-155636-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-155636-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 5/15/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were -0.2º C, 0.8º C, 1.5º C and 1.8º C.

**GC/MS VOA**
Method(s) 8260C: Surrogate recovery for the following sample was outside the upper control limit: Trip Blank-2 (310-155636-10). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

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

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

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

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

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Ground Water | 05/14/19 12:29 | 05/15/19 10:00 | |
| 310-155636-2 | MW-42ox | Ground Water | 05/14/19 10:36 | 05/15/19 10:00 | |
| 310-155636-3 | MW-44ox | Ground Water | 05/14/19 15:44 | 05/15/19 10:00 | |
| 310-155636-4 | MW-45ox | Ground Water | 05/14/19 16:29 | 05/15/19 10:00 | |
| 310-155636-5 | MW-47ox | Ground Water | 05/14/19 09:49 | 05/15/19 10:00 | |
| 310-155636-6 | MW-54ox | Ground Water | 05/14/19 13:12 | 05/15/19 10:00 | |
| 310-155636-7 | MW-57ox | Ground Water | 05/14/19 08:36 | 05/15/19 10:00 | |
| 310-155636-8 | MW-59ox | Ground Water | 05/14/19 14:48 | 05/15/19 10:00 | |
| 310-155636-9 | MW-60ox | Ground Water | 05/14/19 14:09 | 05/15/19 10:00 | |
| 310-155636-10 | Trip Blank-2 | Water | 05/14/19 00:00 | 05/15/19 10:00 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-39ox — Lab Sample ID: 310-155636-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.81 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 580 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 183 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0114 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 3.60 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 15.3 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 302 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 3.31 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-42ox — Lab Sample ID: 310-155636-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29.5 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2240 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 371 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0114 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 8.18 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 75.0 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 1.03 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 7.50 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 426 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 3.64 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-44ox — Lab Sample ID: 310-155636-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11.5 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 668 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 222 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.172 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 2.75 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 15.3 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.132 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 3.36 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 421 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.04 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-45ox — Lab Sample ID: 310-155636-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.63 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 976 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 343 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0306 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 6.66 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 33.9 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 366 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.00 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-47ox — Lab Sample ID: 310-155636-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 93.3 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: MW-47ox (Continued) — Lab Sample ID: 310-155636-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1600 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 444 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 7.19 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 33.0 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Chemical Oxygen Demand | 9.12 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 470 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 4.26 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-54ox — Lab Sample ID: 310-155636-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 119 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 847 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 255 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Magnesium | 105 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.07 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 104 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.35 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 14.0 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 420 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Bicarbonate Alkalinity as CaCO3 | 420 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Dissolved Solids | 2140 | | 150 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 7.0 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Total Organic Carbon | 5.13 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-57ox — Lab Sample ID: 310-155636-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50.9 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1600 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 491 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 8.76 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 98.6 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Chemical Oxygen Demand | 8.15 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 210 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.95 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-59ox — Lab Sample ID: 310-155636-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.50 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2050 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 460 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0449 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 18.7 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 81.1 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0285 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 8.48 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 273 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 1.95 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-60ox — Lab Sample ID: 310-155636-9

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 30.7 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2180 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 495 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.163 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 17.5 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 106 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.130 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.138 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 273 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.28 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank-2 — Lab Sample ID: 310-155636-10

No Detections.

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-39ox**
**Date Collected: 05/14/19 12:29**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-1**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 21:23 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:23 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:23 | 1 |

## Client Sample ID: MW-39ox

**Date Collected: 05/14/19 12:29**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *115* | | *80 - 120* | | *05/20/19 21:23* | *1* |
| *Dibromofluoromethane (Surr)* | *108* | | *80 - 120* | | *05/20/19 21:23* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *05/20/19 21:23* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **5.81** | | 5.00 | | mg/L | | | 05/19/19 07:55 | 5 |
| **Sulfate** | **580** | | 100 | | mg/L | | | 05/19/19 08:11 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **183** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:19 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:19 | 1 |
| **Manganese** | **0.0114** | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:19 | 1 |
| **Potassium** | **3.60** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:19 | 1 |
| **Sodium** | **15.3** | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:19 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:20 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 16:20 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:16 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:21 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **302** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 22:55 | 1 |
| **Total Organic Carbon** | **3.31** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-42ox**
**Date Collected: 05/14/19 10:36**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-2**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 21:44 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 21:44 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 21:44 | 1 |

## Client Sample ID: MW-42ox

**Date Collected: 05/14/19 10:36**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-2

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *115* | | *80 - 120* | | *05/20/19 21:44* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *05/20/19 21:44* | *1* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* | | *05/20/19 21:44* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **29.5** | | 5.00 | | mg/L | | | 05/19/19 09:00 | 5 |
| **Sulfate** | **2240** | | 100 | | mg/L | | | 05/19/19 09:16 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **371** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:20 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:20 | 1 |
| **Manganese** | **0.0114** | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:20 | 1 |
| **Potassium** | **8.18** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:20 | 1 |
| **Sodium** | **75.0** | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:20 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:21 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 16:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:20 | 1 |
| **Nitrate Nitrite as N** | **1.03** | | 0.100 | | mg/L | | | 05/23/19 17:22 | 1 |
| **Chemical Oxygen Demand** | **7.50** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **426** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 22:57 | 1 |
| **Total Organic Carbon** | **3.64** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-44ox**
**Date Collected: 05/14/19 15:44**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-3**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 22:06 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:06 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:06 | 1 |

## Client Sample ID: MW-44ox

**Date Collected: 05/14/19 15:44**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *114* | | *80 - 120* | | *05/20/19 22:06* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *05/20/19 22:06* | *1* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* | | *05/20/19 22:06* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **11.5** | | 5.00 | | mg/L | | | 05/19/19 09:33 | 5 |
| **Sulfate** | **668** | | 100 | | mg/L | | | 05/19/19 09:49 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **222** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:27 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:27 | 1 |
| **Manganese** | **0.172** | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:27 | 1 |
| **Potassium** | **2.75** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:27 | 1 |
| **Sodium** | **15.3** | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:27 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:23 | 1 |
| **Manganese** | **0.132** | | 0.0100 | | mg/L | | | 05/20/19 16:23 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:21 | 1 |
| **Nitrate Nitrite as N** | **3.36** | | 1.00 | | mg/L | | | 05/23/19 17:23 | 10 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **421** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:02 | 1 |
| **Total Organic Carbon** | **2.04** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-45ox**
**Date Collected: 05/14/19 16:29**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-4**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 22:28 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 22:28 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 22:28 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-45ox**
**Date Collected: 05/14/19 16:29**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-4**
**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *117* | | *80 - 120* | | *05/20/19 22:28* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *05/20/19 22:28* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *05/20/19 22:28* | *1* |

## Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **5.63** | | 5.00 | | mg/L | | | 05/19/19 10:05 | 5 |
| **Sulfate** | **976** | | 100 | | mg/L | | | 05/19/19 10:22 | 100 |

## Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **343** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:29 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:29 | 1 |
| **Manganese** | **0.0306** | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:29 | 1 |
| **Potassium** | **6.66** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:29 | 1 |
| **Sodium** | **33.9** | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:29 | 1 |

## Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:25 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 16:25 | 1 |

## General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:45 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:24 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **366** | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:17 | 1 |
| **Total Organic Carbon** | **2.00** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-47ox**
**Date Collected: 05/14/19 09:49**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-5**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 04:11 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:11 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:11 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-47ox**
**Date Collected: 05/14/19 09:49**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-5**
**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *111* | | *80 - 120* | | *05/21/19 04:11* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *05/21/19 04:11* | *1* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* | | *05/21/19 04:11* | *1* |

## Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **93.3** | | 5.00 | | mg/L | | | 05/19/19 10:38 | 5 |
| **Sulfate** | **1600** | | 100 | | mg/L | | | 05/19/19 10:54 | 100 |

## Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **444** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:30 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:30 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:30 | 1 |
| **Potassium** | **7.19** | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:30 | 1 |
| **Sodium** | **33.0** | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 18:30 | 1 |

## Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:26 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 16:26 | 1 |

## General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:46 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:25 | 1 |
| **Chemical Oxygen Demand** | **9.12** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **470** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:44 | 1 |
| **Total Organic Carbon** | **4.26** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-54ox**
**Date Collected: 05/14/19 13:12**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-6**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 04:33 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:33 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:33 | 1 |

## Client Sample ID: MW-54ox

**Date Collected: 05/14/19 13:12**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-6

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *117* | | *80 - 120* | | *05/21/19 04:33* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *05/21/19 04:33* | *1* |
| *Toluene-d8 (Surr)* | *90* | | *80 - 120* | | *05/21/19 04:33* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **119** | | 5.00 | | mg/L | | | 05/19/19 11:11 | 5 |
| **Sulfate** | **847** | | 100 | | mg/L | | | 05/19/19 11:27 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **255** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |
| **Magnesium** | **105** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |
| **Manganese** | **1.07** | | 0.0100 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |
| **Sodium** | **104** | | 2.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:28 | 1 |
| **Manganese** | **1.35** | | 0.0100 | | mg/L | | | 05/20/19 16:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:47 | 1 |
| Nitrogen, Kjeldahl | <1.00 | | 1.00 | | mg/L | | 05/23/19 08:19 | 05/25/19 00:31 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:26 | 1 |
| **Chemical Oxygen Demand** | **14.0** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| Total Suspended Solids | <1.88 | | 1.88 | | mg/L | | | 05/16/19 12:10 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **420** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| **Bicarbonate Alkalinity as CaCO3** | **420** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Carbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| **Total Dissolved Solids** | **2140** | | 150 | | mg/L | | | 05/16/19 10:16 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 22:46 | 1 |
| **Total Organic Carbon** | **5.13** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **pH** | **7.0** | **HF** | 0.1 | | SU | | | 05/15/19 15:38 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-57ox**
**Date Collected: 05/14/19 08:36**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-7**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 04:54 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 04:54 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 04:54 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-57ox**
**Date Collected: 05/14/19 08:36**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-7**
**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* | | *05/21/19 04:54* | *1* |
| *Dibromofluoromethane (Surr)* | *107* | | *80 - 120* | | *05/21/19 04:54* | *1* |
| *Toluene-d8 (Surr)* | *91* | | *80 - 120* | | *05/21/19 04:54* | *1* |

## Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **50.9** | | 5.00 | | mg/L | | | 05/19/19 12:16 | 5 |
| **Sulfate** | **1600** | | 100 | | mg/L | | | 05/19/19 12:32 | 100 |

## Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **491** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:34 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:34 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:34 | 1 |
| **Potassium** | **8.76** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:34 | 1 |
| **Sodium** | **98.6** | | 2.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:34 | 1 |

## Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:29 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 16:29 | 1 |

## General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:48 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:27 | 1 |
| **Chemical Oxygen Demand** | **8.15** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **210** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:49 | 1 |
| **Total Organic Carbon** | **2.95** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-59ox**
**Date Collected: 05/14/19 14:48**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-8**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 05:16 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:16 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:16 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-59ox**
**Date Collected: 05/14/19 14:48**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-8**
**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *116* | | *80 - 120* | | *05/21/19 05:16* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *05/21/19 05:16* | *1* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* | | *05/21/19 05:16* | *1* |

## Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **7.50** | | 5.00 | | mg/L | | | 05/19/19 12:49 | 5 |
| **Sulfate** | **2050** | | 100 | | mg/L | | | 05/19/19 13:05 | 100 |

## Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **460** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:35 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:35 | 1 |
| **Manganese** | **0.0449** | | 0.0100 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:35 | 1 |
| **Potassium** | **18.7** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:35 | 1 |
| **Sodium** | **81.1** | | 2.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:35 | 1 |

## Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:31 | 1 |
| **Manganese** | **0.0285** | | 0.0100 | | mg/L | | | 05/20/19 16:31 | 1 |

## General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:50 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:29 | 1 |
| **Chemical Oxygen Demand** | **8.48** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **273** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:51 | 1 |
| **Total Organic Carbon** | **1.95** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: MW-60ox**
**Date Collected: 05/14/19 14:09**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-9**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 05:37 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:37 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:37 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-60ox

**Date Collected: 05/14/19 14:09**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-9

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *114* | | *80 - 120* | | *05/21/19 05:37* | *1* |
| *Dibromofluoromethane (Surr)* | *106* | | *80 - 120* | | *05/21/19 05:37* | *1* |
| *Toluene-d8 (Surr)* | *90* | | *80 - 120* | | *05/21/19 05:37* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **30.7** | | 5.00 | | mg/L | | | 05/19/19 13:22 | 5 |
| **Sulfate** | **2180** | | 100 | | mg/L | | | 05/19/19 13:38 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **495** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:37 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:37 | 1 |
| **Manganese** | **0.163** | | 0.0100 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:37 | 1 |
| **Potassium** | **17.5** | | 1.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:37 | 1 |
| **Sodium** | **106** | | 2.00 | | mg/L | | 05/16/19 08:26 | 05/17/19 18:37 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 16:36 | 1 |
| **Manganese** | **0.130** | | 0.0100 | | mg/L | | | 05/20/19 16:36 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:51 | 1 |
| **Nitrate Nitrite as N** | **0.138** | | 0.100 | | mg/L | | | 05/23/19 17:30 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **273** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 23:53 | 1 |
| **Total Organic Carbon** | **2.28** | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-2**
**Date Collected: 05/14/19 00:00**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-10**
**Matrix: Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 05:59 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 05:59 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 05:59 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-2**
**Date Collected: 05/14/19 00:00**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-10**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 121 | X | 80 - 120 | | 05/21/19 05:59 | 1 |
| Dibromofluoromethane (Surr) | 105 | | 80 - 120 | | 05/21/19 05:59 | 1 |
| Toluene-d8 (Surr) | 93 | | 80 - 120 | | 05/21/19 05:59 | 1 |

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| X | Surrogate is outside control limits |

### General Chemistry

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

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155636-1 | MW-39ox | 115 | 108 | 94 |
| 310-155636-2 | MW-42ox | 115 | 103 | 92 |
| 310-155636-3 | MW-44ox | 114 | 105 | 92 |
| 310-155636-4 | MW-45ox | 117 | 103 | 94 |
| 310-155636-5 | MW-47ox | 111 | 103 | 92 |
| 310-155636-5 MS | MW-47ox | 103 | 103 | 99 |
| 310-155636-5 MSD | MW-47ox | 100 | 101 | 99 |
| 310-155636-6 | MW-54ox | 117 | 105 | 90 |
| 310-155636-7 | MW-57ox | 119 | 107 | 91 |
| 310-155636-8 | MW-59ox | 116 | 104 | 93 |
| 310-155636-9 | MW-60ox | 114 | 106 | 90 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155636-10 | Trip Blank-2 | 121 X | 105 | 93 |
| LCS 310-240116/6 | Lab Control Sample | 101 | 101 | 100 |
| LCS 310-240116/7 | Lab Control Sample | 113 | 100 | 92 |
| LCS 310-240137/6 | Lab Control Sample | 99 | 102 | 97 |
| LCS 310-240137/7 | Lab Control Sample | 119 | 101 | 97 |
| MB 310-240116/5 | Method Blank | 116 | 99 | 94 |
| MB 310-240137/5 | Method Blank | 115 | 104 | 93 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-240116/5**
**Matrix: Water**
**Analysis Batch: 240116**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/20/19 15:17 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/20/19 15:17 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/20/19 15:17 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240116/5**
**Matrix: Water**
**Analysis Batch: 240116**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 116 | | 80 - 120 | | 05/20/19 15:17 | 1 |
| Dibromofluoromethane (Surr) | 99 | | 80 - 120 | | 05/20/19 15:17 | 1 |
| Toluene-d8 (Surr) | 94 | | 80 - 120 | | 05/20/19 15:17 | 1 |

**Lab Sample ID: LCS 310-240116/6**
**Matrix: Water**
**Analysis Batch: 240116**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 41.03 | | ug/L | | 103 | 50 - 150 |
| Acrylonitrile | 200 | 185.8 | | ug/L | | 93 | 50 - 150 |
| Benzene | 20.0 | 19.77 | | ug/L | | 99 | 77 - 120 |
| Bromochloromethane | 20.0 | 20.25 | | ug/L | | 101 | 73 - 132 |
| Bromodichloromethane | 20.0 | 17.84 | | ug/L | | 89 | 73 - 120 |
| Bromoform | 20.0 | 17.06 | | ug/L | | 85 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 36.35 | | ug/L | | 91 | 50 - 150 |
| Carbon disulfide | 20.0 | 19.75 | | ug/L | | 99 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 20.16 | | ug/L | | 101 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.54 | | ug/L | | 98 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 18.40 | | ug/L | | 92 | 66 - 120 |
| Chloroform | 20.0 | 19.46 | | ug/L | | 97 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 19.53 | | ug/L | | 98 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.94 | | ug/L | | 90 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 16.29 | | ug/L | | 81 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 18.90 | | ug/L | | 94 | 71 - 125 |
| Dibromomethane | 20.0 | 19.25 | | ug/L | | 96 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 18.84 | | ug/L | | 94 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 19.45 | | ug/L | | 97 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 19.01 | | ug/L | | 95 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 19.22 | | ug/L | | 96 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 19.98 | | ug/L | | 100 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 18.69 | | ug/L | | 93 | 75 - 123 |
| Ethylbenzene | 20.0 | 19.71 | | ug/L | | 99 | 73 - 120 |
| 2-Hexanone | 40.0 | 34.28 | | ug/L | | 86 | 57 - 128 |
| Iodomethane | 20.0 | 19.16 | | ug/L | | 96 | 20 - 150 |
| Methylene Chloride | 20.0 | 18.89 | | ug/L | | 94 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 35.92 | | ug/L | | 90 | 59 - 126 |
| m,p-Xylene | 20.0 | 20.30 | | ug/L | | 102 | 70 - 120 |
| o-Xylene | 20.0 | 19.37 | | ug/L | | 97 | 67 - 120 |
| Styrene | 20.0 | 19.27 | | ug/L | | 96 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 18.56 | | ug/L | | 93 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 18.59 | | ug/L | | 93 | 63 - 122 |
| Tetrachloroethene | 20.0 | 21.02 | | ug/L | | 105 | 72 - 129 |
| Toluene | 20.0 | 19.89 | | ug/L | | 99 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 17.27 | | ug/L | | 86 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 20.13 | | ug/L | | 101 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 18.88 | | ug/L | | 94 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 19.57 | | ug/L | | 98 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240116/6**
**Matrix: Water**
**Analysis Batch: 240116**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 19.69 | | ug/L | | 98 | 69 - 127 |
| Trichloroethene | 20.0 | 19.82 | | ug/L | | 99 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 17.87 | | ug/L | | 89 | 66 - 120 |
| Vinyl acetate | 40.0 | 38.80 | | ug/L | | 97 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

**Lab Sample ID: LCS 310-240116/7**
**Matrix: Water**
**Analysis Batch: 240116**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 15.03 | | ug/L | | 75 | 38 - 150 |
| Chloroethane | 20.0 | 17.62 | | ug/L | | 88 | 69 - 129 |
| Chloromethane | 20.0 | 17.05 | | ug/L | | 85 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 20.47 | | ug/L | | 102 | 68 - 146 |
| Vinyl chloride | 20.0 | 18.55 | | ug/L | | 93 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *113* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* |

**Lab Sample ID: MB 310-240137/5**
**Matrix: Water**
**Analysis Batch: 240137**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 01:40 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240137/5**
**Matrix: Water**
**Analysis Batch: 240137**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 01:40 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 01:40 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *115* | | *80 - 120* | | *05/21/19 01:40* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *05/21/19 01:40* | *1* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* | | *05/21/19 01:40* | *1* |

**Lab Sample ID: LCS 310-240137/6**
**Matrix: Water**
**Analysis Batch: 240137**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 41.70 | | ug/L | | 104 | 50 - 150 |
| Acrylonitrile | 200 | 191.8 | | ug/L | | 96 | 50 - 150 |
| Benzene | 20.0 | 20.04 | | ug/L | | 100 | 77 - 120 |
| Bromochloromethane | 20.0 | 21.44 | | ug/L | | 107 | 73 - 132 |
| Bromodichloromethane | 20.0 | 18.76 | | ug/L | | 94 | 73 - 120 |
| Bromoform | 20.0 | 17.70 | | ug/L | | 89 | 57 - 120 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240137/6**
**Matrix: Water**
**Analysis Batch: 240137**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | 40.0 | 38.74 | | ug/L | | 97 | 50 - 150 |
| Carbon disulfide | 20.0 | 19.82 | | ug/L | | 99 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 20.17 | | ug/L | | 101 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.46 | | ug/L | | 97 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 18.30 | | ug/L | | 92 | 66 - 120 |
| Chloroform | 20.0 | 19.95 | | ug/L | | 100 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 20.12 | | ug/L | | 101 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.24 | | ug/L | | 86 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 17.80 | | ug/L | | 89 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.39 | | ug/L | | 97 | 71 - 125 |
| Dibromomethane | 20.0 | 19.77 | | ug/L | | 99 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 19.59 | | ug/L | | 98 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 19.98 | | ug/L | | 100 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 19.38 | | ug/L | | 97 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 20.17 | | ug/L | | 101 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 20.32 | | ug/L | | 102 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 18.82 | | ug/L | | 94 | 75 - 123 |
| Ethylbenzene | 20.0 | 19.45 | | ug/L | | 97 | 73 - 120 |
| 2-Hexanone | 40.0 | 35.47 | | ug/L | | 89 | 57 - 128 |
| Iodomethane | 20.0 | 19.93 | | ug/L | | 100 | 20 - 150 |
| Methylene Chloride | 20.0 | 19.68 | | ug/L | | 98 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 35.65 | | ug/L | | 89 | 59 - 126 |
| m,p-Xylene | 20.0 | 19.91 | | ug/L | | 100 | 70 - 120 |
| o-Xylene | 20.0 | 19.44 | | ug/L | | 97 | 67 - 120 |
| Styrene | 20.0 | 19.45 | | ug/L | | 97 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 18.90 | | ug/L | | 95 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 18.74 | | ug/L | | 94 | 63 - 122 |
| Tetrachloroethene | 20.0 | 20.78 | | ug/L | | 104 | 72 - 129 |
| Toluene | 20.0 | 19.83 | | ug/L | | 99 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 16.01 | | ug/L | | 80 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 20.18 | | ug/L | | 101 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 18.87 | | ug/L | | 94 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 19.70 | | ug/L | | 98 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 19.54 | | ug/L | | 98 | 69 - 127 |
| Trichloroethene | 20.0 | 20.17 | | ug/L | | 101 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 18.40 | | ug/L | | 92 | 66 - 120 |
| Vinyl acetate | 40.0 | 37.92 | | ug/L | | 95 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240137/7**
**Matrix: Water**
**Analysis Batch: 240137**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromomethane | | | 20.0 | 15.40 | | ug/L | | 77 | 38 - 150 | | |
| Chloroethane | | | 20.0 | 17.62 | | ug/L | | 88 | 69 - 129 | | |
| Chloromethane | | | 20.0 | 17.11 | | ug/L | | 86 | 50 - 150 | | |
| Trichlorofluoromethane | | | 20.0 | 20.85 | | ug/L | | 104 | 68 - 146 | | |
| Vinyl chloride | | | 20.0 | 18.67 | | ug/L | | 93 | 67 - 133 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* |

**Lab Sample ID: 310-155636-5 MS**
**Matrix: Ground Water**
**Analysis Batch: 240137**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 40.0 | 35.90 | | ug/L | | 90 | 31 - 150 | | |
| Acrylonitrile | <5.00 | | 200 | 180.6 | | ug/L | | 90 | 50 - 150 | | |
| Benzene | <0.500 | | 20.0 | 19.24 | | ug/L | | 96 | 59 - 120 | | |
| Bromochloromethane | <5.00 | | 20.0 | 19.68 | | ug/L | | 98 | 55 - 135 | | |
| Bromodichloromethane | <1.00 | | 20.0 | 17.78 | | ug/L | | 89 | 53 - 120 | | |
| Bromoform | <5.00 | | 20.0 | 16.96 | | ug/L | | 85 | 42 - 120 | | |
| 2-Butanone (MEK) | <10.0 | | 40.0 | 33.77 | | ug/L | | 84 | 49 - 150 | | |
| Carbon disulfide | <1.00 | | 20.0 | 19.76 | | ug/L | | 99 | 43 - 122 | | |
| Carbon tetrachloride | <2.00 | | 20.0 | 18.43 | | ug/L | | 92 | 47 - 126 | | |
| Chlorobenzene | <1.00 | | 20.0 | 19.29 | | ug/L | | 96 | 52 - 120 | | |
| Chlorodibromomethane | <5.00 | | 20.0 | 17.96 | | ug/L | | 90 | 48 - 120 | | |
| Chloroform | <3.00 | | 20.0 | 19.32 | | ug/L | | 97 | 50 - 130 | | |
| cis-1,2-Dichloroethene | <1.00 | | 20.0 | 18.85 | | ug/L | | 94 | 46 - 130 | | |
| cis-1,3-Dichloropropene | <5.00 | | 20.0 | 16.27 | | ug/L | | 81 | 51 - 120 | | |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 20.0 | 15.42 | | ug/L | | 77 | 32 - 150 | | |
| 1,2-Dibromoethane (EDB) | <1.00 | | 20.0 | 18.65 | | ug/L | | 93 | 52 - 127 | | |
| Dibromomethane | <1.00 | | 20.0 | 18.57 | | ug/L | | 93 | 61 - 130 | | |
| 1,2-Dichlorobenzene | <1.00 | | 20.0 | 19.25 | | ug/L | | 96 | 46 - 120 | | |
| 1,4-Dichlorobenzene | <1.00 | | 20.0 | 19.59 | | ug/L | | 98 | 45 - 120 | | |
| 1,1-Dichloroethane | <1.00 | | 20.0 | 18.29 | | ug/L | | 91 | 50 - 127 | | |
| 1,2-Dichloroethane | <1.00 | | 20.0 | 19.05 | | ug/L | | 95 | 55 - 128 | | |
| 1,1-Dichloroethene | <2.00 | | 20.0 | 19.50 | | ug/L | | 98 | 47 - 124 | | |
| 1,2-Dichloropropane | <1.00 | | 20.0 | 18.21 | | ug/L | | 91 | 57 - 125 | | |
| Ethylbenzene | <1.00 | | 20.0 | 18.96 | | ug/L | | 95 | 46 - 120 | | |
| 2-Hexanone | <10.0 | | 40.0 | 31.85 | | ug/L | | 80 | 43 - 129 | | |
| Iodomethane | <10.0 | | 20.0 | 18.73 | | ug/L | | 94 | 20 - 150 | | |
| Methylene Chloride | <5.00 | | 20.0 | 18.10 | | ug/L | | 90 | 50 - 150 | | |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 40.0 | 33.36 | | ug/L | | 83 | 44 - 131 | | |
| m,p-Xylene | <2.00 | | 20.0 | 19.64 | | ug/L | | 98 | 37 - 120 | | |
| o-Xylene | <1.00 | | 20.0 | 19.22 | | ug/L | | 96 | 46 - 120 | | |
| Styrene | <1.00 | | 20.0 | 18.84 | | ug/L | | 94 | 42 - 120 | | |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 20.0 | 18.38 | | ug/L | | 92 | 50 - 120 | | |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-155636-5 MS**
**Matrix: Ground Water**
**Analysis Batch: 240137**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | <1.00 | | 20.0 | 18.24 | | ug/L | | 91 | 49 - 129 |
| Tetrachloroethene | <1.00 | | 20.0 | 19.94 | | ug/L | | 100 | 40 - 129 |
| Toluene | <1.00 | | 20.0 | 19.47 | | ug/L | | 97 | 52 - 120 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 20.0 | 14.56 | | ug/L | | 73 | 15 - 150 |
| trans-1,2-Dichloroethene | <1.00 | | 20.0 | 19.48 | | ug/L | | 97 | 51 - 122 |
| trans-1,3-Dichloropropene | <5.00 | | 20.0 | 17.65 | | ug/L | | 88 | 51 - 122 |
| 1,1,1-Trichloroethane | <1.00 | | 20.0 | 18.39 | | ug/L | | 92 | 50 - 127 |
| 1,1,2-Trichloroethane | <1.00 | | 20.0 | 19.27 | | ug/L | | 96 | 50 - 131 |
| Trichloroethene | <1.00 | | 20.0 | 19.09 | | ug/L | | 95 | 54 - 123 |
| 1,2,3-Trichloropropane | <1.00 | | 20.0 | 18.11 | | ug/L | | 91 | 42 - 134 |
| Vinyl acetate | <10.0 | | 40.0 | 36.26 | | ug/L | | 91 | 34 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *103* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* |

**Lab Sample ID: 310-155636-5 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240137**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 40.0 | 36.76 | | ug/L | | 92 | 31 - 150 | 2 | 24 |
| Acrylonitrile | <5.00 | | 200 | 184.7 | | ug/L | | 92 | 50 - 150 | 2 | 21 |
| Benzene | <0.500 | | 20.0 | 18.58 | | ug/L | | 93 | 59 - 120 | 3 | 21 |
| Bromochloromethane | <5.00 | | 20.0 | 19.66 | | ug/L | | 98 | 55 - 135 | 0 | 24 |
| Bromodichloromethane | <1.00 | | 20.0 | 17.62 | | ug/L | | 88 | 53 - 120 | 1 | 21 |
| Bromoform | <5.00 | | 20.0 | 16.78 | | ug/L | | 84 | 42 - 120 | 1 | 24 |
| 2-Butanone (MEK) | <10.0 | | 40.0 | 34.93 | | ug/L | | 87 | 49 - 150 | 3 | 20 |
| Carbon disulfide | <1.00 | | 20.0 | 17.93 | | ug/L | | 90 | 43 - 122 | 10 | 25 |
| Carbon tetrachloride | <2.00 | | 20.0 | 18.16 | | ug/L | | 91 | 47 - 126 | 1 | 21 |
| Chlorobenzene | <1.00 | | 20.0 | 19.26 | | ug/L | | 96 | 52 - 120 | 0 | 21 |
| Chlorodibromomethane | <5.00 | | 20.0 | 17.40 | | ug/L | | 87 | 48 - 120 | 3 | 23 |
| Chloroform | <3.00 | | 20.0 | 18.33 | | ug/L | | 92 | 50 - 130 | 5 | 20 |
| cis-1,2-Dichloroethene | <1.00 | | 20.0 | 18.79 | | ug/L | | 94 | 46 - 130 | 0 | 22 |
| cis-1,3-Dichloropropene | <5.00 | | 20.0 | 16.21 | | ug/L | | 81 | 51 - 120 | 0 | 22 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 20.0 | 16.27 | | ug/L | | 81 | 32 - 150 | 5 | 24 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 20.0 | 18.46 | | ug/L | | 92 | 52 - 127 | 1 | 22 |
| Dibromomethane | <1.00 | | 20.0 | 18.67 | | ug/L | | 93 | 61 - 130 | 1 | 21 |
| 1,2-Dichlorobenzene | <1.00 | | 20.0 | 20.14 | | ug/L | | 101 | 46 - 120 | 5 | 23 |
| 1,4-Dichlorobenzene | <1.00 | | 20.0 | 20.31 | | ug/L | | 102 | 45 - 120 | 4 | 22 |
| 1,1-Dichloroethane | <1.00 | | 20.0 | 17.98 | | ug/L | | 90 | 50 - 127 | 2 | 23 |
| 1,2-Dichloroethane | <1.00 | | 20.0 | 18.62 | | ug/L | | 93 | 55 - 128 | 2 | 21 |
| 1,1-Dichloroethene | <2.00 | | 20.0 | 18.48 | | ug/L | | 92 | 47 - 124 | 5 | 24 |
| 1,2-Dichloropropane | <1.00 | | 20.0 | 17.79 | | ug/L | | 89 | 57 - 125 | 2 | 21 |
| Ethylbenzene | <1.00 | | 20.0 | 19.10 | | ug/L | | 95 | 46 - 120 | 1 | 23 |
| 2-Hexanone | <10.0 | | 40.0 | 33.77 | | ug/L | | 84 | 43 - 129 | 6 | 20 |
| Iodomethane | <10.0 | | 20.0 | 19.25 | | ug/L | | 96 | 20 - 150 | 3 | 35 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-155636-5 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240137**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Methylene Chloride | <5.00 | | 20.0 | 17.37 | | ug/L | | 87 | 50 - 150 | 4 | 23 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 40.0 | 34.48 | | ug/L | | 86 | 44 - 131 | 3 | 20 |
| m,p-Xylene | <2.00 | | 20.0 | 19.75 | | ug/L | | 99 | 37 - 120 | 1 | 35 |
| o-Xylene | <1.00 | | 20.0 | 19.64 | | ug/L | | 98 | 46 - 120 | 2 | 23 |
| Styrene | <1.00 | | 20.0 | 18.86 | | ug/L | | 94 | 42 - 120 | 0 | 25 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 20.0 | 18.61 | | ug/L | | 93 | 50 - 120 | 1 | 21 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 20.0 | 18.58 | | ug/L | | 93 | 49 - 129 | 2 | 20 |
| Tetrachloroethene | <1.00 | | 20.0 | 19.69 | | ug/L | | 98 | 40 - 129 | 1 | 21 |
| Toluene | <1.00 | | 20.0 | 18.84 | | ug/L | | 94 | 52 - 120 | 3 | 23 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 20.0 | 15.28 | | ug/L | | 76 | 15 - 150 | 5 | 28 |
| trans-1,2-Dichloroethene | <1.00 | | 20.0 | 18.53 | | ug/L | | 93 | 51 - 122 | 5 | 23 |
| trans-1,3-Dichloropropene | <5.00 | | 20.0 | 17.56 | | ug/L | | 88 | 51 - 122 | 0 | 25 |
| 1,1,1-Trichloroethane | <1.00 | | 20.0 | 17.82 | | ug/L | | 89 | 50 - 127 | 3 | 21 |
| 1,1,2-Trichloroethane | <1.00 | | 20.0 | 19.21 | | ug/L | | 96 | 50 - 131 | 0 | 22 |
| Trichloroethene | <1.00 | | 20.0 | 18.75 | | ug/L | | 94 | 54 - 123 | 2 | 20 |
| 1,2,3-Trichloropropane | <1.00 | | 20.0 | 17.45 | | ug/L | | 87 | 42 - 134 | 4 | 23 |
| Vinyl acetate | <10.0 | | 40.0 | 36.14 | | ug/L | | 90 | 34 - 150 | 0 | 31 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-240160/3**
**Matrix: Water**
**Analysis Batch: 240160**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 05/19/19 02:59 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 05/19/19 02:59 | 1 |

**Lab Sample ID: LCS 310-240160/44**
**Matrix: Water**
**Analysis Batch: 240160**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.05 | | mg/L | | 100 | 90 - 110 |
| Sulfate | 10.0 | 10.39 | | mg/L | | 104 | 90 - 110 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-239649/1-A**
**Matrix: Water**
**Analysis Batch: 240090**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239649**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 310-239649/1-A**
**Matrix: Water**
**Analysis Batch: 240090**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239649**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |
| Magnesium | <1.00 | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |
| Sodium | <2.00 | | 2.00 | | mg/L | | 05/16/19 08:25 | 05/17/19 17:51 | 1 |

**Lab Sample ID: LCS 310-239649/2-A**
**Matrix: Water**
**Analysis Batch: 240090**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239649**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 16.65 | | mg/L | | 83 | 80 - 120 |
| Iron | 2.00 | 1.759 | | mg/L | | 88 | 80 - 120 |
| Magnesium | 20.0 | 17.38 | | mg/L | | 87 | 80 - 120 |
| Manganese | 1.00 | 0.8273 | | mg/L | | 83 | 80 - 120 |
| Sodium | 20.0 | 15.96 | | mg/L | | 80 | 80 - 120 |

**Lab Sample ID: LCS 310-239649/2-A**
**Matrix: Water**
**Analysis Batch: 240092**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239649**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Potassium | 20.0 | 21.05 | | mg/L | | 105 | 80 - 120 |

**Lab Sample ID: 310-155636-2 DU**
**Matrix: Ground Water**
**Analysis Batch: 240090**

**Client Sample ID: MW-42ox**
**Prep Type: Total/NA**
**Prep Batch: 239649**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Calcium | 371 | | 436.5 | | mg/L | | 16 | 20 |
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | 0.0114 | | 0.01358 | | mg/L | | 17 | 20 |
| Potassium | 8.18 | | 9.434 | | mg/L | | 14 | 20 |
| Sodium | 75.0 | | 85.68 | | mg/L | | 13 | 20 |

**Lab Sample ID: MB 310-240331/16**
**Matrix: Water**
**Analysis Batch: 240331**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/20/19 15:51 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/20/19 15:51 | 1 |

**Lab Sample ID: LCS 310-240331/17**
**Matrix: Water**
**Analysis Batch: 240331**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 2.00 | 1.958 | | mg/L | | 98 | 80 - 120 |
| Manganese | 2.00 | 1.938 | | mg/L | | 97 | 80 - 120 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-239906/195**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:14 | 1 |

**Lab Sample ID: LCS 310-239906/196**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | | | 3.11 | 3.299 | | mg/L | | 106 | 90 - 110 | | |

**Lab Sample ID: 310-155636-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 239906**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 2.50 | 2.414 | | mg/L | | 97 | 90 - 110 | | |

**Lab Sample ID: 310-155636-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 239906**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 2.50 | 2.428 | | mg/L | | 97 | 90 - 110 | 1 | 10 |

## Method: 351.2 - Nitrogen, Total Kjeldahl

**Lab Sample ID: MB 310-240562/1-A**
**Matrix: Water**
**Analysis Batch: 240826**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240562**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Kjeldahl | <1.00 | | 1.00 | | mg/L | | 05/23/19 08:19 | 05/25/19 00:02 | 1 |

**Lab Sample ID: LCS 310-240562/2-A**
**Matrix: Water**
**Analysis Batch: 240826**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240562**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Kjeldahl | | | 4.01 | 4.355 | | mg/L | | 109 | 90 - 110 | | |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-240678/43**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 17:07 | 1 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

**Lab Sample ID: LCS 310-240678/44 ^10**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 18.6 | 17.29 | | mg/L | | 93 | 90 - 110 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-240097/32**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |

**Lab Sample ID: LCS 310-240097/33**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 115.9 | | mg/L | | 92 | 85 - 115 |

## Method: I-3765-85 - Residue, Non-filterable (TSS)

**Lab Sample ID: MB 310-239688/1**
**Matrix: Water**
**Analysis Batch: 239688**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | <5.00 | | 5.00 | | mg/L | | | 05/16/19 12:10 | 1 |

**Lab Sample ID: LCS 310-239688/2**
**Matrix: Water**
**Analysis Batch: 239688**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 94.00 | | mg/L | | 94 | 74 - 114 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-239846/1**
**Matrix: Water**
**Analysis Batch: 239846**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/17/19 10:50 | 1 |

**Lab Sample ID: LCS 310-239846/2**
**Matrix: Water**
**Analysis Batch: 239846**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 965.3 | | mg/L | | 91 | 90 - 110 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 310-240478/1**
**Matrix: Water**
**Analysis Batch: 240478**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Bicarbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Carbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |

**Lab Sample ID: LCS 310-240478/2**
**Matrix: Water**
**Analysis Batch: 240478**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 966.0 | | mg/L | | 91 | 90 - 110 |

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

**Lab Sample ID: MB 310-239676/1**
**Matrix: Water**
**Analysis Batch: 239676**

**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 | <30.0 | | 30.0 | | mg/L | | | 05/16/19 10:16 | 1 |

**Lab Sample ID: LCS 310-239676/2**
**Matrix: Water**
**Analysis Batch: 239676**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 1000 | 1044 | | mg/L | | 104 | 90 - 110 |

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 310-239582/1**
**Matrix: Water**
**Analysis Batch: 239582**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH | 7.00 | 7.0 | | SU | | 99 | 98 - 102 |

**Lab Sample ID: LCS 310-239582/26**
**Matrix: Water**
**Analysis Batch: 239582**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH | 7.00 | 7.0 | | SU | | 99 | 98 - 102 |

**Lab Sample ID: 310-155636-6 DU**
**Matrix: Ground Water**
**Analysis Batch: 239582**

**Client Sample ID: MW-54ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| pH | 7.0 | HF | 6.9 | | SU | | 1 | 20 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-240267/1-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |

**Lab Sample ID: LCS 310-240267/2-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 3.632 | | mg/L | | 73 | 33 - 117 |

**Lab Sample ID: 310-155636-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 240273**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 3.632 | | mg/L | | 73 | 10 - 142 |

**Lab Sample ID: 310-155636-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240273**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 3.632 | | mg/L | | 73 | 10 - 142 | 0 | 33 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-239589/1**
**Matrix: Water**
**Analysis Batch: 239589**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/15/19 22:33 | 1 |

**Lab Sample ID: LCS 310-239589/2**
**Matrix: Water**
**Analysis Batch: 239589**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 195.2 | | mg/L | | 99 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 490-596721/1**
**Matrix: Water**
**Analysis Batch: 596721**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | <1.00 | | 1.00 | | mg/L | | | 05/21/19 11:30 | 1 |

## Method: SM 5310C - TOC (Continued)

**Lab Sample ID: LCS 490-596721/5**
**Matrix: Water**
**Analysis Batch: 596721**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 10.0 | 9.625 | | mg/L | | 96 | 90 - 110 |

## GC/MS VOA

### Analysis Batch: 240116

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 8260C | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 8260C | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 8260C | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 8260C | |
| MB 310-240116/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240116/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240116/7 | Lab Control Sample | Total/NA | Water | 8260C | |

### Analysis Batch: 240137

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 8260C | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 8260C | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 8260C | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 8260C | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 8260C | |
| 310-155636-10 | Trip Blank-2 | Total/NA | Water | 8260C | |
| MB 310-240137/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240137/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240137/7 | Lab Control Sample | Total/NA | Water | 8260C | |
| 310-155636-5 MS | MW-47ox | Total/NA | Ground Water | 8260C | |
| 310-155636-5 MSD | MW-47ox | Total/NA | Ground Water | 8260C | |

## HPLC/IC

### Analysis Batch: 240160

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 9056A | |
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 9056A | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 9056A | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 9056A | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 9056A | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 9056A | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 9056A | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 9056A | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 9056A | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 9056A | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 9056A | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 9056A | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 9056A | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 9056A | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 9056A | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 9056A | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 9056A | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 9056A | |
| MB 310-240160/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-240160/44 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 239649

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 3010A | |

## Metals (Continued)

### Prep Batch: 239649 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 3010A | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 3010A | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 3010A | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 3010A | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 3010A | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 3010A | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 3010A | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 3010A | |
| MB 310-239649/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-239649/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| 310-155636-2 DU | MW-42ox | Total/NA | Ground Water | 3010A | |

### Analysis Batch: 240090

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 6010C | 239649 |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 6010C | 239649 |
| MB 310-239649/1-A | Method Blank | Total/NA | Water | 6010C | 239649 |
| LCS 310-239649/2-A | Lab Control Sample | Total/NA | Water | 6010C | 239649 |
| 310-155636-2 DU | MW-42ox | Total/NA | Ground Water | 6010C | 239649 |

### Analysis Batch: 240092

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 310-239649/2-A | Lab Control Sample | Total/NA | Water | 6010C | 239649 |

### Analysis Batch: 240331

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Dissolved | Ground Water | 6010C | |
| 310-155636-2 | MW-42ox | Dissolved | Ground Water | 6010C | |
| 310-155636-3 | MW-44ox | Dissolved | Ground Water | 6010C | |
| 310-155636-4 | MW-45ox | Dissolved | Ground Water | 6010C | |
| 310-155636-5 | MW-47ox | Dissolved | Ground Water | 6010C | |
| 310-155636-6 | MW-54ox | Dissolved | Ground Water | 6010C | |
| 310-155636-7 | MW-57ox | Dissolved | Ground Water | 6010C | |
| 310-155636-8 | MW-59ox | Dissolved | Ground Water | 6010C | |
| 310-155636-9 | MW-60ox | Dissolved | Ground Water | 6010C | |
| MB 310-240331/16 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-240331/17 | Lab Control Sample | Total/NA | Water | 6010C | |

## General Chemistry

### Analysis Batch: 239582

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 4500 H+ B | |
| LCS 310-239582/1 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |

## General Chemistry (Continued)

### Analysis Batch: 239582 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 310-239582/26 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |
| 310-155636-6 DU | MW-54ox | Total/NA | Ground Water | SM 4500 H+ B | |

### Analysis Batch: 239589

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | SM 5210B | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-239589/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-239589/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 239676

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 2540C | |
| MB 310-239676/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 310-239676/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |

### Analysis Batch: 239688

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | I-3765-85 | |
| MB 310-239688/1 | Method Blank | Total/NA | Water | I-3765-85 | |
| LCS 310-239688/2 | Lab Control Sample | Total/NA | Water | I-3765-85 | |

### Analysis Batch: 239846

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-239846/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-239846/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 239906

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 350.1 | |
| MB 310-239906/195 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-239906/196 | Lab Control Sample | Total/NA | Water | 350.1 | |

## General Chemistry (Continued)

### Analysis Batch: 239906 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 MS | MW-39ox | Total/NA | Ground Water | 350.1 | |
| 310-155636-1 MSD | MW-39ox | Total/NA | Ground Water | 350.1 | |

### Analysis Batch: 240097

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 5220D LL | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-240097/32 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-240097/33 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Prep Batch: 240267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |
| 310-155636-1 MS | MW-39ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155636-1 MSD | MW-39ox | Total/NA | Ground Water | SM 4500 S2 C | |

### Analysis Batch: 240273

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 240267 |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 240267 |
| 310-155636-1 MS | MW-39ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155636-1 MSD | MW-39ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |

## General Chemistry

### Analysis Batch: 240478

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | SM 2320B | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-240478/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-240478/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Prep Batch: 240562

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 351.2 | |
| MB 310-240562/1-A | Method Blank | Total/NA | Water | 351.2 | |
| LCS 310-240562/2-A | Lab Control Sample | Total/NA | Water | 351.2 | |

### Analysis Batch: 240678

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | 353.2 | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | 353.2 | |
| MB 310-240678/43 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-240678/44 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 240826

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | 351.2 | 240562 |
| MB 310-240562/1-A | Method Blank | Total/NA | Water | 351.2 | 240562 |
| LCS 310-240562/2-A | Lab Control Sample | Total/NA | Water | 351.2 | 240562 |

### Analysis Batch: 596721

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155636-1 | MW-39ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-2 | MW-42ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-3 | MW-44ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-4 | MW-45ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-5 | MW-47ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-6 | MW-54ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-7 | MW-57ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-8 | MW-59ox | Total/NA | Ground Water | SM 5310C | |
| 310-155636-9 | MW-60ox | Total/NA | Ground Water | SM 5310C | |
| MB 490-596721/1 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 490-596721/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-39ox

**Date Collected: 05/14/19 12:29**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240116 | 05/20/19 21:23 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 07:55 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 08:11 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:20 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:25 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:19 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:16 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:21 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 22:55 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-42ox

**Date Collected: 05/14/19 10:36**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-2

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240116 | 05/20/19 21:44 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 09:00 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 09:16 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:21 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:25 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:20 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:20 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:22 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 22:57 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-44ox

**Date Collected: 05/14/19 15:44**
**Date Received: 05/15/19 10:00**

## Lab Sample ID: 310-155636-3

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240116 | 05/20/19 22:06 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 09:33 | MLU | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-44ox

**Lab Sample ID: 310-155636-3**

**Date Collected: 05/14/19 15:44**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 09:49 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:23 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:25 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:27 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:21 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 240678 | 05/23/19 17:23 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:02 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-45ox

**Lab Sample ID: 310-155636-4**

**Date Collected: 05/14/19 16:29**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240116 | 05/20/19 22:28 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 10:05 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 10:22 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:25 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:25 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:29 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:45 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:24 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 239846 | 05/17/19 10:50 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:17 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-47ox

**Lab Sample ID: 310-155636-5**

**Date Collected: 05/14/19 09:49**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 04:11 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 10:38 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 10:54 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:26 | CTB | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-47ox

**Lab Sample ID: 310-155636-5**

**Date Collected: 05/14/19 09:49**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:25 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:30 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:46 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:25 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:44 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-54ox

**Lab Sample ID: 310-155636-6**

**Date Collected: 05/14/19 13:12**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 04:33 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 11:11 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 11:27 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:28 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:26 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:32 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:47 | JMH | TAL CF |
| Total/NA | Prep | 351.2 | | | 240562 | 05/23/19 08:19 | MDK | TAL CF |
| Total/NA | Analysis | 351.2 | | 1 | 240826 | 05/25/19 00:31 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:26 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | I-3765-85 | | 1 | 239688 | 05/16/19 12:10 | SAS | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Analysis | SM 2540C | | 1 | 239676 | 05/16/19 10:16 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 239582 | 05/15/19 15:38 | SAS | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 22:46 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-57ox

**Lab Sample ID: 310-155636-7**

**Date Collected: 05/14/19 08:36**
**Matrix: Ground Water**
**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 04:54 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 12:16 | MLU | TAL CF |

## Client Sample ID: MW-57ox

**Lab Sample ID: 310-155636-7**

**Date Collected: 05/14/19 08:36**

**Matrix: Ground Water**

**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 12:32 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:29 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:26 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:34 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:48 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:27 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:49 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-59ox

**Lab Sample ID: 310-155636-8**

**Date Collected: 05/14/19 14:48**

**Matrix: Ground Water**

**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 05:16 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 12:49 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 13:05 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:31 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:26 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:35 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:50 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:29 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:51 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: MW-60ox

**Lab Sample ID: 310-155636-9**

**Date Collected: 05/14/19 14:09**

**Matrix: Ground Water**

**Date Received: 05/15/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 05:37 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240160 | 05/19/19 13:22 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240160 | 05/19/19 13:38 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 240331 | 05/20/19 16:36 | CTB | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Client Sample ID: MW-60ox

**Date Collected: 05/14/19 14:09**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-9**
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3010A | | | 239649 | 05/16/19 08:26 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240090 | 05/17/19 18:37 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:51 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 17:30 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239589 | 05/15/19 23:53 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 596721 | 05/21/19 11:30 | MPH | TAL NSH |

## Client Sample ID: Trip Blank-2

**Date Collected: 05/14/19 00:00**
**Date Received: 05/15/19 10:00**

**Lab Sample ID: 310-155636-10**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240137 | 05/21/19 05:59 | TRZ | TAL CF |

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

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

## Laboratory: Eurofins TestAmerica, Nashville

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-19 |
| Alaska (UST) | State Program | 10 | UST-087 | 06-30-19 |
| Arizona | State Program | 9 | AZ0473 | 05-05-20 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-20 |
| California | State Program | 9 | 2938 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0220 | 12-31-19 |
| Florida | NELAP | 4 | E87358 | 06-30-19 |
| Georgia | State Program | 4 | NA: NELAP & A2LA | 12-31-19 |
| Illinois | NELAP | 5 | 200010 | 12-09-19 |
| Iowa | State Program | 7 | 131 | 04-01-20 |
| Kansas | NELAP | 7 | E-10229 | 10-31-19 |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-19 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-19 |
| Louisiana | NELAP | 6 | 30613 | 06-30-19 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-20 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-19 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-19 |
| Mississippi | State Program | 4 | N/A | 06-30-19 |
| Nevada | State Program | 9 | TN00032 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-19 |
| New Jersey | NELAP | 2 | TN965 | 06-30-19 |
| New York | NELAP | 2 | 11342 | 03-31-20 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-19 |
| North Dakota | State Program | 8 | R-146 | 06-30-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-19 |
| Oregon | NELAP | 10 | TN200001 | 04-26-19 * |
| Pennsylvania | NELAP | 3 | 68-00585 | 07-31-19 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-19 |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-19 * |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-19 |
| USDA | Federal | | P330-13-00306 | 04-10-20 |
| Utah | NELAP | 8 | TN00032 | 07-31-19 |
| Virginia | NELAP | 3 | 460152 | 06-14-19 |

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

## Laboratory: Eurofins TestAmerica, Nashville (Continued)

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Washington | State Program | 10 | C789 | 07-19-19 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-20 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-19 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-155636-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 351.2 | Nitrogen, Total Kjeldahl | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| I-3765-85 | Residue, Non-filterable (TSS) | USGS | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL CF |
| SM 4500 H+ B | pH | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL NSH |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 351.2 | Nitrogen, Total Kjeldahl | MCAWW | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

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

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

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

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

310-155636 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE | Project: SiouxFalls LF

**Receipt Information**

Date/Time Received: DATE 5/15/19 TIME 1000 | Received By: EAR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 1 of 4

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

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

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

Trip Blank-2, MW-44ox, 420x, 540x, 570x, 470x
MW-42x, 600x, 396x

**Temperature Record**

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

Thermometer ID: I | Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 1.9 | Corrected Temp (°C): 1.8

• **Sample Container Temperature**

| Container type(s) used: | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Uncorrected Temp (°C): | TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2 |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 5/15/19 TIME 1000 Received By: EAR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 2 of 4

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

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

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

MW-59 ax, 44ax, 45ax

**Temperature Record**

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

Thermometer ID: I Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): -0.1 Corrected Temp (°C): -0.2

• **Sample Container Temperature**

| Container type(s) used: | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Uncorrected Temp (°C): | TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2 |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 05/15/19 TIME 1000 Received By: EAR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 3 of 4

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

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

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

MW- 420x, 540x, 470x

**Temperature Record**

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

Thermometer ID: I Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 1.6 Corrected Temp (°C): 1.5

• **Sample Container Temperature**

| Container type(s) used: | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Uncorrected Temp (°C): | TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2 |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 5/15/19 TIME 1000 Received By: ETR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 4 of 4

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

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

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

MW-540x, 390x, 600x

**Temperature Record**

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

Thermometer ID: I Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 0.9 Corrected Temp (°C): 0.8

• **Sample Container Temperature**

| Container type(s) used: | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Uncorrected Temp (°C): | TEMP 1 | TEMP 2 | Corrected Temp (°C): | TEMP 1 | TEMP 2 |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Daisy Tingerman
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | HNO3 (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | H2SO4 Plastic (Yellow & White Label) | H2SO4 Glass(Yellow & White Label) | NaOH (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead!) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-11ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-21ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-23ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-25ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-39ox | 5.14.19 | 12:29 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-42ox | 5.14.19 | 16:36 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-44ox | 5.14.19 | 15:44 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-45ox | 5.14.19 | 16:29 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-47ox | 5.14.19 | 09:49 | 9 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-48ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-53ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 5.14.19 | 17:30 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 5-15-19 | 1000 | | | | | | |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Doug Tasema
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| | | | | | | | Preservative | | | | | | | Matrix | | | | | | Analyze For: | | | | | | |

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-39ox | 310-155636-A-1 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-39ox | 310-155636-B-1 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-39ox | 310-155636-C-1 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-39ox | 310-155636-D-1 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-39ox | 310-155636-E-1 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-42ox | 310-155636-A-2 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-42ox | 310-155636-B-2 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-42ox | 310-155636-C-2 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-42ox | 310-155636-D-2 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-42ox | 310-155636-E-2 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-44ox | 310-155636-A-3 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-44ox | 310-155636-B-3 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-44ox | 310-155636-C-3 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-44ox | 310-155636-D-3 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-44ox | 310-155636-E-3 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-45ox | 310-155636-A-4 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-45ox | 310-155636-B-4 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-45ox | 310-155636-C-4 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-45ox | 310-155636-D-4 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-45ox | 310-155636-E-4 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-47ox | 310-155636-A-5 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-47ox | 310-155636-B-5 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-47ox | 310-155636-C-5 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-47ox | 310-155636-D-5 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-47ox | 310-155636-E-5 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-54ox | 310-155636-A-6 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-54ox | 310-155636-B-6 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-54ox | 310-155636-C-6 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-54ox | 310-155636-D-6 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-54ox | 310-155636-E-6 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-57ox | 310-155636-A-7 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-57ox | 310-155636-B-7 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-57ox | 310-155636-C-7 | Plastic 500ml - with Sulfuric Acid | <2 | | |
| MW-57ox | 310-155636-D-7 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-57ox | 310-155636-E-7 | Amber Glass 250ml - Sulfuric Acid | <2 | | |
| MW-59ox | 310-155636-A-8 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-59ox | 310-155636-B-8 | Plastic 250ml - with Nitric Acid | <2 | | |

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-59ox | 310-155636-C-8 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-59ox | 310-155636-D-8 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-59ox | 310-155636-E-8 | Amber Glass 250ml - Sulfuric Acid | <2 | _____ | _____ |
| MW-60ox | 310-155636-A-9 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-60ox | 310-155636-B-9 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-60ox | 310-155636-C-9 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-60ox | 310-155636-D-9 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-60ox | 310-155636-E-9 | Amber Glass 250ml - Sulfuric Acid | <2 | _____ | _____ |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

310-155636 Chain of Custody

Cooler Received/Opened On 5/16/2019 @ 10:20

Time Samples Removed From Cooler_____ Time Samples Placed In Storage_____ (2 Hour Window)

1. Tracking # 7610 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960358 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 4.1 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # KA

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

**Eurofins TestAmerica, Cedar Falls**
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

# Chain of Custody Record

eurofins

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Hayes, Shawn M | | COC No: 310-16493.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc | | Accreditations Required (See note): | | Job #: 310-155636-1 |
| Address: 2960 Foster Creighton Drive, | Due Date Requested: 5/28/2019 | | | |
| City: Nashville | TAT Requested (days): | | | |
| State, Zip: TN, 37204 | | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Sioux Falls LF State Wells | Project #: 31001962 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 6310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-39ox (310-155636-1) | 5/14/19 | 12:29 Central | | Water | | | X | 1 | |
| MW-42ox (310-155636-2) | 5/14/19 | 10:36 Central | | Water | | | X | 1 | |
| MW-44ox (310-155636-3) | 5/14/19 | 15:44 Central | | Water | | | X | 1 | Loc: 310 155636 |
| MW-45ox (310-155636-4) | 5/14/19 | 16:29 Central | | Water | | | X | 1 | |
| MW-47ox (310-155636-5) | 5/14/19 | 09:49 Central | | Water | | | X | 1 | |
| MW-54ox (310-155636-6) | 5/14/19 | 13:12 Central | | Water | | | X | 1 | |
| MW-57ox (310-155636-7) | 5/14/19 | 08:36 Central | | Water | | | X | 1 | |
| MW-59ox (310-155636-8) | 5/14/19 | 14:48 Central | | Water | | | X | 1 | |
| MW-60ox (310-155636-9) | 5/14/19 | 14:09 Central | | Water | | | X | 1 | |

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

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

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

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | | 5/15/19 1610 | | | 05-16-2019 10:20 | TAMAS |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.1 |
|---|---|---|

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-155636-1
SDG Number: 27218345.00

**Login Number: 155636**
**List Number: 1**
**Creator: Bovy, Lorrainna L**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-155765-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls, LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*5/30/2019 4:47:36 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Job ID: 310-155765-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-155765-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 5/16/2019 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6º C and 4.8º C.

**GC/MS VOA**
Method(s) 8260C: The surrogate recovery for the LCS associated with analytical batch 310-240435 was outside the upper control limits.

Method(s) 8260C: Surrogate recovery for the following sample was outside the upper control limit: Trip Blank - 3 (310-155765-5). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

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

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

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

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

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Ground Water | 05/15/19 09:11 | 05/16/19 09:35 | |
| 310-155765-2 | MW-56ox | Ground Water | 05/15/19 08:33 | 05/16/19 09:35 | |
| 310-155765-3 | MW-58ox | Ground Water | 05/15/19 09:50 | 05/16/19 09:35 | |
| 310-155765-4 | Duplicate | Ground Water | 05/15/19 23:59 | 05/16/19 09:35 | |
| 310-155765-5 | Trip Blank - 3 | Water | 05/15/19 00:00 | 05/16/19 09:35 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Client Sample ID: MW-53ox — Lab Sample ID: 310-155765-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 27.5 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1400 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 277 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 6.13 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 70.4 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 33.6 | | 2.00 | | mg/L | 20 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 428 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 3.29 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-56ox — Lab Sample ID: 310-155765-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1090 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 172 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0128 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 1.63 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 26.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 0.232 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 298 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 1.76 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-58ox — Lab Sample ID: 310-155765-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18.0 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1520 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 315 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.66 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 7.16 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 95.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.39 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Alkalinity as CaCO3 to pH 4.5 | 339 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.47 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Duplicate — Lab Sample ID: 310-155765-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.0 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1600 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 265 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.44 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 6.06 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 81.1 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.38 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 5.89 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 326 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.60 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank - 3 — Lab Sample ID: 310-155765-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: MW-53ox**
**Date Collected: 05/15/19 09:11**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-1**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 17:17 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:17 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:17 | 1 |

## Client Sample ID: MW-53ox

**Date Collected: 05/15/19 09:11**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155765-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *105* | | *80 - 120* | | *05/21/19 17:17* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *05/21/19 17:17* | *1* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* | | *05/21/19 17:17* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **27.5** | | 5.00 | | mg/L | | | 05/20/19 10:20 | 5 |
| **Sulfate** | **1400** | | 100 | | mg/L | | | 05/20/19 10:36 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **277** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:55 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:55 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:55 | 1 |
| **Potassium** | **6.13** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:55 | 1 |
| **Sodium** | **70.4** | | 2.00 | | mg/L | | 05/21/19 09:05 | 05/22/19 13:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:31 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/30/19 14:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:53 | 1 |
| **Nitrate Nitrite as N** | **33.6** | | 2.00 | | mg/L | | | 05/23/19 19:06 | 20 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **428** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 18:03 | 1 |
| **Total Organic Carbon** | **3.29** | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: MW-56ox**
**Date Collected: 05/15/19 08:33**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-2**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 17:39 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 17:39 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 17:39 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: MW-56ox**
**Date Collected: 05/15/19 08:33**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-2**
**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *112* | | *80 - 120* | | *05/21/19 17:39* | *1* |
| *Dibromofluoromethane (Surr)* | *106* | | *80 - 120* | | *05/21/19 17:39* | *1* |
| *Toluene-d8 (Surr)* | *95* | | *80 - 120* | | *05/21/19 17:39* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 05/20/19 10:51 | 5 |
| **Sulfate** | **1090** | | 100 | | mg/L | | | 05/20/19 11:07 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **172** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:57 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:57 | 1 |
| **Manganese** | **0.0128** | | 0.0100 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:57 | 1 |
| **Potassium** | **1.63** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:57 | 1 |
| **Sodium** | **26.8** | | 2.00 | | mg/L | | 05/21/19 09:05 | 05/22/19 13:31 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:34 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/30/19 14:34 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:54 | 1 |
| **Nitrate Nitrite as N** | **0.232** | | 0.100 | | mg/L | | | 05/23/19 19:07 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **298** | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 18:06 | 1 |
| **Total Organic Carbon** | **1.76** | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: MW-58ox**
**Date Collected: 05/15/19 09:50**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-3**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 18:00 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:00 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:00 | 1 |

## Client Sample ID: MW-58ox

**Date Collected: 05/15/19 09:50**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155765-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *118* | | *80 - 120* | | *05/21/19 18:00* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *05/21/19 18:00* | *1* |
| *Toluene-d8 (Surr)* | *91* | | *80 - 120* | | *05/21/19 18:00* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **18.0** | | 5.00 | | mg/L | | | 05/20/19 12:27 | 5 |
| **Sulfate** | **1520** | | 100 | | mg/L | | | 05/20/19 12:43 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **315** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:58 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:58 | 1 |
| **Manganese** | **1.66** | | 0.0100 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:58 | 1 |
| **Potassium** | **7.16** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 20:58 | 1 |
| **Sodium** | **95.8** | | 2.00 | | mg/L | | 05/21/19 09:05 | 05/22/19 13:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:37 | 1 |
| **Manganese** | **1.39** | | 0.0100 | | mg/L | | | 05/30/19 14:37 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:55 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 19:08 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **339** | | 5.00 | | mg/L | | | 05/28/19 09:53 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 18:08 | 1 |
| **Total Organic Carbon** | **2.47** | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: Duplicate**
**Date Collected: 05/15/19 23:59**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-4**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 18:22 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 18:22 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 18:22 | 1 |

## Client Sample ID: Duplicate

**Date Collected: 05/15/19 23:59**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155765-4

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *115* | | *80 - 120* | | *05/21/19 18:22* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *05/21/19 18:22* | *1* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* | | *05/21/19 18:22* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **19.0** | | 5.00 | | mg/L | | | 05/20/19 12:58 | 5 |
| **Sulfate** | **1600** | | 100 | | mg/L | | | 05/20/19 13:14 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **265** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:00 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:00 | 1 |
| **Manganese** | **1.44** | | 0.0100 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:00 | 1 |
| **Potassium** | **6.06** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:00 | 1 |
| **Sodium** | **81.1** | | 2.00 | | mg/L | | 05/21/19 09:05 | 05/22/19 13:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:39 | 1 |
| **Manganese** | **1.38** | | 0.0100 | | mg/L | | | 05/30/19 14:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 23:06 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 19:18 | 1 |
| **Chemical Oxygen Demand** | **5.89** | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **326** | | 5.00 | | mg/L | | | 05/28/19 09:53 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/17/19 10:36 | 1 |
| **Total Organic Carbon** | **2.60** | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: Trip Blank - 3**
**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-5**
**Matrix: Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/22/19 12:18 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:18 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:18 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: Trip Blank - 3**
**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-5**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 122 | X | 80 - 120 | | 05/22/19 12:18 | 1 |
| Dibromofluoromethane (Surr) | 101 | | 80 - 120 | | 05/22/19 12:18 | 1 |
| Toluene-d8 (Surr) | 94 | | 80 - 120 | | 05/22/19 12:18 | 1 |

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| X | Surrogate is outside control limits |

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155765-1 | MW-53ox | 105 | 103 | 93 |
| 310-155765-1 MS | MW-53ox | 104 | 105 | 100 |
| 310-155765-1 MSD | MW-53ox | 102 | 102 | 96 |
| 310-155765-2 | MW-56ox | 112 | 106 | 95 |
| 310-155765-3 | MW-58ox | 118 | 104 | 91 |
| 310-155765-4 | Duplicate | 115 | 105 | 92 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155765-5 | Trip Blank - 3 | 122 X | 101 | 94 |
| LCS 310-240295/6 | Lab Control Sample | 100 | 97 | 100 |
| LCS 310-240295/7 | Lab Control Sample | 118 | 98 | 93 |
| LCS 310-240435/6 | Lab Control Sample | 103 | 104 | 98 |
| LCS 310-240435/7 | Lab Control Sample | 121 X | 101 | 93 |
| MB 310-240295/5 | Method Blank | 117 | 101 | 91 |
| MB 310-240435/5 | Method Blank | 119 | 104 | 94 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-240295/5**
**Matrix: Water**
**Analysis Batch: 240295**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/21/19 13:09 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/21/19 13:09 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/21/19 13:09 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240295/5**
**Matrix: Water**
**Analysis Batch: 240295**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *117* | | *80 - 120* | | *05/21/19 13:09* | *1* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* | | *05/21/19 13:09* | *1* |
| *Toluene-d8 (Surr)* | *91* | | *80 - 120* | | *05/21/19 13:09* | *1* |

**Lab Sample ID: LCS 310-240295/6**
**Matrix: Water**
**Analysis Batch: 240295**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 35.74 | | ug/L | | 89 | 50 - 150 |
| Acrylonitrile | 200 | 183.2 | | ug/L | | 92 | 50 - 150 |
| Benzene | 20.0 | 19.38 | | ug/L | | 97 | 77 - 120 |
| Bromochloromethane | 20.0 | 19.62 | | ug/L | | 98 | 73 - 132 |
| Bromodichloromethane | 20.0 | 17.86 | | ug/L | | 89 | 73 - 120 |
| Bromoform | 20.0 | 17.66 | | ug/L | | 88 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 36.36 | | ug/L | | 91 | 50 - 150 |
| Carbon disulfide | 20.0 | 19.42 | | ug/L | | 97 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 19.37 | | ug/L | | 97 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.61 | | ug/L | | 98 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 18.21 | | ug/L | | 91 | 66 - 120 |
| Chloroform | 20.0 | 18.66 | | ug/L | | 93 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 19.24 | | ug/L | | 96 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.51 | | ug/L | | 88 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 15.87 | | ug/L | | 79 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.08 | | ug/L | | 95 | 71 - 125 |
| Dibromomethane | 20.0 | 18.63 | | ug/L | | 93 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 18.88 | | ug/L | | 94 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 19.25 | | ug/L | | 96 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 18.47 | | ug/L | | 92 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 18.71 | | ug/L | | 94 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 19.57 | | ug/L | | 98 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 18.07 | | ug/L | | 90 | 75 - 123 |
| Ethylbenzene | 20.0 | 19.83 | | ug/L | | 99 | 73 - 120 |
| 2-Hexanone | 40.0 | 34.40 | | ug/L | | 86 | 57 - 128 |
| Iodomethane | 20.0 | 19.68 | | ug/L | | 98 | 20 - 150 |
| Methylene Chloride | 20.0 | 18.31 | | ug/L | | 92 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 34.42 | | ug/L | | 86 | 59 - 126 |
| m,p-Xylene | 20.0 | 19.93 | | ug/L | | 100 | 70 - 120 |
| o-Xylene | 20.0 | 19.69 | | ug/L | | 98 | 67 - 120 |
| Styrene | 20.0 | 19.78 | | ug/L | | 99 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 18.93 | | ug/L | | 95 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 18.62 | | ug/L | | 93 | 63 - 122 |
| Tetrachloroethene | 20.0 | 21.24 | | ug/L | | 106 | 72 - 129 |
| Toluene | 20.0 | 19.85 | | ug/L | | 99 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 16.97 | | ug/L | | 85 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 19.97 | | ug/L | | 100 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 18.46 | | ug/L | | 92 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 19.10 | | ug/L | | 95 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240295/6**
**Matrix: Water**
**Analysis Batch: 240295**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 19.56 | | ug/L | | 98 | 69 - 127 |
| Trichloroethene | 20.0 | 19.40 | | ug/L | | 97 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 17.82 | | ug/L | | 89 | 66 - 120 |
| Vinyl acetate | 40.0 | 38.71 | | ug/L | | 97 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

**Lab Sample ID: LCS 310-240295/7**
**Matrix: Water**
**Analysis Batch: 240295**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 14.77 | | ug/L | | 74 | 38 - 150 |
| Chloroethane | 20.0 | 17.21 | | ug/L | | 86 | 69 - 129 |
| Chloromethane | 20.0 | 16.58 | | ug/L | | 83 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 20.14 | | ug/L | | 101 | 68 - 146 |
| Vinyl chloride | 20.0 | 17.80 | | ug/L | | 89 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *118* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *98* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* |

**Lab Sample ID: 310-155765-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 240295**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 40.0 | 32.26 | | ug/L | | 81 | 31 - 150 |
| Acrylonitrile | <5.00 | | 200 | 162.3 | | ug/L | | 81 | 50 - 150 |
| Benzene | <0.500 | | 20.0 | 16.96 | | ug/L | | 85 | 59 - 120 |
| Bromochloromethane | <5.00 | | 20.0 | 17.82 | | ug/L | | 89 | 55 - 135 |
| Bromodichloromethane | <1.00 | | 20.0 | 15.84 | | ug/L | | 79 | 53 - 120 |
| Bromoform | <5.00 | | 20.0 | 15.53 | | ug/L | | 78 | 42 - 120 |
| 2-Butanone (MEK) | <10.0 | | 40.0 | 30.07 | | ug/L | | 75 | 49 - 150 |
| Carbon disulfide | <1.00 | | 20.0 | 16.54 | | ug/L | | 83 | 43 - 122 |
| Carbon tetrachloride | <2.00 | | 20.0 | 15.91 | | ug/L | | 80 | 47 - 126 |
| Chlorobenzene | <1.00 | | 20.0 | 16.78 | | ug/L | | 84 | 52 - 120 |
| Chlorodibromomethane | <5.00 | | 20.0 | 15.60 | | ug/L | | 78 | 48 - 120 |
| Chloroform | <3.00 | | 20.0 | 16.72 | | ug/L | | 84 | 50 - 130 |
| cis-1,2-Dichloroethene | <1.00 | | 20.0 | 18.47 | | ug/L | | 92 | 46 - 130 |
| cis-1,3-Dichloropropene | <5.00 | | 20.0 | 14.37 | | ug/L | | 72 | 51 - 120 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 20.0 | 14.17 | | ug/L | | 71 | 32 - 150 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 20.0 | 16.52 | | ug/L | | 83 | 52 - 127 |
| Dibromomethane | <1.00 | | 20.0 | 16.59 | | ug/L | | 83 | 61 - 130 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-155765-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 240295**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dichlorobenzene | <1.00 | | 20.0 | 16.69 | | ug/L | | 83 | 46 - 120 |
| 1,4-Dichlorobenzene | <1.00 | | 20.0 | 17.18 | | ug/L | | 86 | 45 - 120 |
| 1,1-Dichloroethane | <1.00 | | 20.0 | 16.24 | | ug/L | | 81 | 50 - 127 |
| 1,2-Dichloroethane | <1.00 | | 20.0 | 16.96 | | ug/L | | 85 | 55 - 128 |
| 1,1-Dichloroethene | <2.00 | | 20.0 | 15.70 | | ug/L | | 79 | 47 - 124 |
| 1,2-Dichloropropane | <1.00 | | 20.0 | 15.94 | | ug/L | | 80 | 57 - 125 |
| Ethylbenzene | <1.00 | | 20.0 | 16.47 | | ug/L | | 82 | 46 - 120 |
| 2-Hexanone | <10.0 | | 40.0 | 27.99 | | ug/L | | 70 | 43 - 129 |
| Iodomethane | <10.0 | | 20.0 | 17.30 | | ug/L | | 87 | 20 - 150 |
| Methylene Chloride | <5.00 | | 20.0 | 15.80 | | ug/L | | 79 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 40.0 | 29.29 | | ug/L | | 73 | 44 - 131 |
| m,p-Xylene | <2.00 | | 20.0 | 17.24 | | ug/L | | 86 | 37 - 120 |
| o-Xylene | <1.00 | | 20.0 | 16.59 | | ug/L | | 83 | 46 - 120 |
| Styrene | <1.00 | | 20.0 | 16.66 | | ug/L | | 83 | 42 - 120 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 20.0 | 16.32 | | ug/L | | 82 | 50 - 120 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 20.0 | 16.10 | | ug/L | | 81 | 49 - 129 |
| Tetrachloroethene | <1.00 | | 20.0 | 17.21 | | ug/L | | 86 | 40 - 129 |
| Toluene | <1.00 | | 20.0 | 16.53 | | ug/L | | 83 | 52 - 120 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 20.0 | 13.33 | | ug/L | | 67 | 15 - 150 |
| trans-1,2-Dichloroethene | <1.00 | | 20.0 | 16.99 | | ug/L | | 85 | 51 - 122 |
| trans-1,3-Dichloropropene | <5.00 | | 20.0 | 16.28 | | ug/L | | 81 | 51 - 122 |
| 1,1,1-Trichloroethane | <1.00 | | 20.0 | 16.09 | | ug/L | | 80 | 50 - 127 |
| 1,1,2-Trichloroethane | <1.00 | | 20.0 | 17.13 | | ug/L | | 86 | 50 - 131 |
| Trichloroethene | <1.00 | | 20.0 | 17.33 | | ug/L | | 87 | 54 - 123 |
| 1,2,3-Trichloropropane | <1.00 | | 20.0 | 15.30 | | ug/L | | 76 | 42 - 134 |
| Vinyl acetate | <10.0 | | 40.0 | 31.79 | | ug/L | | 79 | 34 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *104* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

**Lab Sample ID: 310-155765-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240295**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 40.0 | 30.30 | | ug/L | | 76 | 31 - 150 | 6 | 24 |
| Acrylonitrile | <5.00 | | 200 | 153.7 | | ug/L | | 77 | 50 - 150 | 5 | 21 |
| Benzene | <0.500 | | 20.0 | 15.49 | | ug/L | | 77 | 59 - 120 | 9 | 21 |
| Bromochloromethane | <5.00 | | 20.0 | 17.00 | | ug/L | | 85 | 55 - 135 | 5 | 24 |
| Bromodichloromethane | <1.00 | | 20.0 | 15.04 | | ug/L | | 75 | 53 - 120 | 5 | 21 |
| Bromoform | <5.00 | | 20.0 | 14.50 | | ug/L | | 72 | 42 - 120 | 7 | 24 |
| 2-Butanone (MEK) | <10.0 | | 40.0 | 28.81 | | ug/L | | 72 | 49 - 150 | 4 | 20 |
| Carbon disulfide | <1.00 | | 20.0 | 14.27 | | ug/L | | 71 | 43 - 122 | 15 | 25 |
| Carbon tetrachloride | <2.00 | | 20.0 | 15.23 | | ug/L | | 76 | 47 - 126 | 4 | 21 |
| Chlorobenzene | <1.00 | | 20.0 | 16.12 | | ug/L | | 81 | 52 - 120 | 4 | 21 |
| Chlorodibromomethane | <5.00 | | 20.0 | 15.40 | | ug/L | | 77 | 48 - 120 | 1 | 23 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-155765-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240295**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloroform | <3.00 | | 20.0 | 15.32 | | ug/L | | 77 | 50 - 130 | 9 | 20 |
| cis-1,2-Dichloroethene | <1.00 | | 20.0 | 16.66 | | ug/L | | 83 | 46 - 130 | 10 | 22 |
| cis-1,3-Dichloropropene | <5.00 | | 20.0 | 14.19 | | ug/L | | 71 | 51 - 120 | 1 | 22 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 20.0 | 14.49 | | ug/L | | 72 | 32 - 150 | 2 | 24 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 20.0 | 15.57 | | ug/L | | 78 | 52 - 127 | 6 | 22 |
| Dibromomethane | <1.00 | | 20.0 | 16.08 | | ug/L | | 80 | 61 - 130 | 3 | 21 |
| 1,2-Dichlorobenzene | <1.00 | | 20.0 | 17.65 | | ug/L | | 88 | 46 - 120 | 6 | 23 |
| 1,4-Dichlorobenzene | <1.00 | | 20.0 | 17.75 | | ug/L | | 89 | 45 - 120 | 3 | 22 |
| 1,1-Dichloroethane | <1.00 | | 20.0 | 14.84 | | ug/L | | 74 | 50 - 127 | 9 | 23 |
| 1,2-Dichloroethane | <1.00 | | 20.0 | 15.70 | | ug/L | | 79 | 55 - 128 | 8 | 21 |
| 1,1-Dichloroethene | <2.00 | | 20.0 | 14.88 | | ug/L | | 74 | 47 - 124 | 5 | 24 |
| 1,2-Dichloropropane | <1.00 | | 20.0 | 15.14 | | ug/L | | 76 | 57 - 125 | 5 | 21 |
| Ethylbenzene | <1.00 | | 20.0 | 16.00 | | ug/L | | 80 | 46 - 120 | 3 | 23 |
| 2-Hexanone | <10.0 | | 40.0 | 27.49 | | ug/L | | 69 | 43 - 129 | 2 | 20 |
| Iodomethane | <10.0 | | 20.0 | 17.07 | | ug/L | | 85 | 20 - 150 | 1 | 35 |
| Methylene Chloride | <5.00 | | 20.0 | 14.41 | | ug/L | | 72 | 50 - 150 | 9 | 23 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 40.0 | 28.94 | | ug/L | | 72 | 44 - 131 | 1 | 20 |
| m,p-Xylene | <2.00 | | 20.0 | 16.89 | | ug/L | | 84 | 37 - 120 | 2 | 35 |
| o-Xylene | <1.00 | | 20.0 | 16.29 | | ug/L | | 81 | 46 - 120 | 2 | 23 |
| Styrene | <1.00 | | 20.0 | 15.65 | | ug/L | | 78 | 42 - 120 | 6 | 25 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 20.0 | 15.21 | | ug/L | | 76 | 50 - 120 | 7 | 21 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 20.0 | 15.37 | | ug/L | | 77 | 49 - 129 | 5 | 20 |
| Tetrachloroethene | <1.00 | | 20.0 | 16.71 | | ug/L | | 84 | 40 - 129 | 3 | 21 |
| Toluene | <1.00 | | 20.0 | 15.46 | | ug/L | | 77 | 52 - 120 | 7 | 23 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 20.0 | 13.34 | | ug/L | | 67 | 15 - 150 | 0 | 28 |
| trans-1,2-Dichloroethene | <1.00 | | 20.0 | 15.86 | | ug/L | | 79 | 51 - 122 | 7 | 23 |
| trans-1,3-Dichloropropene | <5.00 | | 20.0 | 14.58 | | ug/L | | 73 | 51 - 122 | 11 | 25 |
| 1,1,1-Trichloroethane | <1.00 | | 20.0 | 14.54 | | ug/L | | 73 | 50 - 127 | 10 | 21 |
| 1,1,2-Trichloroethane | <1.00 | | 20.0 | 15.78 | | ug/L | | 79 | 50 - 131 | 8 | 22 |
| Trichloroethene | <1.00 | | 20.0 | 15.93 | | ug/L | | 80 | 54 - 123 | 8 | 20 |
| 1,2,3-Trichloropropane | <1.00 | | 20.0 | 14.64 | | ug/L | | 73 | 42 - 134 | 4 | 23 |
| Vinyl acetate | <10.0 | | 40.0 | 31.36 | | ug/L | | 78 | 34 - 150 | 1 | 31 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *102* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* |

**Lab Sample ID: MB 310-240435/5**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240435/5**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* | | *05/22/19 10:48* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *05/22/19 10:48* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *05/22/19 10:48* | *1* |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240435/6**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 43.70 | | ug/L | | 109 | 50 - 150 |
| Acrylonitrile | 200 | 194.0 | | ug/L | | 97 | 50 - 150 |
| Benzene | 20.0 | 20.64 | | ug/L | | 103 | 77 - 120 |
| Bromochloromethane | 20.0 | 21.52 | | ug/L | | 108 | 73 - 132 |
| Bromodichloromethane | 20.0 | 19.00 | | ug/L | | 95 | 73 - 120 |
| Bromoform | 20.0 | 18.77 | | ug/L | | 94 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 37.28 | | ug/L | | 93 | 50 - 150 |
| Carbon disulfide | 20.0 | 20.85 | | ug/L | | 104 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 21.11 | | ug/L | | 106 | 72 - 126 |
| Chlorobenzene | 20.0 | 20.44 | | ug/L | | 102 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 19.18 | | ug/L | | 96 | 66 - 120 |
| Chloroform | 20.0 | 20.62 | | ug/L | | 103 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 20.30 | | ug/L | | 102 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 18.23 | | ug/L | | 91 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 17.59 | | ug/L | | 88 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.18 | | ug/L | | 96 | 71 - 125 |
| Dibromomethane | 20.0 | 19.82 | | ug/L | | 99 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 20.51 | | ug/L | | 103 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 20.83 | | ug/L | | 104 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 19.25 | | ug/L | | 96 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 19.93 | | ug/L | | 100 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 20.91 | | ug/L | | 105 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 19.38 | | ug/L | | 97 | 75 - 123 |
| Ethylbenzene | 20.0 | 20.55 | | ug/L | | 103 | 73 - 120 |
| 2-Hexanone | 40.0 | 36.28 | | ug/L | | 91 | 57 - 128 |
| Iodomethane | 20.0 | 20.74 | | ug/L | | 104 | 20 - 150 |
| Methylene Chloride | 20.0 | 19.38 | | ug/L | | 97 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 35.92 | | ug/L | | 90 | 59 - 126 |
| m,p-Xylene | 20.0 | 21.39 | | ug/L | | 107 | 70 - 120 |
| o-Xylene | 20.0 | 20.45 | | ug/L | | 102 | 67 - 120 |
| Styrene | 20.0 | 20.08 | | ug/L | | 100 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 19.48 | | ug/L | | 97 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 19.60 | | ug/L | | 98 | 63 - 122 |
| Tetrachloroethene | 20.0 | 22.45 | | ug/L | | 112 | 72 - 129 |
| Toluene | 20.0 | 20.38 | | ug/L | | 102 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 16.21 | | ug/L | | 81 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 21.52 | | ug/L | | 108 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 19.60 | | ug/L | | 98 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 20.77 | | ug/L | | 104 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 20.43 | | ug/L | | 102 | 69 - 127 |
| Trichloroethene | 20.0 | 20.93 | | ug/L | | 105 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 18.41 | | ug/L | | 92 | 66 - 120 |
| Vinyl acetate | 40.0 | 41.61 | | ug/L | | 104 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *103* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* |

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: LCS 310-240435/7**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 14.06 | | ug/L | | 70 | 38 - 150 |
| Chloroethane | 20.0 | 17.75 | | ug/L | | 89 | 69 - 129 |
| Chloromethane | 20.0 | 15.96 | | ug/L | | 80 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 20.61 | | ug/L | | 103 | 68 - 146 |
| Vinyl chloride | 20.0 | 18.42 | | ug/L | | 92 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *121* | *X* | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-240361/3**
**Matrix: Water**
**Analysis Batch: 240361**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 05/19/19 14:43 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 05/19/19 14:43 | 1 |

**Lab Sample ID: LCS 310-240361/39**
**Matrix: Water**
**Analysis Batch: 240361**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.41 | | mg/L | | 104 | 90 - 110 |
| Sulfate | 10.0 | 10.62 | | mg/L | | 106 | 90 - 110 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-240251/1-A**
**Matrix: Water**
**Analysis Batch: 240459**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |

**Lab Sample ID: MB 310-240251/1-A**
**Matrix: Water**
**Analysis Batch: 240494**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sodium | <2.00 | | 2.00 | | mg/L | | 05/21/19 09:04 | 05/22/19 13:21 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 310-240251/2-A**
**Matrix: Water**
**Analysis Batch: 240459**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 18.19 | | mg/L | | 91 | 80 - 120 |
| Iron | 2.00 | 1.988 | | mg/L | | 99 | 80 - 120 |
| Manganese | 1.00 | 0.9157 | | mg/L | | 92 | 80 - 120 |
| Potassium | 20.0 | 19.49 | | mg/L | | 97 | 80 - 120 |

**Lab Sample ID: LCS 310-240251/2-A**
**Matrix: Water**
**Analysis Batch: 240494**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sodium | 20.0 | 16.40 | | mg/L | | 82 | 80 - 120 |

**Lab Sample ID: MB 310-241316/39**
**Matrix: Water**
**Analysis Batch: 241316**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:27 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/30/19 14:27 | 1 |

**Lab Sample ID: LCS 310-241316/40**
**Matrix: Water**
**Analysis Batch: 241316**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 2.00 | 1.860 | | mg/L | | 93 | 80 - 120 |
| Manganese | 2.00 | 1.922 | | mg/L | | 96 | 80 - 120 |

**Lab Sample ID: 310-155765-1 DU**
**Matrix: Ground Water**
**Analysis Batch: 241316**

**Client Sample ID: MW-53ox**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | <0.0100 | | <0.0100 | | mg/L | | NC | 20 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-239906/195**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:14 | 1 |

## Method: 350.1 - Nitrogen, Ammonia (Continued)

**Lab Sample ID: LCS 310-239906/196**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 3.11 | 3.299 | | mg/L | | 106 | 90 - 110 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-240678/107**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 18:44 | 1 |

**Lab Sample ID: LCS 310-240678/108 ^10**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 18.6 | 17.14 | | mg/L | | 92 | 90 - 110 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-240097/32**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |

**Lab Sample ID: LCS 310-240097/33**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 115.9 | | mg/L | | 92 | 85 - 115 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-240478/1**
**Matrix: Water**
**Analysis Batch: 240478**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/22/19 13:12 | 1 |

**Lab Sample ID: LCS 310-240478/2**
**Matrix: Water**
**Analysis Batch: 240478**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 966.0 | | mg/L | | 91 | 90 - 110 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 310-240933/1**
**Matrix: Water**
**Analysis Batch: 240933**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/28/19 09:53 | 1 |

**Lab Sample ID: LCS 310-240933/2**
**Matrix: Water**
**Analysis Batch: 240933**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 1001 | | mg/L | | 94 | 90 - 110 |

**Lab Sample ID: 310-155765-3 MS**
**Matrix: Ground Water**
**Analysis Batch: 240933**

**Client Sample ID: MW-58ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 339 | | 106 | 439.4 | | mg/L | | 94 | 66 - 124 |

**Lab Sample ID: 310-155765-3 MSD**
**Matrix: Ground Water**
**Analysis Batch: 240933**

**Client Sample ID: MW-58ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 339 | | 106 | 439.4 | | mg/L | | 94 | 66 - 124 | 0 | 17 |

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-240267/1-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |

**Lab Sample ID: LCS 310-240267/2-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 3.632 | | mg/L | | 73 | 33 - 117 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-239744/1**
**Matrix: Water**
**Analysis Batch: 239744**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 16:58 | 1 |

## Method: SM 5210B - BOD, 5-Day (Continued)

**Lab Sample ID: LCS 310-239744/2**
**Matrix: Water**
**Analysis Batch: 239744**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 192.2 | | mg/L | | 97 | 85 - 115 |

**Lab Sample ID: USB 310-239843/1**
**Matrix: Water**
**Analysis Batch: 239843**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/17/19 09:33 | 1 |

**Lab Sample ID: LCS 310-239843/2**
**Matrix: Water**
**Analysis Batch: 239843**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 195.0 | | mg/L | | 98 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 490-597910/1**
**Matrix: Water**
**Analysis Batch: 597910**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | <1.00 | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

**Lab Sample ID: LCS 490-597910/5**
**Matrix: Water**
**Analysis Batch: 597910**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 10.0 | 9.821 | | mg/L | | 98 | 90 - 110 |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## GC/MS VOA

### Analysis Batch: 240295

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 8260C | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 8260C | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 8260C | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 8260C | |
| MB 310-240295/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240295/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240295/7 | Lab Control Sample | Total/NA | Water | 8260C | |
| 310-155765-1 MS | MW-53ox | Total/NA | Ground Water | 8260C | |
| 310-155765-1 MSD | MW-53ox | Total/NA | Ground Water | 8260C | |

### Analysis Batch: 240435

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-5 | Trip Blank - 3 | Total/NA | Water | 8260C | |
| MB 310-240435/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240435/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240435/7 | Lab Control Sample | Total/NA | Water | 8260C | |

## HPLC/IC

### Analysis Batch: 240361

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 9056A | |
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 9056A | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 9056A | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 9056A | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 9056A | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 9056A | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 9056A | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 9056A | |
| MB 310-240361/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-240361/39 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 240251

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 3010A | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 3010A | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 3010A | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 3010A | |
| MB 310-240251/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-240251/2-A | Lab Control Sample | Total/NA | Water | 3010A | |

### Analysis Batch: 240459

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 6010C | 240251 |
| MB 310-240251/1-A | Method Blank | Total/NA | Water | 6010C | 240251 |
| LCS 310-240251/2-A | Lab Control Sample | Total/NA | Water | 6010C | 240251 |

## Metals

### Analysis Batch: 240494

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 6010C | 240251 |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 6010C | 240251 |
| MB 310-240251/1-A | Method Blank | Total/NA | Water | 6010C | 240251 |
| LCS 310-240251/2-A | Lab Control Sample | Total/NA | Water | 6010C | 240251 |

### Analysis Batch: 241316

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Dissolved | Ground Water | 6010C | |
| 310-155765-2 | MW-56ox | Dissolved | Ground Water | 6010C | |
| 310-155765-3 | MW-58ox | Dissolved | Ground Water | 6010C | |
| 310-155765-4 | Duplicate | Dissolved | Ground Water | 6010C | |
| MB 310-241316/39 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-241316/40 | Lab Control Sample | Total/NA | Water | 6010C | |
| 310-155765-1 DU | MW-53ox | Dissolved | Ground Water | 6010C | |

## General Chemistry

### Analysis Batch: 239744

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | SM 5210B | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | SM 5210B | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-239744/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-239744/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 239843

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-4 | Duplicate | Total/NA | Ground Water | SM 5210B | |
| USB 310-239843/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-239843/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 239906

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 350.1 | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 350.1 | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 350.1 | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 350.1 | |
| MB 310-239906/195 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-239906/196 | Lab Control Sample | Total/NA | Water | 350.1 | |

### Analysis Batch: 240097

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 5220D LL | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 5220D LL | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 5220D LL | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 5220D LL | |
| MB 310-240097/32 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-240097/33 | Lab Control Sample | Total/NA | Water | 5220D LL | |

## General Chemistry

### Prep Batch: 240267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |

### Analysis Batch: 240273

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 240267 |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 240267 |

### Analysis Batch: 240478

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | SM 2320B | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-240478/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-240478/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 240678

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | 353.2 | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | 353.2 | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | 353.2 | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | 353.2 | |
| MB 310-240678/107 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-240678/108 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 240933

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | SM 2320B | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | SM 2320B | |
| MB 310-240933/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-240933/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 310-155765-3 MS | MW-58ox | Total/NA | Ground Water | SM 2320B | |
| 310-155765-3 MSD | MW-58ox | Total/NA | Ground Water | SM 2320B | |

### Analysis Batch: 597910

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155765-1 | MW-53ox | Total/NA | Ground Water | SM 5310C | |
| 310-155765-2 | MW-56ox | Total/NA | Ground Water | SM 5310C | |
| 310-155765-3 | MW-58ox | Total/NA | Ground Water | SM 5310C | |
| 310-155765-4 | Duplicate | Total/NA | Ground Water | SM 5310C | |
| MB 490-597910/1 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 490-597910/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Client Sample ID: MW-53ox

**Date Collected: 05/15/19 09:11**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155765-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240295 | 05/21/19 17:17 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240361 | 05/20/19 10:20 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240361 | 05/20/19 10:36 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 241316 | 05/30/19 14:31 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240459 | 05/21/19 20:55 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240494 | 05/22/19 13:29 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:53 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 20 | 240678 | 05/23/19 19:06 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239744 | 05/16/19 18:03 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 597910 | 05/23/19 13:00 | MPH | TAL NSH |

## Client Sample ID: MW-56ox

**Date Collected: 05/15/19 08:33**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155765-2

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240295 | 05/21/19 17:39 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240361 | 05/20/19 10:51 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240361 | 05/20/19 11:07 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 241316 | 05/30/19 14:34 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240459 | 05/21/19 20:57 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240494 | 05/22/19 13:31 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:54 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 19:07 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240478 | 05/22/19 13:12 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239744 | 05/16/19 18:06 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 597910 | 05/23/19 13:00 | MPH | TAL NSH |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Client Sample ID: MW-58ox

**Date Collected: 05/15/19 09:50**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-3**
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240295 | 05/21/19 18:00 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240361 | 05/20/19 12:27 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240361 | 05/20/19 12:43 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 241316 | 05/30/19 14:37 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240459 | 05/21/19 20:58 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240494 | 05/22/19 13:33 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 22:55 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 19:08 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240933 | 05/28/19 09:53 | WJF | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239744 | 05/16/19 18:08 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 597910 | 05/23/19 13:00 | MPH | TAL NSH |

## Client Sample ID: Duplicate

**Date Collected: 05/15/19 23:59**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-4**
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240295 | 05/21/19 18:22 | TRZ | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 240361 | 05/20/19 12:58 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240361 | 05/20/19 13:14 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 241316 | 05/30/19 14:39 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240459 | 05/21/19 21:00 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240494 | 05/22/19 13:34 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 23:06 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 19:18 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240933 | 05/28/19 09:53 | WJF | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239843 | 05/17/19 10:36 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 597910 | 05/23/19 13:00 | MPH | TAL NSH |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

**Client Sample ID: Trip Blank - 3**
**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155765-5**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240435 | 05/22/19 12:18 | TRZ | TAL CF |

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

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

## Laboratory: Eurofins TestAmerica, Nashville

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-19 |
| Alaska (UST) | State Program | 10 | UST-087 | 06-30-19 |
| Arizona | State Program | 9 | AZ0473 | 05-05-20 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-20 |
| California | State Program | 9 | 2938 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0220 | 12-31-19 |
| Florida | NELAP | 4 | E87358 | 06-30-19 |
| Georgia | State Program | 4 | NA: NELAP & A2LA | 12-31-19 |
| Illinois | NELAP | 5 | 200010 | 12-09-19 |
| Iowa | State Program | 7 | 131 | 04-01-20 |
| Kansas | NELAP | 7 | E-10229 | 10-31-19 |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-19 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-19 |
| Louisiana | NELAP | 6 | 30613 | 06-30-19 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-20 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-19 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-19 |
| Mississippi | State Program | 4 | N/A | 06-30-19 |
| Nevada | State Program | 9 | TN00032 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-19 |
| New Jersey | NELAP | 2 | TN965 | 06-30-19 |
| New York | NELAP | 2 | 11342 | 03-31-20 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-19 |
| North Dakota | State Program | 8 | R-146 | 06-30-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-19 |
| Oregon | NELAP | 10 | TN200001 | 04-26-19 * |
| Pennsylvania | NELAP | 3 | 68-00585 | 07-31-19 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-19 |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-19 * |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-19 |
| USDA | Federal | | P330-13-00306 | 04-10-20 |
| Utah | NELAP | 8 | TN00032 | 07-31-19 |
| Virginia | NELAP | 3 | 460152 | 06-14-19 |

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

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Nashville (Continued)

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Washington | State Program | 10 | C789 | 07-19-19 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-20 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-19 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls, LF State Wells

Job ID: 310-155765-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL NSH |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

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

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

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

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

310-155765 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

| | | | |
|---|---|---|---|
| **Client Information** | | | |
| Client: SGS | | | |
| City/State: CITY Omaha | STATE NE | Project: Sioux Falls LF | |
| **Receipt Information** | | | |
| Date/Time Received: DATE 051619 | TIME 0935 | Received By: ARO | |
| Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ TA Field Services ☐ Client Drop-off ☐ Other:_____ | | | |
| **Condition of Cooler/Containers** | | | |
| Sample(s) received in Cooler? ☒ Yes ☐ No | | *If yes:* Cooler ID: | |
| Multiple Coolers? ☒ Yes ☐ No | | *If yes:* Cooler # 2 of 2 | |
| Cooler Custody Seals Present? ☒ Yes ☐ No | | *If yes:* Cooler custody seals intact? ☐ Yes ☐ No | |
| Sample Custody Seals Present? ☐ Yes ☒ No | | *If yes:* Sample custody seals intact? ☐ Yes ☐ No | |
| Trip Blank Present? ☐ Yes ☐ No | | *If yes:* Which VOA samples are in cooler? ↓ | |
| | | | |
| | | | |
| **Temperature Record** | | | |
| Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE | | | |
| Thermometer ID: N | | Correction Factor (°C): 0.0 | |
| • **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature | | | |
| Uncorrected Temp (°C): 4.8 | | Corrected Temp (°C): 4.8 | |
| • **Sample Container Temperature** | | | |
| Container type(s) used: | CONTAINER 1 | CONTAINER 2 | |
| Uncorrected Temp (°C): | TEMP 1 / TEMP 2 | Corrected Temp (°C): | TEMP 1 / TEMP 2 |
| **Exceptions Noted** | | | |
| 1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No | | | |
| a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No | | | |
| 2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No | | | |
| NOTE: If yes, contact PM before proceeding. If no, proceed with login | | | |
| **Additional Comments** | | | |
| | | | |
| | | | |

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THE LEADER IN ENVIRONMENTAL TESTING

Place COC scanning label here
268

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE | Project: Sioux Falls LF

**Receipt Information**

Date/Time Received: DATE 051619 TIME 0935 | Received By: ARR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ~~ARR~~ 051619 ☒ Yes ☒ No *If yes:* Cooler # 1 of 2

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

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

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

MW58ROX, MW56OX, MW53OX, Dup TB

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): -0.6 | Corrected Temp (°C): -0.6

• **Sample Container Temperature**

Container type(s) used: CONTAINER 1 | CONTAINER 2

Uncorrected Temp (°C): TEMP 1 | TEMP 2 | Corrected Temp (°C): TEMP 1 | TEMP 2

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) [redacted] Ron Tangeman
(Signature) [redacted]

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-11~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-21ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-23ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-25ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-39ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-42ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-44ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-45ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-47ox | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| ~~MW-48ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |
| MW-53ox | 5.15.19 | 09:11 | 9 | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by | Date | Time |
|---|---|---|---|---|---|---|---|---|
| [redacted] | 5.15.19 | 17:00 | | | | | | |
| Shipped Via: | | | Comments | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| [redacted] | 05/16/19 | 0935 | | | | | | |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Ryan Tanseen
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH (Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass (Yellow & White Label) | None (Black & White Label) | Other (Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | pH, TSS, TDS, Alkalinities | TKN, Magnesium | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-54ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| MW-56ox | 5.15.19 | 08:33 | 9 | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | | x | x | | x |
| ~~MW-57ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| MW-58Rox | 5.15.19 | 09:50 | 9 | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | | x | x | | x |
| ~~MW-59ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| ~~MW-60ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| ~~MW-61ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| Duplicate | 5.15.19 | 23:59 | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | | x | x | | x |
| Trip Blank -3 | - | - | | x | | | | | | | | | | | x | | | | | | x | | | | | | | | | | | | x | x | | x |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 5.15.19 | 17:00 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 05/16/19 | 0935 | | | | | | |

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-53ox | 310-155765-A-1 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-53ox | 310-155765-B-1 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-53ox | 310-155765-C-1 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-53ox | 310-155765-D-1 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-53ox | 310-155765-E-1 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-56ox | 310-155765-A-2 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-56ox | 310-155765-B-2 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-56ox | 310-155765-C-2 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-56ox | 310-155765-D-2 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-56ox | 310-155765-E-2 | Amber Glass 250ml - Sulfuric Acid | | | |
| MW-58ox | 310-155765-A-3 | Plastic 250ml - with Nitric Acid | <2 | | |
| MW-58ox | 310-155765-B-3 | Plastic 250ml - w/nitric - dis | <2 | | |
| MW-58ox | 310-155765-C-3 | Plastic 500ml - with Zn Acetate and | >12 | | |
| MW-58ox | 310-155765-D-3 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-58ox | 310-155765-E-3 | Amber Glass 250ml - Sulfuric Acid | | | |
| Duplicate | 310-155765-A-4 | Plastic 250ml - with Nitric Acid | <2 | | |
| Duplicate | 310-155765-B-4 | Plastic 250ml - w/nitric - dis | <2 | | |
| Duplicate | 310-155765-C-4 | Plastic 500ml - with Zn Acetate and | >12 | | |
| Duplicate | 310-155765-D-4 | Plastic 500ml - with Sulfuric Acid | | | |
| Duplicate | 310-155765-E-4 | Amber Glass 250ml - Sulfuric Acid | | | |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

310-155765 Chain of Custody

Cooler Received/Opened On 05-17-2019 @ 09:50

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 8054 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 14740456 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 3.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: _____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) KD

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (intial) KD

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KD

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KD

I certify that I attached a label with the unique LIMS number to each container (intial) KD

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17



5/30/2019

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

# Chain of Custody Record

Loc: 310
**155765**

eurofins

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Hayes, Shawn M | | COC No: 310-16502.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | State: South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc | | Accreditations Required (See note) | | Job #: 310-155765-1 |
| Address: 2960 Foster Creighton Drive, | Due Date Requested: 5/29/2019 | | | |
| City: Nashville | TAT Requested (days): | | | |
| State, Zip: TN, 37204 | | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Sioux Falls, LF State Wells | Project #: 31001962 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-53ox (310-155765-1) | 5/15/19 | 09:11 Central | | Water | | | X | 1 | |
| MW-56ox (310-155765-2) | 5/15/19 | 08:33 Central | | Water | | | X | 1 | |
| MW-58ox (310-155765-3) | 5/15/19 | 09:50 Central | | Water | | | X | 1 | |
| Duplicate (310-155765-4) | 5/15/19 | 23:59 Central | | Water | | | X | 1 | |

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

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***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) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 5/15/19 1435 | Company | Received by: | Date/Time: 05-17-2019 0950 | Company |
| 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: 3.8 |

Ver: 01/16/2019



5/30/2019

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-155765-1
SDG Number: 27218345.00

**Login Number: 155765**
**List Number: 1**
**Creator: Spoerre, Autumn R**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-155767-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF Appendix II Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*5/31/2019 11:14:28 AM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Job ID: 310-155767-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-155767-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 5/16/2019 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.3º C.

**GC/MS VOA**
Method(s) 8260C: The surrogate recovery for the LCS associated with analytical batch 310-240435 was outside the upper control limits.

Method(s) 8260C: Surrogate recovery for the following sample was outside the upper control limit: Trip Blank (310-155767-2). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

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

**GC/MS Semi VOA**
Method(s) 8270D: The continuing calibration verification (CCV) associated with batch 310-240245 recovered above the upper control limit for Dinoseb (23.9%D), p-Phenylene diamine (56.8%D) and Hexachloropropene 27.4%D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270D: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 310-240134 recovered outside control limits for multiple analytes.

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

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

**GC Semi VOA**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

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

**Organic Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Ground Water | 05/15/19 10:41 | 05/16/19 09:35 | |
| 310-155767-2 | Trip Blank | Water | 05/15/19 00:00 | 05/16/19 09:35 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Client Sample ID: MW-13R — Lab Sample ID: 310-155767-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethane | 1.05 | | 1.00 | | ug/L | 1 | | 8260C | Total/NA |
| Chloride | 15.8 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1750 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 387 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 10.3 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 68.5 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 0.429 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 435 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon | 2.69 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank — Lab Sample ID: 310-155767-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

**Client Sample ID: MW-13R**
**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-1**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Acrolein | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Allyl chloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/22/19 17:19 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chloroprene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Dichlorodifluoromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| **1,1-Dichloroethane** | **1.05** | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,3-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 2,2-Dichloropropane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,1-Dichloropropene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,3-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Ethyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Methacrylonitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Methyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Naphthalene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Propionitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |

**Client Sample ID: MW-13R**
**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-1**
**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2,4-Trichlorobenzene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/22/19 17:19 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/22/19 17:19 | 1 |
| Xylenes, Total | <3.00 | | 3.00 | | ug/L | | | 05/22/19 17:19 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* | | *05/22/19 17:19* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *05/22/19 17:19* | *1* |
| *Toluene-d8 (Surr)* | *90* | | *80 - 120* | | *05/22/19 17:19* | *1* |

### Method: 8270D - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Acenaphthylene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Acetophenone | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Acetylaminofluorene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Aminobiphenyl | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Anthracene | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzo[a]anthracene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzo[b]fluoranthene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzo[k]fluoranthene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzo[g,h,i]perylene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzo[a]pyrene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Benzyl alcohol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Bis(2-chloroethoxy)methane | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| bis (2-chloroisopropyl) ether | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Bis(2-chloroethyl)ether | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Bis(2-ethylhexyl) phthalate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Bromophenyl phenyl ether | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Butyl benzyl phthalate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Chloroaniline | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Chlorobenzilate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Chloro-3-methylphenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Chloronaphthalene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Chlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Chlorophenyl phenyl ether | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Chrysene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Methylphenol, 3 & 4 | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Methylphenol | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Diallate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Dibenzo(a,h)anthracene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Dibenzofuran | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

**Client Sample ID: MW-13R**
**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-1**
**Matrix: Ground Water**

**Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Di-n-butyl phthalate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 3,3'-Dichlorobenzidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4-Dichlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,6-Dichlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Diethyl phthalate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Thionazin | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 7,12-Dimethylbenz(a)anthracene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Dimethoate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| p-Dimethylamino azobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 3,3'-Dimethylbenzidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4-Dimethylphenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Dimethyl phthalate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1,3-Dinitrobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4,6-Dinitro-2-methylphenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4-Dinitrophenol | <20.4 | | 20.4 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4-Dinitrotoluene | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,6-Dinitrotoluene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Di-n-octyl phthalate | <20.4 | | 20.4 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Diphenylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Disulfoton | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Ethyl methanesulfonate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Famphur | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Fluoranthene | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Fluorene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Hexachlorobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Hexachlorobutadiene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Hexachlorocyclopentadiene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Hexachloroethane | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Hexachloropropene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Indeno[1,2,3-cd]pyrene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Isodrin | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Isophorone | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Isosafrole | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Kepone | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Methapyrilene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 3-Methylcholanthrene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Methyl methanesulfonate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Methylnaphthalene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Methyl parathion | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1,4-Naphthoquinone | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1-Naphthylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Naphthylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Nitroaniline | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 3-Nitroaniline | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Nitroaniline | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Nitrobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2-Nitrophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 4-Nitrophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosodi-n-butylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |

**Client Sample ID: MW-13R**
**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-1**
**Matrix: Ground Water**

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodiethylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosodimethylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosodiphenylamine | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosodi-n-propylamine | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosomethylethylamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosopiperidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| N-Nitrosopyrrolidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 5-Nitro-o-toluidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Ethyl Parathion | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Pentachlorobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Pentachloronitrobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Pentachlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Phenacetin | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Phenanthrene | <10.2 | * | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Phenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1,4-phenylenediamine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Phorate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Pronamide | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Pyrene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Safrole | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1,2,4,5-Tetrachlorobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,3,4,6-Tetrachlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| o-Toluidine | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4,5-Trichlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 2,4,6-Trichlorophenol | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| o,o',o''-Triethylphosphorothioate | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| 1,3,5-Trinitrobenzene | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |
| Dinoseb | <10.2 | | 10.2 | | ug/L | | 05/20/19 15:56 | 05/21/19 12:55 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorophenol (Surr)* | *41* | | *10 - 110* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |
| *Phenol-d6 (Surr)* | *30* | | *10 - 110* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |
| *Nitrobenzene-d5 (Surr)* | *70* | | *24 - 110* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |
| *2-Fluorobiphenyl (Surr)* | *76* | | *26 - 110* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *79* | | *23 - 110* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |
| *Terphenyl-d14 (Surr)* | *78* | | *10 - 127* | *05/20/19 15:56* | *05/21/19 12:55* | *1* |

## Method: 8015B - Nonhalogenated Organic Compounds - Direct Injection (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetonitrile | <10.0 | | 10.0 | | mg/L | | | 05/23/19 10:52 | 1 |
| Isobutanol | <10.0 | | 10.0 | | mg/L | | | 05/23/19 10:52 | 1 |

## Method: 8081B - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| alpha-BHC | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| beta-BHC | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| gamma-BHC (Lindane) | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Chlordane (technical) | <2.04 | | 2.04 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Dieldrin | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Client Sample ID: MW-13R

**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155767-1

**Matrix: Ground Water**

### Method: 8081B - Organochlorine Pesticides (GC) (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| 4,4'-DDE | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| 4,4'-DDT | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Endosulfan I | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Endosulfan II | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Endosulfan sulfate | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Endrin | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Heptachlor | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Heptachlor epoxide | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Methoxychlor | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Toxaphene | <2.04 | | 2.04 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| delta-BHC | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |
| Endrin aldehyde | <0.0327 | | 0.0327 | | ug/L | | 05/16/19 15:40 | 05/20/19 11:08 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *93* | | *10 - 130* | *05/16/19 15:40* | *05/20/19 11:08* | *1* |
| *Tetrachloro-m-xylene* | *97* | | *23 - 110* | *05/16/19 15:40* | *05/20/19 11:08* | *1* |

### Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1221 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1232 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1242 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1248 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1254 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |
| PCB-1260 | <0.816 | | 0.816 | | ug/L | | 05/21/19 09:51 | 05/22/19 13:33 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *87* | | *10 - 121* | *05/21/19 09:51* | *05/22/19 13:33* | *1* |
| *Tetrachloro-m-xylene* | *83* | | *18 - 110* | *05/21/19 09:51* | *05/22/19 13:33* | *1* |

### Method: 8151A - Herbicides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | <5.11 | | 5.11 | | ug/L | | 05/22/19 11:28 | 05/23/19 12:05 | 1 |
| Silvex (2,4,5-TP) | <2.05 | | 2.05 | | ug/L | | 05/22/19 11:28 | 05/23/19 12:05 | 1 |
| 2,4,5-T | <2.05 | | 2.05 | | ug/L | | 05/22/19 11:28 | 05/23/19 12:05 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Dichloroacetic acid(Surr)* | *98* | | *10 - 150* | *05/22/19 11:28* | *05/23/19 12:05* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **15.8** | | 5.00 | | mg/L | | | 05/20/19 13:30 | 5 |
| **Sulfate** | **1750** | | 100 | | mg/L | | | 05/20/19 13:45 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **387** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:02 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:02 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:02 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

**Client Sample ID: MW-13R**
**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-1**
**Matrix: Ground Water**

### Method: 6010C - Metals (ICP) (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Potassium** | **10.3** | | 1.00 | | mg/L | | 05/21/19 09:05 | 05/21/19 21:02 | 1 |
| **Sodium** | **68.5** | | 2.00 | | mg/L | | 05/21/19 09:05 | 05/30/19 14:53 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:41 | 1 |
| Dissolved Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/30/19 14:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 23:07 | 1 |
| **Nitrate Nitrite as N** | **0.429** | | 0.100 | | mg/L | | | 05/23/19 19:19 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |
| Cyanide, Total | <0.0100 | | 0.0100 | | mg/L | | 05/17/19 08:21 | 05/17/19 20:23 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **435** | | 5.00 | | mg/L | | | 05/28/19 09:53 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 18:10 | 1 |
| **Total Organic Carbon** | **2.69** | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

**Client Sample ID: Trip Blank**
**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-2**
**Matrix: Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Acrolein | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Allyl chloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/22/19 12:40 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chloroprene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Dichlorodifluoromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,3-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 2,2-Dichloropropane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1-Dichloropropene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,3-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Ethyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Methacrylonitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Methyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Naphthalene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Propionitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

**Client Sample ID: Trip Blank**
**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

**Lab Sample ID: 310-155767-2**
**Matrix: Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2,4-Trichlorobenzene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/22/19 12:40 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/22/19 12:40 | 1 |
| Xylenes, Total | <3.00 | | 3.00 | | ug/L | | | 05/22/19 12:40 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *123* | *X* | *80 - 120* | | *05/22/19 12:40* | *1* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* | | *05/22/19 12:40* | *1* |
| *Toluene-d8 (Surr)* | *95* | | *80 - 120* | | *05/22/19 12:40* | *1* |

# Definitions/Glossary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| X | Surrogate is outside control limits |

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| * | RPD of the LCS and LCSD exceeds the control limits |

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155767-1 | MW-13R | 119 | 105 | 90 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-155767-2 | Trip Blank | 123 X | 102 | 95 |
| LCS 310-240435/6 | Lab Control Sample | 103 | 104 | 98 |
| LCS 310-240435/7 | Lab Control Sample | 121 X | 101 | 93 |
| MB 310-240435/5 | Method Blank | 119 | 104 | 94 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8270D - Semivolatile Organic Compounds (GC/MS)

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2FP | PHL6 | NBZ | FBP | TBP | TPHL |
| Lab Sample ID | Client Sample ID | (10-110) | (10-110) | (24-110) | (26-110) | (23-110) | (10-127) |
| 310-155767-1 | MW-13R | 41 | 30 | 70 | 76 | 79 | 78 |

**Surrogate Legend**

2FP = 2-Fluorophenol (Surr)
PHL6 = Phenol-d6 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

## Method: 8270D - Semivolatile Organic Compounds (GC/MS)

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2FP | PHL6 | NBZ | FBP | TBP | TPHL |
| Lab Sample ID | Client Sample ID | (10-110) | (10-110) | (24-110) | (26-110) | (23-110) | (10-127) |
| LCS 310-240134/2-A | Lab Control Sample | 40 | 27 | 58 | 65 | 74 | 77 |
| LCSD 310-240134/3-A | Lab Control Sample Dup | 54 | 37 | 82 | 87 | 97 | 98 |
| MB 310-240134/1-A | Method Blank | 54 | 38 | 88 | 89 | 92 | 99 |

**Surrogate Legend**

2FP = 2-Fluorophenol (Surr)
PHL6 = Phenol-d6 (Surr)
NBZ = Nitrobenzene-d5 (Surr)

FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

## Method: 8081B - Organochlorine Pesticides (GC)

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DCB1 | TCX1 | | | | | | | | |
| Lab Sample ID | Client Sample ID | (10-130) | (23-110) | | | | | | | | |
| 310-155767-1 | MW-13R | 93 | 97 | | | | | | | | |

**Surrogate Legend**
DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

## Method: 8081B - Organochlorine Pesticides (GC)

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DCB1 | TCX1 | | | | | | | | |
| Lab Sample ID | Client Sample ID | (10-130) | (23-110) | | | | | | | | |
| LCS 310-239737/2-A | Lab Control Sample | 84 | 85 | | | | | | | | |
| LCSD 310-239737/3-A | Lab Control Sample Dup | 82 | 84 | | | | | | | | |
| MB 310-239737/1-A | Method Blank | 104 | 109 | | | | | | | | |

**Surrogate Legend**
DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

## Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DCB1 | TCX1 | | | | | | | | |
| Lab Sample ID | Client Sample ID | (10-121) | (18-110) | | | | | | | | |
| 310-155767-1 | MW-13R | 87 | 83 | | | | | | | | |

**Surrogate Legend**
DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

## Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DCB1 | TCX1 | | | | | | | | |
| Lab Sample ID | Client Sample ID | (10-121) | (18-110) | | | | | | | | |
| LCS 310-240265/2-A | Lab Control Sample | 95 | 91 | | | | | | | | |
| LCSD 310-240265/3-A | Lab Control Sample Dup | 83 | 77 | | | | | | | | |
| MB 310-240265/1-A | Method Blank | 102 | 98 | | | | | | | | |

**Surrogate Legend**
DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

# Surrogate Summary

Client: SCS Engineers
Job ID: 310-155767-1
Project/Site: Sioux Falls LF Appendix II Wells
SDG: 27218345.00

## Method: 8151A - Herbicides (GC)

**Matrix: Ground Water**
**Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | DCAA2 (10-150) | | | | | | | | |
| 310-155767-1 | MW-13R | 98 | | | | | | | | |

**Surrogate Legend**
DCAA = Dichloroacetic acid(Surr)

## Method: 8151A - Herbicides (GC)

**Matrix: Water**
**Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | DCAA2 (10-150) | | | | | | | | |
| LCS 490-596828/2-A | Lab Control Sample | 91 | | | | | | | | |
| LCSD 490-596828/3-A | Lab Control Sample Dup | 96 | | | | | | | | |
| MB 490-596828/1-A | Method Blank | 92 | | | | | | | | |

**Surrogate Legend**
DCAA = Dichloroacetic acid(Surr)

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-240435/5**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Acrolein | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Allyl chloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloroprene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Dichlorodifluoromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,3-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 2,2-Dichloropropane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1-Dichloropropene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,3-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Ethyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Methacrylonitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Methyl methacrylate | <2.00 | | 2.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Naphthalene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Propionitrile | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-240435/5**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2,4-Trichlorobenzene | <5.00 | | 5.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 05/22/19 10:48 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 05/22/19 10:48 | 1 |
| Xylenes, Total | <3.00 | | 3.00 | | ug/L | | | 05/22/19 10:48 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* | | *05/22/19 10:48* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *05/22/19 10:48* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *05/22/19 10:48* | *1* |

**Lab Sample ID: LCS 310-240435/6**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 43.70 | | ug/L | | 109 | 50 - 150 |
| Acrolein | 94.9 | 101.1 | | ug/L | | 107 | 45 - 150 |
| Acrylonitrile | 200 | 194.0 | | ug/L | | 97 | 50 - 150 |
| Allyl chloride | 20.0 | 18.93 | | ug/L | | 95 | 50 - 150 |
| Benzene | 20.0 | 20.64 | | ug/L | | 103 | 77 - 120 |
| Bromochloromethane | 20.0 | 21.52 | | ug/L | | 108 | 73 - 132 |
| Bromodichloromethane | 20.0 | 19.00 | | ug/L | | 95 | 73 - 120 |
| Bromoform | 20.0 | 18.77 | | ug/L | | 94 | 57 - 120 |
| Carbon disulfide | 20.0 | 20.85 | | ug/L | | 104 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 21.11 | | ug/L | | 106 | 72 - 126 |
| Chlorobenzene | 20.0 | 20.44 | | ug/L | | 102 | 74 - 120 |
| Chloroform | 20.0 | 20.62 | | ug/L | | 103 | 78 - 121 |
| Chloroprene | 20.0 | 20.23 | | ug/L | | 101 | 76 - 124 |
| Chlorodibromomethane | 20.0 | 19.18 | | ug/L | | 96 | 66 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 17.59 | | ug/L | | 88 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 19.18 | | ug/L | | 96 | 71 - 125 |
| trans-1,4-Dichloro-2-butene | 20.0 | 16.21 | | ug/L | | 81 | 36 - 150 |
| 1,1-Dichloroethane | 20.0 | 19.25 | | ug/L | | 96 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 19.93 | | ug/L | | 100 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 20.91 | | ug/L | | 105 | 75 - 124 |
| cis-1,2-Dichloroethene | 20.0 | 20.30 | | ug/L | | 102 | 77 - 120 |
| trans-1,2-Dichloroethene | 20.0 | 21.52 | | ug/L | | 108 | 75 - 122 |
| 1,2-Dichlorobenzene | 20.0 | 20.51 | | ug/L | | 103 | 66 - 120 |
| 1,2-Dichloropropane | 20.0 | 19.38 | | ug/L | | 97 | 75 - 123 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240435/6**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,3-Dichloropropane | 20.0 | 19.52 | | ug/L | | 98 | 75 - 123 |
| 2,2-Dichloropropane | 20.0 | 21.07 | | ug/L | | 105 | 50 - 150 |
| 1,1-Dichloropropene | 20.0 | 20.96 | | ug/L | | 105 | 77 - 124 |
| cis-1,3-Dichloropropene | 20.0 | 18.23 | | ug/L | | 91 | 70 - 120 |
| trans-1,3-Dichloropropene | 20.0 | 19.60 | | ug/L | | 98 | 69 - 120 |
| 1,3-Dichlorobenzene | 20.0 | 20.47 | | ug/L | | 102 | 67 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 20.83 | | ug/L | | 104 | 68 - 120 |
| Ethylbenzene | 20.0 | 20.55 | | ug/L | | 103 | 73 - 120 |
| Ethyl methacrylate | 20.0 | 18.18 | | ug/L | | 91 | 61 - 120 |
| Methacrylonitrile | 200 | 198.0 | | ug/L | | 99 | 70 - 126 |
| 2-Hexanone | 40.0 | 36.28 | | ug/L | | 91 | 57 - 128 |
| 2-Butanone (MEK) | 40.0 | 37.28 | | ug/L | | 93 | 50 - 150 |
| Iodomethane | 20.0 | 20.74 | | ug/L | | 104 | 20 - 150 |
| Methyl methacrylate | 40.0 | 37.72 | | ug/L | | 94 | 66 - 123 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 35.92 | | ug/L | | 90 | 59 - 126 |
| Dibromomethane | 20.0 | 19.82 | | ug/L | | 99 | 76 - 125 |
| Methylene Chloride | 20.0 | 19.38 | | ug/L | | 97 | 50 - 150 |
| Naphthalene | 20.0 | 16.45 | | ug/L | | 82 | 50 - 150 |
| Propionitrile | 200 | 194.2 | | ug/L | | 97 | 65 - 134 |
| Styrene | 20.0 | 20.08 | | ug/L | | 100 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 19.48 | | ug/L | | 97 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 19.60 | | ug/L | | 98 | 63 - 122 |
| Tetrachloroethene | 20.0 | 22.45 | | ug/L | | 112 | 72 - 129 |
| Toluene | 20.0 | 20.38 | | ug/L | | 102 | 74 - 120 |
| 1,2,4-Trichlorobenzene | 20.0 | 18.05 | | ug/L | | 90 | 59 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 20.77 | | ug/L | | 104 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 20.43 | | ug/L | | 102 | 69 - 127 |
| Trichloroethene | 20.0 | 20.93 | | ug/L | | 105 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 18.41 | | ug/L | | 92 | 66 - 120 |
| Vinyl acetate | 40.0 | 41.61 | | ug/L | | 104 | 50 - 150 |
| Xylenes, Total | 40.0 | 41.84 | | ug/L | | 105 | 69 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *103* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* |

**Lab Sample ID: LCS 310-240435/7**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloroethane | 20.0 | 17.75 | | ug/L | | 89 | 69 - 129 |
| Dichlorodifluoromethane | 20.0 | 22.44 | | ug/L | | 112 | 50 - 150 |
| Bromomethane | 20.0 | 14.06 | | ug/L | | 70 | 38 - 150 |
| Chloromethane | 20.0 | 15.96 | | ug/L | | 80 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 20.61 | | ug/L | | 103 | 68 - 146 |
| Vinyl chloride | 20.0 | 18.42 | | ug/L | | 92 | 67 - 133 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-240435/7**
**Matrix: Water**
**Analysis Batch: 240435**

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

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 121 | X | 80 - 120 |
| Dibromofluoromethane (Surr) | 101 | | 80 - 120 |
| Toluene-d8 (Surr) | 93 | | 80 - 120 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 310-240134/1-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Acenaphthylene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Acetophenone | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Acetylaminofluorene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Aminobiphenyl | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Anthracene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzo[a]anthracene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzo[b]fluoranthene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzo[k]fluoranthene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzo[g,h,i]perylene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzo[a]pyrene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Benzyl alcohol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Bis(2-chloroethoxy)methane | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| bis (2-chloroisopropyl) ether | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Bis(2-chloroethyl)ether | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Bis(2-ethylhexyl) phthalate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Bromophenyl phenyl ether | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Butyl benzyl phthalate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Chloroaniline | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Chlorobenzilate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Chloro-3-methylphenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Chloronaphthalene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Chlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Chlorophenyl phenyl ether | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Chrysene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Methylphenol, 3 & 4 | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Methylphenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Diallate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Dibenzo(a,h)anthracene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Dibenzofuran | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Di-n-butyl phthalate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 3,3'-Dichlorobenzidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4-Dichlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,6-Dichlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Diethyl phthalate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Thionazin | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 7,12-Dimethylbenz(a)anthracene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Dimethoate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 310-240134/1-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| p-Dimethylamino azobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 3,3'-Dimethylbenzidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4-Dimethylphenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Dimethyl phthalate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1,3-Dinitrobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4,6-Dinitro-2-methylphenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4-Dinitrophenol | <20.0 | | 20.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4-Dinitrotoluene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,6-Dinitrotoluene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Di-n-octyl phthalate | <20.0 | | 20.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Diphenylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Disulfoton | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Ethyl methanesulfonate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Famphur | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Fluoranthene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Fluorene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Hexachlorobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Hexachlorobutadiene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Hexachlorocyclopentadiene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Hexachloroethane | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Hexachloropropene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Indeno[1,2,3-cd]pyrene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Isodrin | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Isophorone | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Isosafrole | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Kepone | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Methapyrilene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 3-Methylcholanthrene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Methyl methanesulfonate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Methylnaphthalene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Methyl parathion | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1,4-Naphthoquinone | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1-Naphthylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Naphthylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Nitroaniline | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 3-Nitroaniline | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Nitroaniline | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Nitrobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2-Nitrophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 4-Nitrophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosodi-n-butylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosodiethylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosodimethylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosodiphenylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosodi-n-propylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosomethylethylamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosopiperidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| N-Nitrosopyrrolidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 5-Nitro-o-toluidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 310-240134/1-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ethyl Parathion | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Pentachlorobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Pentachloronitrobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Pentachlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Phenacetin | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Phenanthrene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Phenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1,4-phenylenediamine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Phorate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Pronamide | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Pyrene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Safrole | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1,2,4,5-Tetrachlorobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,3,4,6-Tetrachlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| o-Toluidine | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4,5-Trichlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 2,4,6-Trichlorophenol | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| o,o',o''-Triethylphosphorothioate | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| 1,3,5-Trinitrobenzene | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |
| Dinoseb | <10.0 | | 10.0 | | ug/L | | 05/20/19 15:56 | 05/21/19 10:40 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorophenol (Surr)* | *54* | | *10 - 110* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |
| *Phenol-d6 (Surr)* | *38* | | *10 - 110* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |
| *Nitrobenzene-d5 (Surr)* | *88* | | *24 - 110* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |
| *2-Fluorobiphenyl (Surr)* | *89* | | *26 - 110* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *92* | | *23 - 110* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |
| *Terphenyl-d14 (Surr)* | *99* | | *10 - 127* | *05/20/19 15:56* | *05/21/19 10:40* | *1* |

**Lab Sample ID: LCS 310-240134/2-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 50.0 | 26.27 | | ug/L | | 53 | 33 - 110 |
| Acenaphthylene | 50.0 | 26.67 | | ug/L | | 53 | 32 - 110 |
| Acetophenone | 50.0 | 27.95 | | ug/L | | 56 | 29 - 110 |
| Anthracene | 50.0 | 30.45 | | ug/L | | 61 | 39 - 110 |
| Benzo[a]anthracene | 50.0 | 32.14 | | ug/L | | 64 | 37 - 110 |
| Benzo[b]fluoranthene | 50.0 | 32.74 | | ug/L | | 65 | 33 - 113 |
| Benzo[k]fluoranthene | 50.0 | 32.87 | | ug/L | | 66 | 37 - 110 |
| Benzo[g,h,i]perylene | 50.0 | 28.62 | | ug/L | | 57 | 34 - 110 |
| Benzo[a]pyrene | 50.0 | 31.30 | | ug/L | | 63 | 36 - 110 |
| Benzyl alcohol | 50.0 | 26.37 | | ug/L | | 53 | 23 - 110 |
| Bis(2-chloroethoxy)methane | 50.0 | 25.45 | | ug/L | | 51 | 30 - 110 |
| bis (2-chloroisopropyl) ether | 50.0 | 24.81 | | ug/L | | 50 | 26 - 110 |
| Bis(2-chloroethyl)ether | 50.0 | 25.38 | | ug/L | | 51 | 27 - 110 |
| Bis(2-ethylhexyl) phthalate | 50.0 | 29.87 | | ug/L | | 60 | 30 - 114 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 310-240134/2-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 4-Bromophenyl phenyl ether | 50.0 | 27.80 | | ug/L | | 56 | 37 - 110 |
| Butyl benzyl phthalate | 50.0 | 31.23 | | ug/L | | 62 | 33 - 110 |
| 4-Chloroaniline | 50.0 | 26.68 | | ug/L | | 53 | 16 - 110 |
| 4-Chloro-3-methylphenol | 50.0 | 32.31 | | ug/L | | 65 | 32 - 110 |
| 2-Chloronaphthalene | 50.0 | 24.80 | | ug/L | | 50 | 31 - 110 |
| 2-Chlorophenol | 50.0 | 26.67 | | ug/L | | 53 | 26 - 110 |
| 4-Chlorophenyl phenyl ether | 50.0 | 27.20 | | ug/L | | 54 | 34 - 110 |
| Chrysene | 50.0 | 31.13 | | ug/L | | 62 | 37 - 110 |
| Methylphenol, 3 & 4 | 50.0 | 25.35 | | ug/L | | 51 | 24 - 110 |
| 2-Methylphenol | 50.0 | 26.08 | | ug/L | | 52 | 26 - 110 |
| Dibenzo(a,h)anthracene | 50.0 | 32.21 | | ug/L | | 64 | 36 - 110 |
| Dibenzofuran | 50.0 | 26.40 | | ug/L | | 53 | 35 - 110 |
| Di-n-butyl phthalate | 50.0 | 29.57 | | ug/L | | 59 | 39 - 110 |
| 2,4-Dichlorophenol | 50.0 | 30.80 | | ug/L | | 62 | 28 - 110 |
| 2,6-Dichlorophenol | 50.0 | 30.00 | | ug/L | | 60 | 28 - 110 |
| Diethyl phthalate | 50.0 | 28.08 | | ug/L | | 56 | 36 - 110 |
| 2,4-Dimethylphenol | 50.0 | 29.11 | | ug/L | | 58 | 23 - 110 |
| Dimethyl phthalate | 50.0 | 27.15 | | ug/L | | 54 | 26 - 110 |
| 1,3-Dinitrobenzene | 50.0 | 27.35 | | ug/L | | 55 | 27 - 116 |
| 4,6-Dinitro-2-methylphenol | 100 | 60.96 | | ug/L | | 61 | 21 - 121 |
| 2,4-Dinitrophenol | 100 | 58.31 | | ug/L | | 58 | 10 - 110 |
| 2,4-Dinitrotoluene | 50.0 | 31.44 | | ug/L | | 63 | 30 - 113 |
| 2,6-Dinitrotoluene | 50.0 | 29.30 | | ug/L | | 59 | 35 - 110 |
| Di-n-octyl phthalate | 50.0 | 31.26 | | ug/L | | 63 | 23 - 132 |
| Fluoranthene | 50.0 | 32.91 | | ug/L | | 66 | 40 - 110 |
| Fluorene | 50.0 | 27.58 | | ug/L | | 55 | 36 - 110 |
| Hexachlorobenzene | 50.0 | 28.26 | | ug/L | | 57 | 37 - 110 |
| Hexachlorobutadiene | 50.0 | 27.94 | | ug/L | | 56 | 24 - 110 |
| Hexachlorocyclopentadiene | 50.0 | 21.29 | | ug/L | | 43 | 10 - 110 |
| Hexachloroethane | 50.0 | 24.52 | | ug/L | | 49 | 21 - 110 |
| Indeno[1,2,3-cd]pyrene | 50.0 | 28.96 | | ug/L | | 58 | 30 - 120 |
| Isophorone | 50.0 | 26.41 | | ug/L | | 53 | 29 - 110 |
| 2-Methylnaphthalene | 50.0 | 27.95 | | ug/L | | 56 | 28 - 110 |
| 2-Nitroaniline | 50.0 | 26.67 | | ug/L | | 53 | 34 - 110 |
| 3-Nitroaniline | 50.0 | 27.14 | | ug/L | | 54 | 31 - 110 |
| 4-Nitroaniline | 50.0 | 25.68 | | ug/L | | 51 | 20 - 120 |
| Nitrobenzene | 50.0 | 26.90 | | ug/L | | 54 | 29 - 110 |
| 2-Nitrophenol | 50.0 | 28.22 | | ug/L | | 56 | 23 - 110 |
| 4-Nitrophenol | 100 | 28.15 | | ug/L | | 28 | 10 - 110 |
| N-Nitrosodimethylamine | 50.0 | 17.99 | | ug/L | | 36 | 13 - 110 |
| N-Nitrosodiphenylamine | 50.0 | 28.83 | | ug/L | | 58 | 38 - 110 |
| N-Nitrosodi-n-propylamine | 50.0 | 27.35 | | ug/L | | 55 | 29 - 110 |
| Pentachlorophenol | 100 | 64.65 | | ug/L | | 65 | 26 - 110 |
| Phenanthrene | 50.0 | 29.91 | | ug/L | | 60 | 40 - 110 |
| Phenol | 50.0 | 12.90 | | ug/L | | 26 | 10 - 110 |
| Pyrene | 50.0 | 30.72 | | ug/L | | 61 | 41 - 110 |
| 1,2,4,5-Tetrachlorobenzene | 50.0 | 25.35 | | ug/L | | 51 | 29 - 110 |
| 2,3,4,6-Tetrachlorophenol | 50.0 | 29.13 | | ug/L | | 58 | 31 - 110 |
| 2,4,5-Trichlorophenol | 50.0 | 30.27 | | ug/L | | 61 | 32 - 110 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 310-240134/2-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-Trichlorophenol | | | 50.0 | 28.81 | | ug/L | | 58 | 30 - 110 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorophenol (Surr)* | *40* | | *10 - 110* |
| *Phenol-d6 (Surr)* | *27* | | *10 - 110* |
| *Nitrobenzene-d5 (Surr)* | *58* | | *24 - 110* |
| *2-Fluorobiphenyl (Surr)* | *65* | | *26 - 110* |
| *2,4,6-Tribromophenol (Surr)* | *74* | | *23 - 110* |
| *Terphenyl-d14 (Surr)* | *77* | | *10 - 127* |

**Lab Sample ID: LCSD 310-240134/3-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | | | 50.0 | 36.23 | | ug/L | | 72 | 33 - 110 | 32 | 35 |
| Acenaphthylene | | | 50.0 | 36.35 | | ug/L | | 73 | 32 - 110 | 31 | 35 |
| Acetophenone | | | 50.0 | 40.63 | * | ug/L | | 81 | 29 - 110 | 37 | 35 |
| Anthracene | | | 50.0 | 41.56 | * | ug/L | | 83 | 39 - 110 | 31 | 28 |
| Benzo[a]anthracene | | | 50.0 | 42.00 | | ug/L | | 84 | 37 - 110 | 27 | 35 |
| Benzo[b]fluoranthene | | | 50.0 | 41.69 | | ug/L | | 83 | 33 - 113 | 24 | 35 |
| Benzo[k]fluoranthene | | | 50.0 | 43.49 | | ug/L | | 87 | 37 - 110 | 28 | 35 |
| Benzo[g,h,i]perylene | | | 50.0 | 36.81 | | ug/L | | 74 | 34 - 110 | 25 | 35 |
| Benzo[a]pyrene | | | 50.0 | 40.98 | | ug/L | | 82 | 36 - 110 | 27 | 35 |
| Benzyl alcohol | | | 50.0 | 37.48 | | ug/L | | 75 | 23 - 110 | 35 | 35 |
| Bis(2-chloroethoxy)methane | | | 50.0 | 35.21 | | ug/L | | 70 | 30 - 110 | 32 | 35 |
| bis (2-chloroisopropyl) ether | | | 50.0 | 36.27 | * | ug/L | | 73 | 26 - 110 | 38 | 35 |
| Bis(2-chloroethyl)ether | | | 50.0 | 36.13 | | ug/L | | 72 | 27 - 110 | 35 | 35 |
| Bis(2-ethylhexyl) phthalate | | | 50.0 | 38.91 | | ug/L | | 78 | 30 - 114 | 26 | 35 |
| 4-Bromophenyl phenyl ether | | | 50.0 | 38.61 | * | ug/L | | 77 | 37 - 110 | 33 | 30 |
| Butyl benzyl phthalate | | | 50.0 | 41.11 | | ug/L | | 82 | 33 - 110 | 27 | 34 |
| 4-Chloroaniline | | | 50.0 | 36.84 | | ug/L | | 74 | 16 - 110 | 32 | 35 |
| 4-Chloro-3-methylphenol | | | 50.0 | 43.09 | | ug/L | | 86 | 32 - 110 | 29 | 35 |
| 2-Chloronaphthalene | | | 50.0 | 33.93 | | ug/L | | 68 | 31 - 110 | 31 | 35 |
| 2-Chlorophenol | | | 50.0 | 37.87 | | ug/L | | 76 | 26 - 110 | 35 | 35 |
| 4-Chlorophenyl phenyl ether | | | 50.0 | 37.73 | | ug/L | | 75 | 34 - 110 | 32 | 35 |
| Chrysene | | | 50.0 | 42.24 | | ug/L | | 84 | 37 - 110 | 30 | 35 |
| Methylphenol, 3 & 4 | | | 50.0 | 35.72 | | ug/L | | 71 | 24 - 110 | 34 | 35 |
| 2-Methylphenol | | | 50.0 | 37.59 | * | ug/L | | 75 | 26 - 110 | 36 | 35 |
| Dibenzo(a,h)anthracene | | | 50.0 | 39.82 | | ug/L | | 80 | 36 - 110 | 21 | 35 |
| Dibenzofuran | | | 50.0 | 36.46 | | ug/L | | 73 | 35 - 110 | 32 | 35 |
| Di-n-butyl phthalate | | | 50.0 | 39.62 | | ug/L | | 79 | 39 - 110 | 29 | 30 |
| 2,4-Dichlorophenol | | | 50.0 | 42.25 | | ug/L | | 84 | 28 - 110 | 31 | 35 |
| 2,6-Dichlorophenol | | | 50.0 | 40.83 | | ug/L | | 82 | 28 - 110 | 31 | 35 |
| Diethyl phthalate | | | 50.0 | 37.80 | | ug/L | | 76 | 36 - 110 | 30 | 31 |
| 2,4-Dimethylphenol | | | 50.0 | 38.20 | | ug/L | | 76 | 23 - 110 | 27 | 35 |
| Dimethyl phthalate | | | 50.0 | 37.03 | | ug/L | | 74 | 26 - 110 | 31 | 35 |
| 1,3-Dinitrobenzene | | | 50.0 | 36.64 | | ug/L | | 73 | 27 - 116 | 29 | 31 |

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 310-240134/3-A**
**Matrix: Water**
**Analysis Batch: 240245**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 240134**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | | | 100 | 85.40 | | ug/L | | 85 | 21 - 121 | 33 | 35 |
| 2,4-Dinitrophenol | | | 100 | 75.77 | | ug/L | | 76 | 10 - 110 | 26 | 35 |
| 2,4-Dinitrotoluene | | | 50.0 | 43.03 | * | ug/L | | 86 | 30 - 113 | 31 | 29 |
| 2,6-Dinitrotoluene | | | 50.0 | 39.82 | | ug/L | | 80 | 35 - 110 | 30 | 33 |
| Di-n-octyl phthalate | | | 50.0 | 39.91 | | ug/L | | 80 | 23 - 132 | 24 | 35 |
| Fluoranthene | | | 50.0 | 44.18 | * | ug/L | | 88 | 40 - 110 | 29 | 28 |
| Fluorene | | | 50.0 | 37.62 | | ug/L | | 75 | 36 - 110 | 31 | 35 |
| Hexachlorobenzene | | | 50.0 | 39.04 | | ug/L | | 78 | 37 - 110 | 32 | 34 |
| Hexachlorobutadiene | | | 50.0 | 37.44 | | ug/L | | 75 | 24 - 110 | 29 | 35 |
| Hexachlorocyclopentadiene | | | 50.0 | 29.04 | | ug/L | | 58 | 10 - 110 | 31 | 35 |
| Hexachloroethane | | | 50.0 | 34.65 | | ug/L | | 69 | 21 - 110 | 34 | 35 |
| Indeno[1,2,3-cd]pyrene | | | 50.0 | 36.04 | | ug/L | | 72 | 30 - 120 | 22 | 35 |
| Isophorone | | | 50.0 | 36.77 | | ug/L | | 74 | 29 - 110 | 33 | 35 |
| 2-Methylnaphthalene | | | 50.0 | 38.45 | | ug/L | | 77 | 28 - 110 | 32 | 35 |
| 2-Nitroaniline | | | 50.0 | 35.51 | | ug/L | | 71 | 34 - 110 | 28 | 33 |
| 3-Nitroaniline | | | 50.0 | 36.85 | | ug/L | | 74 | 31 - 110 | 30 | 35 |
| 4-Nitroaniline | | | 50.0 | 34.08 | | ug/L | | 68 | 20 - 120 | 28 | 35 |
| Nitrobenzene | | | 50.0 | 38.28 | | ug/L | | 77 | 29 - 110 | 35 | 35 |
| 2-Nitrophenol | | | 50.0 | 38.40 | | ug/L | | 77 | 23 - 110 | 31 | 35 |
| 4-Nitrophenol | | | 100 | 35.89 | | ug/L | | 36 | 10 - 110 | 24 | 35 |
| N-Nitrosodimethylamine | | | 50.0 | 24.80 | | ug/L | | 50 | 13 - 110 | 32 | 35 |
| N-Nitrosodiphenylamine | | | 50.0 | 38.81 | * | ug/L | | 78 | 38 - 110 | 30 | 29 |
| N-Nitrosodi-n-propylamine | | | 50.0 | 39.81 | * | ug/L | | 80 | 29 - 110 | 37 | 35 |
| Pentachlorophenol | | | 100 | 89.16 | | ug/L | | 89 | 26 - 110 | 32 | 35 |
| Phenanthrene | | | 50.0 | 40.96 | * | ug/L | | 82 | 40 - 110 | 31 | 29 |
| Phenol | | | 50.0 | 17.99 | | ug/L | | 36 | 10 - 110 | 33 | 35 |
| Pyrene | | | 50.0 | 40.14 | | ug/L | | 80 | 41 - 110 | 27 | 31 |
| 1,2,4,5-Tetrachlorobenzene | | | 50.0 | 34.71 | | ug/L | | 69 | 29 - 110 | 31 | 35 |
| 2,3,4,6-Tetrachlorophenol | | | 50.0 | 39.57 | | ug/L | | 79 | 31 - 110 | 30 | 35 |
| 2,4,5-Trichlorophenol | | | 50.0 | 40.55 | | ug/L | | 81 | 32 - 110 | 29 | 35 |
| 2,4,6-Trichlorophenol | | | 50.0 | 38.89 | | ug/L | | 78 | 30 - 110 | 30 | 35 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorophenol (Surr)* | *54* | | *10 - 110* |
| *Phenol-d6 (Surr)* | *37* | | *10 - 110* |
| *Nitrobenzene-d5 (Surr)* | *82* | | *24 - 110* |
| *2-Fluorobiphenyl (Surr)* | *87* | | *26 - 110* |
| *2,4,6-Tribromophenol (Surr)* | *97* | | *23 - 110* |
| *Terphenyl-d14 (Surr)* | *98* | | *10 - 127* |

## Method: 8015B - Nonhalogenated Organic Compounds - Direct Injection (GC)

**Lab Sample ID: MB 310-240561/6**
**Matrix: Water**
**Analysis Batch: 240561**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetonitrile | <10.0 | | 10.0 | | mg/L | | | 05/23/19 09:31 | 1 |
| Isobutanol | <10.0 | | 10.0 | | mg/L | | | 05/23/19 09:31 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Method: 8015B - Nonhalogenated Organic Compounds - Direct Injection (GC)

**Lab Sample ID: LCS 310-240561/7**
**Matrix: Water**
**Analysis Batch: 240561**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetonitrile | 90.2 | 86.99 | | mg/L | | 96 | 80 - 120 |
| Isobutanol | 93.6 | 89.52 | | mg/L | | 96 | 80 - 120 |

## Method: 8081B - Organochlorine Pesticides (GC)

**Lab Sample ID: MB 310-239737/1-A**
**Matrix: Water**
**Analysis Batch: 240015**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239737**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| alpha-BHC | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| beta-BHC | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| gamma-BHC (Lindane) | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Chlordane (technical) | <2.00 | | 2.00 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Dieldrin | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| 4,4'-DDD | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| 4,4'-DDE | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| 4,4'-DDT | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Endosulfan I | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Endosulfan II | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Endosulfan sulfate | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Endrin | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Heptachlor | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Heptachlor epoxide | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Methoxychlor | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Toxaphene | <2.00 | | 2.00 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| delta-BHC | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |
| Endrin aldehyde | <0.0320 | | 0.0320 | | ug/L | | 05/16/19 15:40 | 05/20/19 10:15 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *104* | | *10 - 130* | *05/16/19 15:40* | *05/20/19 10:15* | *1* |
| *Tetrachloro-m-xylene* | *109* | | *23 - 110* | *05/16/19 15:40* | *05/20/19 10:15* | *1* |

**Lab Sample ID: LCS 310-239737/2-A**
**Matrix: Water**
**Analysis Batch: 240015**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239737**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aldrin | 0.500 | 0.3613 | | ug/L | | 72 | 30 - 116 |
| alpha-BHC | 0.500 | 0.3679 | | ug/L | | 74 | 28 - 118 |
| beta-BHC | 0.500 | 0.3653 | | ug/L | | 73 | 35 - 120 |
| gamma-BHC (Lindane) | 0.500 | 0.3712 | | ug/L | | 74 | 31 - 121 |
| Dieldrin | 0.500 | 0.3724 | | ug/L | | 74 | 35 - 127 |
| 4,4'-DDD | 0.500 | 0.3812 | | ug/L | | 76 | 36 - 131 |
| 4,4'-DDE | 0.500 | 0.3625 | | ug/L | | 72 | 33 - 127 |
| 4,4'-DDT | 0.500 | 0.4416 | | ug/L | | 88 | 26 - 140 |
| Endosulfan I | 0.500 | 0.2874 | | ug/L | | 57 | 20 - 110 |
| Endosulfan II | 0.500 | 0.2946 | | ug/L | | 59 | 28 - 111 |

## Method: 8081B - Organochlorine Pesticides (GC) (Continued)

**Lab Sample ID: LCS 310-239737/2-A**
**Matrix: Water**
**Analysis Batch: 240015**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239737**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endosulfan sulfate | | | 0.500 | 0.3763 | | ug/L | | 75 | 34 - 150 | | |
| Endrin | | | 0.500 | 0.3816 | | ug/L | | 76 | 37 - 137 | | |
| Heptachlor | | | 0.500 | 0.4003 | | ug/L | | 80 | 30 - 119 | | |
| Heptachlor epoxide | | | 0.500 | 0.3692 | | ug/L | | 74 | 36 - 122 | | |
| Methoxychlor | | | 0.500 | 0.4503 | | ug/L | | 90 | 23 - 146 | | |
| delta-BHC | | | 0.500 | 0.3962 | | ug/L | | 79 | 29 - 130 | | |
| Endrin aldehyde | | | 0.500 | 0.3539 | | ug/L | | 71 | 34 - 124 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *84* | | *10 - 130* |
| *Tetrachloro-m-xylene* | *85* | | *23 - 110* |

**Lab Sample ID: LCSD 310-239737/3-A**
**Matrix: Water**
**Analysis Batch: 240015**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 239737**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | | | 0.500 | 0.3693 | | ug/L | | 74 | 30 - 116 | 2 | 35 |
| alpha-BHC | | | 0.500 | 0.3774 | | ug/L | | 75 | 28 - 118 | 3 | 35 |
| beta-BHC | | | 0.500 | 0.3721 | | ug/L | | 74 | 35 - 120 | 2 | 35 |
| gamma-BHC (Lindane) | | | 0.500 | 0.3806 | | ug/L | | 76 | 31 - 121 | 2 | 35 |
| Dieldrin | | | 0.500 | 0.3825 | | ug/L | | 76 | 35 - 127 | 3 | 35 |
| 4,4'-DDD | | | 0.500 | 0.3893 | | ug/L | | 78 | 36 - 131 | 2 | 35 |
| 4,4'-DDE | | | 0.500 | 0.3703 | | ug/L | | 74 | 33 - 127 | 2 | 35 |
| 4,4'-DDT | | | 0.500 | 0.4492 | | ug/L | | 90 | 26 - 140 | 2 | 35 |
| Endosulfan I | | | 0.500 | 0.2939 | | ug/L | | 59 | 20 - 110 | 2 | 35 |
| Endosulfan II | | | 0.500 | 0.3009 | | ug/L | | 60 | 28 - 111 | 2 | 35 |
| Endosulfan sulfate | | | 0.500 | 0.4735 | | ug/L | | 95 | 34 - 150 | 23 | 35 |
| Endrin | | | 0.500 | 0.3850 | | ug/L | | 77 | 37 - 137 | 1 | 35 |
| Heptachlor | | | 0.500 | 0.4062 | | ug/L | | 81 | 30 - 119 | 1 | 35 |
| Heptachlor epoxide | | | 0.500 | 0.3781 | | ug/L | | 76 | 36 - 122 | 2 | 35 |
| Methoxychlor | | | 0.500 | 0.4546 | | ug/L | | 91 | 23 - 146 | 1 | 35 |
| delta-BHC | | | 0.500 | 0.3770 | | ug/L | | 75 | 29 - 130 | 5 | 35 |
| Endrin aldehyde | | | 0.500 | 0.3524 | | ug/L | | 70 | 34 - 124 | 0 | 35 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *82* | | *10 - 130* |
| *Tetrachloro-m-xylene* | *84* | | *23 - 110* |

## Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

**Lab Sample ID: MB 310-240265/1-A**
**Matrix: Water**
**Analysis Batch: 240407**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240265**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |
| PCB-1221 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |

## Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

**Lab Sample ID: MB 310-240265/1-A**
**Matrix: Water**
**Analysis Batch: 240407**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240265**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1232 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |
| PCB-1242 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |
| PCB-1248 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |
| PCB-1254 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |
| PCB-1260 | <0.800 | | 0.800 | | ug/L | | 05/21/19 09:51 | 05/22/19 12:49 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *102* | | *10 - 121* | *05/21/19 09:51* | *05/22/19 12:49* | *1* |
| *Tetrachloro-m-xylene* | *98* | | *18 - 110* | *05/21/19 09:51* | *05/22/19 12:49* | *1* |

**Lab Sample ID: LCS 310-240265/2-A**
**Matrix: Water**
**Analysis Batch: 240407**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240265**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| PCB-1016 | 5.00 | 4.535 | | ug/L | | 91 | 26 - 114 |
| PCB-1260 | 5.00 | 4.299 | | ug/L | | 86 | 18 - 122 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *95* | | *10 - 121* |
| *Tetrachloro-m-xylene* | *91* | | *18 - 110* |

**Lab Sample ID: LCSD 310-240265/3-A**
**Matrix: Water**
**Analysis Batch: 240407**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 240265**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | 5.00 | 3.997 | | ug/L | | 80 | 26 - 114 | 13 | 35 |
| PCB-1260 | 5.00 | 3.828 | | ug/L | | 77 | 18 - 122 | 12 | 35 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *83* | | *10 - 121* |
| *Tetrachloro-m-xylene* | *77* | | *18 - 110* |

## Method: 8151A - Herbicides (GC)

**Lab Sample ID: MB 490-596828/1-A**
**Matrix: Water**
**Analysis Batch: 597119**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 596828**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | <5.00 | | 5.00 | | ug/L | | 05/22/19 11:28 | 05/23/19 11:20 | 1 |
| Silvex (2,4,5-TP) | <2.00 | | 2.00 | | ug/L | | 05/22/19 11:28 | 05/23/19 11:20 | 1 |
| 2,4,5-T | <2.00 | | 2.00 | | ug/L | | 05/22/19 11:28 | 05/23/19 11:20 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Dichloroacetic acid(Surr)* | *92* | | *10 - 150* | *05/22/19 11:28* | *05/23/19 11:20* | *1* |

## Method: 8151A - Herbicides (GC) (Continued)

**Lab Sample ID: LCS 490-596828/2-A**
**Matrix: Water**
**Analysis Batch: 597119**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 596828**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | | | 5.00 | 5.376 | | ug/L | | 108 | 10 - 150 | | |
| Silvex (2,4,5-TP) | | | 5.00 | 6.193 | | ug/L | | 124 | 10 - 150 | | |
| 2,4,5-T | | | 5.00 | 5.513 | | ug/L | | 110 | 10 - 150 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Dichloroacetic acid(Surr)* | *91* | | *10 - 150* |

**Lab Sample ID: LCSD 490-596828/3-A**
**Matrix: Water**
**Analysis Batch: 597119**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 596828**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | | | 5.00 | 5.269 | | ug/L | | 105 | 10 - 150 | 2 | 35 |
| Silvex (2,4,5-TP) | | | 5.00 | 5.860 | | ug/L | | 117 | 10 - 150 | 6 | 35 |
| 2,4,5-T | | | 5.00 | 5.326 | | ug/L | | 107 | 10 - 150 | 3 | 35 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *Dichloroacetic acid(Surr)* | *96* | | *10 - 150* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-240361/3**
**Matrix: Water**
**Analysis Batch: 240361**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 05/19/19 14:43 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 05/19/19 14:43 | 1 |

**Lab Sample ID: LCS 310-240361/39**
**Matrix: Water**
**Analysis Batch: 240361**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 10.0 | 10.41 | | mg/L | | 104 | 90 - 110 | | |
| Sulfate | | | 10.0 | 10.62 | | mg/L | | 106 | 90 - 110 | | |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-240251/1-A**
**Matrix: Water**
**Analysis Batch: 240459**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 05/21/19 09:04 | 05/21/19 20:14 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 310-240251/2-A**
**Matrix: Water**
**Analysis Batch: 240459**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240251**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 18.19 | | mg/L | | 91 | 80 - 120 |
| Iron | 2.00 | 1.988 | | mg/L | | 99 | 80 - 120 |
| Manganese | 1.00 | 0.9157 | | mg/L | | 92 | 80 - 120 |
| Potassium | 20.0 | 19.49 | | mg/L | | 97 | 80 - 120 |

**Lab Sample ID: MB 310-241316/39**
**Matrix: Water**
**Analysis Batch: 241316**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Iron | <0.500 | | 0.500 | | mg/L | | | 05/30/19 14:27 | 1 |
| Dissolved Manganese | <0.0100 | | 0.0100 | | mg/L | | | 05/30/19 14:27 | 1 |

**Lab Sample ID: LCS 310-241316/40**
**Matrix: Water**
**Analysis Batch: 241316**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Iron | 2.00 | 1.860 | | mg/L | | 93 | 80 - 120 |
| Dissolved Manganese | 2.00 | 1.922 | | mg/L | | 96 | 80 - 120 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-239906/195**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 05/17/19 22:14 | 1 |

**Lab Sample ID: LCS 310-239906/196**
**Matrix: Water**
**Analysis Batch: 239906**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 3.11 | 3.299 | | mg/L | | 106 | 90 - 110 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-240678/107**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 05/23/19 18:44 | 1 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

**Lab Sample ID: LCS 310-240678/108 ^10**
**Matrix: Water**
**Analysis Batch: 240678**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 18.6 | 17.14 | | mg/L | | 92 | 90 - 110 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-240097/32**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 05/20/19 11:55 | 1 |

**Lab Sample ID: LCS 310-240097/33**
**Matrix: Water**
**Analysis Batch: 240097**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 115.9 | | mg/L | | 92 | 85 - 115 |

## Method: 9012B - Cyanide, Total andor Amenable

**Lab Sample ID: MB 310-239794/1-A**
**Matrix: Water**
**Analysis Batch: 239903**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 239794**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | <0.0100 | | 0.0100 | | mg/L | | 05/17/19 08:21 | 05/17/19 20:06 | 1 |

**Lab Sample ID: LCS 310-239794/2-A**
**Matrix: Water**
**Analysis Batch: 239903**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 239794**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.200 | 0.1939 | | mg/L | | 97 | 90 - 110 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-240933/1**
**Matrix: Water**
**Analysis Batch: 240933**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 05/28/19 09:53 | 1 |

**Lab Sample ID: LCS 310-240933/2**
**Matrix: Water**
**Analysis Batch: 240933**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 1001 | | mg/L | | 94 | 90 - 110 |

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-240267/1-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 05/21/19 10:01 | 05/21/19 10:14 | 1 |

**Lab Sample ID: LCS 310-240267/2-A**
**Matrix: Water**
**Analysis Batch: 240273**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 240267**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 3.632 | | mg/L | | 73 | 33 - 117 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-239744/1**
**Matrix: Water**
**Analysis Batch: 239744**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 05/16/19 16:58 | 1 |

**Lab Sample ID: LCS 310-239744/2**
**Matrix: Water**
**Analysis Batch: 239744**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 192.2 | | mg/L | | 97 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 490-597910/1**
**Matrix: Water**
**Analysis Batch: 597910**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | <1.00 | | 1.00 | | mg/L | | | 05/23/19 13:00 | 1 |

**Lab Sample ID: LCS 490-597910/5**
**Matrix: Water**
**Analysis Batch: 597910**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 10.0 | 9.821 | | mg/L | | 98 | 90 - 110 |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## GC/MS VOA

### Analysis Batch: 240435

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8260C | |
| 310-155767-2 | Trip Blank | Total/NA | Water | 8260C | |
| MB 310-240435/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-240435/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-240435/7 | Lab Control Sample | Total/NA | Water | 8260C | |

## GC/MS Semi VOA

### Prep Batch: 240134

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 3510C | |
| MB 310-240134/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 310-240134/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 310-240134/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 240245

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8270D | 240134 |
| MB 310-240134/1-A | Method Blank | Total/NA | Water | 8270D | 240134 |
| LCS 310-240134/2-A | Lab Control Sample | Total/NA | Water | 8270D | 240134 |
| LCSD 310-240134/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D | 240134 |

## GC VOA

### Analysis Batch: 240561

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8015B | |
| MB 310-240561/6 | Method Blank | Total/NA | Water | 8015B | |
| LCS 310-240561/7 | Lab Control Sample | Total/NA | Water | 8015B | |

## GC Semi VOA

### Prep Batch: 239737

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 3510C | |
| MB 310-239737/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 310-239737/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 310-239737/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 240015

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8081B | 239737 |
| MB 310-239737/1-A | Method Blank | Total/NA | Water | 8081B | 239737 |
| LCS 310-239737/2-A | Lab Control Sample | Total/NA | Water | 8081B | 239737 |
| LCSD 310-239737/3-A | Lab Control Sample Dup | Total/NA | Water | 8081B | 239737 |

### Prep Batch: 240265

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 3510C | |
| MB 310-240265/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 310-240265/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 310-240265/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

## GC Semi VOA

### Analysis Batch: 240407

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8082A | 240265 |
| MB 310-240265/1-A | Method Blank | Total/NA | Water | 8082A | 240265 |
| LCS 310-240265/2-A | Lab Control Sample | Total/NA | Water | 8082A | 240265 |
| LCSD 310-240265/3-A | Lab Control Sample Dup | Total/NA | Water | 8082A | 240265 |

### Prep Batch: 596828

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8151A | |
| MB 490-596828/1-A | Method Blank | Total/NA | Water | 8151A | |
| LCS 490-596828/2-A | Lab Control Sample | Total/NA | Water | 8151A | |
| LCSD 490-596828/3-A | Lab Control Sample Dup | Total/NA | Water | 8151A | |

### Analysis Batch: 597119

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 8151A | 596828 |
| MB 490-596828/1-A | Method Blank | Total/NA | Water | 8151A | 596828 |
| LCS 490-596828/2-A | Lab Control Sample | Total/NA | Water | 8151A | 596828 |
| LCSD 490-596828/3-A | Lab Control Sample Dup | Total/NA | Water | 8151A | 596828 |

## HPLC/IC

### Analysis Batch: 240361

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 9056A | |
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 9056A | |
| MB 310-240361/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-240361/39 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 240251

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 3010A | |
| MB 310-240251/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-240251/2-A | Lab Control Sample | Total/NA | Water | 3010A | |

### Analysis Batch: 240459

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 6010C | 240251 |
| MB 310-240251/1-A | Method Blank | Total/NA | Water | 6010C | 240251 |
| LCS 310-240251/2-A | Lab Control Sample | Total/NA | Water | 6010C | 240251 |

### Analysis Batch: 241316

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Dissolved | Ground Water | 6010C | |
| MB 310-241316/39 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-241316/40 | Lab Control Sample | Total/NA | Water | 6010C | |

### Analysis Batch: 241415

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 6010C | 240251 |

## General Chemistry

### Analysis Batch: 239744

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | SM 5210B | |
| USB 310-239744/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-239744/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Prep Batch: 239794

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 9012B | |
| MB 310-239794/1-A | Method Blank | Total/NA | Water | 9012B | |
| LCS 310-239794/2-A | Lab Control Sample | Total/NA | Water | 9012B | |

### Analysis Batch: 239903

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 9012B | 239794 |
| MB 310-239794/1-A | Method Blank | Total/NA | Water | 9012B | 239794 |
| LCS 310-239794/2-A | Lab Control Sample | Total/NA | Water | 9012B | 239794 |

### Analysis Batch: 239906

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 350.1 | |
| MB 310-239906/195 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-239906/196 | Lab Control Sample | Total/NA | Water | 350.1 | |

### Analysis Batch: 240097

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 5220D LL | |
| MB 310-240097/32 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-240097/33 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Prep Batch: 240267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |

### Analysis Batch: 240273

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | SM 4500 S2 F | 240267 |
| MB 310-240267/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 240267 |
| LCS 310-240267/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 240267 |

### Analysis Batch: 240678

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | 353.2 | |
| MB 310-240678/107 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-240678/108 ^10 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 240933

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | SM 2320B | |
| MB 310-240933/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-240933/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## General Chemistry

### Analysis Batch: 597910

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-155767-1 | MW-13R | Total/NA | Ground Water | SM 5310C | |
| MB 490-597910/1 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 490-597910/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Client Sample ID: MW-13R

**Date Collected: 05/15/19 10:41**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155767-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240435 | 05/22/19 17:19 | TRZ | TAL CF |
| Total/NA | Prep | 3510C | | | 240134 | 05/20/19 15:56 | ACJ | TAL CF |
| Total/NA | Analysis | 8270D | | 1 | 240245 | 05/21/19 12:55 | DMD | TAL CF |
| Total/NA | Analysis | 8015B | | 1 | 240561 | 05/23/19 10:52 | JCM | TAL CF |
| Total/NA | Prep | 3510C | | | 239737 | 05/16/19 15:40 | ACJ | TAL CF |
| Total/NA | Analysis | 8081B | | 1 | 240015 | 05/20/19 11:08 | BBW | TAL CF |
| Total/NA | Prep | 3510C | | | 240265 | 05/21/19 09:51 | ACJ | TAL CF |
| Total/NA | Analysis | 8082A | | 1 | 240407 | 05/22/19 13:33 | BBW | TAL CF |
| Total/NA | Prep | 8151A | | | 596828 | 05/22/19 11:28 | MCO | TAL NSH |
| Total/NA | Analysis | 8151A | | 1 | 597119 | 05/23/19 12:05 | JML | TAL NSH |
| Total/NA | Analysis | 9056A | | 5 | 240361 | 05/20/19 13:30 | MLU | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 240361 | 05/20/19 13:45 | MLU | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 241316 | 05/30/19 14:41 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 240459 | 05/21/19 21:02 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 240251 | 05/21/19 09:05 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 241415 | 05/30/19 14:53 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 239906 | 05/17/19 23:07 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 240678 | 05/23/19 19:19 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 240097 | 05/20/19 11:55 | LBB | TAL CF |
| Total/NA | Prep | 9012B | | | 239794 | 05/17/19 08:21 | BER | TAL CF |
| Total/NA | Analysis | 9012B | | 1 | 239903 | 05/17/19 20:23 | JMH | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 240933 | 05/28/19 09:53 | WJF | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 240267 | 05/21/19 10:01 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 240273 | 05/21/19 10:14 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 239744 | 05/16/19 18:10 | LMB | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 597910 | 05/23/19 13:00 | MPH | TAL NSH |

## Client Sample ID: Trip Blank

**Date Collected: 05/15/19 00:00**
**Date Received: 05/16/19 09:35**

## Lab Sample ID: 310-155767-2

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 240435 | 05/22/19 12:40 | TRZ | TAL CF |

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

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

## Laboratory: Eurofins TestAmerica, Nashville

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-19 |
| Alaska (UST) | State Program | 10 | UST-087 | 06-30-19 |
| Arizona | State Program | 9 | AZ0473 | 05-05-20 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-20 |
| California | State Program | 9 | 2938 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0220 | 12-31-19 |
| Florida | NELAP | 4 | E87358 | 06-30-19 |
| Georgia | State Program | 4 | NA: NELAP & A2LA | 12-31-19 |
| Illinois | NELAP | 5 | 200010 | 12-09-19 |
| Iowa | State Program | 7 | 131 | 04-01-20 |
| Kansas | NELAP | 7 | E-10229 | 10-31-19 |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-19 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-19 |
| Louisiana | NELAP | 6 | 30613 | 06-30-19 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-20 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-19 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-19 |
| Mississippi | State Program | 4 | N/A | 06-30-19 |
| Nevada | State Program | 9 | TN00032 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-19 |
| New Jersey | NELAP | 2 | TN965 | 06-30-19 |
| New York | NELAP | 2 | 11342 | 03-31-20 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-19 |
| North Dakota | State Program | 8 | R-146 | 06-30-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-19 |
| Oregon | NELAP | 10 | TN200001 | 04-26-19 * |
| Pennsylvania | NELAP | 3 | 68-00585 | 07-31-19 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-19 |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-19 * |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-19 |
| USDA | Federal | | P330-13-00306 | 04-10-20 |
| Utah | NELAP | 8 | TN00032 | 07-31-19 |
| Virginia | NELAP | 3 | 460152 | 06-14-19 |

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

# Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-155767-1
Project/Site: Sioux Falls LF Appendix II Wells
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Nashville (Continued)

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Washington | State Program | 10 | C789 | 07-19-19 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-20 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-19 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF Appendix II Wells

Job ID: 310-155767-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 8270D | Semivolatile Organic Compounds (GC/MS) | SW846 | TAL CF |
| 8015B | Nonhalogenated Organic Compounds - Direct Injection (GC) | SW846 | TAL CF |
| 8081B | Organochlorine Pesticides (GC) | SW846 | TAL CF |
| 8082A | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | SW846 | TAL CF |
| 8151A | Herbicides (GC) | SW846 | TAL NSH |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| 9012B | Cyanide, Total andor Amenable | SW846 | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL NSH |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 3510C | Liquid-Liquid Extraction (Separatory Funnel) | SW846 | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| 8151A | Extraction (Herbicides) | SW846 | TAL NSH |
| 9012B | Cyanide, Total and/or Amenable, Distillation | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

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

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

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

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

310-155767 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux Falls

**Receipt Information**

Date/Time Received: DATE 051619 TIME 0935 Received By: AB

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☑ Yes | ☐ No | *If yes:* Cooler ID: |
| Multiple Coolers? | ☐ Yes | ☒ No | *If yes:* Cooler # ____ of ____ |
| Cooler Custody Seals Present? | ☒ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☒ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.3 | Corrected Temp (°C): 0.3

• **Sample Container Temperature**

| | CONTAINER 1 | | CONTAINER 2 | |
|---|---|---|---|---|
| Container type(s) used: | | | | |
| | TEMP 1 | TEMP 2 | TEMP 1 | TEMP 2 |
| Uncorrected Temp (°C): | | | Corrected Temp (°C): | |

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica Omaha SC
268

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Ross Tonsager
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF Appendix II Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify Stormwater | Analyze For: Appendix II Volatiles | Isobutanol and Acetonitrile | Appendix II SVOC | 8081 Pesticides | 8082 PCB | 8151 Herbicides | Cyanide | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-13R 5/15/19/10:41 | → | → | 19 | x | | | X | X | X | X | X | | X | | x | | | | | | x | x | x | x | x | x | x | x | x | x | x | x | | x | x | | x |
| Trip Blank | — | - | 3 | x | | | X | | X | | | | | | x | | | | | | x | | | | | | | | | | | | | | x | x | | x |

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
*NOTICE:* **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 5.15.19 | 17:00 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 05/16/19 | 0935 | | | | | | |

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-13R | 310-155767-A-1 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-13R | 310-155767-B-1 | Plastic 250ml - with Sulfuric Acid - | <2 | _____ | _____ |
| MW-13R | 310-155767-C-1 | Plastic 250ml - with Sodium Hydro› | >12 | _____ | _____ |
| MW-13R | 310-155767-D-1 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-13R | 310-155767-E-1 | Plastic 500ml - with Sulfuric Acid | >2 | _____ | _____ |
| MW-13R | 310-155767-F-1 | Amber Glass 250ml - Sulfuric Acid | _____ | _____ | _____ |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

310-155767 Chain of Custody

Cooler Received/Opened On 05-17-2019 @ 09:50

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 8054 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 14740456 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 3.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES NO NA

If yes, how many and where: _____

5. Were the seals intact, signed, and dated correctly? YES NO NA

6. Were custody papers inside cooler? YES NO NA

I certify that I opened the cooler and answered questions 1-6 (intial) KD

7. Were custody seals on containers: YES NO and Intact YES NO NA

Were these signed and dated correctly? YES NO NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES NO NA

12. Did all container labels and tags agree with custody papers? YES NO NA

13a. Were VOA vials received? YES NO NA

b. Was there any observable headspace present in any VOA vial? YES NO NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES NO NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (intial) KD

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO NA

b. Did the bottle labels indicate that the correct preservatives were used YES NO NA

16. Was residual chlorine present? YES NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KD

17. Were custody papers properly filled out (ink, signed, etc)? YES NO NA

18. Did you sign the custody papers in the appropriate place? YES NO NA

19. Were correct containers used for the analysis requested? YES NO NA

20. Was sufficient amount of sample sent in each container? YES NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KD

I certify that I attached a label with the unique LIMS number to each container (intial) KD

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO #_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

Eurofins TestAmerica, Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

# Chain of Custody Record

Loc: 310
155767

eurofins

| Client Information (Sub Contract Lab) | Sampler | Lab PM: Hayes, Shawn M | COC No.: 310-16504.1 |
|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | State of Origin: South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc | | Accreditations Required (See note): | Job #: 310-155767-1 |
| Address: 2960 Foster Creighton Drive, | Due Date Requested: 5/29/2019 | | |
| City: Nashville | TAT Requested (days): | | |
| State, Zip: TN, 37204 | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | |
| Email: | WO #: | | |
| Project Name: Sioux Falls LF Appendix II Wells | Project #: 31001962 | | |
| Site: | SSOW#: | | |

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 8151A/8151A_AP Appendix II Herbicides | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| MW-13R (310-155767-1) | 5/15/19 | 10:41 Central | | Water | | | X | X | 3 | |

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

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

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

| | Relinquished by | Date/Time: | Company | Received by | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | | 5/16/19 1935 | | | 05-17-2019 09:50 | TAN |
| 2 | Relinquished by | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.5 |
|---|---|---|

Ver: 01/16/2019



5/31/2019

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-155767-1
SDG Number: 27218345.00

**Login Number: 155767**
**List Number: 1**
**Creator: Spoerre, Autumn R**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-170363-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*12/5/2019 3:54:34 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Job ID: 310-170363-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-170363-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 11/20/2019 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 0.4º C, 0.5º C, 0.6º C and 0.7º C.

**GC/MS VOA**
Method 8260C: The continuing calibration verification (CCV) associated with batch 310-262142 recovered above the upper control limit for 1,1-Dichloroethane (-27.2 %D), cis-1,2-Dichloroethene (-21.3 %D), . The following sample is impacted: (CCV 310-262142/3).

Method 8260C: The continuing calibration verification (CCV) associated with batch 310-262142 recovered above the upper control limit for Chloroethane (24.5 %D). The following sample is impacted: (CCV 310-262142/4).

Method 8260C: The laboratory control sample (LCS) analytical batch 310-262142 recovered outside control limits for the following analytes: 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 2-Butanone (MEK), 2-Chlorotoluene, 4-Chlorotoluene, Benzene, Bromobenzene, Bromoform, Carbon Tetrachloride, Chlorobenzene, Chlorodibromomethane, Chloroform, Dibromomethane, Dichlorobromomethane, Ethylbenzene, Ethylene Dibromide, Isopropylbenzene, m&p-Xylene, n-Propylbenzene, o-Xylene, Styrene, Toluene, Trichloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260C: The laboratory control sample (LCS) analytical batch 310-262142 recovered outside control limits for the following analytes: Bromomethane and Chloromethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

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

**HPLC/IC**
No analytical or quality issues were noted, other than those described 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 5210B: Due to a delay in delivery the following samples were received with less than than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-21ox (310-170363-2) and MW-23ox (310-170363-3).

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

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Ground Water | 11/18/19 13:51 | 11/20/19 10:50 | |
| 310-170363-2 | MW-21ox | Ground Water | 11/18/19 12:11 | 11/20/19 10:50 | |
| 310-170363-3 | MW-23ox | Ground Water | 11/18/19 11:05 | 11/20/19 10:50 | |
| 310-170363-4 | MW-25ox | Ground Water | 11/18/19 13:05 | 11/20/19 10:50 | |
| 310-170363-5 | MW-48ox | Ground Water | 11/18/19 15:30 | 11/20/19 10:50 | |
| 310-170363-6 | MW-61ox | Ground Water | 11/18/19 14:48 | 11/20/19 10:50 | |
| 310-170363-7 | Trip Blank-1 | Water | 11/18/19 00:00 | 11/20/19 10:50 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Client Sample ID: MW-11 — Lab Sample ID: 310-170363-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 95.4 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2380 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 504 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0736 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 22.0 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 89.9 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0769 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 3.61 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 6.70 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 258 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.13 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-21ox — Lab Sample ID: 310-170363-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 714 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 400 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.165 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 8.87 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 29.6 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.110 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Alkalinity as CaCO3 to pH 4.5 | 438 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.63 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-23ox — Lab Sample ID: 310-170363-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 8.67 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1880 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 363 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 11.6 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 73.0 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 14.2 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 350 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.19 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-25ox — Lab Sample ID: 310-170363-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1140 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 284 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 5.48 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 53.2 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 324 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.84 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-48ox — Lab Sample ID: 310-170363-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1860 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 426 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 11.4 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 70.2 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: MW-48ox (Continued) — Lab Sample ID: 310-170363-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 6.04 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 242 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.09 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-61ox — Lab Sample ID: 310-170363-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29.3 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1490 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 348 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0464 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 4.73 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 69.2 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Chemical Oxygen Demand | 6.93 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 299 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.69 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank-1 — Lab Sample ID: 310-170363-7

No Detections.

This Detection Summary does not include radiochemical test results.

## Client Sample ID: MW-11

**Date Collected: 11/18/19 13:51**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-1

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Benzene | <0.500 | * | 0.500 | | ug/L | | | 11/24/19 01:31 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Bromodichloromethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Bromoform | <5.00 | * | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Bromomethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 2-Butanone (MEK) | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Carbon tetrachloride | <2.00 | * | 2.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Chlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Chlorodibromomethane | <5.00 | * | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Chloroform | <3.00 | * | 3.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Dibromomethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2-Dichlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,4-Dichlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2-Dichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Ethylbenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| m,p-Xylene | <2.00 | * | 2.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| o-Xylene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Styrene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Toluene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1,1-Trichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,1,2-Trichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Trichloroethene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:31 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:31 | 1 |

# Client Sample Results

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Client Sample ID: MW-11

**Date Collected: 11/18/19 13:51**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *89* | | *80 - 120* | | *11/24/19 01:31* | *1* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* | | *11/24/19 01:31* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *11/24/19 01:31* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **95.4** | | 5.00 | | mg/L | | | 11/25/19 08:30 | 5 |
| **Sulfate** | **2380** | | 100 | | mg/L | | | 11/25/19 08:46 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **504** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:23 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:23 | 1 |
| **Manganese** | **0.0736** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:23 | 1 |
| **Potassium** | **22.0** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:23 | 1 |
| **Sodium** | **89.9** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:23 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:11 | 1 |
| **Manganese** | **0.0769** | | 0.0100 | | mg/L | | | 12/02/19 14:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:26 | 1 |
| **Nitrate Nitrite as N** | **3.61** | | 1.00 | | mg/L | | | 12/03/19 17:09 | 10 |
| **Chemical Oxygen Demand** | **6.70** | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **258** | | 5.00 | | mg/L | | | 11/29/19 08:51 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 13:08 | 1 |
| **Total Organic Carbon - Duplicates** | **2.13** | | 1.00 | | mg/L | | | 11/27/19 10:18 | 1 |

## Client Sample ID: MW-21ox

**Date Collected: 11/18/19 12:11**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-2

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Benzene | <0.500 | * | 0.500 | | ug/L | | | 11/24/19 01:56 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Bromodichloromethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Bromoform | <5.00 | * | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Bromomethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 2-Butanone (MEK) | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Carbon tetrachloride | <2.00 | * | 2.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Chlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Chlorodibromomethane | <5.00 | * | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Chloroform | <3.00 | * | 3.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Dibromomethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2-Dichlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,4-Dichlorobenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2-Dichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Ethylbenzene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| m,p-Xylene | <2.00 | * | 2.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| o-Xylene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Styrene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Toluene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1,1-Trichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,1,2-Trichloroethane | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Trichloroethene | <1.00 | * | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 01:56 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 11/24/19 01:56 | 1 |

## Client Sample ID: MW-21ox

**Date Collected: 11/18/19 12:11**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-2

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *89* | | *80 - 120* | | *11/24/19 01:56* | *1* |
| *Dibromofluoromethane (Surr)* | *112* | | *80 - 120* | | *11/24/19 01:56* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *11/24/19 01:56* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 11/25/19 09:02 | 5 |
| **Sulfate** | **714** | | 100 | | mg/L | | | 11/25/19 09:18 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **400** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:32 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:32 | 1 |
| **Manganese** | **0.165** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:32 | 1 |
| **Potassium** | **8.87** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:32 | 1 |
| **Sodium** | **29.6** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:21 | 1 |
| **Manganese** | **0.110** | | 0.0100 | | mg/L | | | 12/02/19 14:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:40 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:10 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **438** | | 5.00 | | mg/L | | | 11/29/19 08:51 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | H | 3.00 | | mg/L | | | 11/20/19 12:12 | 1 |
| **Total Organic Carbon - Duplicates** | **1.63** | | 1.00 | | mg/L | | | 11/27/19 10:54 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: MW-23ox**
**Date Collected: 11/18/19 11:05**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-3**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/01/19 00:31 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 12:37 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:37 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:37 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:37 | 1 |

## Client Sample ID: MW-23ox

**Date Collected: 11/18/19 11:05**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* | | *11/30/19 12:37* | *1* |
| *4-Bromofluorobenzene (Surr)* | *96* | | *80 - 120* | | *12/01/19 00:31* | *1* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* | | *11/30/19 12:37* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* | | *12/01/19 00:31* | *1* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* | | *11/30/19 12:37* | *1* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* | | *12/01/19 00:31* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **8.67** | | 5.00 | | mg/L | | | 11/25/19 09:34 | 5 |
| **Sulfate** | **1880** | | 100 | | mg/L | | | 11/25/19 09:51 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **363** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:33 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:33 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:33 | 1 |
| **Potassium** | **11.6** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:33 | 1 |
| **Sodium** | **73.0** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:24 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:24 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:41 | 1 |
| **Nitrate Nitrite as N** | **14.2** | | 1.00 | | mg/L | | | 12/03/19 17:12 | 10 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **350** | | 5.00 | | mg/L | | | 11/29/19 08:51 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | H | 3.00 | | mg/L | | | 11/20/19 16:13 | 1 |
| **Total Organic Carbon - Duplicates** | **2.19** | | 1.00 | | mg/L | | | 11/27/19 11:10 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: MW-25ox**
**Date Collected: 11/18/19 13:05**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-4**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/01/19 00:53 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 12:14 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 12:14 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 12:14 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 12:14 | 1 |

## Client Sample ID: MW-25ox

**Date Collected: 11/18/19 13:05**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-4

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *11/30/19 12:14* | *1* |
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *12/01/19 00:53* | *1* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* | | *11/30/19 12:14* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* | | *12/01/19 00:53* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *11/30/19 12:14* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *12/01/19 00:53* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 11/25/19 10:07 | 5 |
| **Sulfate** | **1140** | | 100 | | mg/L | | | 11/25/19 10:23 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **284** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:35 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:35 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:35 | 1 |
| **Potassium** | **5.48** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:35 | 1 |
| **Sodium** | **53.2** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:35 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:26 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:26 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:43 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:21 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **324** | | 5.00 | | mg/L | | | 11/29/19 11:44 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 12:16 | 1 |
| **Total Organic Carbon - Duplicates** | **1.84** | | 1.00 | | mg/L | | | 11/27/19 11:27 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: MW-48ox**
**Date Collected: 11/18/19 15:30**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-5**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/01/19 01:16 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 11:51 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:51 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:51 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:51 | 1 |

## Client Sample ID: MW-48ox

**Date Collected: 11/18/19 15:30**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-5

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *11/30/19 11:51* | *1* |
| *4-Bromofluorobenzene (Surr)* | *95* | | *80 - 120* | | *12/01/19 01:16* | *1* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* | | *11/30/19 11:51* | *1* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* | | *12/01/19 01:16* | *1* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* | | *11/30/19 11:51* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *12/01/19 01:16* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | | 5.00 | | mg/L | | | 11/25/19 11:28 | 5 |
| **Sulfate** | **1860** | | 100 | | mg/L | | | 11/25/19 11:44 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **426** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:40 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:40 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:40 | 1 |
| **Potassium** | **11.4** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:40 | 1 |
| **Sodium** | **70.2** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:40 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:28 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:44 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:22 | 1 |
| **Chemical Oxygen Demand** | **6.04** | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **242** | | 5.00 | | mg/L | | | 11/29/19 11:44 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 13:15 | 1 |
| **Total Organic Carbon - Duplicates** | **2.09** | | 1.00 | | mg/L | | | 11/27/19 11:43 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: MW-61ox**
**Date Collected: 11/18/19 14:48**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-6**
**Matrix: Ground Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/01/19 01:38 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 11:29 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:29 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:29 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:29 | 1 |

## Client Sample ID: MW-61ox

**Date Collected: 11/18/19 14:48**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-6

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *98* | | *80 - 120* | | *11/30/19 11:29* | *1* |
| *4-Bromofluorobenzene (Surr)* | *96* | | *80 - 120* | | *12/01/19 01:38* | *1* |
| *Dibromofluoromethane (Surr)* | *99* | | *80 - 120* | | *11/30/19 11:29* | *1* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* | | *12/01/19 01:38* | *1* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* | | *11/30/19 11:29* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *12/01/19 01:38* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **29.3** | | 5.00 | | mg/L | | | 11/25/19 12:00 | 5 |
| **Sulfate** | **1490** | | 100 | | mg/L | | | 11/25/19 12:16 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **348** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:42 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:42 | 1 |
| **Manganese** | **0.0464** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:42 | 1 |
| **Potassium** | **4.73** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:42 | 1 |
| **Sodium** | **69.2** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:42 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:30 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:45 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 19:17 | 1 |
| **Chemical Oxygen Demand** | **6.93** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **299** | | 5.00 | | mg/L | | | 11/29/19 11:44 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 13:11 | 1 |
| **Total Organic Carbon - Duplicates** | **1.69** | | 1.00 | | mg/L | | | 11/27/19 12:20 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-1**
**Date Collected: 11/18/19 00:00**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-7**
**Matrix: Water**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/01/19 02:01 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 11:06 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 11:06 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 11:06 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 11:06 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-1**
**Date Collected: 11/18/19 00:00**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170363-7**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 98 | | 80 - 120 | | 11/30/19 11:06 | 1 |
| 4-Bromofluorobenzene (Surr) | 99 | | 80 - 120 | | 12/01/19 02:01 | 1 |
| Dibromofluoromethane (Surr) | 94 | | 80 - 120 | | 11/30/19 11:06 | 1 |
| Dibromofluoromethane (Surr) | 102 | | 80 - 120 | | 12/01/19 02:01 | 1 |
| Toluene-d8 (Surr) | 98 | | 80 - 120 | | 11/30/19 11:06 | 1 |
| Toluene-d8 (Surr) | 97 | | 80 - 120 | | 12/01/19 02:01 | 1 |

# Definitions/Glossary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| * | LCS or LCSD is outside acceptance limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### 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 |
|---|---|
| H | Sample was prepped or analyzed beyond the specified holding time |

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-170363-1 | MW-11 | 89 | 102 | 97 |
| 310-170363-2 | MW-21ox | 89 | 112 | 97 |
| 310-170363-3 | MW-23ox | 100 | 97 | 96 |
| 310-170363-3 | MW-23ox | 96 | 100 | 96 |
| 310-170363-4 | MW-25ox | 101 | 102 | 98 |
| 310-170363-4 | MW-25ox | 99 | 100 | 98 |
| 310-170363-5 | MW-48ox | 99 | 97 | 96 |
| 310-170363-5 | MW-48ox | 95 | 97 | 98 |
| 310-170363-6 | MW-61ox | 98 | 99 | 99 |
| 310-170363-6 | MW-61ox | 96 | 101 | 98 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-170363-7 | Trip Blank-1 | 98 | 94 | 98 |
| 310-170363-7 | Trip Blank-1 | 99 | 102 | 97 |
| LCS 310-262142/6 | Lab Control Sample | 104 | 97 | 99 |
| LCS 310-262142/7 | Lab Control Sample | 93 | 105 | 100 |
| LCS 310-262829/5 | Lab Control Sample | 92 | 100 | 99 |
| LCS 310-262829/6 | Lab Control Sample | 100 | 100 | 99 |
| LCS 310-262833/7 | Lab Control Sample | 99 | 101 | 100 |
| MB 310-262142/5 | Method Blank | 92 | 101 | 98 |
| MB 310-262829/7 | Method Blank | 101 | 96 | 100 |
| MB 310-262833/8 | Method Blank | 97 | 101 | 99 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-262142/5**
**Matrix: Water**
**Analysis Batch: 262142**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/23/19 18:39 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/23/19 18:39 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/23/19 18:39 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/23/19 18:39 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-262142/5**
**Matrix: Water**
**Analysis Batch: 262142**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 92 | | 80 - 120 | | 11/23/19 18:39 | 1 |
| Dibromofluoromethane (Surr) | 101 | | 80 - 120 | | 11/23/19 18:39 | 1 |
| Toluene-d8 (Surr) | 98 | | 80 - 120 | | 11/23/19 18:39 | 1 |

**Lab Sample ID: LCS 310-262142/6**
**Matrix: Water**
**Analysis Batch: 262142**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 46.52 | | ug/L | | 116 | 50 - 150 |
| Acrylonitrile | 200 | 212.9 | | ug/L | | 106 | 50 - 150 |
| Benzene | 20.0 | 24.14 | * | ug/L | | 121 | 77 - 120 |
| Bromochloromethane | 20.0 | 26.43 | | ug/L | | 132 | 73 - 132 |
| Bromodichloromethane | 20.0 | 26.30 | * | ug/L | | 132 | 73 - 120 |
| Bromoform | 20.0 | 25.64 | * | ug/L | | 128 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 66.62 | * | ug/L | | 167 | 50 - 150 |
| Carbon disulfide | 20.0 | 14.40 | | ug/L | | 72 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 25.37 | * | ug/L | | 127 | 72 - 126 |
| Chlorobenzene | 20.0 | 25.94 | * | ug/L | | 130 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 26.01 | * | ug/L | | 130 | 66 - 120 |
| Chloroform | 20.0 | 25.39 | * | ug/L | | 127 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 20.03 | | ug/L | | 100 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 23.55 | | ug/L | | 118 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 23.67 | | ug/L | | 118 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 26.40 | * | ug/L | | 132 | 71 - 125 |
| Dibromomethane | 20.0 | 26.15 | * | ug/L | | 131 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 24.72 | * | ug/L | | 124 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 25.42 | * | ug/L | | 127 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 17.39 | | ug/L | | 87 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 27.14 | * | ug/L | | 136 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 15.32 | | ug/L | | 77 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 25.14 | * | ug/L | | 126 | 75 - 123 |
| Ethylbenzene | 20.0 | 24.35 | * | ug/L | | 122 | 73 - 120 |
| 2-Hexanone | 40.0 | 62.52 | * | ug/L | | 156 | 57 - 128 |
| Iodomethane | 20.0 | 13.25 | J | ug/L | | 66 | 20 - 150 |
| Methylene Chloride | 20.0 | 13.39 | | ug/L | | 67 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 59.90 | * | ug/L | | 150 | 59 - 126 |
| m,p-Xylene | 20.0 | 24.86 | * | ug/L | | 124 | 70 - 120 |
| o-Xylene | 20.0 | 24.14 | * | ug/L | | 121 | 67 - 120 |
| Styrene | 20.0 | 24.95 | * | ug/L | | 125 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 26.93 | * | ug/L | | 135 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 26.35 | * | ug/L | | 132 | 63 - 122 |
| Tetrachloroethene | 20.0 | 25.36 | | ug/L | | 127 | 72 - 129 |
| Toluene | 20.0 | 24.73 | * | ug/L | | 124 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 28.32 | | ug/L | | 142 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 15.29 | | ug/L | | 76 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 23.13 | | ug/L | | 116 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 25.69 | * | ug/L | | 128 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262142/6**
**Matrix: Water**
**Analysis Batch: 262142**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 27.68 | * | ug/L | | 138 | 69 - 127 |
| Trichloroethene | 20.0 | 25.66 | * | ug/L | | 128 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 20.91 | | ug/L | | 105 | 66 - 120 |
| Vinyl acetate | 40.0 | 32.43 | | ug/L | | 81 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *104* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* |

**Lab Sample ID: LCS 310-262142/7**
**Matrix: Water**
**Analysis Batch: 262142**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 35.68 | * | ug/L | | 178 | 38 - 150 |
| Chloroethane | 20.0 | 29.28 | * | ug/L | | 146 | 69 - 129 |
| Chloromethane | 20.0 | 23.90 | | ug/L | | 120 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 21.60 | | ug/L | | 108 | 68 - 146 |
| Vinyl chloride | 20.0 | 24.82 | | ug/L | | 124 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *93* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

**Lab Sample ID: MB 310-262829/7**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-262829/7**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/30/19 06:58 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/30/19 06:58 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/30/19 06:58 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/30/19 06:58 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *11/30/19 06:58* | *1* |
| *Dibromofluoromethane (Surr)* | *96* | | *80 - 120* | | *11/30/19 06:58* | *1* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* | | *11/30/19 06:58* | *1* |

**Lab Sample ID: LCS 310-262829/5**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 46.03 | | ug/L | | 115 | 50 - 150 |
| Acrylonitrile | 200 | 227.3 | | ug/L | | 114 | 50 - 150 |
| Benzene | 20.0 | 21.11 | | ug/L | | 106 | 77 - 120 |
| Bromochloromethane | 20.0 | 22.35 | | ug/L | | 112 | 73 - 132 |
| Bromodichloromethane | 20.0 | 20.04 | | ug/L | | 100 | 73 - 120 |
| Bromoform | 20.0 | 20.18 | | ug/L | | 101 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 39.86 | | ug/L | | 100 | 50 - 150 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262829/5**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Carbon disulfide | 20.0 | 20.13 | | ug/L | | 101 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 20.34 | | ug/L | | 102 | 72 - 126 |
| Chlorobenzene | 20.0 | 22.15 | | ug/L | | 111 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 20.62 | | ug/L | | 103 | 66 - 120 |
| Chloroform | 20.0 | 19.98 | | ug/L | | 100 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 20.02 | | ug/L | | 100 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 22.45 | | ug/L | | 112 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 19.47 | | ug/L | | 97 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 21.67 | | ug/L | | 108 | 71 - 125 |
| Dibromomethane | 20.0 | 21.24 | | ug/L | | 106 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 21.87 | | ug/L | | 109 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 21.50 | | ug/L | | 108 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 21.01 | | ug/L | | 105 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 21.15 | | ug/L | | 106 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 20.29 | | ug/L | | 101 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 21.91 | | ug/L | | 110 | 75 - 123 |
| Ethylbenzene | 20.0 | 22.33 | | ug/L | | 112 | 73 - 120 |
| 2-Hexanone | 40.0 | 43.81 | | ug/L | | 110 | 57 - 128 |
| Iodomethane | 20.0 | 13.25 | J | ug/L | | 66 | 20 - 150 |
| Methylene Chloride | 20.0 | 20.31 | | ug/L | | 102 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 43.95 | | ug/L | | 110 | 59 - 126 |
| m,p-Xylene | 20.0 | 22.08 | | ug/L | | 110 | 70 - 120 |
| o-Xylene | 20.0 | 22.60 | | ug/L | | 113 | 67 - 120 |
| Styrene | 20.0 | 23.43 | | ug/L | | 117 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 21.95 | | ug/L | | 110 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 22.99 | | ug/L | | 115 | 63 - 122 |
| Tetrachloroethene | 20.0 | 21.67 | | ug/L | | 108 | 72 - 129 |
| Toluene | 20.0 | 22.24 | | ug/L | | 111 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 17.24 | | ug/L | | 86 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 20.29 | | ug/L | | 101 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 17.35 | | ug/L | | 87 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 20.43 | | ug/L | | 102 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 22.05 | | ug/L | | 110 | 69 - 127 |
| Trichloroethene | 20.0 | 21.05 | | ug/L | | 105 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 22.88 | | ug/L | | 114 | 66 - 120 |
| Vinyl acetate | 40.0 | 35.94 | | ug/L | | 90 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *92* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* |

**Lab Sample ID: LCS 310-262829/6**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloroethane | 20.0 | 19.41 | | ug/L | | 97 | 69 - 129 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262829/6**
**Matrix: Water**
**Analysis Batch: 262829**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloromethane | 20.0 | 20.90 | | ug/L | | 105 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 20.90 | | ug/L | | 105 | 68 - 146 |
| Vinyl chloride | 20.0 | 21.41 | | ug/L | | 107 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* |

**Lab Sample ID: MB 310-262833/8**
**Matrix: Water**
**Analysis Batch: 262833**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/30/19 18:31 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *97* | | *80 - 120* | | *11/30/19 18:31* | *1* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* | | *11/30/19 18:31* | *1* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* | | *11/30/19 18:31* | *1* |

**Lab Sample ID: LCS 310-262833/7**
**Matrix: Water**
**Analysis Batch: 262833**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 11.00 | | ug/L | | 55 | 38 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *100* | | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-262410/3**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 310-262410/4**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.988 | | mg/L | | 100 | 90 - 110 |
| Sulfate | 10.0 | 10.31 | | mg/L | | 103 | 90 - 110 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-261734/1-A**
**Matrix: Water**
**Analysis Batch: 262151**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Sodium | <2.00 | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |

**Lab Sample ID: LCS 310-261734/2-A**
**Matrix: Water**
**Analysis Batch: 262151**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 20.62 | | mg/L | | 103 | 80 - 120 |
| Iron | 2.00 | 2.099 | | mg/L | | 105 | 80 - 120 |
| Manganese | 1.00 | 0.9798 | | mg/L | | 98 | 80 - 120 |
| Potassium | 20.0 | 19.73 | | mg/L | | 99 | 80 - 120 |
| Sodium | 20.0 | 19.93 | | mg/L | | 100 | 80 - 120 |

**Lab Sample ID: 310-170363-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 262151**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 504 | | 20.0 | 514.8 | 4 | mg/L | | 55 | 75 - 125 |
| Iron | <0.500 | | 2.00 | 2.159 | | mg/L | | 108 | 75 - 125 |
| Manganese | 0.0736 | | 1.00 | 0.9887 | | mg/L | | 92 | 75 - 125 |
| Potassium | 22.0 | | 20.0 | 42.69 | | mg/L | | 104 | 75 - 125 |
| Sodium | 89.9 | | 20.0 | 110.2 | 4 | mg/L | | 101 | 75 - 125 |

**Lab Sample ID: 310-170363-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262151**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 504 | | 20.0 | 518.7 | 4 | mg/L | | 75 | 75 - 125 | 1 | 20 |
| Iron | <0.500 | | 2.00 | 2.080 | | mg/L | | 104 | 75 - 125 | 4 | 20 |
| Manganese | 0.0736 | | 1.00 | 1.002 | | mg/L | | 93 | 75 - 125 | 1 | 20 |
| Potassium | 22.0 | | 20.0 | 43.33 | | mg/L | | 107 | 75 - 125 | 1 | 20 |
| Sodium | 89.9 | | 20.0 | 111.9 | 4 | mg/L | | 110 | 75 - 125 | 2 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 310-263176/19**
**Matrix: Water**
**Analysis Batch: 263176**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:08 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:08 | 1 |

**Lab Sample ID: LCS 310-263176/20**
**Matrix: Water**
**Analysis Batch: 263176**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 2.00 | 2.066 | | mg/L | | 103 | 80 - 120 |
| Manganese | 2.00 | 2.023 | | mg/L | | 101 | 80 - 120 |

**Lab Sample ID: 310-170363-1 DU**
**Matrix: Ground Water**
**Analysis Batch: 263176**

**Client Sample ID: MW-11**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | 0.0769 | | 0.07610 | | mg/L | | 1 | 20 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-262369/148**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:24 | 1 |

**Lab Sample ID: LCS 310-262369/149**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 19.3 | 20.22 | | mg/L | | 105 | 90 - 110 |

**Lab Sample ID: 310-170363-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 262369**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 10.0 | 10.40 | | mg/L | | 104 | 90 - 110 |

**Lab Sample ID: 310-170363-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262369**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 10.0 | 10.38 | | mg/L | | 104 | 90 - 110 | 0 | 10 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-262750/106**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 18:54 | 1 |

**Lab Sample ID: MB 310-262750/76**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 18:10 | 1 |

**Lab Sample ID: LCS 310-262750/107**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.947 | | mg/L | | 106 | 90 - 110 |

**Lab Sample ID: LCS 310-262750/77**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.904 | | mg/L | | 105 | 90 - 110 |

**Lab Sample ID: MB 310-263267/136**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 19:48 | 1 |

**Lab Sample ID: MB 310-263267/14**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 16:45 | 1 |

**Lab Sample ID: LCS 310-263267/11**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.842 | | mg/L | | 104 | 90 - 110 |

**Lab Sample ID: LCS 310-263267/137**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 6.091 | | mg/L | | 108 | 90 - 110 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-261757/32**
**Matrix: Water**
**Analysis Batch: 261757**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |

**Lab Sample ID: LCS 310-261757/33**
**Matrix: Water**
**Analysis Batch: 261757**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 125.5 | | mg/L | | 100 | 85 - 115 |

**Lab Sample ID: MB 310-262654/5**
**Matrix: Water**
**Analysis Batch: 262654**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |

**Lab Sample ID: LCS 310-262654/3**
**Matrix: Water**
**Analysis Batch: 262654**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 132.8 | | mg/L | | 106 | 85 - 115 |

**Lab Sample ID: 310-170363-6 MS**
**Matrix: Ground Water**
**Analysis Batch: 262654**

**Client Sample ID: MW-61ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 6.93 | | 50.0 | 67.21 | | mg/L | | 121 | 75 - 150 |

**Lab Sample ID: 310-170363-6 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262654**

**Client Sample ID: MW-61ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 6.93 | | 50.0 | 63.65 | | mg/L | | 113 | 75 - 150 | 5 | 26 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-262795/1**
**Matrix: Water**
**Analysis Batch: 262795**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 11/29/19 08:51 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCS 310-262795/2**
**Matrix: Water**
**Analysis Batch: 262795**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | | | 1060 | 1004 | | mg/L | | 95 | 90 - 110 | | |

**Lab Sample ID: MB 310-262860/1**
**Matrix: Water**
**Analysis Batch: 262860**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 11/29/19 11:44 | 1 |

**Lab Sample ID: LCS 310-262860/2**
**Matrix: Water**
**Analysis Batch: 262860**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | | | 1060 | 1030 | | mg/L | | 97 | 90 - 110 | | |

**Lab Sample ID: 310-170363-4 MS**
**Matrix: Ground Water**
**Analysis Batch: 262860**

**Client Sample ID: MW-25ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 324 | | 106 | 422.3 | | mg/L | | 92 | 66 - 124 | | |

**Lab Sample ID: 310-170363-4 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262860**

**Client Sample ID: MW-25ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 324 | | 106 | 427.5 | | mg/L | | 97 | 66 - 124 | 1 | 17 |

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-261807/1-A**
**Matrix: Water**
**Analysis Batch: 261857**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 261807**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |

**Lab Sample ID: LCS 310-261807/2-A**
**Matrix: Water**
**Analysis Batch: 261857**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 261807**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | | | 5.00 | 2.800 | | mg/L | | 56 | 33 - 117 | | |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-261650/3**
**Matrix: Water**
**Analysis Batch: 261650**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 12:19 | 1 |

**Lab Sample ID: LCS 310-261650/4**
**Matrix: Water**
**Analysis Batch: 261650**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 193.6 | | mg/L | | 98 | 85 - 115 |

**Lab Sample ID: USB 310-261709/1**
**Matrix: Water**
**Analysis Batch: 261709**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 15:57 | 1 |

**Lab Sample ID: LCS 310-261709/2**
**Matrix: Water**
**Analysis Batch: 261709**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 201.8 | | mg/L | | 102 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 500-518124/4**
**Matrix: Water**
**Analysis Batch: 518124**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | <1.00 | | 1.00 | | mg/L | | | 11/27/19 06:37 | 1 |

**Lab Sample ID: LCS 500-518124/5**
**Matrix: Water**
**Analysis Batch: 518124**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 10.0 | 9.500 | | mg/L | | 95 | 80 - 120 |

**Lab Sample ID: 310-170363-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 518124**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 2.13 | | 10.0 | 11.74 | | mg/L | | 96 | 75 - 125 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Method: SM 5310C - TOC (Continued)

**Lab Sample ID: 310-170363-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 518124**

**Client Sample ID: MW-11**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 2.13 | | 10.0 | 11.79 | | mg/L | | 97 | 75 - 125 | 0 | 20 |

## GC/MS VOA

### Analysis Batch: 262142

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 8260C | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 8260C | |
| MB 310-262142/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-262142/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-262142/7 | Lab Control Sample | Total/NA | Water | 8260C | |

### Analysis Batch: 262829

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 8260C | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 8260C | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 8260C | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 8260C | |
| 310-170363-7 | Trip Blank-1 | Total/NA | Water | 8260C | |
| MB 310-262829/7 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-262829/5 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-262829/6 | Lab Control Sample | Total/NA | Water | 8260C | |

### Analysis Batch: 262833

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 8260C | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 8260C | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 8260C | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 8260C | |
| 310-170363-7 | Trip Blank-1 | Total/NA | Water | 8260C | |
| MB 310-262833/8 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-262833/7 | Lab Control Sample | Total/NA | Water | 8260C | |

## HPLC/IC

### Analysis Batch: 262410

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 9056A | |
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 9056A | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 9056A | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 9056A | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 9056A | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 9056A | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 9056A | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 9056A | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 9056A | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 9056A | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 9056A | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 9056A | |
| MB 310-262410/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-262410/4 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 261734

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 3010A | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 3010A | |

## Metals (Continued)

### Prep Batch: 261734 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 3010A | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 3010A | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 3010A | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 3010A | |
| MB 310-261734/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-261734/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| 310-170363-1 MS | MW-11 | Total/NA | Ground Water | 3010A | |
| 310-170363-1 MSD | MW-11 | Total/NA | Ground Water | 3010A | |

### Analysis Batch: 262151

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 6010C | 261734 |
| MB 310-261734/1-A | Method Blank | Total/NA | Water | 6010C | 261734 |
| LCS 310-261734/2-A | Lab Control Sample | Total/NA | Water | 6010C | 261734 |
| 310-170363-1 MS | MW-11 | Total/NA | Ground Water | 6010C | 261734 |
| 310-170363-1 MSD | MW-11 | Total/NA | Ground Water | 6010C | 261734 |

### Analysis Batch: 263176

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Dissolved | Ground Water | 6010C | |
| 310-170363-2 | MW-21ox | Dissolved | Ground Water | 6010C | |
| 310-170363-3 | MW-23ox | Dissolved | Ground Water | 6010C | |
| 310-170363-4 | MW-25ox | Dissolved | Ground Water | 6010C | |
| 310-170363-5 | MW-48ox | Dissolved | Ground Water | 6010C | |
| 310-170363-6 | MW-61ox | Dissolved | Ground Water | 6010C | |
| MB 310-263176/19 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-263176/20 | Lab Control Sample | Total/NA | Water | 6010C | |
| 310-170363-1 DU | MW-11 | Dissolved | Ground Water | 6010C | |

## General Chemistry

### Analysis Batch: 261650

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | SM 5210B | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | SM 5210B | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | SM 5210B | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | SM 5210B | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-261650/3 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-261650/4 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 261709

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-261709/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-261709/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

## General Chemistry

### Analysis Batch: 261757

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 5220D LL | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 5220D LL | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 5220D LL | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 5220D LL | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-261757/32 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-261757/33 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Prep Batch: 261807

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-261807/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-261807/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |

### Analysis Batch: 261857

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| MB 310-261807/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 261807 |
| LCS 310-261807/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 261807 |

### Analysis Batch: 262369

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 350.1 | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 350.1 | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 350.1 | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 350.1 | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 350.1 | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 350.1 | |
| MB 310-262369/148 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-262369/149 | Lab Control Sample | Total/NA | Water | 350.1 | |
| 310-170363-1 MS | MW-11 | Total/NA | Ground Water | 350.1 | |
| 310-170363-1 MSD | MW-11 | Total/NA | Ground Water | 350.1 | |

### Analysis Batch: 262654

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-262654/5 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-262654/3 | Lab Control Sample | Total/NA | Water | 5220D LL | |
| 310-170363-6 MS | MW-61ox | Total/NA | Ground Water | 5220D LL | |
| 310-170363-6 MSD | MW-61ox | Total/NA | Ground Water | 5220D LL | |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## General Chemistry

### Analysis Batch: 262750

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | 353.2 | |
| MB 310-262750/106 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-262750/76 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-262750/107 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-262750/77 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 262795

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | SM 2320B | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | SM 2320B | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-262795/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-262795/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 262860

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | SM 2320B | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | SM 2320B | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-262860/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-262860/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 310-170363-4 MS | MW-25ox | Total/NA | Ground Water | SM 2320B | |
| 310-170363-4 MSD | MW-25ox | Total/NA | Ground Water | SM 2320B | |

### Analysis Batch: 263267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | 353.2 | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | 353.2 | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | 353.2 | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | 353.2 | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | 353.2 | |
| MB 310-263267/136 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-263267/14 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-263267/11 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-263267/137 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 518124

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170363-1 | MW-11 | Total/NA | Ground Water | SM 5310C | |
| 310-170363-2 | MW-21ox | Total/NA | Ground Water | SM 5310C | |
| 310-170363-3 | MW-23ox | Total/NA | Ground Water | SM 5310C | |
| 310-170363-4 | MW-25ox | Total/NA | Ground Water | SM 5310C | |
| 310-170363-5 | MW-48ox | Total/NA | Ground Water | SM 5310C | |
| 310-170363-6 | MW-61ox | Total/NA | Ground Water | SM 5310C | |
| MB 500-518124/4 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 500-518124/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |
| 310-170363-1 MS | MW-11 | Total/NA | Ground Water | SM 5310C | |
| 310-170363-1 MSD | MW-11 | Total/NA | Ground Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Client Sample ID: MW-11

**Date Collected: 11/18/19 13:51**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262142 | 11/24/19 01:31 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 08:30 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 08:46 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:11 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:23 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:26 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 263267 | 12/03/19 17:09 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262795 | 11/29/19 08:51 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261650 | 11/20/19 13:08 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 10:18 | MTB | TAL CHI |

## Client Sample ID: MW-21ox

**Date Collected: 11/18/19 12:11**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-2

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262142 | 11/24/19 01:56 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 09:02 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 09:18 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:21 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:32 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:40 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:10 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262795 | 11/29/19 08:51 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261650 | 11/20/19 12:12 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 10:54 | MTB | TAL CHI |

## Client Sample ID: MW-23ox

**Date Collected: 11/18/19 11:05**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-3

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262829 | 11/30/19 12:37 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 262833 | 12/01/19 00:31 | SJN | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Client Sample ID: MW-23ox
**Date Collected: 11/18/19 11:05**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-3
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 09:34 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 09:51 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:24 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:33 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:41 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 263267 | 12/03/19 17:12 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262795 | 11/29/19 08:51 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261709 | 11/20/19 16:13 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 11:10 | MTB | TAL CHI |

## Client Sample ID: MW-25ox
**Date Collected: 11/18/19 13:05**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-4
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262829 | 11/30/19 12:14 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 262833 | 12/01/19 00:53 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 10:07 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 10:23 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:26 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:35 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:43 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:21 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262860 | 11/29/19 11:44 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261650 | 11/20/19 12:16 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 11:27 | MTB | TAL CHI |

## Client Sample ID: MW-48ox
**Date Collected: 11/18/19 15:30**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-5
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262829 | 11/30/19 11:51 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 262833 | 12/01/19 01:16 | SJN | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Client Sample ID: MW-48ox
**Date Collected: 11/18/19 15:30**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-5
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 11:28 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 11:44 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:28 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:40 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:44 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:22 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262860 | 11/29/19 11:44 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261650 | 11/20/19 13:15 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 11:43 | MTB | TAL CHI |

## Client Sample ID: MW-61ox
**Date Collected: 11/18/19 14:48**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-6
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262829 | 11/30/19 11:29 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 262833 | 12/01/19 01:38 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 12:00 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 12:16 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:30 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:42 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:45 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 262750 | 11/27/19 19:17 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262860 | 11/29/19 11:44 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261650 | 11/20/19 13:11 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 12:20 | MTB | TAL CHI |

## Client Sample ID: Trip Blank-1
**Date Collected: 11/18/19 00:00**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170363-7
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262829 | 11/30/19 11:06 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 262833 | 12/01/19 02:01 | SJN | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

**Laboratory References:**

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

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| AIHA-LAP, LLC | Industrial Hygiene Laboratory Accreditation Program (IHLAP) | 101044 | 11-01-20 |
| Colorado | Petroleum Storage Tank Program | IA100001 (OR) | 09-29-20 |
| Georgia | State | IA100001 (OR) | 09-29-20 |
| Kansas | NELAP | E-10341 | 01-31-20 |
| Minnesota | NELAP | 019-999-319 | 12-31-19 |
| Minnesota (Petrofund) | State Program | 3349 | 08-22-21 |
| North Dakota | State | R-186 | 09-30-20 |
| Oregon | NELAP | IA100001 | 09-29-20 |
| USDA | US Federal Programs | P330-19-00003 | 01-02-22 |

## Laboratory: Eurofins TestAmerica, Chicago

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| California | State | 2903 | 04-30-20 |
| Georgia | State | N/A | 04-30-20 |
| Georgia (DW) | State | 939 | 04-30-20 |
| Hawaii | State | NA | 04-30-20 |
| Illinois | NELAP | IL00035 | 04-30-20 |
| Indiana | State | C-IL-02 | 04-30-20 |
| Iowa | State | 082 | 05-01-20 |
| Kansas | NELAP | E-10161 | 11-01-20 |
| Kentucky (UST) | State | AI # 108083 | 04-30-20 |
| Kentucky (WW) | State | KY90023 | 12-31-19 |
| Louisiana | NELAP | 02046 | 06-30-20 |
| Mississippi | State | NA | 04-30-20 |
| New York | NELAP | 12019 | 04-01-20 |
| North Carolina (WW/SW) | State | 291 | 12-31-19 |
| North Dakota | State | R-194 | 04-30-20 |
| Oklahoma | State | 8908 | 08-31-20 |
| South Carolina | State | 77001003 | 04-30-20 |
| USDA | US Federal Programs | P330-18-00018 | 02-11-21 |
| Wisconsin | State | 999580010 | 08-31-20 |
| Wyoming | State | 8TMS-Q | 04-30-20 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170363-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL CHI |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing TestAmerica

310-170363 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/2019 TIME 1050 Received By: APS

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 1 of 4

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

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

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

MW-610X, MW-210X, MW-11,

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.4 Corrected Temp (°C): 0.4

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/20/19 TIME 1050 Received By: AB

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 2 of 4

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

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

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

MW-230x, MW-250x, MW-480x

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.7 Corrected Temp (°C): 0.7

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/20/19 TIME 1050 Received By: ABB

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes | ☐ No | *If yes:* Cooler ID: |
| Multiple Coolers? | ☒ Yes | ☐ No | *If yes:* Cooler # 3 of 4 |
| Cooler Custody Seals Present? | ☑ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☐ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☐ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.5 Corrected Temp (°C): 0.5

• **Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/20/19 TIME 1050 Received By: ARR

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes ☐ No | *If yes:* Cooler ID: | |
| Multiple Coolers? | ☒ Yes ☐ No | *If yes:* Cooler # 4 of 4 | |
| Cooler Custody Seals Present? | ☑ Yes ☐ No | *If yes:* Cooler custody seals intact? | ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes ☒ No | *If yes:* Sample custody seals intact? | ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes ☐ No | *If yes:* Which VOA samples are in cooler? ↓ | |

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.4 Corrected Temp (°C): 0.6

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

TestAmeri... 26...

Phone: 716 691 - 2600
Fax: 716 691 - 7991

TestAmerica Omaha SC
268

Company: SCS Engineers | Your PO #: 27218345.00

Send Report To: Joel Stenberg | Invoice To: SCS Engineers

Address: 14755 Grover Street

City/State/Zip Code: Omaha, NE 68144 | Project Name: Sioux Falls LF State Wells

Telephone Number: (402) 884-6202 Fax: (402) 884-6203 | Project Number: 27218345.00

Sampled by: (Print Name) Joe Warth

(Signature)

Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | HNO3 (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | H2SO4 Plastic (Yellow & White Lab | H2SO4 Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-11 | 11.18.19 | 13:57 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| MW-21ox | 11.18.19 | 12:11 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| MW-23ox | 11.18.19 | 11:05 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| MW-25ox | 11.18.19 | 13:05 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-39ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-42ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-44ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-45ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-47ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| MW-48ox | 11.18.19 | 15:30 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |
| ~~MW-53ox~~ | | | | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | x | | x |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.

***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**

**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 11.18.19 | 17:30 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |
| | 11/20/19 | 1150 | | | | | | |



12/5/2019

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

TestAmerica Omaha SC
268

Company: SCS Engineers | Your PO #: 27218345.00

Send Report To: Joel Stenberg | Invoice To: SCS Engineers

Address: 14755 Grover Street

City/State/Zip Code: Omaha, NE 68144 | Project Name: Sioux Falls LF State Wells

Telephone Number: (402) 884-6202 Fax: (402) 884-6203 | Project Number: 27218345.00

Sampled by: (Print Name) Joe Wurth

(Signature)

Email Address: JStenberg@scsengineers.com

| | | | | | | | Preservative | | | | | | | Matrix | | | | | | Analyze For: | | | | | | |

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-11 | 310-170363-A-1 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-11 | 310-170363-B-1 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-11 | 310-170363-C-1 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-11 | 310-170363-D-1 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-21ox | 310-170363-A-2 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-21ox | 310-170363-B-2 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-21ox | 310-170363-C-2 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-21ox | 310-170363-D-2 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-23ox | 310-170363-A-3 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-23ox | 310-170363-B-3 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-23ox | 310-170363-C-3 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-23ox | 310-170363-D-3 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-25ox | 310-170363-A-4 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-25ox | 310-170363-B-4 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-25ox | 310-170363-C-4 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-25ox | 310-170363-D-4 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-48ox | 310-170363-A-5 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-48ox | 310-170363-B-5 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-48ox | 310-170363-C-5 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-48ox | 310-170363-D-5 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-61ox | 310-170363-A-6 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-61ox | 310-170363-B-6 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-61ox | 310-170363-C-6 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-61ox | 310-170363-D-6 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |

**Eurofins TestAmerica, Cedar Falls**
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

# Chain of Custody Record

eurofins

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Hayes, Shawn M | Carrier Tracking No(s): | COC No: 310-22228.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | State of Origin: South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 310-170363-1 |
| Address: 2417 Bond Street, | Due Date Requested: 12/3/2019 | | | |
| City: University Park | TAT Requested (days): | | | |
| State, Zip: IL, 60484 | | | | |
| Phone: 708-534-5200(Tel) 708-534-5211(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Sioux Falls LF State Wells | Project #: 31001962 | | | |
| Site: | SSOW#: | | | |

310-170363 COC

**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:

**Analysis Requested**

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-11 (310-170363-1) | 11/18/19 | 13:51 Central | | Water | | | X | 2 | |
| MW-21ox (310-170363-2) | 11/18/19 | 12:11 Central | | Water | | | X | 2 | |
| MW-23ox (310-170363-3) | 11/18/19 | 11:05 Central | | Water | | | X | 2 | |
| MW-25ox (310-170363-4) | 11/18/19 | 13:05 Central | | Water | | | X | 2 | |
| MW-48ox (310-170363-5) | 11/18/19 | 15:30 Central | | Water | | | X | 2 | |
| MW-61ox (310-170363-6) | 11/18/19 | 14:48 Central | | Water | | | X | 2 | |

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

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

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

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| T | 11/20/19 1515 | | Lynn Scott | 11/21/19 0915 | TA-CHS |
| 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: 2.4 |
|---|---|---|

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170363-1
SDG Number: 27218345.00

**Login Number: 170363**
**List Number: 1**
**Creator: Homolar, Dana J**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170363-1
SDG Number: 27218345.00

**Login Number: 170363**
**List Number: 2**
**Creator: Scott, Sherri L**

**List Source: Eurofins TestAmerica, Chicago**
**List Creation: 11/21/19 01:21 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | 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 | 2.4 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | True | |

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-170367-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*12/5/2019 4:11:14 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 310-170367-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-170367-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 11/20/2019 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 6 coolers at receipt time were 0.4º C, 0.6º C, 0.7º C, 0.9º C, 1.4º C and 1.5º C.

**GC/MS VOA**
Method 8260C: The continuing calibration verification (CCV) associated with batch 310-262175 recovered above the upper control limit for 2-Hexanone (29.0 %D) and 4-Methyl-2-pentanone (MIBK) (21.1%D). The following sample is impacted: (CCV 310-262175/3).

Method 8260C: The continuing calibration verification (CCV) associated with batch 310-262175 recovered above the upper control limit for Chloroethane (27.8 %D). The following sample is impacted: (CCV 310-262175/4).

Method 8260C: The laboratory control sample (LCS) for analytical batch 310-262175 recovered outside control limits for the following analyte: 2-Hexaone. This analyte was biased high in the LCS and not detected in the associated samples; therefore, the data have been reported.

Method 8260C: The laboratory control sample (LCS) for analytical batch 310-262175 recovered outside control limits for the following analyte: Chloroethane. This analyte was biased high in the LCS and not detected in the associated samples; therefore, the data have been reported.

Method 8260C: The continuing calibration verification (CCV) associated with batch 310-263121 recovered above the upper control limit for cis-1,3-Dichloropropane (25.7 %D), cis-1,3-Dichloropropene (25.7 %D), 1,2-Dichlorobenzene (-21.3 %D), m,p-Xylene (22.0 %D), Toluene (22.0 %D), trans-1,2-Dichloroethene (43.4 %D). The laboratory control sample associated with this CCV were within CCV control limits for the affected analytes; therefore, the data have been reported. The following sample is impacted: (CCV 310-263121/3).

Method 8260C: The continuing calibration verification (CCV) associated with batch 310-263121 recovered above the upper control limit for 1,1-Dichloroethane (34.2 %D), The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: (CCV 310-263121/3).

Method 8260C: Surrogate recovery for the following samples were outside the upper control limit: (LCS 310-263121/6) and (MB 310-263121/7).

Method 8260C: The laboratory control sample (LCS) for analytical batch 310-263121 recovered outside control limits for the following analyte: 1,1-Dichloroethane. This analyte was biased high in the LCS and were detected in the associated samples; therefore, the data have been reported.

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

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

**Metals**
Method 6010C: The following samples were diluted due to the presence of an interferent. MW-42ox (310-170367-2) and MW-45ox (310-170367-3). 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.

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

## Job ID: 310-170367-1 (Continued)

### Laboratory: Eurofins TestAmerica, Cedar Falls (Continued)

**VOA Prep**

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

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Ground Water | 11/19/19 12:33 | 11/20/19 10:50 | |
| 310-170367-2 | MW-42ox | Ground Water | 11/19/19 10:52 | 11/20/19 10:50 | |
| 310-170367-3 | MW-45ox | Ground Water | 11/19/19 16:28 | 11/20/19 10:50 | |
| 310-170367-4 | MW-47ox | Ground Water | 11/19/19 09:54 | 11/20/19 10:50 | |
| 310-170367-5 | MW-54ox | Ground Water | 11/19/19 13:19 | 11/20/19 10:50 | |
| 310-170367-6 | MW-56ox | Ground Water | 11/19/19 15:49 | 11/20/19 10:50 | |
| 310-170367-7 | MW-57ox | Ground Water | 11/19/19 08:41 | 11/20/19 10:50 | |
| 310-170367-8 | MW-59ox | Ground Water | 11/19/19 15:07 | 11/20/19 10:50 | |
| 310-170367-9 | MW-60ox | Ground Water | 11/19/19 14:18 | 11/20/19 10:50 | |
| 310-170367-10 | Trip Blank-2 | Water | 11/19/19 00:00 | 11/20/19 10:50 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-39ox — Lab Sample ID: 310-170367-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31.7 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1430 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 368 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0934 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 7.36 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 84.9 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0462 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 8.36 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 453 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.59 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-42ox — Lab Sample ID: 310-170367-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17.2 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2510 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 487 | | 2.00 | | mg/L | 2 | | 6010C | Total/NA |
| Manganese | 0.142 | | 0.0200 | | mg/L | 2 | | 6010C | Total/NA |
| Potassium | 15.5 | | 2.00 | | mg/L | 2 | | 6010C | Total/NA |
| Sodium | 127 | | 4.00 | | mg/L | 2 | | 6010C | Total/NA |
| Manganese | 0.0485 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.602 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 12.6 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 371 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 3.39 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-45ox — Lab Sample ID: 310-170367-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.61 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2400 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 477 | | 2.00 | | mg/L | 2 | | 6010C | Total/NA |
| Manganese | 0.184 | | 0.0200 | | mg/L | 2 | | 6010C | Total/NA |
| Potassium | 17.3 | | 2.00 | | mg/L | 2 | | 6010C | Total/NA |
| Sodium | 113 | | 4.00 | | mg/L | 2 | | 6010C | Total/NA |
| Manganese | 0.120 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 10.1 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 371 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.17 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-47ox — Lab Sample ID: 310-170367-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 67.0 | | 50.0 | | mg/L | 50 | | 9056A | Total/NA |
| Sulfate | 1080 | | 50.0 | | mg/L | 50 | | 9056A | Total/NA |
| Calcium | 389 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 9.10 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 36.2 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Chemical Oxygen Demand | 7.29 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 417 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.81 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-54ox — Lab Sample ID: 310-170367-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 107 | | 50.0 | | mg/L | 50 | | 9056A | Total/NA |
| Sulfate | 817 | | 50.0 | | mg/L | 50 | | 9056A | Total/NA |
| Calcium | 294 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Magnesium | 154 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.92 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 1.49 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 87.9 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 2.00 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 5.71 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Total Suspended Solids | 2.50 | | 1.88 | | mg/L | 1 | | I-3765-85 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 500 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Bicarbonate Alkalinity as CaCO3 | 500 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Dissolved Solids | 1880 | | 60.0 | | mg/L | 1 | | SM 2540C | Total/NA |
| pH | 6.9 | HF | 0.1 | | SU | 1 | | SM 4500 H+ B | Total/NA |
| Total Organic Carbon - Duplicates | 3.14 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-56ox — Lab Sample ID: 310-170367-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.75 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1140 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 263 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 2.43 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 37.5 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 2.09 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 386 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.49 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-57ox — Lab Sample ID: 310-170367-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 72.3 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1920 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 517 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0100 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 10.1 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 108 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.0122 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 10.5 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 299 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 3.29 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-59ox — Lab Sample ID: 310-170367-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.85 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1830 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 513 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.890 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 20.6 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 80.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.864 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: MW-59ox (Continued) — Lab Sample ID: 310-170367-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 330 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.84 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-60ox — Lab Sample ID: 310-170367-9

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29.1 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1970 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 498 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.301 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 18.2 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 111 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.392 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Chemical Oxygen Demand | 5.15 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 273 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.23 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank-2 — Lab Sample ID: 310-170367-10

No Detections.

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-39ox

**Date Collected: 11/19/19 12:33**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-1

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 10:50 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 19:55 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 19:55 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 19:55 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 19:55 | 1 |

# Client Sample Results

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-39ox

**Date Collected: 11/19/19 12:33**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *12/02/19 19:55* | *1* |
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *12/03/19 10:50* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *12/02/19 19:55* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *12/03/19 10:50* | *1* |
| *Toluene-d8 (Surr)* | *102* | | *80 - 120* | | *12/02/19 19:55* | *1* |
| *Toluene-d8 (Surr)* | *82* | | *80 - 120* | | *12/03/19 10:50* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **31.7** | | 5.00 | | mg/L | | | 11/25/19 12:32 | 5 |
| **Sulfate** | **1430** | | 100 | | mg/L | | | 11/25/19 12:48 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **368** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:44 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:44 | 1 |
| **Manganese** | **0.0934** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:44 | 1 |
| **Potassium** | **7.36** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:44 | 1 |
| **Sodium** | **84.9** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:44 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:31 | 1 |
| **Manganese** | **0.0462** | | 0.0100 | | mg/L | | | 12/02/19 14:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:46 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 19:18 | 1 |
| **Chemical Oxygen Demand** | **8.36** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **453** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:40 | 1 |
| **Total Organic Carbon - Duplicates** | **2.59** | | 1.00 | | mg/L | | | 11/27/19 12:36 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-42ox**
**Date Collected: 11/19/19 10:52**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-2**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 11:18 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 20:22 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:22 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:22 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:22 | 1 |

## Client Sample ID: MW-42ox

**Date Collected: 11/19/19 10:52**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-2

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* | | *12/02/19 20:22* | *1* |
| *4-Bromofluorobenzene (Surr)* | *91* | | *80 - 120* | | *12/03/19 11:18* | *1* |
| *Dibromofluoromethane (Surr)* | *115* | | *80 - 120* | | *12/02/19 20:22* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* | | *12/03/19 11:18* | *1* |
| *Toluene-d8 (Surr)* | *103* | | *80 - 120* | | *12/02/19 20:22* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *12/03/19 11:18* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **17.2** | | 5.00 | | mg/L | | | 11/25/19 13:05 | 5 |
| **Sulfate** | **2510** | | 100 | | mg/L | | | 11/25/19 13:21 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **487** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:05 | 2 |
| Iron | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:05 | 2 |
| **Manganese** | **0.142** | | 0.0200 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:05 | 2 |
| **Potassium** | **15.5** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:05 | 2 |
| **Sodium** | **127** | | 4.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:05 | 2 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:33 | 1 |
| **Manganese** | **0.0485** | | 0.0100 | | mg/L | | | 12/02/19 14:33 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:47 | 1 |
| **Nitrate Nitrite as N** | **0.602** | | 0.100 | | mg/L | | | 11/27/19 19:19 | 1 |
| **Chemical Oxygen Demand** | **12.6** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **371** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:40 | 1 |
| **Total Organic Carbon - Duplicates** | **3.39** | | 1.00 | | mg/L | | | 11/27/19 12:53 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-45ox**
**Date Collected: 11/19/19 16:28**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-3**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 11:46 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 20:50 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 20:50 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 20:50 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 20:50 | 1 |

## Client Sample ID: MW-45ox

**Date Collected: 11/19/19 16:28**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *94* | | *80 - 120* | | *12/02/19 20:50* | *1* |
| *4-Bromofluorobenzene (Surr)* | *111* | | *80 - 120* | | *12/03/19 11:46* | *1* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* | | *12/02/19 20:50* | *1* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* | | *12/03/19 11:46* | *1* |
| *Toluene-d8 (Surr)* | *101* | | *80 - 120* | | *12/02/19 20:50* | *1* |
| *Toluene-d8 (Surr)* | *115* | | *80 - 120* | | *12/03/19 11:46* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **6.61** | | 5.00 | | mg/L | | | 11/25/19 13:37 | 5 |
| **Sulfate** | **2400** | | 100 | | mg/L | | | 11/25/19 13:53 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **477** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:07 | 2 |
| Iron | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:07 | 2 |
| **Manganese** | **0.184** | | 0.0200 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:07 | 2 |
| **Potassium** | **17.3** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:07 | 2 |
| **Sodium** | **113** | | 4.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 11:07 | 2 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:35 | 1 |
| **Manganese** | **0.120** | | 0.0100 | | mg/L | | | 12/02/19 14:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:49 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:24 | 1 |
| **Chemical Oxygen Demand** | **10.1** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **371** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:44 | 1 |
| **Total Organic Carbon - Duplicates** | **2.17** | | 1.00 | | mg/L | | | 11/27/19 13:09 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-47ox**
**Date Collected: 11/19/19 09:54**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-4**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 12:14 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 21:18 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:18 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:18 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:18 | 1 |

## Client Sample ID: MW-47ox

**Date Collected: 11/19/19 09:54**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-4

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *97* | | *80 - 120* | | *12/02/19 21:18* | *1* |
| *4-Bromofluorobenzene (Surr)* | *101* | | *80 - 120* | | *12/03/19 12:14* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* | | *12/02/19 21:18* | *1* |
| *Dibromofluoromethane (Surr)* | *99* | | *80 - 120* | | *12/03/19 12:14* | *1* |
| *Toluene-d8 (Surr)* | *102* | | *80 - 120* | | *12/02/19 21:18* | *1* |
| *Toluene-d8 (Surr)* | *104* | | *80 - 120* | | *12/03/19 12:14* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **67.0** | | 50.0 | | mg/L | | | 11/25/19 14:41 | 50 |
| **Sulfate** | **1080** | | 50.0 | | mg/L | | | 11/25/19 14:41 | 50 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **389** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:49 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:49 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:49 | 1 |
| **Potassium** | **9.10** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:49 | 1 |
| **Sodium** | **36.2** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:49 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:37 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:37 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:00 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:25 | 1 |
| **Chemical Oxygen Demand** | **7.29** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **417** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:25 | 1 |
| **Total Organic Carbon - Duplicates** | **2.81** | | 1.00 | | mg/L | | | 11/27/19 13:25 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-54ox**
**Date Collected: 11/19/19 13:19**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-5**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 17:57 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 17:57 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 17:57 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 17:57 | 1 |

## Client Sample ID: MW-54ox

**Date Collected: 11/19/19 13:19**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-5

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *88* | | *80 - 120* | | *11/24/19 17:57* | *1* |
| *Dibromofluoromethane (Surr)* | *106* | | *80 - 120* | | *11/24/19 17:57* | *1* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* | | *11/24/19 17:57* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **107** | | 50.0 | | mg/L | | | 11/25/19 15:29 | 50 |
| **Sulfate** | **817** | | 50.0 | | mg/L | | | 11/25/19 15:29 | 50 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **294** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |
| **Magnesium** | **154** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |
| **Manganese** | **1.92** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |
| **Potassium** | **1.49** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |
| **Sodium** | **87.9** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:42 | 1 |
| **Manganese** | **2.00** | | 0.0100 | | mg/L | | | 12/02/19 14:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:01 | 1 |
| Nitrogen, Kjeldahl | <1.00 | | 1.00 | | mg/L | | 11/29/19 08:40 | 12/04/19 17:07 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:30 | 1 |
| **Chemical Oxygen Demand** | **5.71** | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Total Suspended Solids** | **2.50** | | 1.88 | | mg/L | | | 11/21/19 11:53 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **500** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| **Bicarbonate Alkalinity as CaCO3** | **500** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Carbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| **Total Dissolved Solids** | **1880** | | 60.0 | | mg/L | | | 11/25/19 12:22 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:37 | 1 |
| **Total Organic Carbon - Duplicates** | **3.14** | | 1.00 | | mg/L | | | 11/27/19 13:42 | 1 |
| **Analyte** | **Result** | **Qualifier** | **RL** | **RL** | **Unit** | **D** | **Prepared** | **Analyzed** | **Dil Fac** |
| **pH** | **6.9** | **HF** | 0.1 | | SU | | | 11/21/19 01:55 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-56ox**
**Date Collected: 11/19/19 15:49**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-6**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 18:21 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:21 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:21 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:21 | 1 |

## Client Sample ID: MW-56ox

**Date Collected: 11/19/19 15:49**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-6

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *91* | | *80 - 120* | | *11/24/19 18:21* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* | | *11/24/19 18:21* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *11/24/19 18:21* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **7.75** | | 5.00 | | mg/L | | | 11/25/19 15:45 | 5 |
| **Sulfate** | **1140** | | 100 | | mg/L | | | 11/25/19 16:01 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **263** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:54 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:54 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:54 | 1 |
| **Potassium** | **2.43** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:54 | 1 |
| **Sodium** | **37.5** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:54 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:44 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:44 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:03 | 1 |
| **Nitrate Nitrite as N** | **2.09** | | 0.100 | | mg/L | | | 12/03/19 17:42 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **386** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:44 | 1 |
| **Total Organic Carbon - Duplicates** | **1.49** | | 1.00 | | mg/L | | | 12/02/19 13:16 | 1 |

## Client Sample ID: MW-57ox

**Date Collected: 11/19/19 08:41**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-7

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 18:45 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 18:45 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 18:45 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 18:45 | 1 |

## Client Sample ID: MW-57ox

**Date Collected: 11/19/19 08:41**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-7

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *92* | | *80 - 120* | | *11/24/19 18:45* | *1* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* | | *11/24/19 18:45* | *1* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* | | *11/24/19 18:45* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **72.3** | | 5.00 | | mg/L | | | 11/25/19 16:18 | 5 |
| **Sulfate** | **1920** | | 100 | | mg/L | | | 11/25/19 16:34 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **517** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:56 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:56 | 1 |
| **Manganese** | **0.0100** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:56 | 1 |
| **Potassium** | **10.1** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:56 | 1 |
| **Sodium** | **108** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:56 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:46 | 1 |
| **Manganese** | **0.0122** | | 0.0100 | | mg/L | | | 12/02/19 14:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:04 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:43 | 1 |
| **Chemical Oxygen Demand** | **10.5** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **299** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:31 | 1 |
| **Total Organic Carbon - Duplicates** | **3.29** | | 1.00 | | mg/L | | | 12/02/19 13:33 | 1 |

## Client Sample ID: MW-59ox

**Date Collected: 11/19/19 15:07**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-8

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 19:09 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 19:09 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 19:09 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 19:09 | 1 |

## Client Sample ID: MW-59ox

**Date Collected: 11/19/19 15:07**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-8

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *89* | | *80 - 120* | | *11/24/19 19:09* | *1* |
| *Dibromofluoromethane (Surr)* | *107* | | *80 - 120* | | *11/24/19 19:09* | *1* |
| *Toluene-d8 (Surr)* | *94* | | *80 - 120* | | *11/24/19 19:09* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **6.85** | | 5.00 | | mg/L | | | 11/25/19 16:50 | 5 |
| **Sulfate** | **1830** | | 100 | | mg/L | | | 11/25/19 17:06 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **513** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:58 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:58 | 1 |
| **Manganese** | **0.890** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:58 | 1 |
| **Potassium** | **20.6** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:58 | 1 |
| **Sodium** | **80.8** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:58 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:47 | 1 |
| **Manganese** | **0.864** | | 0.0100 | | mg/L | | | 12/02/19 14:47 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:05 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:44 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **330** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:35 | 1 |
| **Total Organic Carbon - Duplicates** | **1.84** | | 1.00 | | mg/L | | | 12/02/19 13:49 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: MW-60ox**
**Date Collected: 11/19/19 14:18**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-9**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| Carbon disulfide | <1.00 | F2 | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Chlorodibromomethane | <5.00 | F1 | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Chloroethane | <4.00 | * | 4.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 2-Hexanone | <10.0 | * | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 13:04 | 1 |
| Methylene Chloride | <5.00 | F2 | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 13:04 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 13:04 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 13:04 | 1 |

## Client Sample ID: MW-60ox

**Date Collected: 11/19/19 14:18**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-9

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *89* | | *80 - 120* | | *11/24/19 13:04* | *1* |
| *Dibromofluoromethane (Surr)* | *96* | | *80 - 120* | | *11/24/19 13:04* | *1* |
| *Toluene-d8 (Surr)* | *96* | | *80 - 120* | | *11/24/19 13:04* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **29.1** | | 5.00 | | mg/L | | | 11/25/19 17:54 | 5 |
| **Sulfate** | **1970** | | 100 | | mg/L | | | 11/25/19 18:10 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **498** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:59 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:59 | 1 |
| **Manganese** | **0.301** | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:59 | 1 |
| **Potassium** | **18.2** | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:59 | 1 |
| **Sodium** | **111** | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:59 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:49 | 1 |
| **Manganese** | **0.392** | | 0.0100 | | mg/L | | | 12/02/19 14:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 15:06 | 1 |
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:45 | 1 |
| **Chemical Oxygen Demand** | **5.15** | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **273** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:32 | 1 |
| **Total Organic Carbon - Duplicates** | **2.23** | | 1.00 | | mg/L | | | 12/02/19 14:05 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-2**
**Date Collected: 11/19/19 00:00**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-10**
**Matrix: Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 12:42 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 21:46 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 21:46 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 21:46 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 21:46 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-2**
**Date Collected: 11/19/19 00:00**
**Date Received: 11/20/19 10:50**

**Lab Sample ID: 310-170367-10**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 100 | | 80 - 120 | | 12/02/19 21:46 | 1 |
| 4-Bromofluorobenzene (Surr) | 99 | | 80 - 120 | | 12/03/19 12:42 | 1 |
| Dibromofluoromethane (Surr) | 98 | | 80 - 120 | | 12/02/19 21:46 | 1 |
| Dibromofluoromethane (Surr) | 107 | | 80 - 120 | | 12/03/19 12:42 | 1 |
| Toluene-d8 (Surr) | 103 | | 80 - 120 | | 12/02/19 21:46 | 1 |
| Toluene-d8 (Surr) | 91 | | 80 - 120 | | 12/03/19 12:42 | 1 |

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| * | LCS or LCSD is outside acceptance limits. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| F2 | MS/MSD RPD exceeds control limits |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| X | Surrogate is outside control limits |

### HPLC/IC

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

### General Chemistry

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

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-170367-1 | MW-39ox | 99 | 104 | 102 |
| 310-170367-1 | MW-39ox | 101 | 105 | 82 |
| 310-170367-2 | MW-42ox | 100 | 115 | 103 |
| 310-170367-2 | MW-42ox | 91 | 100 | 94 |
| 310-170367-3 | MW-45ox | 94 | 101 | 101 |
| 310-170367-3 | MW-45ox | 111 | 104 | 115 |
| 310-170367-4 | MW-47ox | 97 | 100 | 102 |
| 310-170367-4 | MW-47ox | 101 | 99 | 104 |
| 310-170367-5 | MW-54ox | 88 | 106 | 98 |
| 310-170367-6 | MW-56ox | 91 | 100 | 94 |
| 310-170367-7 | MW-57ox | 92 | 105 | 96 |
| 310-170367-8 | MW-59ox | 89 | 107 | 94 |
| 310-170367-9 | MW-60ox | 89 | 96 | 96 |
| 310-170367-9 MS | MW-60ox | 91 | 100 | 97 |
| 310-170367-9 MSD | MW-60ox | 95 | 103 | 98 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | DBFM | TOL |
| Lab Sample ID | Client Sample ID | (80-120) | (80-120) | (80-120) |
| 310-170367-10 | Trip Blank-2 | 100 | 98 | 103 |
| 310-170367-10 | Trip Blank-2 | 99 | 107 | 91 |
| LCS 310-262175/6 | Lab Control Sample | 93 | 97 | 97 |
| LCS 310-262175/7 | Lab Control Sample | 85 | 105 | 92 |
| LCS 310-262933/5 | Lab Control Sample | 109 | 97 | 102 |
| LCS 310-262933/6 | Lab Control Sample | 99 | 101 | 104 |
| LCS 310-263121/5 | Lab Control Sample | 120 | 93 | 118 |
| LCS 310-263121/6 | Lab Control Sample | 117 | 104 | 124 X |
| MB 310-262175/5 | Method Blank | 96 | 107 | 97 |
| MB 310-262933/7 | Method Blank | 99 | 103 | 103 |
| MB 310-263121/7 | Method Blank | 94 | 115 | 122 X |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-262175/5**
**Matrix: Water**
**Analysis Batch: 262175**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 11/24/19 11:52 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 11/24/19 11:52 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 11/24/19 11:52 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 11/24/19 11:52 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-262175/5**
**Matrix: Water**
**Analysis Batch: 262175**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *96* | | *80 - 120* | | *11/24/19 11:52* | *1* |
| *Dibromofluoromethane (Surr)* | *107* | | *80 - 120* | | *11/24/19 11:52* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *11/24/19 11:52* | *1* |

**Lab Sample ID: LCS 310-262175/6**
**Matrix: Water**
**Analysis Batch: 262175**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 52.88 | | ug/L | | 132 | 50 - 150 |
| Acrylonitrile | 200 | 249.1 | | ug/L | | 125 | 50 - 150 |
| Benzene | 20.0 | 21.43 | | ug/L | | 107 | 77 - 120 |
| Bromochloromethane | 20.0 | 24.25 | | ug/L | | 121 | 73 - 132 |
| Bromodichloromethane | 20.0 | 21.40 | | ug/L | | 107 | 73 - 120 |
| Bromoform | 20.0 | 21.73 | | ug/L | | 109 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 51.53 | | ug/L | | 129 | 50 - 150 |
| Carbon disulfide | 20.0 | 20.78 | | ug/L | | 104 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 21.71 | | ug/L | | 109 | 72 - 126 |
| Chlorobenzene | 20.0 | 20.33 | | ug/L | | 102 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 21.68 | | ug/L | | 108 | 66 - 120 |
| Chloroform | 20.0 | 21.99 | | ug/L | | 110 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 22.29 | | ug/L | | 111 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 19.50 | | ug/L | | 98 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 23.23 | | ug/L | | 116 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 21.39 | | ug/L | | 107 | 71 - 125 |
| Dibromomethane | 20.0 | 23.06 | | ug/L | | 115 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 18.72 | | ug/L | | 94 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 20.32 | | ug/L | | 102 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 21.38 | | ug/L | | 107 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 24.08 | | ug/L | | 120 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 19.70 | | ug/L | | 99 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 21.42 | | ug/L | | 107 | 75 - 123 |
| Ethylbenzene | 20.0 | 20.76 | | ug/L | | 104 | 73 - 120 |
| 2-Hexanone | 40.0 | 51.73 | * | ug/L | | 129 | 57 - 128 |
| Iodomethane | 20.0 | 15.86 | J | ug/L | | 79 | 20 - 150 |
| Methylene Chloride | 20.0 | 19.73 | | ug/L | | 99 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 50.29 | | ug/L | | 126 | 59 - 126 |
| m,p-Xylene | 20.0 | 19.79 | | ug/L | | 99 | 70 - 120 |
| o-Xylene | 20.0 | 20.15 | | ug/L | | 101 | 67 - 120 |
| Styrene | 20.0 | 20.52 | | ug/L | | 103 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 21.08 | | ug/L | | 105 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 23.13 | | ug/L | | 116 | 63 - 122 |
| Tetrachloroethene | 20.0 | 22.20 | | ug/L | | 111 | 72 - 129 |
| Toluene | 20.0 | 20.90 | | ug/L | | 105 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 24.76 | | ug/L | | 124 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 21.32 | | ug/L | | 107 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 20.20 | | ug/L | | 101 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 22.93 | | ug/L | | 115 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262175/6**
**Matrix: Water**
**Analysis Batch: 262175**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 22.42 | | ug/L | | 112 | 69 - 127 |
| Trichloroethene | 20.0 | 23.03 | | ug/L | | 115 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 20.23 | | ug/L | | 101 | 66 - 120 |
| Vinyl acetate | 40.0 | 45.78 | | ug/L | | 114 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *93* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* |

**Lab Sample ID: LCS 310-262175/7**
**Matrix: Water**
**Analysis Batch: 262175**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 27.81 | | ug/L | | 139 | 38 - 150 |
| Chloroethane | 20.0 | 28.70 | * | ug/L | | 144 | 69 - 129 |
| Chloromethane | 20.0 | 20.29 | | ug/L | | 101 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 21.94 | | ug/L | | 110 | 68 - 146 |
| Vinyl chloride | 20.0 | 19.96 | | ug/L | | 100 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *85* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *105* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *92* | | *80 - 120* |

**Lab Sample ID: 310-170367-9 MS**
**Matrix: Ground Water**
**Analysis Batch: 262175**

**Client Sample ID: MW-60ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 50.0 | 53.94 | | ug/L | | 108 | 31 - 150 |
| Acrylonitrile | <10.0 | | 250 | 290.0 | | ug/L | | 116 | 50 - 150 |
| Benzene | <1.00 | | 25.0 | 25.49 | | ug/L | | 102 | 59 - 120 |
| Bromochloromethane | <5.00 | | 25.0 | 27.90 | | ug/L | | 112 | 55 - 135 |
| Bromodichloromethane | <1.00 | | 25.0 | 26.00 | | ug/L | | 104 | 53 - 120 |
| Bromoform | <5.00 | | 25.0 | 25.26 | | ug/L | | 101 | 42 - 120 |
| 2-Butanone (MEK) | <10.0 | | 50.0 | 60.64 | | ug/L | | 121 | 49 - 150 |
| Carbon disulfide | <1.00 | F2 | 25.0 | 27.36 | | ug/L | | 109 | 43 - 122 |
| Carbon tetrachloride | <2.00 | | 25.0 | 27.08 | | ug/L | | 108 | 47 - 126 |
| Chlorobenzene | <1.00 | | 25.0 | 25.68 | | ug/L | | 103 | 52 - 120 |
| Chlorodibromomethane | <5.00 | F1 | 25.0 | 26.14 | | ug/L | | 105 | 48 - 120 |
| Chloroform | <3.00 | | 25.0 | 26.67 | | ug/L | | 107 | 50 - 130 |
| cis-1,2-Dichloroethene | <1.00 | | 25.0 | 25.98 | | ug/L | | 104 | 46 - 130 |
| cis-1,3-Dichloropropene | <5.00 | | 25.0 | 23.55 | | ug/L | | 94 | 51 - 120 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 25.0 | 26.51 | | ug/L | | 106 | 32 - 150 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 25.0 | 26.88 | | ug/L | | 108 | 52 - 127 |
| Dibromomethane | <1.00 | | 25.0 | 27.50 | | ug/L | | 110 | 61 - 130 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-170367-9 MS**
**Matrix: Ground Water**
**Analysis Batch: 262175**

**Client Sample ID: MW-60ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dichlorobenzene | <1.00 | | 25.0 | 25.16 | | ug/L | | 101 | 46 - 120 |
| 1,4-Dichlorobenzene | <1.00 | | 25.0 | 24.61 | | ug/L | | 98 | 45 - 120 |
| 1,1-Dichloroethane | <1.00 | | 25.0 | 27.25 | | ug/L | | 109 | 50 - 127 |
| 1,2-Dichloroethane | <1.00 | | 25.0 | 28.41 | | ug/L | | 114 | 55 - 128 |
| 1,1-Dichloroethene | <2.00 | | 25.0 | 23.36 | | ug/L | | 93 | 47 - 124 |
| 1,2-Dichloropropane | <1.00 | | 25.0 | 26.14 | | ug/L | | 105 | 57 - 125 |
| Ethylbenzene | <1.00 | | 25.0 | 24.90 | | ug/L | | 100 | 46 - 120 |
| 2-Hexanone | <10.0 | * | 50.0 | 58.16 | | ug/L | | 116 | 43 - 129 |
| Iodomethane | <100 | | 25.0 | <100 | | ug/L | | 94 | 20 - 150 |
| Methylene Chloride | <5.00 | F2 | 25.0 | 25.18 | | ug/L | | 101 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 50.0 | 57.49 | | ug/L | | 115 | 44 - 131 |
| m,p-Xylene | <2.00 | | 25.0 | 24.57 | | ug/L | | 98 | 37 - 120 |
| o-Xylene | <1.00 | | 25.0 | 24.54 | | ug/L | | 98 | 46 - 120 |
| Styrene | <1.00 | | 25.0 | 25.28 | | ug/L | | 101 | 42 - 120 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 25.0 | 26.42 | | ug/L | | 106 | 50 - 120 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 25.0 | 27.66 | | ug/L | | 111 | 49 - 129 |
| Tetrachloroethene | <1.00 | | 25.0 | 25.36 | | ug/L | | 101 | 40 - 129 |
| Toluene | <1.00 | | 25.0 | 25.71 | | ug/L | | 103 | 52 - 120 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 25.0 | 27.83 | | ug/L | | 111 | 15 - 150 |
| trans-1,2-Dichloroethene | <1.00 | | 25.0 | 26.84 | | ug/L | | 107 | 51 - 122 |
| trans-1,3-Dichloropropene | <5.00 | | 25.0 | 23.87 | | ug/L | | 95 | 51 - 122 |
| 1,1,1-Trichloroethane | <1.00 | | 25.0 | 28.26 | | ug/L | | 113 | 50 - 127 |
| 1,1,2-Trichloroethane | <1.00 | | 25.0 | 26.58 | | ug/L | | 106 | 50 - 131 |
| Trichloroethene | <1.00 | | 25.0 | 27.13 | | ug/L | | 109 | 54 - 123 |
| 1,2,3-Trichloropropane | <1.00 | | 25.0 | 24.90 | | ug/L | | 100 | 42 - 134 |
| Vinyl acetate | <10.0 | | 50.0 | 56.05 | | ug/L | | 112 | 34 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *91* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *100* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* |

**Lab Sample ID: 310-170367-9 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262175**

**Client Sample ID: MW-60ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 50.0 | 48.24 | | ug/L | | 96 | 31 - 150 | 11 | 24 |
| Acrylonitrile | <10.0 | | 250 | 324.0 | | ug/L | | 130 | 50 - 150 | 11 | 21 |
| Benzene | <1.00 | | 25.0 | 28.88 | | ug/L | | 116 | 59 - 120 | 12 | 21 |
| Bromochloromethane | <5.00 | | 25.0 | 29.67 | | ug/L | | 119 | 55 - 135 | 6 | 24 |
| Bromodichloromethane | <1.00 | | 25.0 | 29.09 | | ug/L | | 116 | 53 - 120 | 11 | 21 |
| Bromoform | <5.00 | | 25.0 | 28.71 | | ug/L | | 115 | 42 - 120 | 13 | 24 |
| 2-Butanone (MEK) | <10.0 | | 50.0 | 67.28 | | ug/L | | 135 | 49 - 150 | 10 | 20 |
| Carbon disulfide | <1.00 | F2 | 25.0 | 13.88 | F2 | ug/L | | 56 | 43 - 122 | 65 | 25 |
| Carbon tetrachloride | <2.00 | | 25.0 | 29.85 | | ug/L | | 119 | 47 - 126 | 10 | 21 |
| Chlorobenzene | <1.00 | | 25.0 | 29.72 | | ug/L | | 119 | 52 - 120 | 15 | 21 |
| Chlorodibromomethane | <5.00 | F1 | 25.0 | 30.85 | F1 | ug/L | | 123 | 48 - 120 | 17 | 23 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-170367-9 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262175**

**Client Sample ID: MW-60ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloroform | <3.00 | | 25.0 | 29.06 | | ug/L | | 116 | 50 - 130 | 9 | 20 |
| cis-1,2-Dichloroethene | <1.00 | | 25.0 | 27.93 | | ug/L | | 112 | 46 - 130 | 7 | 22 |
| cis-1,3-Dichloropropene | <5.00 | | 25.0 | 26.20 | | ug/L | | 105 | 51 - 120 | 11 | 22 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 25.0 | 27.70 | | ug/L | | 111 | 32 - 150 | 4 | 24 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 25.0 | 29.65 | | ug/L | | 119 | 52 - 127 | 10 | 22 |
| Dibromomethane | <1.00 | | 25.0 | 29.97 | | ug/L | | 120 | 61 - 130 | 9 | 21 |
| 1,2-Dichlorobenzene | <1.00 | | 25.0 | 28.44 | | ug/L | | 114 | 46 - 120 | 12 | 23 |
| 1,4-Dichlorobenzene | <1.00 | | 25.0 | 28.10 | | ug/L | | 112 | 45 - 120 | 13 | 22 |
| 1,1-Dichloroethane | <1.00 | | 25.0 | 28.80 | | ug/L | | 115 | 50 - 127 | 6 | 23 |
| 1,2-Dichloroethane | <1.00 | | 25.0 | 31.31 | | ug/L | | 125 | 55 - 128 | 10 | 21 |
| 1,1-Dichloroethene | <2.00 | | 25.0 | 20.52 | | ug/L | | 82 | 47 - 124 | 13 | 24 |
| 1,2-Dichloropropane | <1.00 | | 25.0 | 29.43 | | ug/L | | 118 | 57 - 125 | 12 | 21 |
| Ethylbenzene | <1.00 | | 25.0 | 29.55 | | ug/L | | 118 | 46 - 120 | 17 | 23 |
| 2-Hexanone | <10.0 | * | 50.0 | 62.59 | | ug/L | | 125 | 43 - 129 | 7 | 20 |
| Iodomethane | <100 | | 25.0 | <100 | | ug/L | | 76 | 20 - 150 | 21 | 35 |
| Methylene Chloride | <5.00 | F2 | 25.0 | 16.07 | F2 | ug/L | | 64 | 50 - 150 | 44 | 23 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 50.0 | 63.31 | | ug/L | | 127 | 44 - 131 | 10 | 20 |
| m,p-Xylene | <2.00 | | 25.0 | 28.82 | | ug/L | | 115 | 37 - 120 | 16 | 35 |
| o-Xylene | <1.00 | | 25.0 | 28.40 | | ug/L | | 114 | 46 - 120 | 15 | 23 |
| Styrene | <1.00 | | 25.0 | 29.30 | | ug/L | | 117 | 42 - 120 | 15 | 25 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 25.0 | 29.27 | | ug/L | | 117 | 50 - 120 | 10 | 21 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 25.0 | 30.68 | | ug/L | | 123 | 49 - 129 | 10 | 20 |
| Tetrachloroethene | <1.00 | | 25.0 | 30.32 | | ug/L | | 121 | 40 - 129 | 18 | 21 |
| Toluene | <1.00 | | 25.0 | 28.48 | | ug/L | | 114 | 52 - 120 | 10 | 23 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 25.0 | 30.70 | | ug/L | | 123 | 15 - 150 | 10 | 28 |
| trans-1,2-Dichloroethene | <1.00 | | 25.0 | 26.97 | | ug/L | | 108 | 51 - 122 | 0 | 23 |
| trans-1,3-Dichloropropene | <5.00 | | 25.0 | 26.18 | | ug/L | | 105 | 51 - 122 | 9 | 25 |
| 1,1,1-Trichloroethane | <1.00 | | 25.0 | 29.97 | | ug/L | | 120 | 50 - 127 | 6 | 21 |
| 1,1,2-Trichloroethane | <1.00 | | 25.0 | 30.29 | | ug/L | | 121 | 50 - 131 | 13 | 22 |
| Trichloroethene | <1.00 | | 25.0 | 29.24 | | ug/L | | 117 | 54 - 123 | 8 | 20 |
| 1,2,3-Trichloropropane | <1.00 | | 25.0 | 28.46 | | ug/L | | 114 | 42 - 134 | 13 | 23 |
| Vinyl acetate | <10.0 | | 50.0 | 63.37 | | ug/L | | 127 | 34 - 150 | 12 | 31 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *95* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *98* | | *80 - 120* |

**Lab Sample ID: MB 310-262933/7**
**Matrix: Water**
**Analysis Batch: 262933**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-262933/7**
**Matrix: Water**
**Analysis Batch: 262933**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/02/19 18:31 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/02/19 18:31 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/02/19 18:31 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/02/19 18:31 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *12/02/19 18:31* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *12/02/19 18:31* | *1* |
| *Toluene-d8 (Surr)* | *103* | | *80 - 120* | | *12/02/19 18:31* | *1* |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262933/5**
**Matrix: Water**
**Analysis Batch: 262933**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 28.89 | | ug/L | | 72 | 50 - 150 |
| Acrylonitrile | 200 | 159.0 | | ug/L | | 80 | 50 - 150 |
| Benzene | 20.0 | 17.36 | | ug/L | | 87 | 77 - 120 |
| Bromochloromethane | 20.0 | 19.73 | | ug/L | | 99 | 73 - 132 |
| Bromodichloromethane | 20.0 | 16.63 | | ug/L | | 83 | 73 - 120 |
| Bromoform | 20.0 | 16.47 | | ug/L | | 82 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 34.35 | | ug/L | | 86 | 50 - 150 |
| Carbon disulfide | 20.0 | 15.20 | | ug/L | | 76 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 15.99 | | ug/L | | 80 | 72 - 126 |
| Chlorobenzene | 20.0 | 18.60 | | ug/L | | 93 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 16.89 | | ug/L | | 84 | 66 - 120 |
| Chloroform | 20.0 | 16.17 | | ug/L | | 81 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 16.42 | | ug/L | | 82 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 17.72 | | ug/L | | 89 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 16.77 | | ug/L | | 84 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 17.05 | | ug/L | | 85 | 71 - 125 |
| Dibromomethane | 20.0 | 16.14 | | ug/L | | 81 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 17.53 | | ug/L | | 88 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 18.06 | | ug/L | | 90 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 19.07 | | ug/L | | 95 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 16.79 | | ug/L | | 84 | 75 - 123 |
| 1,2-Dichloropropane | 20.0 | 16.15 | | ug/L | | 81 | 75 - 123 |
| Ethylbenzene | 20.0 | 17.66 | | ug/L | | 88 | 73 - 120 |
| 2-Hexanone | 40.0 | 34.68 | | ug/L | | 87 | 57 - 128 |
| Iodomethane | 20.0 | 13.84 | J | ug/L | | 69 | 20 - 150 |
| Methylene Chloride | 20.0 | 16.40 | | ug/L | | 82 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 35.30 | | ug/L | | 88 | 59 - 126 |
| m,p-Xylene | 20.0 | 17.77 | | ug/L | | 89 | 70 - 120 |
| o-Xylene | 20.0 | 17.86 | | ug/L | | 89 | 67 - 120 |
| Styrene | 20.0 | 16.96 | | ug/L | | 85 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 16.99 | | ug/L | | 85 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 18.02 | | ug/L | | 90 | 63 - 122 |
| Tetrachloroethene | 20.0 | 16.43 | | ug/L | | 82 | 72 - 129 |
| Toluene | 20.0 | 17.35 | | ug/L | | 87 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 17.83 | | ug/L | | 89 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 15.34 | | ug/L | | 77 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 17.27 | | ug/L | | 86 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 15.82 | | ug/L | | 79 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 17.50 | | ug/L | | 87 | 69 - 127 |
| Trichloroethene | 20.0 | 16.76 | | ug/L | | 84 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 18.37 | | ug/L | | 92 | 66 - 120 |
| Vinyl acetate | 40.0 | 32.65 | | ug/L | | 82 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *109* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *97* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *102* | | *80 - 120* |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-262933/6**
**Matrix: Water**
**Analysis Batch: 262933**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromomethane | | | 20.0 | 11.37 | | ug/L | | 57 | 38 - 150 | | |
| Chloroethane | | | 20.0 | 16.61 | | ug/L | | 83 | 69 - 129 | | |
| Chloromethane | | | 20.0 | 18.25 | | ug/L | | 91 | 50 - 150 | | |
| Trichlorofluoromethane | | | 20.0 | 14.47 | | ug/L | | 72 | 68 - 146 | | |
| Vinyl chloride | | | 20.0 | 16.37 | | ug/L | | 82 | 67 - 133 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *101* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *104* | | *80 - 120* |

**Lab Sample ID: MB 310-263121/7**
**Matrix: Water**
**Analysis Batch: 263121**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| Acrylonitrile | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| Benzene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| Iodomethane | <100 | | 100 | | ug/L | | | 12/03/19 08:59 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/03/19 08:59 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-263121/7**
**Matrix: Water**
**Analysis Batch: 263121**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1,1,2-Tetrachloroethane | <2.00 | | 2.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/03/19 08:59 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/03/19 08:59 | 1 |
| Vinyl chloride | <2.00 | | 2.00 | | ug/L | | | 12/03/19 08:59 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *94* | | *80 - 120* | | *12/03/19 08:59* | *1* |
| *Dibromofluoromethane (Surr)* | *115* | | *80 - 120* | | *12/03/19 08:59* | *1* |
| *Toluene-d8 (Surr)* | *122* | *X* | *80 - 120* | | *12/03/19 08:59* | *1* |

**Lab Sample ID: LCS 310-263121/5**
**Matrix: Water**
**Analysis Batch: 263121**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 41.60 | | ug/L | | 104 | 50 - 150 |
| Acrylonitrile | 200 | 214.8 | | ug/L | | 107 | 50 - 150 |
| Benzene | 20.0 | 19.39 | | ug/L | | 97 | 77 - 120 |
| Bromochloromethane | 20.0 | 20.90 | | ug/L | | 104 | 73 - 132 |
| Bromodichloromethane | 20.0 | 17.88 | | ug/L | | 89 | 73 - 120 |
| Bromoform | 20.0 | 19.24 | | ug/L | | 96 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 34.01 | | ug/L | | 85 | 50 - 150 |
| Carbon disulfide | 20.0 | 23.42 | | ug/L | | 117 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 18.84 | | ug/L | | 94 | 72 - 126 |
| Chlorobenzene | 20.0 | 20.44 | | ug/L | | 102 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 16.63 | | ug/L | | 83 | 66 - 120 |
| Chloroform | 20.0 | 16.11 | | ug/L | | 81 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 18.25 | | ug/L | | 91 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 19.85 | | ug/L | | 99 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 20.06 | | ug/L | | 100 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 18.54 | | ug/L | | 93 | 71 - 125 |
| Dibromomethane | 20.0 | 17.18 | | ug/L | | 86 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 17.06 | | ug/L | | 85 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 18.78 | | ug/L | | 94 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 25.63 | * | ug/L | | 128 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 16.66 | | ug/L | | 83 | 75 - 123 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-263121/5**
**Matrix: Water**
**Analysis Batch: 263121**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 20.0 | 21.14 | | ug/L | | 106 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 18.16 | | ug/L | | 91 | 75 - 123 |
| Ethylbenzene | 20.0 | 21.75 | | ug/L | | 109 | 73 - 120 |
| 2-Hexanone | 40.0 | 35.36 | | ug/L | | 88 | 57 - 128 |
| Iodomethane | 20.0 | 19.26 | J | ug/L | | 96 | 20 - 150 |
| Methylene Chloride | 20.0 | 22.07 | | ug/L | | 110 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 41.31 | | ug/L | | 103 | 59 - 126 |
| m,p-Xylene | 20.0 | 22.09 | | ug/L | | 110 | 70 - 120 |
| o-Xylene | 20.0 | 20.94 | | ug/L | | 105 | 67 - 120 |
| Styrene | 20.0 | 20.54 | | ug/L | | 103 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 19.90 | | ug/L | | 99 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 17.53 | | ug/L | | 88 | 63 - 122 |
| Tetrachloroethene | 20.0 | 22.31 | | ug/L | | 112 | 72 - 129 |
| Toluene | 20.0 | 22.31 | | ug/L | | 112 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 17.86 | | ug/L | | 89 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 22.43 | | ug/L | | 112 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 21.21 | | ug/L | | 106 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 17.41 | | ug/L | | 87 | 76 - 127 |
| 1,1,2-Trichloroethane | 20.0 | 20.27 | | ug/L | | 101 | 69 - 127 |
| Trichloroethene | 20.0 | 18.42 | | ug/L | | 92 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 15.98 | | ug/L | | 80 | 66 - 120 |
| Vinyl acetate | 40.0 | 44.69 | | ug/L | | 112 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *120* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *93* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *118* | | *80 - 120* |

**Lab Sample ID: LCS 310-263121/6**
**Matrix: Water**
**Analysis Batch: 263121**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 7.860 | | ug/L | | 39 | 38 - 150 |
| Chloroethane | 20.0 | 24.02 | | ug/L | | 120 | 69 - 129 |
| Chloromethane | 20.0 | 21.40 | | ug/L | | 107 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 24.22 | | ug/L | | 121 | 68 - 146 |
| Vinyl chloride | 20.0 | 24.27 | | ug/L | | 121 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *117* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *104* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *124* | *X* | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-262410/3**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |

**Lab Sample ID: LCS 310-262410/4**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.988 | | mg/L | | 100 | 90 - 110 |
| Sulfate | 10.0 | 10.31 | | mg/L | | 103 | 90 - 110 |

**Lab Sample ID: 310-170367-4 MS**
**Matrix: Ground Water**
**Analysis Batch: 262410**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 67.0 | | 250 | 304.7 | | mg/L | | 95 | 80 - 120 |
| Sulfate | 1080 | | 250 | 1303 | 4 | mg/L | | 87 | 80 - 120 |

**Lab Sample ID: 310-170367-4 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262410**

**Client Sample ID: MW-47ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 67.0 | | 250 | 304.4 | | mg/L | | 95 | 80 - 120 | 0 | 15 |
| Sulfate | 1080 | | 250 | 1309 | 4 | mg/L | | 90 | 80 - 120 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-261734/1-A**
**Matrix: Water**
**Analysis Batch: 262151**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Magnesium | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |
| Sodium | <2.00 | | 2.00 | | mg/L | | 11/21/19 08:00 | 11/22/19 10:20 | 1 |

**Lab Sample ID: LCS 310-261734/2-A**
**Matrix: Water**
**Analysis Batch: 262151**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 20.62 | | mg/L | | 103 | 80 - 120 |
| Iron | 2.00 | 2.099 | | mg/L | | 105 | 80 - 120 |
| Magnesium | 20.0 | 21.19 | | mg/L | | 106 | 80 - 120 |
| Manganese | 1.00 | 0.9798 | | mg/L | | 98 | 80 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 310-261734/2-A**
**Matrix: Water**
**Analysis Batch: 262151**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Potassium | 20.0 | 19.73 | | mg/L | | 99 | 80 - 120 |
| Sodium | 20.0 | 19.93 | | mg/L | | 100 | 80 - 120 |

**Lab Sample ID: 310-170367-5 DU**
**Matrix: Ground Water**
**Analysis Batch: 262151**

**Client Sample ID: MW-54ox**
**Prep Type: Total/NA**
**Prep Batch: 261734**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Calcium | 294 | | 301.1 | | mg/L | | 2 | 20 |
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Magnesium | 154 | | 157.8 | | mg/L | | 3 | 20 |
| Manganese | 1.92 | | 1.973 | | mg/L | | 2 | 20 |
| Potassium | 1.49 | | 1.500 | | mg/L | | 0.6 | 20 |
| Sodium | 87.9 | | 87.35 | | mg/L | | 0.6 | 20 |

**Lab Sample ID: MB 310-263176/19**
**Matrix: Water**
**Analysis Batch: 263176**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/02/19 14:08 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/02/19 14:08 | 1 |

**Lab Sample ID: LCS 310-263176/20**
**Matrix: Water**
**Analysis Batch: 263176**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 2.00 | 2.066 | | mg/L | | 103 | 80 - 120 |
| Manganese | 2.00 | 2.023 | | mg/L | | 101 | 80 - 120 |

**Lab Sample ID: 310-170367-9 DU**
**Matrix: Ground Water**
**Analysis Batch: 263176**

**Client Sample ID: MW-60ox**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | <0.500 | | mg/L | | NC | 20 |
| Manganese | 0.392 | | 0.4060 | | mg/L | | 3 | 20 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-262369/148**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 14:24 | 1 |

## Method: 350.1 - Nitrogen, Ammonia (Continued)

**Lab Sample ID: LCS 310-262369/149**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 19.3 | 20.22 | | mg/L | | 105 | 90 - 110 |

## Method: 351.2 - Nitrogen, Total Kjeldahl

**Lab Sample ID: MB 310-262791/1-A**
**Matrix: Water**
**Analysis Batch: 263447**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262791**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Kjeldahl | <1.00 | | 1.00 | | mg/L | | 11/29/19 08:40 | 12/04/19 16:55 | 1 |

**Lab Sample ID: LCS 310-262791/2-A**
**Matrix: Water**
**Analysis Batch: 263447**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262791**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrogen, Kjeldahl | 4.01 | 3.932 | | mg/L | | 98 | 90 - 110 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-262750/106**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 18:54 | 1 |

**Lab Sample ID: MB 310-262750/76**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 11/27/19 18:10 | 1 |

**Lab Sample ID: LCS 310-262750/107**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.947 | | mg/L | | 106 | 90 - 110 |

**Lab Sample ID: LCS 310-262750/77**
**Matrix: Water**
**Analysis Batch: 262750**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.904 | | mg/L | | 105 | 90 - 110 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

**Lab Sample ID: MB 310-263267/14**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 16:45 | 1 |

**Lab Sample ID: MB 310-263267/43**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 17:28 | 1 |

**Lab Sample ID: LCS 310-263267/11**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.842 | | mg/L | | 104 | 90 - 110 |

**Lab Sample ID: LCS 310-263267/44**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 5.981 | | mg/L | | 106 | 90 - 110 |

**Lab Sample ID: 310-170367-5 MS**
**Matrix: Ground Water**
**Analysis Batch: 263267**

**Client Sample ID: MW-54ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.500 | 0.4900 | | mg/L | | 98 | 90 - 110 |

**Lab Sample ID: 310-170367-5 MSD**
**Matrix: Ground Water**
**Analysis Batch: 263267**

**Client Sample ID: MW-54ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.500 | 0.4911 | | mg/L | | 98 | 90 - 110 | 0 | 20 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-261757/32**
**Matrix: Water**
**Analysis Batch: 261757**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/21/19 09:39 | 1 |

## Method: 5220D LL - COD (Continued)

**Lab Sample ID: LCS 310-261757/33**
**Matrix: Water**
**Analysis Batch: 261757**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 125.5 | | mg/L | | 100 | 85 - 115 |

**Lab Sample ID: MB 310-262654/5**
**Matrix: Water**
**Analysis Batch: 262654**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 11/27/19 10:36 | 1 |

**Lab Sample ID: LCS 310-262654/3**
**Matrix: Water**
**Analysis Batch: 262654**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 132.8 | | mg/L | | 106 | 85 - 115 |

## Method: I-3765-85 - Residue, Non-filterable (TSS)

**Lab Sample ID: MB 310-261817/1**
**Matrix: Water**
**Analysis Batch: 261817**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | <5.00 | | 5.00 | | mg/L | | | 11/21/19 11:53 | 1 |

**Lab Sample ID: LCS 310-261817/2**
**Matrix: Water**
**Analysis Batch: 261817**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 94.00 | | mg/L | | 94 | 74 - 114 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-262994/1**
**Matrix: Water**
**Analysis Batch: 262994**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Bicarbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Carbonate Alkalinity as CaCO3 | <5.00 | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |

**Lab Sample ID: LCS 310-262994/2**
**Matrix: Water**
**Analysis Batch: 262994**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 978.5 | | mg/L | | 92 | 90 - 110 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: 310-170367-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 262994**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 453 | | 106 | 556.2 | 4 | mg/L | | 97 | 66 - 124 |

**Lab Sample ID: 310-170367-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262994**

**Client Sample ID: MW-39ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 453 | | 106 | 556.2 | 4 | mg/L | | 97 | 66 - 124 | 0 | 17 |

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

**Lab Sample ID: MB 310-262324/1**
**Matrix: Water**
**Analysis Batch: 262324**

**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 | <30.0 | | 30.0 | | mg/L | | | 11/25/19 12:22 | 1 |

**Lab Sample ID: LCS 310-262324/2**
**Matrix: Water**
**Analysis Batch: 262324**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 1000 | 990.0 | | mg/L | | 99 | 90 - 110 |

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 310-261719/1**
**Matrix: Water**
**Analysis Batch: 261719**

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

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

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-261807/1-A**
**Matrix: Water**
**Analysis Batch: 261857**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 261807**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/21/19 11:09 | 11/21/19 14:41 | 1 |

**Lab Sample ID: LCS 310-261807/2-A**
**Matrix: Water**
**Analysis Batch: 261857**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 261807**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 2.800 | | mg/L | | 56 | 33 - 117 |

## Method: SM 4500 S2 F - Sulfide, Total (Continued)

**Lab Sample ID: MB 310-262314/1-A**
**Matrix: Water**
**Analysis Batch: 262331**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |

**Lab Sample ID: LCS 310-262314/2-A**
**Matrix: Water**
**Analysis Batch: 262331**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 4.800 | | mg/L | | 96 | 33 - 117 |

**Lab Sample ID: 310-170367-3 MS**
**Matrix: Ground Water**
**Analysis Batch: 262331**

**Client Sample ID: MW-45ox**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 4.000 | | mg/L | | 80 | 10 - 142 |

**Lab Sample ID: 310-170367-3 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262331**

**Client Sample ID: MW-45ox**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 3.600 | | mg/L | | 72 | 10 - 142 | 11 | 33 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-261709/1**
**Matrix: Water**
**Analysis Batch: 261709**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 15:57 | 1 |

**Lab Sample ID: LCS 310-261709/2**
**Matrix: Water**
**Analysis Batch: 261709**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 201.8 | | mg/L | | 102 | 85 - 115 |

**Lab Sample ID: USB 310-261712/1**
**Matrix: Water**
**Analysis Batch: 261712**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/20/19 17:05 | 1 |

## Method: SM 5210B - BOD, 5-Day (Continued)

**Lab Sample ID: LCS 310-261712/2**
**Matrix: Water**
**Analysis Batch: 261712**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 194.5 | | mg/L | | 98 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 500-518124/4**
**Matrix: Water**
**Analysis Batch: 518124**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | <1.00 | | 1.00 | | mg/L | | | 11/27/19 06:37 | 1 |

**Lab Sample ID: LCS 500-518124/5**
**Matrix: Water**
**Analysis Batch: 518124**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 10.0 | 9.500 | | mg/L | | 95 | 80 - 120 |

**Lab Sample ID: MB 500-518304/4**
**Matrix: Water**
**Analysis Batch: 518304**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | <1.00 | | 1.00 | | mg/L | | | 12/02/19 09:02 | 1 |

**Lab Sample ID: LCS 500-518304/5**
**Matrix: Water**
**Analysis Batch: 518304**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 10.0 | 10.39 | | mg/L | | 104 | 80 - 120 |

## GC/MS VOA

### Analysis Batch: 262175

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 8260C | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 8260C | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 8260C | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 8260C | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 8260C | |
| MB 310-262175/5 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-262175/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-262175/7 | Lab Control Sample | Total/NA | Water | 8260C | |
| 310-170367-9 MS | MW-60ox | Total/NA | Ground Water | 8260C | |
| 310-170367-9 MSD | MW-60ox | Total/NA | Ground Water | 8260C | |

### Analysis Batch: 262933

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 8260C | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 8260C | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 8260C | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 8260C | |
| 310-170367-10 | Trip Blank-2 | Total/NA | Water | 8260C | |
| MB 310-262933/7 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-262933/5 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-262933/6 | Lab Control Sample | Total/NA | Water | 8260C | |

### Analysis Batch: 263121

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 8260C | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 8260C | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 8260C | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 8260C | |
| 310-170367-10 | Trip Blank-2 | Total/NA | Water | 8260C | |
| MB 310-263121/7 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-263121/5 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-263121/6 | Lab Control Sample | Total/NA | Water | 8260C | |

## HPLC/IC

### Analysis Batch: 262410

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 9056A | |
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 9056A | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 9056A | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 9056A | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 9056A | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 9056A | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 9056A | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 9056A | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 9056A | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 9056A | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 9056A | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 9056A | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 9056A | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 9056A | |

## HPLC/IC (Continued)

### Analysis Batch: 262410 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 9056A | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 9056A | |
| MB 310-262410/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-262410/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| 310-170367-4 MS | MW-47ox | Total/NA | Ground Water | 9056A | |
| 310-170367-4 MSD | MW-47ox | Total/NA | Ground Water | 9056A | |

## Metals

### Prep Batch: 261734

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 3010A | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 3010A | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 3010A | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 3010A | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 3010A | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 3010A | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 3010A | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 3010A | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 3010A | |
| MB 310-261734/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-261734/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| 310-170367-5 DU | MW-54ox | Total/NA | Ground Water | 3010A | |

### Analysis Batch: 262151

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 6010C | 261734 |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 6010C | 261734 |
| MB 310-261734/1-A | Method Blank | Total/NA | Water | 6010C | 261734 |
| LCS 310-261734/2-A | Lab Control Sample | Total/NA | Water | 6010C | 261734 |
| 310-170367-5 DU | MW-54ox | Total/NA | Ground Water | 6010C | 261734 |

### Analysis Batch: 263176

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Dissolved | Ground Water | 6010C | |
| 310-170367-2 | MW-42ox | Dissolved | Ground Water | 6010C | |
| 310-170367-3 | MW-45ox | Dissolved | Ground Water | 6010C | |
| 310-170367-4 | MW-47ox | Dissolved | Ground Water | 6010C | |
| 310-170367-5 | MW-54ox | Dissolved | Ground Water | 6010C | |
| 310-170367-6 | MW-56ox | Dissolved | Ground Water | 6010C | |
| 310-170367-7 | MW-57ox | Dissolved | Ground Water | 6010C | |
| 310-170367-8 | MW-59ox | Dissolved | Ground Water | 6010C | |
| 310-170367-9 | MW-60ox | Dissolved | Ground Water | 6010C | |
| MB 310-263176/19 | Method Blank | Total/NA | Water | 6010C | |

## Metals (Continued)

### Analysis Batch: 263176 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 310-263176/20 | Lab Control Sample | Total/NA | Water | 6010C | |
| 310-170367-9 DU | MW-60ox | Dissolved | Ground Water | 6010C | |

## General Chemistry

### Analysis Batch: 261709

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-261709/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-261709/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 261712

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | SM 5210B | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | SM 5210B | |
| USB 310-261712/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-261712/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Analysis Batch: 261719

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 4500 H+ B | |
| LCS 310-261719/1 | Lab Control Sample | Total/NA | Water | SM 4500 H+ B | |

### Analysis Batch: 261757

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-261757/32 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-261757/33 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Prep Batch: 261807

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-261807/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-261807/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |

### Analysis Batch: 261817

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | I-3765-85 | |
| MB 310-261817/1 | Method Blank | Total/NA | Water | I-3765-85 | |
| LCS 310-261817/2 | Lab Control Sample | Total/NA | Water | I-3765-85 | |

## General Chemistry

### Analysis Batch: 261857

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | SM 4500 S2 F | 261807 |
| MB 310-261807/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 261807 |
| LCS 310-261807/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 261807 |

### Prep Batch: 262314

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-262314/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-262314/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |
| 310-170367-3 MS | MW-45ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170367-3 MSD | MW-45ox | Total/NA | Ground Water | SM 4500 S2 C | |

### Analysis Batch: 262324

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 2540C | |
| MB 310-262324/1 | Method Blank | Total/NA | Water | SM 2540C | |
| LCS 310-262324/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |

### Analysis Batch: 262331

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| MB 310-262314/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 262314 |
| LCS 310-262314/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 262314 |
| 310-170367-3 MS | MW-45ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| 310-170367-3 MSD | MW-45ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |

### Analysis Batch: 262369

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 350.1 | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 350.1 | |
| MB 310-262369/148 | Method Blank | Total/NA | Water | 350.1 | |

## General Chemistry (Continued)

### Analysis Batch: 262369 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 310-262369/149 | Lab Control Sample | Total/NA | Water | 350.1 | |

### Analysis Batch: 262654

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 5220D LL | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 5220D LL | |
| MB 310-262654/5 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-262654/3 | Lab Control Sample | Total/NA | Water | 5220D LL | |

### Analysis Batch: 262750

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | 353.2 | |
| MB 310-262750/106 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-262750/76 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-262750/107 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-262750/77 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Prep Batch: 262791

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 351.2 | |
| MB 310-262791/1-A | Method Blank | Total/NA | Water | 351.2 | |
| LCS 310-262791/2-A | Lab Control Sample | Total/NA | Water | 351.2 | |

### Analysis Batch: 262994

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-262994/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-262994/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 310-170367-1 MS | MW-39ox | Total/NA | Ground Water | SM 2320B | |
| 310-170367-1 MSD | MW-39ox | Total/NA | Ground Water | SM 2320B | |

### Analysis Batch: 263267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | 353.2 | |

## General Chemistry (Continued)

### Analysis Batch: 263267 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | 353.2 | |
| MB 310-263267/14 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-263267/43 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-263267/11 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-263267/44 | Lab Control Sample | Total/NA | Water | 353.2 | |
| 310-170367-5 MS | MW-54ox | Total/NA | Ground Water | 353.2 | |
| 310-170367-5 MSD | MW-54ox | Total/NA | Ground Water | 353.2 | |

### Analysis Batch: 263447

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | 351.2 | 262791 |
| MB 310-262791/1-A | Method Blank | Total/NA | Water | 351.2 | 262791 |
| LCS 310-262791/2-A | Lab Control Sample | Total/NA | Water | 351.2 | 262791 |

### Analysis Batch: 518124

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-1 | MW-39ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-2 | MW-42ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-3 | MW-45ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-4 | MW-47ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-5 | MW-54ox | Total/NA | Ground Water | SM 5310C | |
| MB 500-518124/4 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 500-518124/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |

### Analysis Batch: 518304

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170367-6 | MW-56ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-7 | MW-57ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-8 | MW-59ox | Total/NA | Ground Water | SM 5310C | |
| 310-170367-9 | MW-60ox | Total/NA | Ground Water | SM 5310C | |
| MB 500-518304/4 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 500-518304/5 | Lab Control Sample | Total/NA | Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-39ox

**Date Collected: 11/19/19 12:33**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-1

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262933 | 12/02/19 19:55 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 263121 | 12/03/19 10:50 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 12:32 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 12:48 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:31 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:44 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:46 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 262750 | 11/27/19 19:18 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261709 | 11/20/19 17:40 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 12:36 | MTB | TAL CHI |

## Client Sample ID: MW-42ox

**Date Collected: 11/19/19 10:52**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-2

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262933 | 12/02/19 20:22 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 263121 | 12/03/19 11:18 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 13:05 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 13:21 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:33 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 2 | 262151 | 11/22/19 11:05 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:47 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 262750 | 11/27/19 19:19 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 261807 | 11/21/19 11:09 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 261857 | 11/21/19 14:41 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261712 | 11/20/19 17:40 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 12:53 | MTB | TAL CHI |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-45ox

**Date Collected: 11/19/19 16:28**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-3

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262933 | 12/02/19 20:50 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 263121 | 12/03/19 11:46 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 13:37 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 13:53 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:35 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 2 | 262151 | 11/22/19 11:07 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 14:49 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:24 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261712 | 11/20/19 17:44 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 13:09 | MTB | TAL CHI |

## Client Sample ID: MW-47ox

**Date Collected: 11/19/19 09:54**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-4

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262933 | 12/02/19 21:18 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 263121 | 12/03/19 12:14 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 50 | 262410 | 11/25/19 14:41 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:37 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:49 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:00 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:25 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261712 | 11/20/19 17:25 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 13:25 | MTB | TAL CHI |

## Client Sample ID: MW-54ox

**Date Collected: 11/19/19 13:19**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-5

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262175 | 11/24/19 17:57 | DLK | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-54ox

**Date Collected: 11/19/19 13:19**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-5

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 50 | 262410 | 11/25/19 15:29 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:42 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:51 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:01 | LBB | TAL CF |
| Total/NA | Prep | 351.2 | | | 262791 | 11/29/19 08:40 | MDK | TAL CF |
| Total/NA | Analysis | 351.2 | | 1 | 263447 | 12/04/19 17:07 | JMH | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:30 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | I-3765-85 | | 1 | 261817 | 11/21/19 11:53 | SAS | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Analysis | SM 2540C | | 1 | 262324 | 11/25/19 12:22 | SAS | TAL CF |
| Total/NA | Analysis | SM 4500 H+ B | | 1 | 261719 | 11/21/19 01:55 | JMH | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261709 | 11/20/19 17:37 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518124 | 11/27/19 13:42 | MTB | TAL CHI |

## Client Sample ID: MW-56ox

**Date Collected: 11/19/19 15:49**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-6

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262175 | 11/24/19 18:21 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 15:45 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 16:01 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:44 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:54 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:03 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:42 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 261757 | 11/21/19 09:39 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261709 | 11/20/19 17:44 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 13:16 | MTB | TAL CHI |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-57ox
**Date Collected: 11/19/19 08:41**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-7
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262175 | 11/24/19 18:45 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 16:18 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 16:34 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:46 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:56 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:04 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:43 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261712 | 11/20/19 17:31 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 13:33 | MTB | TAL CHI |

## Client Sample ID: MW-59ox
**Date Collected: 11/19/19 15:07**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-8
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262175 | 11/24/19 19:09 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 16:50 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 17:06 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:47 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:58 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:05 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:44 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261712 | 11/20/19 17:35 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 13:49 | MTB | TAL CHI |

## Client Sample ID: MW-60ox
**Date Collected: 11/19/19 14:18**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-9
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262175 | 11/24/19 13:04 | DLK | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 17:54 | ACJ | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Client Sample ID: MW-60ox

**Date Collected: 11/19/19 14:18**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-9

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 18:10 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263176 | 12/02/19 14:49 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 261734 | 11/21/19 08:00 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262151 | 11/22/19 10:59 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 15:06 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 17:45 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 262654 | 11/27/19 10:36 | LBB | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261709 | 11/20/19 17:32 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 14:05 | MTB | TAL CHI |

## Client Sample ID: Trip Blank-2

**Date Collected: 11/19/19 00:00**
**Date Received: 11/20/19 10:50**

## Lab Sample ID: 310-170367-10

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 262933 | 12/02/19 21:46 | SJN | TAL CF |
| Total/NA | Analysis | 8260C | | 1 | 263121 | 12/03/19 12:42 | DLK | TAL CF |

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| AIHA-LAP, LLC | Industrial Hygiene Laboratory Accreditation Program (IHLAP) | 101044 | 11-01-20 |
| Colorado | Petroleum Storage Tank Program | IA100001 (OR) | 09-29-20 |
| Georgia | State | IA100001 (OR) | 09-29-20 |
| Kansas | NELAP | E-10341 | 01-31-20 |
| Minnesota | NELAP | 019-999-319 | 12-31-19 |
| Minnesota (Petrofund) | State Program | 3349 | 08-22-21 |
| North Dakota | State | R-186 | 09-30-20 |
| Oregon | NELAP | IA100001 | 09-29-20 |
| USDA | US Federal Programs | P330-19-00003 | 01-02-22 |

## Laboratory: Eurofins TestAmerica, Chicago

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| California | State | 2903 | 04-30-20 |
| Georgia | State | N/A | 04-30-20 |
| Georgia (DW) | State | 939 | 04-30-20 |
| Hawaii | State | NA | 04-30-20 |
| Illinois | NELAP | IL00035 | 04-30-20 |
| Indiana | State | C-IL-02 | 04-30-20 |
| Iowa | State | 082 | 05-01-20 |
| Kansas | NELAP | E-10161 | 11-01-20 |
| Kentucky (UST) | State | AI # 108083 | 04-30-20 |
| Kentucky (WW) | State | KY90023 | 12-31-19 |
| Louisiana | NELAP | 02046 | 06-30-20 |
| Mississippi | State | NA | 04-30-20 |
| New York | NELAP | 12019 | 04-01-20 |
| North Carolina (WW/SW) | State | 291 | 12-31-19 |
| North Dakota | State | R-194 | 04-30-20 |
| Oklahoma | State | 8908 | 08-31-20 |
| South Carolina | State | 77001003 | 04-30-20 |
| USDA | US Federal Programs | P330-18-00018 | 02-11-21 |
| Wisconsin | State | 999580010 | 08-31-20 |
| Wyoming | State | 8TMS-Q | 04-30-20 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170367-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 351.2 | Nitrogen, Total Kjeldahl | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| I-3765-85 | Residue, Non-filterable (TSS) | USGS | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL CF |
| SM 4500 H+ B | pH | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL CHI |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 351.2 | Nitrogen, Total Kjeldahl | MCAWW | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing TestAmerica

310-170367 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE

Project: Sioux City ILF

**Receipt Information**

Date/Time Received: DATE 11/20/19 TIME 1050

Received By: ARS

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 1 of 2

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

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

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

MW-600X, MW-420X, MW-450X

**Temperature Record**

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

Thermometer ID: N

Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.5

Corrected Temp (°C): 1.5

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha | STATE NE | Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/2019 | TIME 1050 | Received By: ARR

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☑ Yes ☐ No *If yes:* Cooler # 2 of 4

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

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

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

MW-590X - MW-540X, MW-390X

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

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

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/2019 TIME 1050 Received By: ABB

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

**Condition of Cooler/Containers**

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

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 3 of 6

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

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

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

MW-470X, MW-570X, MW-560X

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.7 Corrected Temp (°C): 0.7

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/20/19 TIME 1050 Received By: ABS

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes | ☐ No | *If yes:* Cooler ID: |
| Multiple Coolers? | ☒ Yes | ☐ No | *If yes:* Cooler # 4 of 6 |
| Cooler Custody Seals Present? | ☒ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☒ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.9 Corrected Temp (°C): 0.9

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha STATE NE Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 112019 TIME 1050 Received By: AP

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☑ Yes | ☐ No | *If yes:* Cooler ID: |
| Multiple Coolers? | ☑ Yes | ☐ No | *If yes:* Cooler # 5 of 6 |
| Cooler Custody Seals Present? | ☒ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☑ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: N Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 0.4 Corrected Temp (°C): 0.4

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS

City/State: CITY Omaha | STATE NE | Project: Sioux City LF

**Receipt Information**

Date/Time Received: DATE 11/2019 | TIME 1050 | Received By: ARP

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes ☐ No | *If yes:* Cooler ID: | |
| Multiple Coolers? | ☒ Yes ☐ No | *If yes:* Cooler # 6 of 6 | |
| Cooler Custody Seals Present? | ☒ Yes ☐ No | *If yes:* Cooler custody seals intact? | ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes ☒ No | *If yes:* Sample custody seals intact? | ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes ☒ No | *If yes:* Which VOA samples are in cooler? ↓ | |

**Temperature Record**

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

Thermometer ID: N | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.4 | Corrected Temp (°C): 1.4

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

TestAmerica Omaha SC
268

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers | Your PO #: 27218345.00

Send Report To: Joel Stenberg | Invoice To: SCS Engineers

Address: 14755 Grover Street

City/State/Zip Code: Omaha, NE 68144 | Project Name: Sioux Falls LF State Wells

Telephone Number: (402) 884-6202 Fax: (402) 884-6203 | Project Number: 27218345.00

Sampled by: (Print Name) Joe Warth

(Signature) | Email Address: JStenberg@scsengineers.com

| | | | | | | | Preservative | | | | | | | Matrix | | | | | | Analyze For: | | | | | | |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

Phone: 716 691 - 2600
Fax: 716 691 - 7991

TestAmerica Omaha SC
268

Company: SCS Engineers
Your PO #: 27218345.00

Send Report To: Joel Stenberg
Invoice To: SCS Engineers

Address: 14755 Grover Street

City/State/Zip Code: Omaha, NE 68144
Project Name: Sioux Falls LF State Wells

Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Project Number: 27218345.00

Sampled by: (Print Name) Joe Warth

(Signature)
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify: | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-11~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-21ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-23ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-25ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| MW-39ox | 11.19.19 | 12:33 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-42ox | 11.19.19 | 10:52 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-44ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| MW-45ox | 11.19.19 | 16:28 | 10 | x | | | | | | | | | | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| MW-47ox | 11.19.19 | 09:54 | 10 | x | | | X | X | X | X | X | X | X | | x | | | | | | x | x | x | x | x | x | x | x | | | | x | x | x |
| ~~MW-48ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-53ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.

***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**

**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Brad Sth | 11.19.19 | 17:00 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | Laboratory Comments: | | | | |
| | 11/20/19 | 1050 | | | | | | |



12/5/2019

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-39ox | 310-170367-A-1 | Plastic 250ml - w/nitric - dis | | | |
| MW-39ox | 310-170367-B-1 | Plastic 250ml - with Nitric Acid | | | |
| MW-39ox | 310-170367-C-1 | Plastic 500ml - with Zn Acetate and | | | |
| MW-39ox | 310-170367-D-1 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-42ox | 310-170367-A-2 | Plastic 250ml - w/nitric - dis | | | |
| MW-42ox | 310-170367-B-2 | Plastic 250ml - with Nitric Acid | | | |
| MW-42ox | 310-170367-C-2 | Plastic 500ml - with Zn Acetate and | | | |
| MW-42ox | 310-170367-D-2 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-45ox | 310-170367-A-3 | Plastic 250ml - w/nitric - dis | | | |
| MW-45ox | 310-170367-B-3 | Plastic 250ml - with Nitric Acid | | | |
| MW-45ox | 310-170367-C-3 | Plastic 500ml - with Zn Acetate and | | | |
| MW-45ox | 310-170367-D-3 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-47ox | 310-170367-A-4 | Plastic 250ml - w/nitric - dis | | | |
| MW-47ox | 310-170367-B-4 | Plastic 250ml - with Nitric Acid | | | |
| MW-47ox | 310-170367-C-4 | Plastic 500ml - with Zn Acetate and | | | |
| MW-47ox | 310-170367-D-4 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-54ox | 310-170367-A-5 | Plastic 250ml - w/nitric - dis | | | |
| MW-54ox | 310-170367-B-5 | Plastic 250ml - with Nitric Acid | | | |
| MW-54ox | 310-170367-C-5 | Plastic 500ml - with Zn Acetate and | | | |
| MW-54ox | 310-170367-D-5 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-56ox | 310-170367-A-6 | Plastic 250ml - w/nitric - dis | | | |
| MW-56ox | 310-170367-B-6 | Plastic 250ml - with Nitric Acid | | | |
| MW-56ox | 310-170367-C-6 | Plastic 500ml - with Zn Acetate and | | | |
| MW-56ox | 310-170367-D-6 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-57ox | 310-170367-A-7 | Plastic 250ml - w/nitric - dis | | | |
| MW-57ox | 310-170367-B-7 | Plastic 250ml - with Nitric Acid | | | |
| MW-57ox | 310-170367-C-7 | Plastic 500ml - with Zn Acetate and | | | |
| MW-57ox | 310-170367-D-7 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-59ox | 310-170367-A-8 | Plastic 250ml - w/nitric - dis | | | |
| MW-59ox | 310-170367-B-8 | Plastic 250ml - with Nitric Acid | | | |
| MW-59ox | 310-170367-C-8 | Plastic 500ml - with Zn Acetate and | | | |
| MW-59ox | 310-170367-D-8 | Plastic 500ml - with Sulfuric Acid | | | |
| MW-60ox | 310-170367-A-9 | Plastic 250ml - w/nitric - dis | | | |
| MW-60ox | 310-170367-B-9 | Plastic 250ml - with Nitric Acid | | | |
| MW-60ox | 310-170367-C-9 | Plastic 500ml - with Zn Acetate and | | | |
| MW-60ox | 310-170367-D-9 | Plastic 500ml - with Sulfuric Acid | | | |

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

# Chain of Custody Record



Eurofins

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Hayes, Shawn M | Carrier Tracking No(s): | COC No: 310-22237.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | State of Origin: South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 310-170367-1 |
| Address: 2417 Bond Street, , | Due Date Requested: 12/3/2019 | | | |
| City: University Park | TAT Requested (days): | | | |
| State, Zip: IL, 60484 | PO #: | | | |
| Phone: 708-534-5200(Tel) 708-534-5211(Fax) | WO #: | | | |
| Email: | Project #: 31001962 | | | |
| Project Name: Sioux Falls LF State Wells | SSOW#: | | | |
| Site: | | | | |

310-170367 COC

**Analysis Requested**

**Preservation Codes:**

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

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-39ox (310-170367-1) | 11/19/19 | 12:33 Central | | Water | | | X | 2 | |
| MW-42ox (310-170367-2) | 11/19/19 | 10:52 Central | | Water | | | X | 2 | |
| MW-45ox (310-170367-3) | 11/19/19 | 16:28 Central | | Water | | | X | 2 | |
| MW-47ox (310-170367-4) | 11/19/19 | 09:54 Central | | Water | | | X | 2 | |
| MW-54ox (310-170367-5) | 11/19/19 | 13:19 Central | | Water | | | X | 2 | |
| MW-56ox (310-170367-6) | 11/19/19 | 15:49 Central | | Water | | | X | 2 | |
| MW-57ox (310-170367-7) | 11/19/19 | 08:41 Central | | Water | | | X | 2 | |
| MW-59ox (310-170367-8) | 11/19/19 | 15:07 Central | | Water | | | X | 2 | |
| MW-60ox (310-170367-9) | 11/19/19 | 14:18 Central | | Water | | | X | 2 | |

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

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

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

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11/20/19 1615 | | [signature] | 11/21/19 0915 | TAL-CHI |
| 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: 0.2-1.2 |
|---|---|---|

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170367-1
SDG Number: 27218345.00

**Login Number: 170367**
**List Number: 1**
**Creator: Homolar, Dana J**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170367-1
SDG Number: 27218345.00

**Login Number: 170367**
**List Number: 2**
**Creator: Scott, Sherri L**

**List Source: Eurofins TestAmerica, Chicago**
**List Creation: 11/21/19 01:21 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | 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 | 1.2 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | True | |

eurofins | Environment Testing TestAmerica



# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-170451-1
Laboratory Sample Delivery Group: 27218345.00
Client Project/Site: Sioux Falls LF State Wells

For:
SCS Engineers
14755 Grover St
Omaha, Nebraska 68144

Attn: Joel Stenberg

*Authorized for release by:*
*12/6/2019 12:24:13 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Job ID: 310-170451-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative**

**Job Narrative**
**310-170451-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 11/21/2019 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.2º C, 0.5º C and 1.2º C.

**GC/MS VOA**
Method 8260C: Surrogate recovery for the following sample was outside the upper control limit: Duplicate (310-170451-5). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8260C: The continuing calibration verification (CCV) associated with batch 310-263131 recovered above the upper control limit for trans-1,3-Dichloropropene (22.0 %D). The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported. The following sample is impacted: (CCV 310-263131/3).

Method 8260C: The laboratory control sample (LCS) for analytical batch 310-263131 recovered outside acceptance limits for 1,2-Dichloropropane. There was insufficient time to perform a re-extraction or re-analysis; therefore, the data have been reported.

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

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

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

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

**VOA Prep**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Ground Water | 11/20/19 08:16 | 11/21/19 09:40 | |
| 310-170451-2 | MW-53ox | Ground Water | 11/20/19 08:59 | 11/21/19 09:40 | |
| 310-170451-3 | MW-58Rox | Ground Water | 11/20/19 09:46 | 11/21/19 09:40 | |
| 310-170451-4 | MW-13R | Ground Water | 11/20/19 10:45 | 11/21/19 09:40 | |
| 310-170451-5 | Duplicate | Ground Water | 11/20/19 23:59 | 11/21/19 09:40 | |
| 310-170451-6 | Trip Blank-3 | Water | 11/20/19 00:00 | 11/21/19 09:40 | |

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: MW-44ox — Lab Sample ID: 310-170451-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11.2 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 627 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 385 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.31 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 7.00 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 23.8 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.232 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 2.46 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 6.05 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 443 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 1.50 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-53ox — Lab Sample ID: 310-170451-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14.5 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 2210 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 493 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Iron | 2.17 | | 0.500 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 0.119 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 14.1 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 121 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 32.7 | | 1.00 | | mg/L | 10 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 5.41 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 412 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 3.35 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-58Rox — Lab Sample ID: 310-170451-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16.7 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1200 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 225 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 2.08 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 5.54 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 71.9 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.36 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.509 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 11.2 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 299 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.87 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: MW-13R — Lab Sample ID: 310-170451-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14.9 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1500 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 408 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 10.3 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 63.3 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Nitrate Nitrite as N | 0.328 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 397 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: MW-13R (Continued) — Lab Sample ID: 310-170451-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 2.44 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Duplicate — Lab Sample ID: 310-170451-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15.5 | | 5.00 | | mg/L | 5 | | 9056A | Total/NA |
| Sulfate | 1180 | | 100 | | mg/L | 100 | | 9056A | Total/NA |
| Calcium | 259 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.63 | | 0.0100 | | mg/L | 1 | | 6010C | Total/NA |
| Potassium | 6.17 | | 1.00 | | mg/L | 1 | | 6010C | Total/NA |
| Sodium | 81.3 | | 2.00 | | mg/L | 1 | | 6010C | Total/NA |
| Manganese | 1.17 | | 0.0100 | | mg/L | 1 | | 6010C | Dissolved |
| Nitrate Nitrite as N | 0.423 | | 0.100 | | mg/L | 1 | | 353.2 | Total/NA |
| Chemical Oxygen Demand | 9.58 | | 5.00 | | mg/L | 1 | | 5220D LL | Total/NA |
| Alkalinity as CaCO3 to pH 4.5 | 304 | | 5.00 | | mg/L | 1 | | SM 2320B | Total/NA |
| Total Organic Carbon - Duplicates | 2.76 | | 1.00 | | mg/L | 1 | | SM 5310C | Total/NA |

## Client Sample ID: Trip Blank-3 — Lab Sample ID: 310-170451-6

No Detections.

This Detection Summary does not include radiochemical test results.

## Client Sample ID: MW-44ox

**Date Collected: 11/20/19 08:16**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-1

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| Acrylonitrile | <5.00 | F2 | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 10:45 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| Carbon disulfide | <1.00 | F2 | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1-Dichloroethene | <2.00 | F2 | 2.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| trans-1,2-Dichloroethene | <1.00 | F2 | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:45 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:45 | 1 |

## Client Sample ID: MW-44ox

**Date Collected: 11/20/19 08:16**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-1

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *92* | | *80 - 120* | | *12/04/19 10:45* | *1* |
| *Dibromofluoromethane (Surr)* | *114* | | *80 - 120* | | *12/04/19 10:45* | *1* |
| *Toluene-d8 (Surr)* | *99* | | *80 - 120* | | *12/04/19 10:45* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **11.2** | | 5.00 | | mg/L | | | 11/25/19 18:26 | 5 |
| **Sulfate** | **627** | | 100 | | mg/L | | | 11/25/19 18:43 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **385** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:03 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:03 | 1 |
| **Manganese** | **1.31** | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:03 | 1 |
| **Potassium** | **7.00** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:03 | 1 |
| **Sodium** | **23.8** | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:03 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:42 | 1 |
| **Manganese** | **0.232** | | 0.0100 | | mg/L | | | 12/04/19 16:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:31 | 1 |
| **Nitrate Nitrite as N** | **2.46** | | 1.00 | | mg/L | | | 12/03/19 19:22 | 10 |
| **Chemical Oxygen Demand** | **6.05** | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **443** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 13:36 | 1 |
| **Total Organic Carbon - Duplicates** | **1.50** | | 1.00 | | mg/L | | | 12/02/19 17:17 | 1 |

## Client Sample ID: MW-53ox

**Date Collected: 11/20/19 08:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-2

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 11:13 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:13 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:13 | 1 |

## Client Sample ID: MW-53ox

**Date Collected: 11/20/19 08:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-2

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *99* | | *80 - 120* | | *12/04/19 11:13* | *1* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* | | *12/04/19 11:13* | *1* |
| *Toluene-d8 (Surr)* | *80* | | *80 - 120* | | *12/04/19 11:13* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **14.5** | | 5.00 | | mg/L | | | 11/25/19 18:59 | 5 |
| **Sulfate** | **2210** | | 100 | | mg/L | | | 11/25/19 19:15 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **493** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:12 | 1 |
| **Iron** | **2.17** | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:12 | 1 |
| **Manganese** | **0.119** | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:12 | 1 |
| **Potassium** | **14.1** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:12 | 1 |
| **Sodium** | **121** | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:12 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:45 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/04/19 16:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:39 | 1 |
| **Nitrate Nitrite as N** | **32.7** | | 1.00 | | mg/L | | | 12/03/19 19:23 | 10 |
| **Chemical Oxygen Demand** | **5.41** | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **412** | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/27/19 13:04 | 11/27/19 13:19 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 13:33 | 1 |
| **Total Organic Carbon - Duplicates** | **3.35** | | 1.00 | | mg/L | | | 12/02/19 17:53 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

**Client Sample ID: MW-58Rox**
**Date Collected: 11/20/19 09:46**
**Date Received: 11/21/19 09:40**

**Lab Sample ID: 310-170451-3**
**Matrix: Ground Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 11:41 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 11:41 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 11:41 | 1 |

## Client Sample ID: MW-58Rox

**Date Collected: 11/20/19 09:46**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-3

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *102* | | *80 - 120* | | *12/04/19 11:41* | *1* |
| *Dibromofluoromethane (Surr)* | *96* | | *80 - 120* | | *12/04/19 11:41* | *1* |
| *Toluene-d8 (Surr)* | *97* | | *80 - 120* | | *12/04/19 11:41* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **16.7** | | 5.00 | | mg/L | | | 11/25/19 19:31 | 5 |
| **Sulfate** | **1200** | | 100 | | mg/L | | | 11/25/19 19:47 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **225** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:14 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:14 | 1 |
| **Manganese** | **2.08** | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:14 | 1 |
| **Potassium** | **5.54** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:14 | 1 |
| **Sodium** | **71.9** | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:14 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:49 | 1 |
| **Manganese** | **1.36** | | 0.0100 | | mg/L | | | 12/04/19 16:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:53 | 1 |
| **Nitrate Nitrite as N** | **0.509** | | 0.100 | | mg/L | | | 12/03/19 19:24 | 1 |
| **Chemical Oxygen Demand** | **11.2** | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **299** | | 5.00 | | mg/L | | | 12/03/19 08:36 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/27/19 13:04 | 11/27/19 13:19 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 13:48 | 1 |
| **Total Organic Carbon - Duplicates** | **2.87** | | 1.00 | | mg/L | | | 12/02/19 18:10 | 1 |

## Client Sample ID: MW-13R

**Date Collected: 11/20/19 10:45**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-4

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 12:09 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:09 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:09 | 1 |

## Client Sample ID: MW-13R

**Date Collected: 11/20/19 10:45**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-4

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *95* | | *80 - 120* | | *12/04/19 12:09* | *1* |
| *Dibromofluoromethane (Surr)* | *103* | | *80 - 120* | | *12/04/19 12:09* | *1* |
| *Toluene-d8 (Surr)* | *105* | | *80 - 120* | | *12/04/19 12:09* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **14.9** | | 5.00 | | mg/L | | | 11/25/19 20:03 | 5 |
| **Sulfate** | **1500** | | 100 | | mg/L | | | 11/25/19 20:19 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **408** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:16 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:16 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:16 | 1 |
| **Potassium** | **10.3** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:16 | 1 |
| **Sodium** | **63.3** | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:50 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/04/19 16:50 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:54 | 1 |
| **Nitrate Nitrite as N** | **0.328** | | 0.100 | | mg/L | | | 12/03/19 19:25 | 1 |
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **397** | | 5.00 | | mg/L | | | 12/03/19 08:36 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/27/19 13:04 | 11/27/19 13:19 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 13:44 | 1 |
| **Total Organic Carbon - Duplicates** | **2.44** | | 1.00 | | mg/L | | | 12/02/19 18:26 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: Duplicate

**Date Collected: 11/20/19 23:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-5

**Matrix: Ground Water**

### Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 12:37 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 12:37 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 12:37 | 1 |

## Client Sample ID: Duplicate

**Date Collected: 11/20/19 23:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-5

**Matrix: Ground Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *119* | | *80 - 120* | | *12/04/19 12:37* | *1* |
| *Dibromofluoromethane (Surr)* | *99* | | *80 - 120* | | *12/04/19 12:37* | *1* |
| *Toluene-d8 (Surr)* | *121* | *X* | *80 - 120* | | *12/04/19 12:37* | *1* |

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **15.5** | | 5.00 | | mg/L | | | 11/25/19 21:08 | 5 |
| **Sulfate** | **1180** | | 100 | | mg/L | | | 11/25/19 21:24 | 100 |

### Method: 6010C - Metals (ICP)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Calcium** | **259** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:17 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:17 | 1 |
| **Manganese** | **1.63** | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:17 | 1 |
| **Potassium** | **6.17** | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:17 | 1 |
| **Sodium** | **81.3** | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:17 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:52 | 1 |
| **Manganese** | **1.17** | | 0.0100 | | mg/L | | | 12/04/19 16:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:56 | 1 |
| **Nitrate Nitrite as N** | **0.423** | | 0.100 | | mg/L | | | 12/03/19 19:26 | 1 |
| **Chemical Oxygen Demand** | **9.58** | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |
| **Alkalinity as CaCO3 to pH 4.5** | **304** | | 5.00 | | mg/L | | | 12/03/19 08:36 | 1 |
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/27/19 13:04 | 11/27/19 13:19 | 1 |
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 13:40 | 1 |
| **Total Organic Carbon - Duplicates** | **2.76** | | 1.00 | | mg/L | | | 12/02/19 18:43 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-3**
**Date Collected: 11/20/19 00:00**
**Date Received: 11/21/19 09:40**

**Lab Sample ID: 310-170451-6**
**Matrix: Water**

## Method: 8260C - Volatile Organic Compounds by GC/MS

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 13:05 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2-Dichloropropane | <1.00 | * | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 13:05 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 13:05 | 1 |

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

**Client Sample ID: Trip Blank-3**
**Date Collected: 11/20/19 00:00**
**Date Received: 11/21/19 09:40**

**Lab Sample ID: 310-170451-6**
**Matrix: Water**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 112 | | 80 - 120 | | 12/04/19 13:05 | 1 |
| Dibromofluoromethane (Surr) | 95 | | 80 - 120 | | 12/04/19 13:05 | 1 |
| Toluene-d8 (Surr) | 97 | | 80 - 120 | | 12/04/19 13:05 | 1 |

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| * | LCS or LCSD is outside acceptance limits. |
| F2 | MS/MSD RPD exceeds control limits |
| X | Surrogate is outside control limits |

### 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. |

## Glossary

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

# Surrogate Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Ground Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | BFB (80-120) | DBFM (80-120) | TOL (80-120) |
| 310-170451-1 | MW-44ox | 92 | 114 | 99 |
| 310-170451-1 MS | MW-44ox | 103 | 102 | 104 |
| 310-170451-2 | MW-53ox | 99 | 102 | 80 |
| 310-170451-3 | MW-58Rox | 102 | 96 | 97 |
| 310-170451-4 | MW-13R | 95 | 103 | 105 |
| 310-170451-5 | Duplicate | 119 | 99 | 121 X |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Matrix: Water** — **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | BFB (80-120) | DBFM (80-120) | TOL (80-120) |
| 310-170451-6 | Trip Blank-3 | 112 | 95 | 97 |
| LCS 310-263131/5 | Lab Control Sample | 82 | 99 | 107 |
| LCS 310-263131/6 | Lab Control Sample | 100 | 120 | 93 |
| MB 310-263131/7 | Method Blank | 100 | 83 | 102 |

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-263131/7**
**Matrix: Water**
**Analysis Batch: 263131**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| Acrylonitrile | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Benzene | <0.500 | | 0.500 | | ug/L | | | 12/04/19 10:17 | 1 |
| Bromochloromethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Bromodichloromethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Bromoform | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Bromomethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 2-Butanone (MEK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| Carbon disulfide | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Carbon tetrachloride | <2.00 | | 2.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Chlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Chlorodibromomethane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Chloroethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Chloroform | <3.00 | | 3.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Chloromethane | <3.00 | | 3.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| cis-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| cis-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Dibromomethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,4-Dichlorobenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2-Dichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1-Dichloroethene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2-Dichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Ethylbenzene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 2-Hexanone | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| Iodomethane | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| Methylene Chloride | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| m,p-Xylene | <2.00 | | 2.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| o-Xylene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Styrene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Tetrachloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Toluene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| trans-1,2-Dichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| trans-1,3-Dichloropropene | <5.00 | | 5.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1,1-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,1,2-Trichloroethane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Trichloroethene | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Trichlorofluoromethane | <4.00 | | 4.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| 1,2,3-Trichloropropane | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |
| Vinyl acetate | <10.0 | | 10.0 | | ug/L | | | 12/04/19 10:17 | 1 |
| Vinyl chloride | <1.00 | | 1.00 | | ug/L | | | 12/04/19 10:17 | 1 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-263131/7**
**Matrix: Water**
**Analysis Batch: 263131**

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

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (Surr) | 100 | | 80 - 120 | | 12/04/19 10:17 | 1 |
| Dibromofluoromethane (Surr) | 83 | | 80 - 120 | | 12/04/19 10:17 | 1 |
| Toluene-d8 (Surr) | 102 | | 80 - 120 | | 12/04/19 10:17 | 1 |

**Lab Sample ID: LCS 310-263131/5**
**Matrix: Water**
**Analysis Batch: 263131**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acetone | 40.0 | 34.58 | | ug/L | | 86 | 50 - 150 |
| Acrylonitrile | 200 | 194.5 | | ug/L | | 97 | 50 - 150 |
| Benzene | 20.0 | 19.93 | | ug/L | | 100 | 77 - 120 |
| Bromochloromethane | 20.0 | 20.24 | | ug/L | | 101 | 73 - 132 |
| Bromodichloromethane | 20.0 | 15.97 | | ug/L | | 80 | 73 - 120 |
| Bromoform | 20.0 | 15.35 | | ug/L | | 77 | 57 - 120 |
| 2-Butanone (MEK) | 40.0 | 37.17 | | ug/L | | 93 | 50 - 150 |
| Carbon disulfide | 20.0 | 19.42 | | ug/L | | 97 | 65 - 122 |
| Carbon tetrachloride | 20.0 | 19.13 | | ug/L | | 96 | 72 - 126 |
| Chlorobenzene | 20.0 | 19.49 | | ug/L | | 97 | 74 - 120 |
| Chlorodibromomethane | 20.0 | 18.00 | | ug/L | | 90 | 66 - 120 |
| Chloroform | 20.0 | 19.17 | | ug/L | | 96 | 78 - 121 |
| cis-1,2-Dichloroethene | 20.0 | 18.57 | | ug/L | | 93 | 77 - 120 |
| cis-1,3-Dichloropropene | 20.0 | 18.84 | | ug/L | | 94 | 70 - 120 |
| 1,2-Dibromo-3-Chloropropane | 20.0 | 19.04 | | ug/L | | 95 | 50 - 150 |
| 1,2-Dibromoethane (EDB) | 20.0 | 18.79 | | ug/L | | 94 | 71 - 125 |
| Dibromomethane | 20.0 | 15.58 | | ug/L | | 78 | 76 - 125 |
| 1,2-Dichlorobenzene | 20.0 | 19.06 | | ug/L | | 95 | 66 - 120 |
| 1,4-Dichlorobenzene | 20.0 | 20.30 | | ug/L | | 101 | 68 - 120 |
| 1,1-Dichloroethane | 20.0 | 22.61 | | ug/L | | 113 | 75 - 125 |
| 1,2-Dichloroethane | 20.0 | 19.08 | | ug/L | | 95 | 75 - 123 |
| 1,1-Dichloroethene | 20.0 | 18.46 | | ug/L | | 92 | 75 - 124 |
| 1,2-Dichloropropane | 20.0 | 14.56 | * | ug/L | | 73 | 75 - 123 |
| Ethylbenzene | 20.0 | 19.33 | | ug/L | | 97 | 73 - 120 |
| 2-Hexanone | 40.0 | 36.21 | | ug/L | | 91 | 57 - 128 |
| Iodomethane | 20.0 | 18.57 | | ug/L | | 93 | 20 - 150 |
| Methylene Chloride | 20.0 | 18.20 | | ug/L | | 91 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | 40.0 | 38.70 | | ug/L | | 97 | 59 - 126 |
| m,p-Xylene | 20.0 | 20.08 | | ug/L | | 100 | 70 - 120 |
| o-Xylene | 20.0 | 16.55 | | ug/L | | 83 | 67 - 120 |
| Styrene | 20.0 | 16.59 | | ug/L | | 83 | 70 - 120 |
| 1,1,1,2-Tetrachloroethane | 20.0 | 18.53 | | ug/L | | 93 | 72 - 120 |
| 1,1,2,2-Tetrachloroethane | 20.0 | 16.45 | | ug/L | | 82 | 63 - 122 |
| Tetrachloroethene | 20.0 | 19.71 | | ug/L | | 99 | 72 - 129 |
| Toluene | 20.0 | 19.72 | | ug/L | | 99 | 74 - 120 |
| trans-1,4-Dichloro-2-butene | 20.0 | 16.63 | | ug/L | | 83 | 36 - 150 |
| trans-1,2-Dichloroethene | 20.0 | 20.44 | | ug/L | | 102 | 75 - 122 |
| trans-1,3-Dichloropropene | 20.0 | 18.84 | | ug/L | | 94 | 69 - 120 |
| 1,1,1-Trichloroethane | 20.0 | 18.74 | | ug/L | | 94 | 76 - 127 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-263131/5**
**Matrix: Water**
**Analysis Batch: 263131**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 20.0 | 18.57 | | ug/L | | 93 | 69 - 127 |
| Trichloroethene | 20.0 | 16.17 | | ug/L | | 81 | 77 - 123 |
| 1,2,3-Trichloropropane | 20.0 | 15.60 | | ug/L | | 78 | 66 - 120 |
| Vinyl acetate | 40.0 | 41.12 | | ug/L | | 103 | 50 - 150 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *82* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *99* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *107* | | *80 - 120* |

**Lab Sample ID: LCS 310-263131/6**
**Matrix: Water**
**Analysis Batch: 263131**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Bromomethane | 20.0 | 14.77 | | ug/L | | 74 | 38 - 150 |
| Chloroethane | 20.0 | 23.27 | | ug/L | | 116 | 69 - 129 |
| Chloromethane | 20.0 | 21.31 | | ug/L | | 107 | 50 - 150 |
| Trichlorofluoromethane | 20.0 | 23.24 | | ug/L | | 116 | 68 - 146 |
| Vinyl chloride | 20.0 | 21.75 | | ug/L | | 109 | 67 - 133 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *100* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *120* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *93* | | *80 - 120* |

**Lab Sample ID: 310-170451-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 263131**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | <10.0 | | 40.0 | 41.55 | | ug/L | | 104 | 31 - 150 |
| Acrylonitrile | <5.00 | F2 | 200 | 238.0 | | ug/L | | 119 | 50 - 150 |
| Benzene | <0.500 | | 20.0 | 19.13 | | ug/L | | 96 | 59 - 120 |
| Bromochloromethane | <5.00 | | 20.0 | 21.57 | | ug/L | | 108 | 55 - 135 |
| Bromodichloromethane | <1.00 | | 20.0 | 19.70 | | ug/L | | 99 | 53 - 120 |
| Bromoform | <5.00 | | 20.0 | 19.16 | | ug/L | | 96 | 42 - 120 |
| 2-Butanone (MEK) | <10.0 | | 40.0 | 39.87 | | ug/L | | 100 | 49 - 150 |
| Carbon disulfide | <1.00 | F2 | 20.0 | 21.72 | | ug/L | | 109 | 43 - 122 |
| Carbon tetrachloride | <2.00 | | 20.0 | 17.40 | | ug/L | | 87 | 47 - 126 |
| Chlorobenzene | <1.00 | | 20.0 | 19.76 | | ug/L | | 99 | 52 - 120 |
| Chlorodibromomethane | <5.00 | | 20.0 | 18.94 | | ug/L | | 95 | 48 - 120 |
| Chloroform | <3.00 | | 20.0 | 18.09 | | ug/L | | 90 | 50 - 130 |
| cis-1,2-Dichloroethene | <1.00 | | 20.0 | 17.89 | | ug/L | | 89 | 46 - 130 |
| cis-1,3-Dichloropropene | <5.00 | | 20.0 | 19.38 | | ug/L | | 97 | 51 - 120 |
| 1,2-Dibromo-3-Chloropropane | <5.00 | | 20.0 | 18.79 | | ug/L | | 94 | 32 - 150 |
| 1,2-Dibromoethane (EDB) | <1.00 | | 20.0 | 19.75 | | ug/L | | 99 | 52 - 127 |
| Dibromomethane | <1.00 | | 20.0 | 19.57 | | ug/L | | 98 | 61 - 130 |

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-170451-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 263131**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dichlorobenzene | <1.00 | | 20.0 | 17.67 | | ug/L | | 88 | 46 - 120 |
| 1,4-Dichlorobenzene | <1.00 | | 20.0 | 18.13 | | ug/L | | 91 | 45 - 120 |
| 1,1-Dichloroethane | <1.00 | | 20.0 | 21.04 | | ug/L | | 105 | 50 - 127 |
| 1,2-Dichloroethane | <1.00 | | 20.0 | 19.57 | | ug/L | | 98 | 55 - 128 |
| 1,1-Dichloroethene | <2.00 | F2 | 20.0 | 20.50 | | ug/L | | 102 | 47 - 124 |
| 1,2-Dichloropropane | <1.00 | * | 20.0 | 18.85 | | ug/L | | 94 | 57 - 125 |
| Ethylbenzene | <1.00 | | 20.0 | 18.40 | | ug/L | | 92 | 46 - 120 |
| 2-Hexanone | <10.0 | | 40.0 | 38.05 | | ug/L | | 95 | 43 - 129 |
| Iodomethane | <10.0 | | 20.0 | 16.53 | | ug/L | | 83 | 20 - 150 |
| Methylene Chloride | <5.00 | | 20.0 | 21.08 | | ug/L | | 105 | 50 - 150 |
| 4-Methyl-2-pentanone (MIBK) | <10.0 | | 40.0 | 40.56 | | ug/L | | 101 | 44 - 131 |
| m,p-Xylene | <2.00 | | 20.0 | 18.74 | | ug/L | | 94 | 37 - 120 |
| o-Xylene | <1.00 | | 20.0 | 18.58 | | ug/L | | 93 | 46 - 120 |
| Styrene | <1.00 | | 20.0 | 18.19 | | ug/L | | 91 | 42 - 120 |
| 1,1,1,2-Tetrachloroethane | <1.00 | | 20.0 | 19.37 | | ug/L | | 97 | 50 - 120 |
| 1,1,2,2-Tetrachloroethane | <1.00 | | 20.0 | 20.10 | | ug/L | | 100 | 49 - 129 |
| Tetrachloroethene | <1.00 | | 20.0 | 17.46 | | ug/L | | 87 | 40 - 129 |
| Toluene | <1.00 | | 20.0 | 19.10 | | ug/L | | 95 | 52 - 120 |
| trans-1,4-Dichloro-2-butene | <10.0 | | 20.0 | 20.95 | | ug/L | | 105 | 15 - 150 |
| trans-1,2-Dichloroethene | <1.00 | F2 | 20.0 | 20.51 | | ug/L | | 103 | 51 - 122 |
| trans-1,3-Dichloropropene | <5.00 | | 20.0 | 19.37 | | ug/L | | 97 | 51 - 122 |
| 1,1,1-Trichloroethane | <1.00 | | 20.0 | 17.46 | | ug/L | | 87 | 50 - 127 |
| 1,1,2-Trichloroethane | <1.00 | | 20.0 | 21.10 | | ug/L | | 106 | 50 - 131 |
| Trichloroethene | <1.00 | | 20.0 | 17.64 | | ug/L | | 88 | 54 - 123 |
| 1,2,3-Trichloropropane | <1.00 | | 20.0 | 19.93 | | ug/L | | 100 | 42 - 134 |
| Vinyl acetate | <10.0 | | 40.0 | 38.16 | | ug/L | | 95 | 34 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene (Surr)* | *103* | | *80 - 120* |
| *Dibromofluoromethane (Surr)* | *102* | | *80 - 120* |
| *Toluene-d8 (Surr)* | *104* | | *80 - 120* |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-262410/3**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |
| Sulfate | <1.00 | | 1.00 | | mg/L | | | 11/25/19 07:58 | 1 |

**Lab Sample ID: LCS 310-262410/4**
**Matrix: Water**
**Analysis Batch: 262410**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.988 | | mg/L | | 100 | 90 - 110 |
| Sulfate | 10.0 | 10.31 | | mg/L | | 103 | 90 - 110 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 310-262406/1-A**
**Matrix: Water**
**Analysis Batch: 262883**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262406**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | <1.00 | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:00 | 1 |
| Iron | <0.500 | | 0.500 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:00 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:00 | 1 |
| Potassium | <1.00 | | 1.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:00 | 1 |
| Sodium | <2.00 | | 2.00 | | mg/L | | 11/26/19 07:57 | 11/29/19 15:00 | 1 |

**Lab Sample ID: LCS 310-262406/2-A**
**Matrix: Water**
**Analysis Batch: 262883**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262406**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Calcium | 20.0 | 18.20 | | mg/L | | 91 | 80 - 120 |
| Iron | 2.00 | 1.860 | | mg/L | | 93 | 80 - 120 |
| Manganese | 1.00 | 0.8801 | | mg/L | | 88 | 80 - 120 |
| Potassium | 20.0 | 17.41 | | mg/L | | 87 | 80 - 120 |
| Sodium | 20.0 | 17.38 | | mg/L | | 87 | 80 - 120 |

**Lab Sample ID: 310-170451-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 262883**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**
**Prep Batch: 262406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 385 | | 20.0 | 416.3 | 4 | mg/L | | 155 | 75 - 125 |
| Iron | <0.500 | | 2.00 | 2.213 | | mg/L | | 111 | 75 - 125 |
| Manganese | 1.31 | | 1.00 | 2.355 | | mg/L | | 104 | 75 - 125 |
| Potassium | 7.00 | | 20.0 | 27.34 | | mg/L | | 102 | 75 - 125 |
| Sodium | 23.8 | | 20.0 | 43.92 | | mg/L | | 101 | 75 - 125 |

**Lab Sample ID: 310-170451-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262883**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**
**Prep Batch: 262406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 385 | | 20.0 | 400.0 | 4 | mg/L | | 74 | 75 - 125 | 4 | 20 |
| Iron | <0.500 | | 2.00 | 2.029 | | mg/L | | 101 | 75 - 125 | 9 | 20 |
| Manganese | 1.31 | | 1.00 | 2.244 | | mg/L | | 93 | 75 - 125 | 5 | 20 |
| Potassium | 7.00 | | 20.0 | 28.90 | | mg/L | | 110 | 75 - 125 | 6 | 20 |
| Sodium | 23.8 | | 20.0 | 45.98 | | mg/L | | 111 | 75 - 125 | 5 | 20 |

**Lab Sample ID: MB 310-263500/82**
**Matrix: Water**
**Analysis Batch: 263500**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | 0.500 | | mg/L | | | 12/04/19 16:38 | 1 |
| Manganese | <0.0100 | | 0.0100 | | mg/L | | | 12/04/19 16:38 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 310-263500/83**
**Matrix: Water**
**Analysis Batch: 263500**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | | | 2.00 | 2.067 | | mg/L | | 103 | 80 - 120 | | |
| Manganese | | | 2.00 | 2.003 | | mg/L | | 100 | 80 - 120 | | |

**Lab Sample ID: 310-170451-1 DU**
**Matrix: Ground Water**
**Analysis Batch: 263500**

**Client Sample ID: MW-44ox**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | <0.500 | | | <0.500 | | mg/L | | | | NC | 20 |
| Manganese | 0.232 | | | 0.2348 | | mg/L | | | | 1 | 20 |

## Method: 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 310-262369/225**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 0.200 | | mg/L | | | 11/25/19 16:37 | 1 |

**Lab Sample ID: LCS 310-262369/226 ^2**
**Matrix: Water**
**Analysis Batch: 262369**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | | | 19.3 | 20.00 | | mg/L | | 104 | 90 - 110 | | |

**Lab Sample ID: 310-170451-2 MS**
**Matrix: Ground Water**
**Analysis Batch: 262369**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 10.0 | 10.32 | | mg/L | | 103 | 90 - 110 | | |

**Lab Sample ID: 310-170451-2 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262369**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia | <0.200 | | 10.0 | 10.36 | | mg/L | | 104 | 90 - 110 | 0 | 10 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite

**Lab Sample ID: MB 310-263267/106**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 19:04 | 1 |

## Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

**Lab Sample ID: MB 310-263267/136**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | <0.100 | | 0.100 | | mg/L | | | 12/03/19 19:48 | 1 |

**Lab Sample ID: LCS 310-263267/107**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 6.004 | | mg/L | | 107 | 90 - 110 |

**Lab Sample ID: LCS 310-263267/137**
**Matrix: Water**
**Analysis Batch: 263267**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N | 5.63 | 6.091 | | mg/L | | 108 | 90 - 110 |

## Method: 5220D LL - COD

**Lab Sample ID: MB 310-263161/5**
**Matrix: Water**
**Analysis Batch: 263161**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 12/03/19 08:55 | 1 |

**Lab Sample ID: MB 310-263161/90**
**Matrix: Water**
**Analysis Batch: 263161**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | <5.00 | | 5.00 | | mg/L | | | 12/03/19 09:05 | 1 |

**Lab Sample ID: LCS 310-263161/3**
**Matrix: Water**
**Analysis Batch: 263161**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 120.3 | | mg/L | | 96 | 85 - 115 |

**Lab Sample ID: LCS 310-263161/91**
**Matrix: Water**
**Analysis Batch: 263161**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 125 | 124.5 | | mg/L | | 99 | 85 - 115 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-262994/1**
**Matrix: Water**
**Analysis Batch: 262994**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 12/02/19 09:11 | 1 |

**Lab Sample ID: LCS 310-262994/2**
**Matrix: Water**
**Analysis Batch: 262994**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 978.5 | | mg/L | | 92 | 90 - 110 |

**Lab Sample ID: MB 310-263154/1**
**Matrix: Water**
**Analysis Batch: 263154**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | <5.00 | | 5.00 | | mg/L | | | 12/03/19 08:36 | 1 |

**Lab Sample ID: LCS 310-263154/2**
**Matrix: Water**
**Analysis Batch: 263154**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 1060 | 955.5 | | mg/L | | 90 | 90 - 110 |

**Lab Sample ID: 310-170451-3 MS**
**Matrix: Ground Water**
**Analysis Batch: 263154**

**Client Sample ID: MW-58Rox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 299 | | 106 | 406.7 | | mg/L | | 102 | 66 - 124 |

**Lab Sample ID: 310-170451-3 MSD**
**Matrix: Ground Water**
**Analysis Batch: 263154**

**Client Sample ID: MW-58Rox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity as CaCO3 to pH 4.5 | 299 | | 106 | 401.8 | | mg/L | | 97 | 66 - 124 | 1 | 17 |

## Method: SM 4500 S2 F - Sulfide, Total

**Lab Sample ID: MB 310-262314/1-A**
**Matrix: Water**
**Analysis Batch: 262331**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/25/19 11:46 | 11/25/19 13:12 | 1 |

## Method: SM 4500 S2 F - Sulfide, Total (Continued)

**Lab Sample ID: LCS 310-262314/2-A**
**Matrix: Water**
**Analysis Batch: 262331**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262314**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 4.800 | | mg/L | | 96 | 33 - 117 |

**Lab Sample ID: MB 310-262694/1-A**
**Matrix: Water**
**Analysis Batch: 262696**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262694**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 2.00 | | mg/L | | 11/27/19 13:04 | 11/27/19 13:19 | 1 |

**Lab Sample ID: LCS 310-262694/2-A**
**Matrix: Water**
**Analysis Batch: 262696**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262694**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 5.00 | 4.000 | | mg/L | | 80 | 33 - 117 |

**Lab Sample ID: 310-170451-2 MS**
**Matrix: Ground Water**
**Analysis Batch: 262696**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**
**Prep Batch: 262694**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 4.600 | | mg/L | | 72 | 10 - 142 |

**Lab Sample ID: 310-170451-2 MSD**
**Matrix: Ground Water**
**Analysis Batch: 262696**

**Client Sample ID: MW-53ox**
**Prep Type: Total/NA**
**Prep Batch: 262694**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | <2.00 | | 5.00 | 4.600 | | mg/L | | 72 | 10 - 142 | 0 | 33 |

## Method: SM 5210B - BOD, 5-Day

**Lab Sample ID: USB 310-261819/1**
**Matrix: Water**
**Analysis Batch: 261819**

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

| Analyte | USB Result | USB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | <3.00 | | 3.00 | | mg/L | | | 11/21/19 12:03 | 1 |

**Lab Sample ID: LCS 310-261819/2**
**Matrix: Water**
**Analysis Batch: 261819**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Biochemical Oxygen Demand | 198 | 195.2 | | mg/L | | 99 | 85 - 115 |

## Method: SM 5310C - TOC

**Lab Sample ID: MB 500-518304/36**
**Matrix: Water**
**Analysis Batch: 518304**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | <1.00 | | 1.00 | | mg/L | | | 12/02/19 16:44 | 1 |

**Lab Sample ID: LCS 500-518304/37**
**Matrix: Water**
**Analysis Batch: 518304**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | | | 10.0 | 10.05 | | mg/L | | 100 | 80 - 120 | | |

**Lab Sample ID: 310-170451-1 MS**
**Matrix: Ground Water**
**Analysis Batch: 518304**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 1.50 | | 10.0 | 11.41 | | mg/L | | 99 | 75 - 125 | | |

**Lab Sample ID: 310-170451-1 MSD**
**Matrix: Ground Water**
**Analysis Batch: 518304**

**Client Sample ID: MW-44ox**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon - Duplicates | 1.50 | | 10.0 | 11.49 | | mg/L | | 100 | 75 - 125 | 1 | 20 |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## GC/MS VOA

### Analysis Batch: 263131

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 8260C | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 8260C | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 8260C | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 8260C | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 8260C | |
| 310-170451-6 | Trip Blank-3 | Total/NA | Water | 8260C | |
| MB 310-263131/7 | Method Blank | Total/NA | Water | 8260C | |
| LCS 310-263131/5 | Lab Control Sample | Total/NA | Water | 8260C | |
| LCS 310-263131/6 | Lab Control Sample | Total/NA | Water | 8260C | |
| 310-170451-1 MS | MW-44ox | Total/NA | Ground Water | 8260C | |

## HPLC/IC

### Analysis Batch: 262410

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 9056A | |
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 9056A | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 9056A | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 9056A | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 9056A | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 9056A | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 9056A | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 9056A | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 9056A | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 9056A | |
| MB 310-262410/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 310-262410/4 | Lab Control Sample | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 262406

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 3010A | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 3010A | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 3010A | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 3010A | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 3010A | |
| MB 310-262406/1-A | Method Blank | Total/NA | Water | 3010A | |
| LCS 310-262406/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| 310-170451-1 MS | MW-44ox | Total/NA | Ground Water | 3010A | |
| 310-170451-1 MSD | MW-44ox | Total/NA | Ground Water | 3010A | |

### Analysis Batch: 262883

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 6010C | 262406 |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 6010C | 262406 |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 6010C | 262406 |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 6010C | 262406 |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 6010C | 262406 |
| MB 310-262406/1-A | Method Blank | Total/NA | Water | 6010C | 262406 |
| LCS 310-262406/2-A | Lab Control Sample | Total/NA | Water | 6010C | 262406 |
| 310-170451-1 MS | MW-44ox | Total/NA | Ground Water | 6010C | 262406 |

## Metals (Continued)

### Analysis Batch: 262883 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 MSD | MW-44ox | Total/NA | Ground Water | 6010C | 262406 |

### Analysis Batch: 263500

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Dissolved | Ground Water | 6010C | |
| 310-170451-2 | MW-53ox | Dissolved | Ground Water | 6010C | |
| 310-170451-3 | MW-58Rox | Dissolved | Ground Water | 6010C | |
| 310-170451-4 | MW-13R | Dissolved | Ground Water | 6010C | |
| 310-170451-5 | Duplicate | Dissolved | Ground Water | 6010C | |
| MB 310-263500/82 | Method Blank | Total/NA | Water | 6010C | |
| LCS 310-263500/83 | Lab Control Sample | Total/NA | Water | 6010C | |
| 310-170451-1 DU | MW-44ox | Dissolved | Ground Water | 6010C | |

## General Chemistry

### Analysis Batch: 261819

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | SM 5210B | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | SM 5210B | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | SM 5210B | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | SM 5210B | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | SM 5210B | |
| USB 310-261819/1 | Method Blank | Total/NA | Water | SM 5210B | |
| LCS 310-261819/2 | Lab Control Sample | Total/NA | Water | SM 5210B | |

### Prep Batch: 262314

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-262314/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-262314/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |

### Analysis Batch: 262331

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | SM 4500 S2 F | 262314 |
| MB 310-262314/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 262314 |
| LCS 310-262314/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 262314 |

### Analysis Batch: 262369

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 350.1 | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 350.1 | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 350.1 | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 350.1 | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 350.1 | |
| MB 310-262369/225 | Method Blank | Total/NA | Water | 350.1 | |
| LCS 310-262369/226 ^2 | Lab Control Sample | Total/NA | Water | 350.1 | |
| 310-170451-2 MS | MW-53ox | Total/NA | Ground Water | 350.1 | |
| 310-170451-2 MSD | MW-53ox | Total/NA | Ground Water | 350.1 | |

## General Chemistry

### Prep Batch: 262694

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | SM 4500 S2 C | |
| MB 310-262694/1-A | Method Blank | Total/NA | Water | SM 4500 S2 C | |
| LCS 310-262694/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 C | |
| 310-170451-2 MS | MW-53ox | Total/NA | Ground Water | SM 4500 S2 C | |
| 310-170451-2 MSD | MW-53ox | Total/NA | Ground Water | SM 4500 S2 C | |

### Analysis Batch: 262696

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | SM 4500 S2 F | 262694 |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | SM 4500 S2 F | 262694 |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | SM 4500 S2 F | 262694 |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | SM 4500 S2 F | 262694 |
| MB 310-262694/1-A | Method Blank | Total/NA | Water | SM 4500 S2 F | 262694 |
| LCS 310-262694/2-A | Lab Control Sample | Total/NA | Water | SM 4500 S2 F | 262694 |
| 310-170451-2 MS | MW-53ox | Total/NA | Ground Water | SM 4500 S2 F | 262694 |
| 310-170451-2 MSD | MW-53ox | Total/NA | Ground Water | SM 4500 S2 F | 262694 |

### Analysis Batch: 262994

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | SM 2320B | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | SM 2320B | |
| MB 310-262994/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-262994/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 263154

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | SM 2320B | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | SM 2320B | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | SM 2320B | |
| MB 310-263154/1 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 310-263154/2 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 310-170451-3 MS | MW-58Rox | Total/NA | Ground Water | SM 2320B | |
| 310-170451-3 MSD | MW-58Rox | Total/NA | Ground Water | SM 2320B | |

### Analysis Batch: 263161

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 5220D LL | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 5220D LL | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 5220D LL | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 5220D LL | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 5220D LL | |
| MB 310-263161/5 | Method Blank | Total/NA | Water | 5220D LL | |
| MB 310-263161/90 | Method Blank | Total/NA | Water | 5220D LL | |
| LCS 310-263161/3 | Lab Control Sample | Total/NA | Water | 5220D LL | |
| LCS 310-263161/91 | Lab Control Sample | Total/NA | Water | 5220D LL | |

# QC Association Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## General Chemistry

### Analysis Batch: 263267

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | 353.2 | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | 353.2 | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | 353.2 | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | 353.2 | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | 353.2 | |
| MB 310-263267/106 | Method Blank | Total/NA | Water | 353.2 | |
| MB 310-263267/136 | Method Blank | Total/NA | Water | 353.2 | |
| LCS 310-263267/107 | Lab Control Sample | Total/NA | Water | 353.2 | |
| LCS 310-263267/137 | Lab Control Sample | Total/NA | Water | 353.2 | |

### Analysis Batch: 518304

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 310-170451-1 | MW-44ox | Total/NA | Ground Water | SM 5310C | |
| 310-170451-2 | MW-53ox | Total/NA | Ground Water | SM 5310C | |
| 310-170451-3 | MW-58Rox | Total/NA | Ground Water | SM 5310C | |
| 310-170451-4 | MW-13R | Total/NA | Ground Water | SM 5310C | |
| 310-170451-5 | Duplicate | Total/NA | Ground Water | SM 5310C | |
| MB 500-518304/36 | Method Blank | Total/NA | Water | SM 5310C | |
| LCS 500-518304/37 | Lab Control Sample | Total/NA | Water | SM 5310C | |
| 310-170451-1 MS | MW-44ox | Total/NA | Ground Water | SM 5310C | |
| 310-170451-1 MSD | MW-44ox | Total/NA | Ground Water | SM 5310C | |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: MW-44ox
**Date Collected: 11/20/19 08:16**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-1
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 10:45 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 18:26 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 18:43 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263500 | 12/04/19 16:42 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 262406 | 11/26/19 07:57 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262883 | 11/29/19 15:03 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 16:31 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 263267 | 12/03/19 19:22 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 263161 | 12/03/19 08:55 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262314 | 11/25/19 11:46 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262331 | 11/25/19 13:12 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261819 | 11/21/19 13:36 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 17:17 | MTB | TAL CHI |

## Client Sample ID: MW-53ox
**Date Collected: 11/20/19 08:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-2
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 11:13 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 18:59 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 19:15 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263500 | 12/04/19 16:45 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 262406 | 11/26/19 07:57 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262883 | 11/29/19 15:12 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 16:39 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 10 | 263267 | 12/03/19 19:23 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 263161 | 12/03/19 08:55 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 262994 | 12/02/19 09:11 | MDK | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262694 | 11/27/19 13:04 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262696 | 11/27/19 13:19 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261819 | 11/21/19 13:33 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 17:53 | MTB | TAL CHI |

## Client Sample ID: MW-58Rox
**Date Collected: 11/20/19 09:46**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-3
**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 11:41 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 19:31 | ACJ | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: MW-58Rox

**Date Collected: 11/20/19 09:46**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-3

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 19:47 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263500 | 12/04/19 16:49 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 262406 | 11/26/19 07:57 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262883 | 11/29/19 15:14 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 16:53 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 19:24 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 263161 | 12/03/19 08:55 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 263154 | 12/03/19 08:36 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262694 | 11/27/19 13:04 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262696 | 11/27/19 13:19 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261819 | 11/21/19 13:48 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 18:10 | MTB | TAL CHI |

## Client Sample ID: MW-13R

**Date Collected: 11/20/19 10:45**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-4

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 12:09 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 20:03 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 20:19 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263500 | 12/04/19 16:50 | CTB | TAL CF |
| Total/NA | Prep | 3010A | | | 262406 | 11/26/19 07:57 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262883 | 11/29/19 15:16 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 16:54 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 19:25 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 263161 | 12/03/19 08:55 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 263154 | 12/03/19 08:36 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262694 | 11/27/19 13:04 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262696 | 11/27/19 13:19 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261819 | 11/21/19 13:44 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 18:26 | MTB | TAL CHI |

## Client Sample ID: Duplicate

**Date Collected: 11/20/19 23:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-5

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 12:37 | SJN | TAL CF |
| Total/NA | Analysis | 9056A | | 5 | 262410 | 11/25/19 21:08 | ACJ | TAL CF |
| Total/NA | Analysis | 9056A | | 100 | 262410 | 11/25/19 21:24 | ACJ | TAL CF |
| Dissolved | Analysis | 6010C | | 1 | 263500 | 12/04/19 16:52 | CTB | TAL CF |

# Lab Chronicle

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Client Sample ID: Duplicate

**Date Collected: 11/20/19 23:59**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-5

**Matrix: Ground Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3010A | | | 262406 | 11/26/19 07:57 | HED | TAL CF |
| Total/NA | Analysis | 6010C | | 1 | 262883 | 11/29/19 15:17 | CTB | TAL CF |
| Total/NA | Analysis | 350.1 | | 1 | 262369 | 11/25/19 16:56 | LBB | TAL CF |
| Total/NA | Analysis | 353.2 | | 1 | 263267 | 12/03/19 19:26 | JMH | TAL CF |
| Total/NA | Analysis | 5220D LL | | 1 | 263161 | 12/03/19 08:55 | WJF | TAL CF |
| Total/NA | Analysis | SM 2320B | | 1 | 263154 | 12/03/19 08:36 | LBB | TAL CF |
| Total/NA | Prep | SM 4500 S2 C | | | 262694 | 11/27/19 13:04 | MDK | TAL CF |
| Total/NA | Analysis | SM 4500 S2 F | | 1 | 262696 | 11/27/19 13:19 | MDK | TAL CF |
| Total/NA | Analysis | SM 5210B | | 1 | 261819 | 11/21/19 13:40 | BKY | TAL CF |
| Total/NA | Analysis | SM 5310C | | 1 | 518304 | 12/02/19 18:43 | MTB | TAL CHI |

## Client Sample ID: Trip Blank-3

**Date Collected: 11/20/19 00:00**
**Date Received: 11/21/19 09:40**

## Lab Sample ID: 310-170451-6

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260C | | 1 | 263131 | 12/04/19 13:05 | SJN | TAL CF |

**Laboratory References:**

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

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

# Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

## Laboratory: Eurofins TestAmerica, Cedar Falls

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| AIHA-LAP, LLC | Industrial Hygiene Laboratory Accreditation Program (IHLAP) | 101044 | 11-01-20 |
| Colorado | Petroleum Storage Tank Program | IA100001 (OR) | 09-29-20 |
| Georgia | State | IA100001 (OR) | 09-29-20 |
| Kansas | NELAP | E-10341 | 01-31-20 |
| Minnesota | NELAP | 019-999-319 | 12-31-19 |
| Minnesota (Petrofund) | State Program | 3349 | 08-22-21 |
| North Dakota | State | R-186 | 09-30-20 |
| Oregon | NELAP | IA100001 | 09-29-20 |
| USDA | US Federal Programs | P330-19-00003 | 01-02-22 |

## Laboratory: Eurofins TestAmerica, Chicago

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

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| California | State | 2903 | 04-30-20 |
| Georgia | State | N/A | 04-30-20 |
| Georgia (DW) | State | 939 | 04-30-20 |
| Hawaii | State | NA | 04-30-20 |
| Illinois | NELAP | IL00035 | 04-30-20 |
| Indiana | State | C-IL-02 | 04-30-20 |
| Iowa | State | 082 | 05-01-20 |
| Kansas | NELAP | E-10161 | 11-01-20 |
| Kentucky (UST) | State | AI # 108083 | 04-30-20 |
| Kentucky (WW) | State | KY90023 | 12-31-19 |
| Louisiana | NELAP | 02046 | 06-30-20 |
| Mississippi | State | NA | 04-30-20 |
| New York | NELAP | 12019 | 04-01-20 |
| North Carolina (WW/SW) | State | 291 | 12-31-19 |
| North Dakota | State | R-194 | 04-30-20 |
| Oklahoma | State | 8908 | 08-31-20 |
| South Carolina | State | 77001003 | 04-30-20 |
| USDA | US Federal Programs | P330-18-00018 | 02-11-21 |
| Wisconsin | State | 999580010 | 08-31-20 |
| Wyoming | State | 8TMS-Q | 04-30-20 |

# Method Summary

Client: SCS Engineers
Project/Site: Sioux Falls LF State Wells

Job ID: 310-170451-1
SDG: 27218345.00

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260C | Volatile Organic Compounds by GC/MS | SW846 | TAL CF |
| 9056A | Anions, Ion Chromatography | SW846 | TAL CF |
| 6010C | Metals (ICP) | SW846 | TAL CF |
| 350.1 | Nitrogen, Ammonia | MCAWW | TAL CF |
| 353.2 | Nitrogen, Nitrate-Nitrite | MCAWW | TAL CF |
| 5220D LL | COD | SM | TAL CF |
| SM 2320B | Alkalinity | SM | TAL CF |
| SM 4500 S2 F | Sulfide, Total | SM | TAL CF |
| SM 5210B | BOD, 5-Day | SM | TAL CF |
| SM 5310C | TOC | SM | TAL CHI |
| 3010A | Preparation, Total Metals | SW846 | TAL CF |
| 5030B | Purge and Trap | SW846 | TAL CF |
| SM 4500 S2 C | Sulfide, Sample Pretreatment/Concentration | SM | TAL CF |

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing TestAmerica

310-170451 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE

Project: Sioux Falls LF State Wells

**Receipt Information**

Date/Time Received: DATE 11-21-19 TIME 940

Received By: LAB

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes | ☐ No | *If yes:* Cooler ID: |
| Multiple Coolers? | ☒ Yes | ☐ No | *If yes:* Cooler # 1 of 3 |
| Cooler Custody Seals Present? | ☒ Yes | ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No |
| Sample Custody Seals Present? | ☐ Yes | ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No |
| Trip Blank Present? | ☐ Yes | ☒ No | *If yes:* Which VOA samples are in cooler? ↓ |

**Temperature Record**

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

Thermometer ID: M

Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 0.3

Corrected Temp (°C): 0.2

**• Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here
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# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE

Project: Sioux Falls LF State Wells

**Receipt Information**

Date/Time Received: DATE 11-21-19 TIME 940

Received By: LAB

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

**Condition of Cooler/Containers**

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

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

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

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

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

MW-13R, Dup.

**Temperature Record**

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

Thermometer ID: M

Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 0.6

Corrected Temp (°C): 0.5

**Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

eurofins | Environment Testing TestAmerica

Place COC scanning label here
268

# Cooler/Sample Receipt and Temperature Log Form

**Client Information**

Client: SCS Engineers

City/State: CITY Omaha STATE NE

Project: Sioux Falls LF State Wells

**Receipt Information**

Date/Time Received: DATE 11-21-19 TIME 940

Received By: LAB

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

**Condition of Cooler/Containers**

| | | | |
|---|---|---|---|
| Sample(s) received in Cooler? | ☒ Yes ☐ No | *If yes:* Cooler ID: | |
| Multiple Coolers? | ☒ Yes ☐ No | *If yes:* Cooler # 3 of 3 | |
| Cooler Custody Seals Present? | ☒ Yes ☐ No | *If yes:* Cooler custody seals intact? ☒ Yes ☐ No | |
| Sample Custody Seals Present? | ☐ Yes ☒ No | *If yes:* Sample custody seals intact? ☐ Yes ☐ No | |
| Trip Blank Present? | ☐ Yes ☒ No | *If yes:* Which VOA samples are in cooler? ↓ | |

**Temperature Record**

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

Thermometer ID: M

Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 1.3

Corrected Temp (°C): 1.2

**Sample Container Temperature**

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

**Exceptions Noted**

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

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

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

**Additional Comments**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

TestAmerica Omaha SC
268

Phone: 716 691 - 2600
Fax: 716 691 - 7991

Company: SCS Engineers
Your PO #: 27218345.00

Send Report To: Joel Stenberg
Invoice To: SCS Engineers

Address: 14755 Grover Street

City/State/Zip Code: Omaha, NE 68144
Project Name: Sioux Falls LF State Wells

Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Project Number: 27218345.00

Sampled by: (Print Name) Joe Wirth

(Signature)
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Label) | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify: | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | | | RUSH TAT (Must call ahead) | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-11~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-21ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-23ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-25ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-39ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-42ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| MW-44ox | 11.20.19 | 08:16 | 10 | X | | | X | X | X | X | X | X | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-45ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-47ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| ~~MW-48ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |
| MW-53ox | 11.20.19 | 08:59 | 10 | X | | | X | X | X | X | X | X | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | X |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.

***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**

**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| | 11.20.19 | 16:00 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |



12/6/2019

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

America C
268

Phone: 716 691 - 2600
Fax: 716 691 - 7991

TestAmerica Omaha SC
268

Company: SCS Engineers
Send Report To: Joel Stenberg
Address: 14755 Grover Street
City/State/Zip Code: Omaha, NE 68144
Telephone Number: (402) 884-6202 Fax: (402) 884-6203
Sampled by: (Print Name) Joe Warth
(Signature)

Your PO #: 27218345.00
Invoice To: SCS Engineers
Project Name: Sioux Falls LF State Wells
Project Number: 27218345.00
Email Address: JStenberg@scsengineers.com

| Sample ID | Date Sampled | Time Sampled | # of containers shipped | Grab | Composite | Field Filtered | Preservative: Ice | $HNO_3$ (Red & White Label) | HCl (Blue & White Label) | NaOH ( Orange & White Label) | $H_2SO_4$ Plastic (Yellow & White Lab | $H_2SO_4$ Glass(Yellow & White Label) | None (Black & White Label) | Other ( Specify) | Matrix: Groundwater | Wastewater | Drinking Water | Sludge | Soil | Other Specify: | Analyze For: Appendix 1 Volatiles | Alkalinity (total), BOD | Chloride, Sulfate | COD, Ammonia, TOC | Nitrate + Nitrite | Sulfide | Total Fe, Mn, Ca, Na, K | Dissolved Fe, Mn | Bicarbonate, Carbonate, Mg, Alkalinities | pH, TSS, TDS, TKN | RUSH TAT (Must call ahead | Standard TAT | E-mail results | Fax Results | Send QC with report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-54ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | X | X | | X | X | | X |
| ~~MW-56ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| ~~MW-57ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| MW-58Rox | 11.20.19 | 09:46 | 10 | X | | | X | X | X | X | X | X | X | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| ~~MW-59ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| ~~MW-60ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| ~~MW-61ox~~ | | | | X | | | | | | | | | | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| MW-13R | 11.20.19 | 10:45 | 10 | X | | | X | X | X | X | X | X | X | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| Duplicate | 11.20.19 | 23:59 | 10 | X | | | X | X | X | X | X | X | X | | X | | | | | | X | X | X | X | X | X | X | X | | | | X | X | | X |
| Trip Blank - 3 | — | — | 3 | | | | X | | X | | | | | | | | | | | | X | | | | | | | | | | | X | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**NOTE:** All turn around times are calculated from the time of receipt at TestAmerica.

***NOTICE:*** **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**

**NOTE:** There may be a charge assessed for TestAmerica disposing of sample remainders.

**NOTES:**

| Relinquished by: | Date | Time | Received by: | Date | Time | Relinquished by: | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Bob Sth | 11.20.19 | 16:00 | | | | | | |
| Shipped Via: | | | Comments: | | | Shipped Via: | | |
| Received for TestAmerica by: | Date | Time | Temperature Upon Receipt: | | | Laboratory Comments: | | |



12/6/2019

# Login Container Summary Report



Temperature readings: _____

| Client Sample ID | Lab ID | Container Type | Container pH | Preservative Added (mls) | Lot # |
|---|---|---|---|---|---|
| MW-44ox | 310-170451-A-1 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-44ox | 310-170451-B-1 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-44ox | 310-170451-C-1 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-44ox | 310-170451-D-1 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-53ox | 310-170451-A-2 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-53ox | 310-170451-B-2 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-53ox | 310-170451-C-2 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-53ox | 310-170451-D-2 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-58Rox | 310-170451-A-3 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-58Rox | 310-170451-B-3 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-58Rox | 310-170451-C-3 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-58Rox | 310-170451-D-3 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| MW-13R | 310-170451-A-4 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| MW-13R | 310-170451-B-4 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| MW-13R | 310-170451-C-4 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| MW-13R | 310-170451-D-4 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |
| Duplicate | 310-170451-A-5 | Plastic 250ml - w/nitric - dis | <2 | _____ | _____ |
| Duplicate | 310-170451-B-5 | Plastic 250ml - with Nitric Acid | <2 | _____ | _____ |
| Duplicate | 310-170451-C-5 | Plastic 500ml - with Sulfuric Acid | <2 | _____ | _____ |
| Duplicate | 310-170451-D-5 | Plastic 500ml - with Zn Acetate and | >12 | _____ | _____ |

**Eurofins TestAmerica, Cedar Falls**
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax. 319-277-2425

# Chain of Custody Record

eurofins

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Hayes, Shawn M | Carrier Tracking No(s): | COC No: 310-22285.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: shawn.hayes@testamericainc.com | State of Origin: South Dakota | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 310-170451-1 |
| Address: 2417 Bond Street, | Due Date Requested: 12/4/2019 | | | |
| City: University Park | TAT Requested (days): | | | |
| State, Zip: IL, 60484 | | | | |
| Phone: 708-534-5200(Tel) 708-534-5211(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Sioux Falls LF State Wells | Project #: 31001962 | | | |
| Site: | SSOW#: | | | |

310-170451 COC

**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:

**Analysis Requested**

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 5310C/ Total Organic Carbon | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | Preservation Code: | | | | | | | |
| MW-44ox (310-170451-1) | 11/20/19 | 08:16 Central | | Water | | | X | 2 | |
| MW-53ox (310-170451-2) | 11/20/19 | 08:59 Central | | Water | | | X | 2 | |
| MW-58Rox (310-170451-3) | 11/20/19 | 09:46 Central | | Water | | | X | 2 | |
| MW-13R (310-170451-4) | 11/20/19 | 10:45 Central | | Water | | | X | 2 | |
| Duplicate (310-170451-5) | 11/20/19 | 23:59 Central | | Water | | | X | 2 | |

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

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

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

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| T Rech | 12/19 1505 | | Shawn Scott | 11/22/19 0900 | TAL-CHL |
| 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: 0.6-7.6 |
|---|---|---|

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170451-1
SDG Number: 27218345.00

**Login Number: 170451**
**List Number: 1**
**Creator: Bindert, Lindsay A**

**List Source: Eurofins TestAmerica, Cedar Falls**

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

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-170451-1
SDG Number: 27218345.00

**Login Number: 170451**
**List Number: 2**
**Creator: Scott, Sherri L**

**List Source: Eurofins TestAmerica, Chicago**
**List Creation: 11/22/19 04:19 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | 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 | 1.6 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | True | |

# Appendix D

# Statistical Analysis Results

(Refer to the enclosed CD)

# Background Data Update

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

# Shapiro-Wilk Normality Test

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9621 | 0.878 | Yes |
| | square root | 0.9656 | 0.878 | Yes |
| | square | 0.9534 | 0.878 | Yes |
| | cube root | 0.9667 | 0.878 | Yes |
| | cube | 0.943 | 0.878 | Yes |
| | natural log | 0.9687 | 0.878 | Yes |
| | x^4 | 0.9309 | 0.878 | Yes |
| | x^5 | 0.9173 | 0.878 | Yes |
| | x^6 | 0.9024 | 0.878 | Yes |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9429 | 0.878 | Yes |
| | square root | 0.9542 | 0.878 | Yes |
| | square | 0.9102 | 0.878 | Yes |
| | cube root | 0.9572 | 0.878 | Yes |
| | cube | 0.8657 | 0.878 | No |
| | natural log | 0.9621 | 0.878 | Yes |
| | x^4 | 0.8123 | 0.878 | No |
| | x^5 | 0.7536 | 0.878 | No |
| | x^6 | 0.6933 | 0.878 | No |
| MW-23ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9488 | 0.873 | Yes |
| | square root | 0.9495 | 0.873 | Yes |
| | square | 0.9441 | 0.873 | Yes |
| | cube root | 0.9495 | 0.873 | Yes |
| | cube | 0.9354 | 0.873 | Yes |
| | natural log | 0.9491 | 0.873 | Yes |
| | x^4 | 0.9232 | 0.873 | Yes |
| | x^5 | 0.908 | 0.873 | Yes |
| | x^6 | 0.8904 | 0.873 | Yes |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9829 | 0.878 | Yes |
| | square root | 0.981 | 0.878 | Yes |
| | square | 0.9856 | 0.878 | Yes |
| | cube root | 0.9802 | 0.878 | Yes |
| | cube | 0.9868 | 0.878 | Yes |
| | natural log | 0.9786 | 0.878 | Yes |
| | x^4 | 0.9864 | 0.878 | Yes |
| | x^5 | 0.9845 | 0.878 | Yes |
| | x^6 | 0.9813 | 0.878 | Yes |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9432 | 0.73 | Yes |
| | square root | 0.9435 | 0.73 | Yes |
| | square | 0.9422 | 0.73 | Yes |
| | cube root | 0.9435 | 0.73 | Yes |
| | cube | 0.9408 | 0.73 | Yes |
| | natural log | 0.9436 | 0.73 | Yes |
| | x^4 | 0.9389 | 0.73 | Yes |
| | x^5 | 0.9365 | 0.73 | Yes |
| | x^6 | 0.9337 | 0.73 | Yes |
| Pooled Background (bg) (n = 94 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.9616 | 0.964 | No |
| | square root | 0.9682 | 0.964 | Yes |
| | square | 0.9313 | 0.964 | No |
| | cube root | 0.9693 | 0.964 | Yes |
| | cube | 0.8766 | 0.964 | No |
| | natural log | 0.97 | 0.964 | Yes |
| | x^4 | 0.7988 | 0.964 | No |
| | x^5 | 0.7046 | 0.964 | No |
| | x^6 | 0.6039 | 0.964 | No |

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

# Shapiro-Wilk Normality Test

Constituent: Ammonia as N Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | -1 | 0.878 | No |
| | square root | -1 | 0.878 | No |
| | square | -1 | 0.878 | No |
| | cube root | -1 | 0.878 | No |
| | cube | -1 | 0.878 | No |
| | natural log | 0 | 0.878 | No |
| | x^4 | -1 | 0.878 | No |
| | x^5 | -1 | 0.878 | No |
| | x^6 | -1 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.2207 | 0.878 | No |
| | square root | 0.2207 | 0.878 | No |
| | square | 0.2207 | 0.878 | No |
| | cube root | 0.2207 | 0.878 | No |
| | cube | 0.2207 | 0.878 | No |
| | natural log | 0.2207 | 0.878 | No |
| | x^4 | 0.2207 | 0.878 | No |
| | x^5 | 0.2207 | 0.878 | No |
| | x^6 | 0.2207 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.2207 | 0.878 | No |
| | square root | 0.2207 | 0.878 | No |
| | square | 0.2207 | 0.878 | No |
| | cube root | 0.2207 | 0.878 | No |
| | cube | 0.2207 | 0.878 | No |
| | natural log | 0.2207 | 0.878 | No |
| | x^4 | 0.2207 | 0.878 | No |
| | x^5 | 0.2207 | 0.878 | No |
| | x^6 | 0.2207 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | -1 | 0.878 | No |
| | square root | -1 | 0.878 | No |
| | square | -1 | 0.878 | No |
| | cube root | -1 | 0.878 | No |
| | cube | -1 | 0.878 | No |
| | natural log | 0 | 0.878 | No |
| | x^4 | -1 | 0.878 | No |
| | x^5 | -1 | 0.878 | No |
| | x^6 | -1 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | -1 | 0.73 | No |
| | square root | -1 | 0.73 | No |
| | square | -1 | 0.73 | No |
| | cube root | -1 | 0.73 | No |
| | cube | -1 | 0.73 | No |
| | natural log | -1 | 0.73 | No |
| | x^4 | -1 | 0.73 | No |
| | x^5 | -1 | 0.73 | No |
| | x^6 | -1 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.06411 | 0.965 | No |
| | square root | 0.06445 | 0.965 | No |
| | square | 0.06352 | 0.965 | No |
| | cube root | 0.06458 | 0.965 | No |
| | cube | 0.06306 | 0.965 | No |
| | natural log | 0.06483 | 0.965 | No |
| | x^4 | 0.06272 | 0.965 | No |
| | x^5 | 0.06246 | 0.965 | No |
| | x^6 | 0.06228 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Biochemical Oxygen Demand  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.3953 | 0.873 | No |
| | square root | 0.4174 | 0.873 | No |
| | square | 0.3404 | 0.873 | No |
| | cube root | 0.4233 | 0.873 | No |
| | cube | 0.2927 | 0.873 | No |
| | natural log | 0.4324 | 0.873 | No |
| | x^4 | 0.262 | 0.873 | No |
| | x^5 | 0.2448 | 0.873 | No |
| | x^6 | 0.2357 | 0.873 | No |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.4625 | 0.873 | No |
| | square root | 0.4904 | 0.873 | No |
| | square | 0.3875 | 0.873 | No |
| | cube root | 0.4973 | 0.873 | No |
| | cube | 0.3198 | 0.873 | No |
| | natural log | 0.5073 | 0.873 | No |
| | x^4 | 0.2761 | 0.873 | No |
| | x^5 | 0.2519 | 0.873 | No |
| | x^6 | 0.2393 | 0.873 | No |
| MW-23ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.3953 | 0.873 | No |
| | square root | 0.4174 | 0.873 | No |
| | square | 0.3404 | 0.873 | No |
| | cube root | 0.4233 | 0.873 | No |
| | cube | 0.2927 | 0.873 | No |
| | natural log | 0.4324 | 0.873 | No |
| | x^4 | 0.262 | 0.873 | No |
| | x^5 | 0.2448 | 0.873 | No |
| | x^6 | 0.2357 | 0.873 | No |
| MW-25ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.4625 | 0.873 | No |
| | square root | 0.4904 | 0.873 | No |
| | square | 0.3875 | 0.873 | No |
| | cube root | 0.4973 | 0.873 | No |
| | cube | 0.3198 | 0.873 | No |
| | natural log | 0.5073 | 0.873 | No |
| | x^4 | 0.2761 | 0.873 | No |
| | x^5 | 0.2519 | 0.873 | No |
| | x^6 | 0.2393 | 0.873 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.7803 | 0.73 | Yes |
| | square root | 0.8177 | 0.73 | Yes |
| | square | 0.672 | 0.73 | No |
| | cube root | 0.8253 | 0.73 | Yes |
| | cube | 0.5776 | 0.73 | No |
| | natural log | 0.8328 | 0.73 | Yes |
| | x^4 | 0.5189 | 0.73 | No |
| | x^5 | 0.4869 | 0.73 | No |
| | x^6 | 0.4702 | 0.73 | No |
| Pooled Background (bg) (n = 91 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.4559 | 0.962 | No |
| | square root | 0.4857 | 0.962 | No |
| | square | 0.381 | 0.962 | No |
| | cube root | 0.4935 | 0.962 | No |
| | cube | 0.316 | 0.962 | No |
| | natural log | 0.5055 | 0.962 | No |
| | x^4 | 0.2748 | 0.962 | No |
| | x^5 | 0.252 | 0.962 | No |
| | x^6 | 0.2402 | 0.962 | No |

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# Shapiro-Wilk Normality Test

Constituent: Calcium Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9319 | 0.873 | Yes |
| | square root | 0.9278 | 0.873 | Yes |
| | square | 0.9368 | 0.873 | Yes |
| | cube root | 0.9261 | 0.873 | Yes |
| | cube | 0.937 | 0.873 | Yes |
| | natural log | 0.9225 | 0.873 | Yes |
| | x^4 | 0.9323 | 0.873 | Yes |
| | x^5 | 0.9228 | 0.873 | Yes |
| | x^6 | 0.9089 | 0.873 | Yes |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9553 | 0.873 | Yes |
| | square root | 0.9378 | 0.873 | Yes |
| | square | 0.9534 | 0.873 | Yes |
| | cube root | 0.9288 | 0.873 | Yes |
| | cube | 0.9199 | 0.873 | Yes |
| | natural log | 0.9065 | 0.873 | Yes |
| | x^4 | 0.874 | 0.873 | Yes |
| | x^5 | 0.8264 | 0.873 | No |
| | x^6 | 0.7815 | 0.873 | No |
| MW-23ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.8894 | 0.873 | Yes |
| | square root | 0.8168 | 0.873 | No |
| | square | 0.9561 | 0.873 | Yes |
| | cube root | 0.7858 | 0.873 | No |
| | cube | 0.9675 | 0.873 | Yes |
| | natural log | 0.715 | 0.873 | No |
| | x^4 | 0.9572 | 0.873 | Yes |
| | x^5 | 0.9363 | 0.873 | Yes |
| | x^6 | 0.9091 | 0.873 | Yes |
| MW-25ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.8942 | 0.873 | Yes |
| | square root | 0.9051 | 0.873 | Yes |
| | square | 0.8675 | 0.873 | No |
| | cube root | 0.9084 | 0.873 | Yes |
| | cube | 0.8349 | 0.873 | No |
| | natural log | 0.9144 | 0.873 | Yes |
| | x^4 | 0.7971 | 0.873 | No |
| | x^5 | 0.7549 | 0.873 | No |
| | x^6 | 0.7096 | 0.873 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9157 | 0.73 | Yes |
| | square root | 0.9239 | 0.73 | Yes |
| | square | 0.8962 | 0.73 | Yes |
| | cube root | 0.9264 | 0.73 | Yes |
| | cube | 0.8731 | 0.73 | Yes |
| | natural log | 0.931 | 0.73 | Yes |
| | x^4 | 0.8471 | 0.73 | Yes |
| | x^5 | 0.8192 | 0.73 | Yes |
| | x^6 | 0.79 | 0.73 | Yes |
| Pooled Background (bg) (n = 91 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.9363 | 0.962 | No |
| | square root | 0.9199 | 0.962 | No |
| | square | 0.9423 | 0.962 | No |
| | cube root | 0.9117 | 0.962 | No |
| | cube | 0.9283 | 0.962 | No |
| | natural log | 0.8901 | 0.962 | No |
| | x^4 | 0.9056 | 0.962 | No |
| | x^5 | 0.8792 | 0.962 | No |
| | x^6 | 0.8515 | 0.962 | No |

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# Shapiro-Wilk Normality Test

Constituent: Chemical Oxygen Demand  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.6968 | 0.873 | No |
| | square root | 0.7214 | 0.873 | No |
| | square | 0.6378 | 0.873 | No |
| | cube root | 0.7286 | 0.873 | No |
| | cube | 0.5752 | 0.873 | No |
| | natural log | 0.7414 | 0.873 | No |
| | x^4 | 0.5188 | 0.873 | No |
| | x^5 | 0.4734 | 0.873 | No |
| | x^6 | 0.4393 | 0.873 | No |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.5175 | 0.873 | No |
| | square root | 0.5185 | 0.873 | No |
| | square | 0.514 | 0.873 | No |
| | cube root | 0.5187 | 0.873 | No |
| | cube | 0.508 | 0.873 | No |
| | natural log | 0.519 | 0.873 | No |
| | x^4 | 0.4996 | 0.873 | No |
| | x^5 | 0.4889 | 0.873 | No |
| | x^6 | 0.476 | 0.873 | No |
| MW-23ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.6759 | 0.873 | No |
| | square root | 0.7092 | 0.873 | No |
| | square | 0.605 | 0.873 | No |
| | cube root | 0.7196 | 0.873 | No |
| | cube | 0.5383 | 0.873 | No |
| | natural log | 0.7391 | 0.873 | No |
| | x^4 | 0.483 | 0.873 | No |
| | x^5 | 0.441 | 0.873 | No |
| | x^6 | 0.411 | 0.873 | No |
| MW-25ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.7237 | 0.873 | No |
| | square root | 0.7258 | 0.873 | No |
| | square | 0.7122 | 0.873 | No |
| | cube root | 0.726 | 0.873 | No |
| | cube | 0.6911 | 0.873 | No |
| | natural log | 0.7258 | 0.873 | No |
| | x^4 | 0.6621 | 0.873 | No |
| | x^5 | 0.6282 | 0.873 | No |
| | x^6 | 0.5929 | 0.873 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.65 | 0.73 | No |
| | square root | 0.647 | 0.73 | No |
| | square | 0.6519 | 0.73 | No |
| | cube root | 0.6458 | 0.73 | No |
| | cube | 0.6473 | 0.73 | No |
| | natural log | 0.6432 | 0.73 | No |
| | x^4 | 0.6361 | 0.73 | No |
| | x^5 | 0.62 | 0.73 | No |
| | x^6 | 0.6011 | 0.73 | No |
| Pooled Background (bg) (n = 91 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.657 | 0.962 | No |
| | square root | 0.6791 | 0.962 | No |
| | square | 0.6007 | 0.962 | No |
| | cube root | 0.6854 | 0.962 | No |
| | cube | 0.5345 | 0.962 | No |
| | natural log | 0.6966 | 0.962 | No |
| | x^4 | 0.468 | 0.962 | No |
| | x^5 | 0.4081 | 0.962 | No |
| | x^6 | 0.3578 | 0.962 | No |

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# Shapiro-Wilk Normality Test

Constituent: Chloride Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 33, alpha = 0.01) | | | | |
| | no | 0.6772 | 0.906 | No |
| | square root | 0.802 | 0.906 | No |
| | square | 0.5577 | 0.906 | No |
| | cube root | 0.8503 | 0.906 | No |
| | cube | 0.5151 | 0.906 | No |
| | natural log | 0.9248 | 0.906 | Yes |
| | x^4 | 0.488 | 0.906 | No |
| | x^5 | 0.4619 | 0.906 | No |
| | x^6 | 0.4356 | 0.906 | No |
| MW-21ox (bg) (n = 32, alpha = 0.01) | | | | |
| | no | 0.8997 | 0.904 | No |
| | square root | 0.8782 | 0.904 | No |
| | square | 0.9243 | 0.904 | Yes |
| | cube root | 0.87 | 0.904 | No |
| | cube | 0.9218 | 0.904 | Yes |
| | natural log | 0.8522 | 0.904 | No |
| | x^4 | 0.8962 | 0.904 | No |
| | x^5 | 0.8559 | 0.904 | No |
| | x^6 | 0.8088 | 0.904 | No |
| MW-23ox (bg) (n = 37, alpha = 0.01) | | | | |
| | no | 0.9628 | 0.914 | Yes |
| | square root | 0.9887 | 0.914 | Yes |
| | square | 0.8226 | 0.914 | No |
| | cube root | 0.988 | 0.914 | Yes |
| | cube | 0.6444 | 0.914 | No |
| | natural log | 0.9711 | 0.914 | Yes |
| | x^4 | 0.4916 | 0.914 | No |
| | x^5 | 0.3821 | 0.914 | No |
| | x^6 | 0.3096 | 0.914 | No |
| MW-25ox (bg) (n = 32, alpha = 0.01) | | | | |
| | no | 0.9308 | 0.904 | Yes |
| | square root | 0.8669 | 0.904 | No |
| | square | 0.9213 | 0.904 | Yes |
| | cube root | 0.8318 | 0.904 | No |
| | cube | 0.8479 | 0.904 | No |
| | natural log | 0.7437 | 0.904 | No |
| | x^4 | 0.7704 | 0.904 | No |
| | x^5 | 0.7004 | 0.904 | No |
| | x^6 | 0.6385 | 0.904 | No |
| MW-61ox (bg) (n = 5, alpha = 0.01) | | | | |
| | no | 0.9588 | 0.686 | Yes |
| | square root | 0.9591 | 0.686 | Yes |
| | square | 0.9538 | 0.686 | Yes |
| | cube root | 0.9589 | 0.686 | Yes |
| | cube | 0.9427 | 0.686 | Yes |
| | natural log | 0.9579 | 0.686 | Yes |
| | x^4 | 0.926 | 0.686 | Yes |
| | x^5 | 0.9046 | 0.686 | Yes |
| | x^6 | 0.8797 | 0.686 | Yes |
| Pooled Background (bg) (n = 139: Chi-Squared used, alpha = 0.05) | | | | |
| | no | 400.4 | 14.07 | No |
| | square root | 129.4 | 14.07 | No |
| | square | 500.6 | 14.07 | No |
| | cube root | 92.01 | 14.07 | No |
| | cube | 1098 | 14.07 | No |
| | natural log | 38.48 | 14.07 | No |
| | x^4 | 1136 | 14.07 | No |
| | x^5 | 1136 | 14.07 | No |
| | x^6 | 1136 | 14.07 | No |

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# Shapiro-Wilk Normality Test

Constituent: Iron [total] Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.7075 | 0.878 | No |
| | square root | 0.7386 | 0.878 | No |
| | square | 0.6461 | 0.878 | No |
| | cube root | 0.7481 | 0.878 | No |
| | cube | 0.5967 | 0.878 | No |
| | natural log | 0.7648 | 0.878 | No |
| | x^4 | 0.5573 | 0.878 | No |
| | x^5 | 0.523 | 0.878 | No |
| | x^6 | 0.4913 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.7698 | 0.878 | No |
| | square root | 0.8698 | 0.878 | No |
| | square | 0.5803 | 0.878 | No |
| | cube root | 0.8988 | 0.878 | Yes |
| | cube | 0.4498 | 0.878 | No |
| | natural log | 0.944 | 0.878 | Yes |
| | x^4 | 0.3692 | 0.878 | No |
| | x^5 | 0.3194 | 0.878 | No |
| | x^6 | 0.2878 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.2388 | 0.878 | No |
| | square root | 0.2982 | 0.878 | No |
| | square | 0.2214 | 0.878 | No |
| | cube root | 0.3372 | 0.878 | No |
| | cube | 0.2207 | 0.878 | No |
| | natural log | 0.4349 | 0.878 | No |
| | x^4 | 0.2207 | 0.878 | No |
| | x^5 | 0.2207 | 0.878 | No |
| | x^6 | 0.2207 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.3952 | 0.878 | No |
| | square root | 0.407 | 0.878 | No |
| | square | 0.37 | 0.878 | No |
| | cube root | 0.4103 | 0.878 | No |
| | cube | 0.3511 | 0.878 | No |
| | natural log | 0.4158 | 0.878 | No |
| | x^4 | 0.3403 | 0.878 | No |
| | x^5 | 0.3349 | 0.878 | No |
| | x^6 | 0.3322 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.7281 | 0.73 | No |
| | square root | 0.733 | 0.73 | Yes |
| | square | 0.6999 | 0.73 | No |
| | cube root | 0.7329 | 0.73 | Yes |
| | cube | 0.6661 | 0.73 | No |
| | natural log | 0.73 | 0.73 | Yes |
| | x^4 | 0.6402 | 0.73 | No |
| | x^5 | 0.6237 | 0.73 | No |
| | x^6 | 0.6138 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.1205 | 0.965 | No |
| | square root | 0.3358 | 0.965 | No |
| | square | 0.06458 | 0.965 | No |
| | cube root | 0.466 | 0.965 | No |
| | cube | 0.06206 | 0.965 | No |
| | natural log | 0.6815 | 0.965 | No |
| | x^4 | 0.06192 | 0.965 | No |
| | x^5 | 0.06191 | 0.965 | No |
| | x^6 | 0.06191 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Iron, Dissolved  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.384 | 0.878 | No |
| | square root | 0.3974 | 0.878 | No |
| | square | 0.3595 | 0.878 | No |
| | cube root | 0.4015 | 0.878 | No |
| | cube | 0.3439 | 0.878 | No |
| | natural log | 0.4089 | 0.878 | No |
| | x^4 | 0.336 | 0.878 | No |
| | x^5 | 0.3325 | 0.878 | No |
| | x^6 | 0.331 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.7275 | 0.878 | No |
| | square root | 0.8333 | 0.878 | No |
| | square | 0.5124 | 0.878 | No |
| | cube root | 0.862 | 0.878 | No |
| | cube | 0.376 | 0.878 | No |
| | natural log | 0.9054 | 0.878 | Yes |
| | x^4 | 0.3047 | 0.878 | No |
| | x^5 | 0.2676 | 0.878 | No |
| | x^6 | 0.2475 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.3528 | 0.878 | No |
| | square root | 0.363 | 0.878 | No |
| | square | 0.3393 | 0.878 | No |
| | cube root | 0.3668 | 0.878 | No |
| | cube | 0.3333 | 0.878 | No |
| | natural log | 0.3749 | 0.878 | No |
| | x^4 | 0.3311 | 0.878 | No |
| | x^5 | 0.3303 | 0.878 | No |
| | x^6 | 0.3301 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.3429 | 0.878 | No |
| | square root | 0.3496 | 0.878 | No |
| | square | 0.3348 | 0.878 | No |
| | cube root | 0.3522 | 0.878 | No |
| | cube | 0.3316 | 0.878 | No |
| | natural log | 0.3581 | 0.878 | No |
| | x^4 | 0.3305 | 0.878 | No |
| | x^5 | 0.3301 | 0.878 | No |
| | x^6 | 0.33 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.6008 | 0.73 | No |
| | square root | 0.6008 | 0.73 | No |
| | square | 0.6008 | 0.73 | No |
| | cube root | 0.6008 | 0.73 | No |
| | cube | 0.6008 | 0.73 | No |
| | natural log | 0.6008 | 0.73 | No |
| | x^4 | 0.6008 | 0.73 | No |
| | x^5 | 0.6008 | 0.73 | No |
| | x^6 | 0.6008 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.5137 | 0.965 | No |
| | square root | 0.5554 | 0.965 | No |
| | square | 0.4041 | 0.965 | No |
| | cube root | 0.567 | 0.965 | No |
| | cube | 0.2842 | 0.965 | No |
| | natural log | 0.5866 | 0.965 | No |
| | x^4 | 0.1909 | 0.965 | No |
| | x^5 | 0.1339 | 0.965 | No |
| | x^6 | 0.1022 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Manganese Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9458 | 0.878 | Yes |
| | square root | 0.9492 | 0.878 | Yes |
| | square | 0.8287 | 0.878 | No |
| | cube root | 0.9256 | 0.878 | Yes |
| | cube | 0.7137 | 0.878 | No |
| | natural log | 0.8322 | 0.878 | No |
| | x^4 | 0.6228 | 0.878 | No |
| | x^5 | 0.5535 | 0.878 | No |
| | x^6 | 0.5011 | 0.878 | No |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.7487 | 0.873 | No |
| | square root | 0.8721 | 0.873 | No |
| | square | 0.5246 | 0.873 | No |
| | cube root | 0.9048 | 0.873 | Yes |
| | cube | 0.4003 | 0.873 | No |
| | natural log | 0.9468 | 0.873 | Yes |
| | x^4 | 0.3375 | 0.873 | No |
| | x^5 | 0.3027 | 0.873 | No |
| | x^6 | 0.281 | 0.873 | No |
| MW-23ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.6334 | 0.873 | No |
| | square root | 0.7175 | 0.873 | No |
| | square | 0.4487 | 0.873 | No |
| | cube root | 0.7394 | 0.873 | No |
| | cube | 0.3314 | 0.873 | No |
| | natural log | 0.772 | 0.873 | No |
| | x^4 | 0.2753 | 0.873 | No |
| | x^5 | 0.2498 | 0.873 | No |
| | x^6 | 0.2378 | 0.873 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.6208 | 0.878 | No |
| | square root | 0.7979 | 0.878 | No |
| | square | 0.3953 | 0.878 | No |
| | cube root | 0.8534 | 0.878 | No |
| | cube | 0.3064 | 0.878 | No |
| | natural log | 0.934 | 0.878 | Yes |
| | x^4 | 0.2672 | 0.878 | No |
| | x^5 | 0.2472 | 0.878 | No |
| | x^6 | 0.2361 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.8325 | 0.73 | Yes |
| | square root | 0.8929 | 0.73 | Yes |
| | square | 0.6872 | 0.73 | No |
| | cube root | 0.9073 | 0.73 | Yes |
| | cube | 0.5802 | 0.73 | No |
| | natural log | 0.9255 | 0.73 | Yes |
| | x^4 | 0.5198 | 0.73 | No |
| | x^5 | 0.488 | 0.73 | No |
| | x^6 | 0.4715 | 0.73 | No |
| Pooled Background (bg) (n = 93 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.7422 | 0.963 | No |
| | square root | 0.8955 | 0.963 | No |
| | square | 0.4561 | 0.963 | No |
| | cube root | 0.9288 | 0.963 | No |
| | cube | 0.2854 | 0.963 | No |
| | natural log | 0.9486 | 0.963 | No |
| | x^4 | 0.1909 | 0.963 | No |
| | x^5 | 0.1393 | 0.963 | No |
| | x^6 | 0.1105 | 0.963 | No |

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# Shapiro-Wilk Normality Test

Constituent: Manganese, Dissolved  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.8574 | 0.878 | No |
| | square root | 0.9264 | 0.878 | Yes |
| | square | 0.7372 | 0.878 | No |
| | cube root | 0.9369 | 0.878 | Yes |
| | cube | 0.66 | 0.878 | No |
| | natural log | 0.9093 | 0.878 | Yes |
| | x^4 | 0.6026 | 0.878 | No |
| | x^5 | 0.5573 | 0.878 | No |
| | x^6 | 0.5199 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.8294 | 0.878 | No |
| | square root | 0.9369 | 0.878 | Yes |
| | square | 0.5824 | 0.878 | No |
| | cube root | 0.9522 | 0.878 | Yes |
| | cube | 0.4278 | 0.878 | No |
| | natural log | 0.9285 | 0.878 | Yes |
| | x^4 | 0.3449 | 0.878 | No |
| | x^5 | 0.2994 | 0.878 | No |
| | x^6 | 0.2729 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5933 | 0.878 | No |
| | square root | 0.6317 | 0.878 | No |
| | square | 0.508 | 0.878 | No |
| | cube root | 0.6427 | 0.878 | No |
| | cube | 0.4394 | 0.878 | No |
| | natural log | 0.6613 | 0.878 | No |
| | x^4 | 0.3956 | 0.878 | No |
| | x^5 | 0.3695 | 0.878 | No |
| | x^6 | 0.3534 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5933 | 0.878 | No |
| | square root | 0.7465 | 0.878 | No |
| | square | 0.4133 | 0.878 | No |
| | cube root | 0.7962 | 0.878 | No |
| | cube | 0.3586 | 0.878 | No |
| | natural log | 0.8724 | 0.878 | No |
| | x^4 | 0.3438 | 0.878 | No |
| | x^5 | 0.3402 | 0.878 | No |
| | x^6 | 0.3396 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9408 | 0.73 | Yes |
| | square root | 0.9689 | 0.73 | Yes |
| | square | 0.8489 | 0.73 | Yes |
| | cube root | 0.9728 | 0.73 | Yes |
| | cube | 0.7609 | 0.73 | Yes |
| | natural log | 0.97 | 0.73 | Yes |
| | x^4 | 0.6938 | 0.73 | No |
| | x^5 | 0.6444 | 0.73 | No |
| | x^6 | 0.6069 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.7553 | 0.965 | No |
| | square root | 0.8902 | 0.965 | No |
| | square | 0.5014 | 0.965 | No |
| | cube root | 0.9166 | 0.965 | No |
| | cube | 0.3693 | 0.965 | No |
| | natural log | 0.9273 | 0.965 | No |
| | x^4 | 0.2974 | 0.965 | No |
| | x^5 | 0.2521 | 0.965 | No |
| | x^6 | 0.2202 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Nitrate Nitrite as N  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.947 | 0.878 | Yes |
| | square root | 0.9213 | 0.878 | Yes |
| | square | 0.9558 | 0.878 | Yes |
| | cube root | 0.9084 | 0.878 | Yes |
| | cube | 0.931 | 0.878 | Yes |
| | natural log | 0.8753 | 0.878 | No |
| | x^4 | 0.8896 | 0.878 | Yes |
| | x^5 | 0.8414 | 0.878 | No |
| | x^6 | 0.7921 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.7357 | 0.878 | No |
| | square root | 0.8592 | 0.878 | No |
| | square | 0.4281 | 0.878 | No |
| | cube root | 0.8601 | 0.878 | No |
| | cube | 0.3063 | 0.878 | No |
| | natural log | 0.8124 | 0.878 | No |
| | x^4 | 0.2603 | 0.878 | No |
| | x^5 | 0.2404 | 0.878 | No |
| | x^6 | 0.231 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.948 | 0.878 | Yes |
| | square root | 0.9318 | 0.878 | Yes |
| | square | 0.8758 | 0.878 | No |
| | cube root | 0.913 | 0.878 | Yes |
| | cube | 0.7814 | 0.878 | No |
| | natural log | 0.8543 | 0.878 | No |
| | x^4 | 0.7081 | 0.878 | No |
| | x^5 | 0.6555 | 0.878 | No |
| | x^6 | 0.6173 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5998 | 0.878 | No |
| | square root | 0.7324 | 0.878 | No |
| | square | 0.3223 | 0.878 | No |
| | cube root | 0.7427 | 0.878 | No |
| | cube | 0.2448 | 0.878 | No |
| | natural log | 0.7261 | 0.878 | No |
| | x^4 | 0.2266 | 0.878 | No |
| | x^5 | 0.2222 | 0.878 | No |
| | x^6 | 0.2211 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9308 | 0.73 | Yes |
| | square root | 0.9103 | 0.73 | Yes |
| | square | 0.8785 | 0.73 | Yes |
| | cube root | 0.896 | 0.73 | Yes |
| | cube | 0.7824 | 0.73 | Yes |
| | natural log | 0.8594 | 0.73 | Yes |
| | x^4 | 0.7016 | 0.73 | No |
| | x^5 | 0.6426 | 0.73 | No |
| | x^6 | 0.5995 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.8453 | 0.965 | No |
| | square root | 0.9034 | 0.965 | No |
| | square | 0.7178 | 0.965 | No |
| | cube root | 0.9154 | 0.965 | No |
| | cube | 0.5786 | 0.965 | No |
| | natural log | 0.896 | 0.965 | No |
| | x^4 | 0.4607 | 0.965 | No |
| | x^5 | 0.3756 | 0.965 | No |
| | x^6 | 0.3172 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Potassium Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9414 | 0.873 | Yes |
| | square root | 0.9476 | 0.873 | Yes |
| | square | 0.9245 | 0.873 | Yes |
| | cube root | 0.9493 | 0.873 | Yes |
| | cube | 0.9018 | 0.873 | Yes |
| | natural log | 0.9523 | 0.873 | Yes |
| | x^4 | 0.8737 | 0.873 | Yes |
| | x^5 | 0.841 | 0.873 | No |
| | x^6 | 0.8048 | 0.873 | No |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.874 | 0.873 | Yes |
| | square root | 0.9083 | 0.873 | Yes |
| | square | 0.7956 | 0.873 | No |
| | cube root | 0.918 | 0.873 | Yes |
| | cube | 0.7223 | 0.873 | No |
| | natural log | 0.9342 | 0.873 | Yes |
| | x^4 | 0.6621 | 0.873 | No |
| | x^5 | 0.6145 | 0.873 | No |
| | x^6 | 0.5762 | 0.873 | No |
| MW-23ox (bg) (n = 20, alpha = 0.01) | | | | |
| | no | 0.9235 | 0.868 | Yes |
| | square root | 0.9253 | 0.868 | Yes |
| | square | 0.9084 | 0.868 | Yes |
| | cube root | 0.9249 | 0.868 | Yes |
| | cube | 0.8834 | 0.868 | Yes |
| | natural log | 0.9225 | 0.868 | Yes |
| | x^4 | 0.8545 | 0.868 | No |
| | x^5 | 0.8256 | 0.868 | No |
| | x^6 | 0.7988 | 0.868 | No |
| MW-25ox (bg) (n = 20, alpha = 0.01) | | | | |
| | no | 0.8754 | 0.868 | Yes |
| | square root | 0.8896 | 0.868 | Yes |
| | square | 0.8408 | 0.868 | No |
| | cube root | 0.8939 | 0.868 | Yes |
| | cube | 0.7991 | 0.868 | No |
| | natural log | 0.9018 | 0.868 | Yes |
| | x^4 | 0.7522 | 0.868 | No |
| | x^5 | 0.7027 | 0.868 | No |
| | x^6 | 0.6533 | 0.868 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9121 | 0.73 | Yes |
| | square root | 0.9331 | 0.73 | Yes |
| | square | 0.864 | 0.73 | Yes |
| | cube root | 0.9395 | 0.73 | Yes |
| | cube | 0.8119 | 0.73 | Yes |
| | natural log | 0.9513 | 0.73 | Yes |
| | x^4 | 0.7601 | 0.73 | Yes |
| | x^5 | 0.7119 | 0.73 | No |
| | x^6 | 0.6687 | 0.73 | No |
| Pooled Background (bg) (n = 89 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.8748 | 0.961 | No |
| | square root | 0.8904 | 0.961 | No |
| | square | 0.8285 | 0.961 | No |
| | cube root | 0.8936 | 0.961 | No |
| | cube | 0.7798 | 0.961 | No |
| | natural log | 0.8967 | 0.961 | No |
| | x^4 | 0.7361 | 0.961 | No |
| | x^5 | 0.6955 | 0.961 | No |
| | x^6 | 0.655 | 0.961 | No |

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# Shapiro-Wilk Normality Test

Constituent: Sodium [total] Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9733 | 0.873 | Yes |
| | square root | 0.9723 | 0.873 | Yes |
| | square | 0.9743 | 0.873 | Yes |
| | cube root | 0.9719 | 0.873 | Yes |
| | cube | 0.9738 | 0.873 | Yes |
| | natural log | 0.971 | 0.873 | Yes |
| | x^4 | 0.972 | 0.873 | Yes |
| | x^5 | 0.9689 | 0.873 | Yes |
| | x^6 | 0.9645 | 0.873 | Yes |
| MW-21ox (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.8751 | 0.873 | Yes |
| | square root | 0.9035 | 0.873 | Yes |
| | square | 0.8127 | 0.873 | No |
| | cube root | 0.9123 | 0.873 | Yes |
| | cube | 0.7505 | 0.873 | No |
| | natural log | 0.9284 | 0.873 | Yes |
| | x^4 | 0.6944 | 0.873 | No |
| | x^5 | 0.6466 | 0.873 | No |
| | x^6 | 0.6067 | 0.873 | No |
| MW-23ox (bg) (n = 20, alpha = 0.01) | | | | |
| | no | 0.9534 | 0.868 | Yes |
| | square root | 0.9511 | 0.868 | Yes |
| | square | 0.9426 | 0.868 | Yes |
| | cube root | 0.949 | 0.868 | Yes |
| | cube | 0.9173 | 0.868 | Yes |
| | natural log | 0.9427 | 0.868 | Yes |
| | x^4 | 0.8843 | 0.868 | Yes |
| | x^5 | 0.8485 | 0.868 | No |
| | x^6 | 0.8122 | 0.868 | No |
| MW-25ox (bg) (n = 20, alpha = 0.01) | | | | |
| | no | 0.9526 | 0.868 | Yes |
| | square root | 0.9564 | 0.868 | Yes |
| | square | 0.9435 | 0.868 | Yes |
| | cube root | 0.9575 | 0.868 | Yes |
| | cube | 0.9324 | 0.868 | Yes |
| | natural log | 0.9596 | 0.868 | Yes |
| | x^4 | 0.9195 | 0.868 | Yes |
| | x^5 | 0.9051 | 0.868 | Yes |
| | x^6 | 0.8893 | 0.868 | Yes |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9784 | 0.73 | Yes |
| | square root | 0.9766 | 0.73 | Yes |
| | square | 0.9806 | 0.73 | Yes |
| | cube root | 0.9759 | 0.73 | Yes |
| | cube | 0.9811 | 0.73 | Yes |
| | natural log | 0.9745 | 0.73 | Yes |
| | x^4 | 0.98 | 0.73 | Yes |
| | x^5 | 0.9773 | 0.73 | Yes |
| | x^6 | 0.9729 | 0.73 | Yes |
| Pooled Background (bg) (n = 89 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.9621 | 0.961 | Yes |
| | square root | 0.9662 | 0.961 | Yes |
| | square | 0.9143 | 0.961 | No |
| | cube root | 0.9636 | 0.961 | Yes |
| | cube | 0.8362 | 0.961 | No |
| | natural log | 0.9522 | 0.961 | No |
| | x^4 | 0.7455 | 0.961 | No |
| | x^5 | 0.6536 | 0.961 | No |
| | x^6 | 0.5683 | 0.961 | No |

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# Shapiro-Wilk Normality Test

Constituent: Sulfate Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9201 | 0.878 | Yes |
| | square root | 0.9236 | 0.878 | Yes |
| | square | 0.9127 | 0.878 | Yes |
| | cube root | 0.9247 | 0.878 | Yes |
| | cube | 0.9048 | 0.878 | Yes |
| | natural log | 0.9269 | 0.878 | Yes |
| | x^4 | 0.8965 | 0.878 | Yes |
| | x^5 | 0.8878 | 0.878 | Yes |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9769 | 0.878 | Yes |
| | square root | 0.9617 | 0.878 | Yes |
| | square | 0.9268 | 0.878 | Yes |
| | cube root | 0.9493 | 0.878 | Yes |
| | cube | 0.8245 | 0.878 | No |
| | natural log | 0.9141 | 0.878 | Yes |
| | x^4 | 0.7195 | 0.878 | No |
| | x^5 | 0.6309 | 0.878 | No |
| | x^6 | 0.5613 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.9462 | 0.878 | Yes |
| | square root | 0.9297 | 0.878 | Yes |
| | square | 0.9644 | 0.878 | Yes |
| | cube root | 0.9232 | 0.878 | Yes |
| | cube | 0.9637 | 0.878 | Yes |
| | natural log | 0.9085 | 0.878 | Yes |
| | x^4 | 0.9463 | 0.878 | Yes |
| | x^5 | 0.9157 | 0.878 | Yes |
| | x^6 | 0.8754 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.8712 | 0.878 | No |
| | square root | 0.8927 | 0.878 | Yes |
| | square | 0.8264 | 0.878 | No |
| | cube root | 0.8994 | 0.878 | Yes |
| | cube | 0.7839 | 0.878 | No |
| | natural log | 0.9118 | 0.878 | Yes |
| | x^4 | 0.746 | 0.878 | No |
| | x^5 | 0.7126 | 0.878 | No |
| | x^6 | 0.6824 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.8461 | 0.73 | Yes |
| | square root | 0.8412 | 0.73 | Yes |
| | square | 0.8554 | 0.73 | Yes |
| | cube root | 0.8396 | 0.73 | Yes |
| | cube | 0.8638 | 0.73 | Yes |
| | natural log | 0.8362 | 0.73 | Yes |
| | x^4 | 0.8712 | 0.73 | Yes |
| | x^5 | 0.8774 | 0.73 | Yes |
| | x^6 | 0.8823 | 0.73 | Yes |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.9503 | 0.965 | No |
| | square root | 0.9472 | 0.965 | No |
| | square | 0.9199 | 0.965 | No |
| | cube root | 0.9414 | 0.965 | No |
| | cube | 0.8756 | 0.965 | No |
| | natural log | 0.9203 | 0.965 | No |
| | x^4 | 0.8331 | 0.965 | No |
| | x^5 | 0.7947 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Sulfide Analysis Run 2/14/2020 5:38 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5501 | 0.878 | No |
| | square root | 0.5496 | 0.878 | No |
| | square | 0.5487 | 0.878 | No |
| | cube root | 0.5492 | 0.878 | No |
| | cube | 0.5452 | 0.878 | No |
| | natural log | 0.5481 | 0.878 | No |
| | x^4 | 0.5409 | 0.878 | No |
| | x^5 | 0.5368 | 0.878 | No |
| | x^6 | 0.5333 | 0.878 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5346 | 0.878 | No |
| | square root | 0.5356 | 0.878 | No |
| | square | 0.5323 | 0.878 | No |
| | cube root | 0.5359 | 0.878 | No |
| | cube | 0.53 | 0.878 | No |
| | natural log | 0.5365 | 0.878 | No |
| | x^4 | 0.528 | 0.878 | No |
| | x^5 | 0.5264 | 0.878 | No |
| | x^6 | 0.5252 | 0.878 | No |
| MW-23ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.5687 | 0.878 | No |
| | square root | 0.5617 | 0.878 | No |
| | square | 0.5846 | 0.878 | No |
| | cube root | 0.5595 | 0.878 | No |
| | cube | 0.602 | 0.878 | No |
| | natural log | 0.5554 | 0.878 | No |
| | x^4 | 0.62 | 0.878 | No |
| | x^5 | 0.6371 | 0.878 | No |
| | x^6 | 0.6519 | 0.878 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.6601 | 0.878 | No |
| | square root | 0.6446 | 0.878 | No |
| | square | 0.6815 | 0.878 | No |
| | cube root | 0.6392 | 0.878 | No |
| | cube | 0.6787 | 0.878 | No |
| | natural log | 0.6282 | 0.878 | No |
| | x^4 | 0.6447 | 0.878 | No |
| | x^5 | 0.5859 | 0.878 | No |
| | x^6 | 0.518 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.4533 | 0.73 | No |
| | square root | 0.4533 | 0.73 | No |
| | square | 0.4533 | 0.73 | No |
| | cube root | 0.4533 | 0.73 | No |
| | cube | 0.4533 | 0.73 | No |
| | natural log | 0.4533 | 0.73 | No |
| | x^4 | 0.4533 | 0.73 | No |
| | x^5 | 0.4533 | 0.73 | No |
| | x^6 | 0.4533 | 0.73 | No |
| Pooled Background (bg) (n = 95 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.577 | 0.965 | No |
| | square root | 0.5706 | 0.965 | No |
| | square | 0.5875 | 0.965 | No |
| | cube root | 0.5684 | 0.965 | No |
| | cube | 0.5904 | 0.965 | No |
| | natural log | 0.564 | 0.965 | No |
| | x^4 | 0.5781 | 0.965 | No |
| | x^5 | 0.5441 | 0.965 | No |
| | x^6 | 0.4876 | 0.965 | No |

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# Shapiro-Wilk Normality Test

Constituent: Total Organic Carbon  Analysis Run 2/14/2020 5:38 PM  View: Background Analysis
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

| Well | Transformation | Calculated | Critical | Normal |
|---|---|---|---|---|
| MW-11 (bg) (n = 21, alpha = 0.01) | | | | |
| | no | 0.9062 | 0.873 | Yes |
| | square root | 0.885 | 0.873 | Yes |
| | square | 0.8302 | 0.873 | No |
| | cube root | 0.8628 | 0.873 | No |
| | cube | 0.7268 | 0.873 | No |
| | natural log | 0.7955 | 0.873 | No |
| | x^4 | 0.6412 | 0.873 | No |
| | x^5 | 0.5747 | 0.873 | No |
| | x^6 | 0.5227 | 0.873 | No |
| MW-21ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.853 | 0.878 | No |
| | square root | 0.8899 | 0.878 | Yes |
| | square | 0.7712 | 0.878 | No |
| | cube root | 0.9012 | 0.878 | Yes |
| | cube | 0.689 | 0.878 | No |
| | natural log | 0.922 | 0.878 | Yes |
| | x^4 | 0.6149 | 0.878 | No |
| | x^5 | 0.5528 | 0.878 | No |
| | x^6 | 0.5031 | 0.878 | No |
| MW-23ox (bg) (n = 20, alpha = 0.01) | | | | |
| | no | 0.8722 | 0.868 | Yes |
| | square root | 0.8857 | 0.868 | Yes |
| | square | 0.8429 | 0.868 | No |
| | cube root | 0.89 | 0.868 | Yes |
| | cube | 0.8113 | 0.868 | No |
| | natural log | 0.8983 | 0.868 | Yes |
| | x^4 | 0.7783 | 0.868 | No |
| | x^5 | 0.7448 | 0.868 | No |
| | x^6 | 0.7114 | 0.868 | No |
| MW-25ox (bg) (n = 22, alpha = 0.01) | | | | |
| | no | 0.7261 | 0.878 | No |
| | square root | 0.7588 | 0.878 | No |
| | square | 0.6602 | 0.878 | No |
| | cube root | 0.7695 | 0.878 | No |
| | cube | 0.5973 | 0.878 | No |
| | natural log | 0.7905 | 0.878 | No |
| | x^4 | 0.5406 | 0.878 | No |
| | x^5 | 0.4916 | 0.878 | No |
| | x^6 | 0.4504 | 0.878 | No |
| MW-61ox (bg) (n = 7, alpha = 0.01) | | | | |
| | no | 0.9836 | 0.73 | Yes |
| | square root | 0.982 | 0.73 | Yes |
| | square | 0.9837 | 0.73 | Yes |
| | cube root | 0.9813 | 0.73 | Yes |
| | cube | 0.9798 | 0.73 | Yes |
| | natural log | 0.9794 | 0.73 | Yes |
| | x^4 | 0.9721 | 0.73 | Yes |
| | x^5 | 0.961 | 0.73 | Yes |
| | x^6 | 0.947 | 0.73 | Yes |
| Pooled Background (bg) (n = 92 - Shapiro-Francia used, alpha = 0.01) | | | | |
| | no | 0.9028 | 0.962 | No |
| | square root | 0.9195 | 0.962 | No |
| | square | 0.7927 | 0.962 | No |
| | cube root | 0.9147 | 0.962 | No |
| | cube | 0.6511 | 0.962 | No |
| | natural log | 0.885 | 0.962 | No |
| | x^4 | 0.5175 | 0.962 | No |
| | x^5 | 0.4076 | 0.962 | No |
| | x^6 | 0.3241 | 0.962 | No |

# Outlier Analysis

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/14/2020, 6:08 PM

| Constituent | Well | Outlier | Value(s) | Date(s) | Method | Alpha | N | Mean | Std. Dev. | Distribution | Normality Test |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 263909 | 13673 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 339955 | 63185 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 353143 | 21270 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 341500 | 17930 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 310143 | 13717 | normal | ShapiroWilk |
| Ammonia as N (ug/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 200 | 0 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 206.8 | 31.98 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 200.1 | 0.6396 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 200 | 0 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 7 | 200 | 0 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 21 | 3.714 | 2.101 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 21 | 3.857 | 2.151 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 21 | 3.714 | 2.101 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 21 | 3.857 | 2.151 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 7 | 5.571 | 3.207 | unknown | ShapiroWilk |
| Calcium (ug/L) | MW-11 (bg) | No | n/a | n/a | Dixon`s | 0.05 | 21 | 500000 | 26745 | normal | ShapiroWilk |
| Calcium (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 353762 | 121576 | normal | ShapiroWilk |
| **Calcium (ug/L)** | **MW-23ox (bg)** | **Yes** | **94700** | **6/9/2009** | **Dixon`s** | **0.05** | **21** | **395652** | **104581** | **normal** | **ShapiroWilk** |
| Calcium (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 227524 | 56149 | unknown | ShapiroWilk |
| Calcium (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 390143 | 40392 | normal | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 6465 | 2295 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 21 | 5329 | 732.9 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 6125 | 1780 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 6188 | 1713 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-61ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 7 | 6433 | 2512 | unknown | ShapiroWilk |
| Chloride (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 33 | 21256 | 27134 | unknown | ShapiroWilk |
| Chloride (ug/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 32 | 4418 | 1290 | unknown | ShapiroWilk |
| **Chloride (ug/L)** | **MW-23ox (bg)** | **Yes** | **50000** | **5/3/2016** | **Rosner`s** | **0.01** | **38** | **7434** | **7390** | **ln(x)** | **ShapiroWilk** |
| Chloride (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 32 | 2863 | 851.4 | unknown | ShapiroWilk |
| **Chloride (ug/L)** | **MW-61ox (bg)** | **Yes** | **50000,165000** | **5/8/2017,...** | **Dixon`s** | **0.05** | **7** | **47200** | **52997** | **normal** | **ShapiroWilk** |
| Iron [total] (mg/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 0.2068 | 0.1583 | unknown | ShapiroWilk |
| Iron [total] (mg/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 0.3621 | 0.3069 | ln(x) | ShapiroWilk |
| **Iron [total] (mg/L)** | **MW-23ox (bg)** | **Yes** | **0.215,15,...** | **11/22/200...** | **NP (nrm)** | **NaN** | **22** | **0.8202** | **3.169** | **unknown** | **ShapiroWilk** |
| Iron [total] (mg/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 0.1422 | 0.119 | unknown | ShapiroWilk |
| Iron [total] (mg/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 7 | 0.2401 | 0.1894 | unknown | ShapiroWilk |
| Iron, Dissolved (ug/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 140.9 | 118.2 | unknown | ShapiroWilk |
| Iron, Dissolved (ug/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 232.6 | 179.9 | unknown | ShapiroWilk |
| Iron, Dissolved (ug/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 138.1 | 117.4 | unknown | ShapiroWilk |
| Iron, Dissolved (ug/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 137.3 | 117.5 | unknown | ShapiroWilk |
| Iron, Dissolved (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 7 | 214.3 | 195.2 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 261.3 | 183.9 | normal | ShapiroWilk |
| Manganese (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 123.1 | 77.54 | ln(x) | ShapiroWilk |
| Manganese (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 18.18 | 14.49 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 51.55 | 67.09 | ln(x) | ShapiroWilk |
| Manganese (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 318.4 | 262.9 | ln(x) | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 178.7 | 161.9 | unknown | ShapiroWilk |
| **Manganese, Dissolved (ug/L)** | **MW-21ox (bg)** | **Yes** | **17.3** | **5/20/2008** | **Dixon`s** | **0.05** | **22** | **131.1** | **81.94** | **ln(x)** | **ShapiroWilk** |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 16.2 | 12 | unknown | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 36.69 | 45.41 | unknown | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 159.9 | 92.16 | normal | ShapiroWilk |

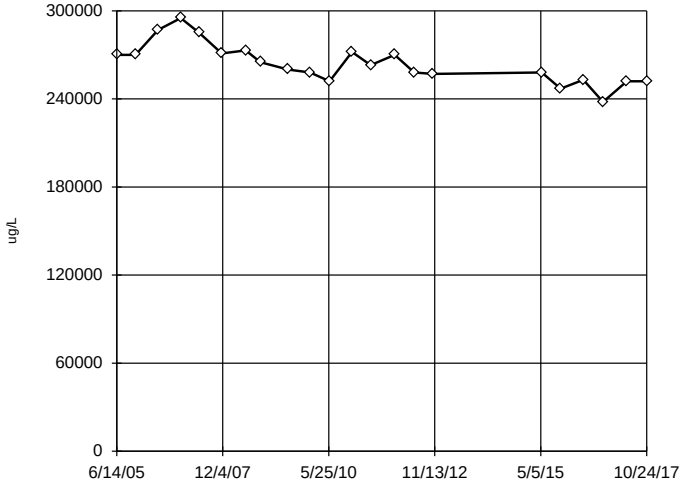
# Outlier Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 6:08 PM

| Constituent | Well | Outlier | Value(s) | Date(s) | Method | Alpha | N | Mean | Std. Dev. | Distribution | Normality Test |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N (mg/L) | MW-11 (bg) | No | n/a | n/a | Dixon`s | 0.05 | 22 | 8.826 | 3.021 | normal | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1.073 | 1.096 | unknown | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | No | n/a | n/a | Dixon`s | 0.05 | 22 | 10.36 | 4.342 | normal | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 22 | 0.8122 | 0.8378 | unknown | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 0.3289 | 0.1927 | normal | ShapiroWilk |
| **Potassium (ug/L)** | **MW-11 (bg)** | **Yes** | **26600** | **10/21/2015** | **Dixon`s** | **0.05** | **21** | **22576** | **1454** | **normal** | **ShapiroWilk** |
| Potassium (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 7734 | 3900 | ln(x) | ShapiroWilk |
| Potassium (ug/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 20 | 15347 | 3840 | normal | ShapiroWilk |
| Potassium (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 20 | 4845 | 977.8 | unknown | ShapiroWilk |
| Potassium (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 3986 | 758.4 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 91.31 | 5.018 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 21 | 32.82 | 9.282 | ln(x) | ShapiroWilk |
| Sodium [total] (mg/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 20 | 92.08 | 21.66 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 20 | 48.52 | 4.369 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 67.16 | 3.845 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 2437273 | 135301 | ln(x) | ShapiroWilk |
| Sulfate (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 1058409 | 429738 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 22 | 1947727 | 374101 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 857182 | 303007 | unknown | ShapiroWilk |
| Sulfate (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 1561429 | 209637 | normal | ShapiroWilk |
| Sulfide (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1805 | 378.6 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1782 | 413.6 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1781 | 435.1 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1813 | 440.3 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 7 | 1857 | 378 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 21 | 1994 | 629.7 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 22 | 1540 | 316.8 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 20 | 1998 | 162 | unknown | ShapiroWilk |
| **Total Organic Carbon (ug/L)** | **MW-25ox (bg)** | **Yes** | **2000,2800...** | **5/30/2006...** | **Dixon`s** | **0.05** | **22** | **1692** | **365.8** | **normal** | **ShapiroWilk** |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 7 | 1637 | 151.6 | normal | ShapiroWilk |

EPA Screening (suspected outliers for Dixon's Test)

MW-11 (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 263909, std. dev. 13673, critical Tn 2.603

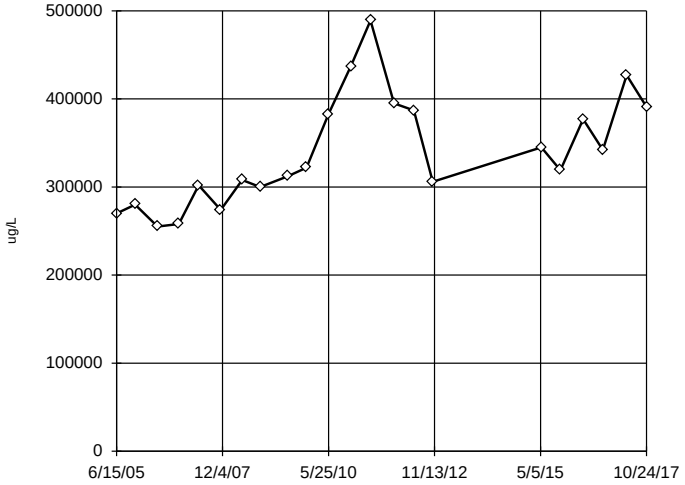
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9621
Critical = 0.926
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 339955, std. dev. 63185, critical Tn 2.603

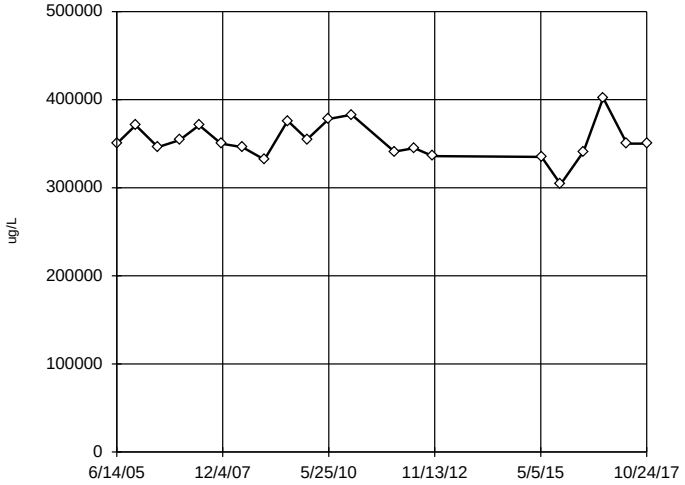
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9429
Critical = 0.926
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-23ox (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 353143, std. dev. 21270, critical Tn 2.58

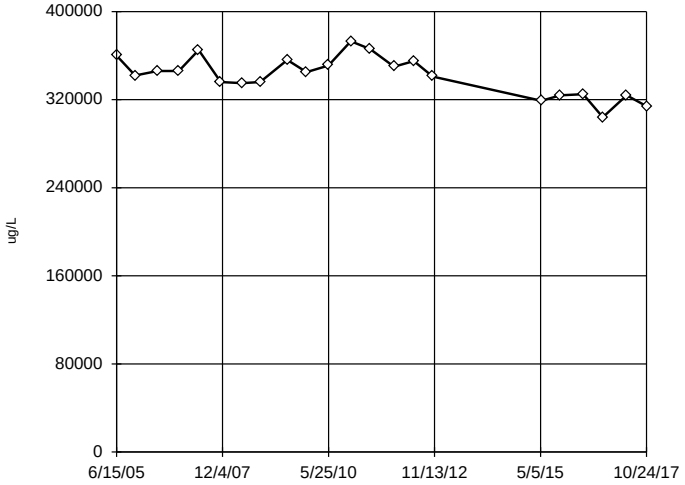
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9488
Critical = 0.923
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-25ox (bg)




n = 22

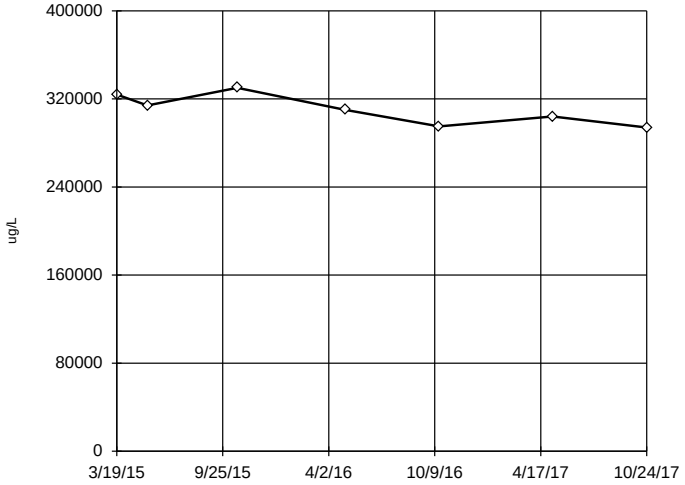
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 341500, std. dev. 17930, critical Tn 2.603

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9829
Critical = 0.926
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 310143, std. dev. 13717, critical Tn 1.938

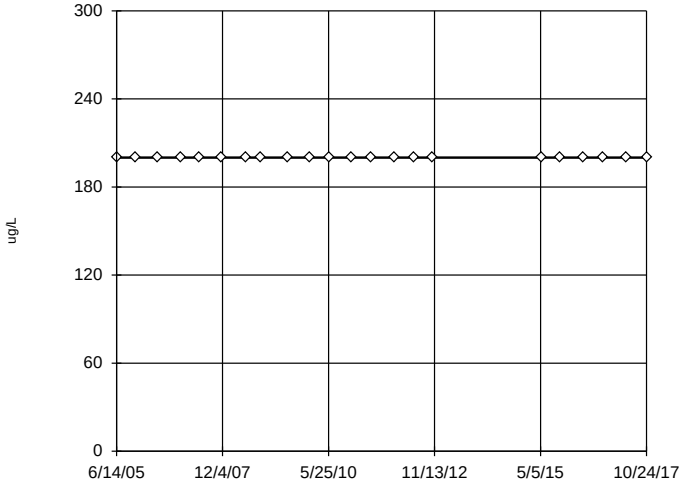
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9432
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

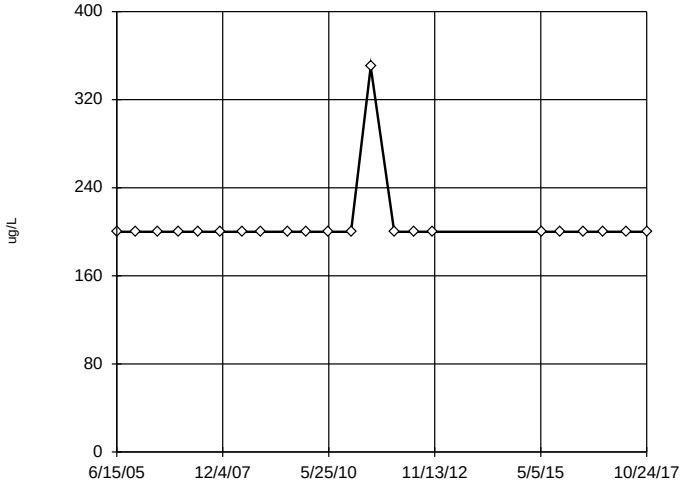
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

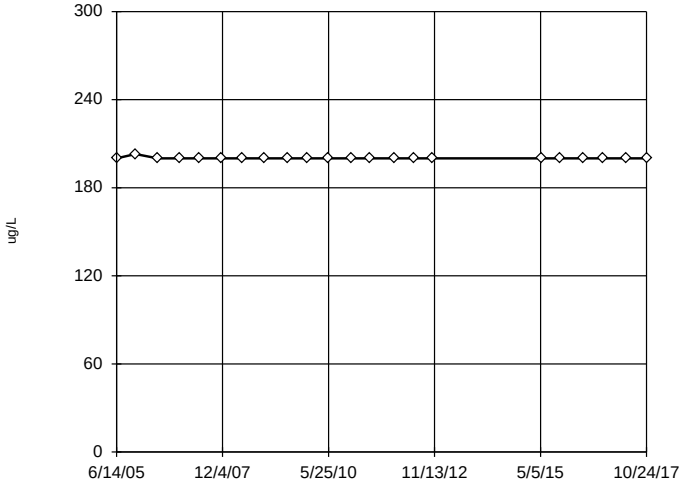
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

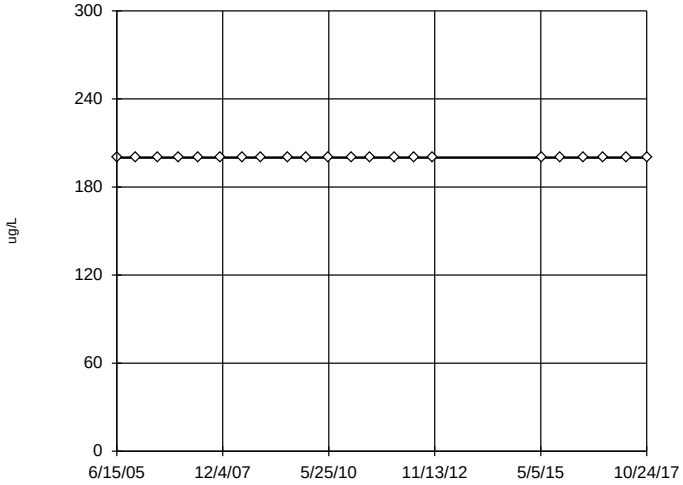
Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

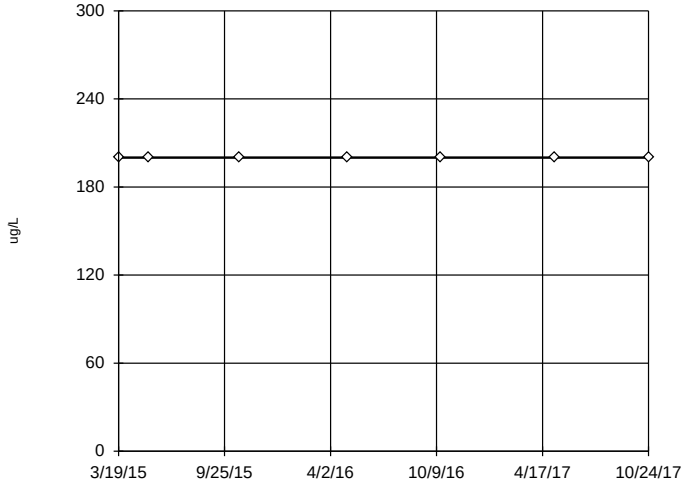
Constituent: Ammonia as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

The results were invalidated, because the lower and upper quartiles are equal.

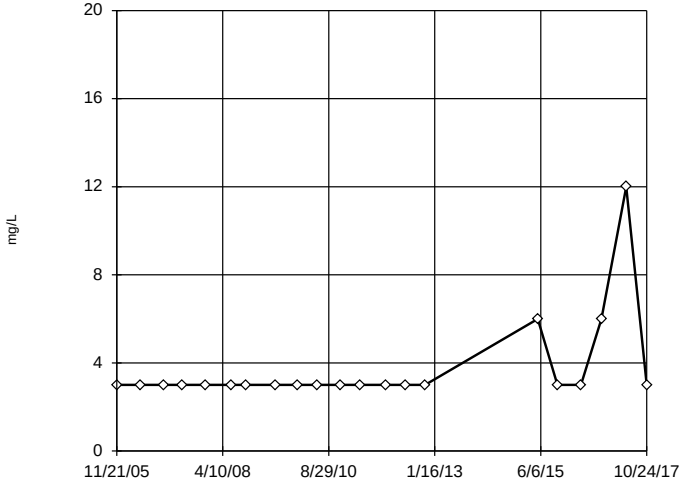
Constituent: Ammonia as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

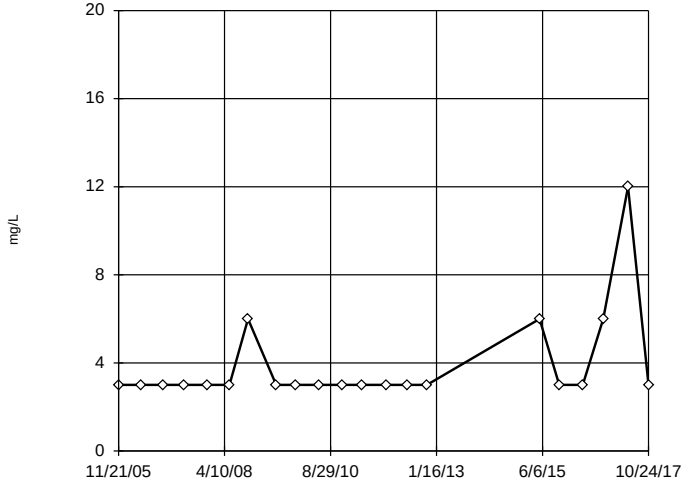
Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-21ox (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

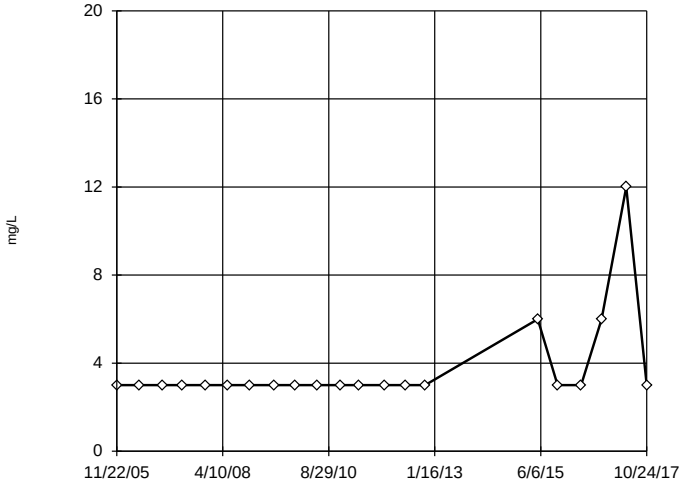
Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

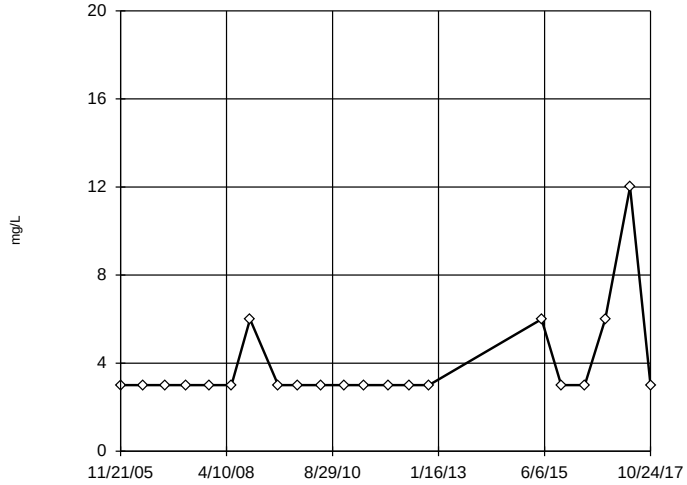
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

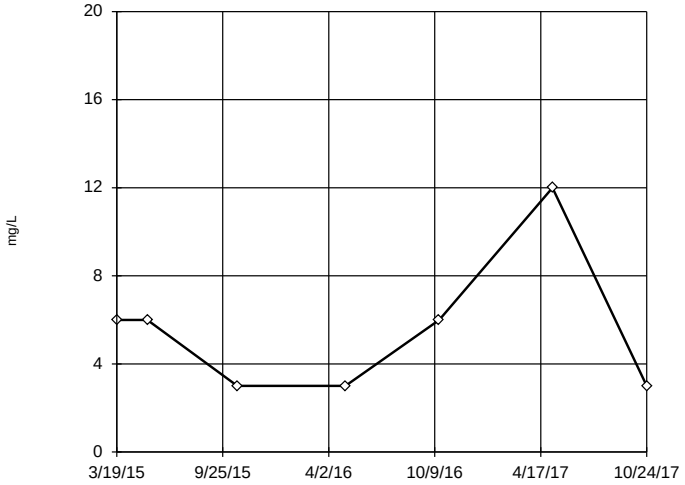
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

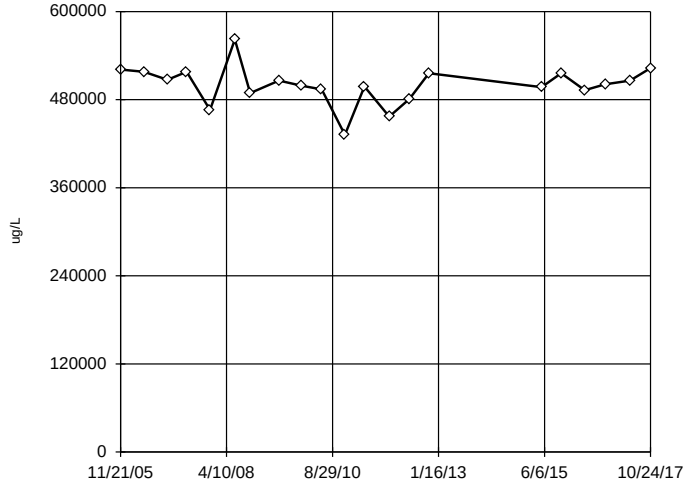
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-11 (bg)




n = 21

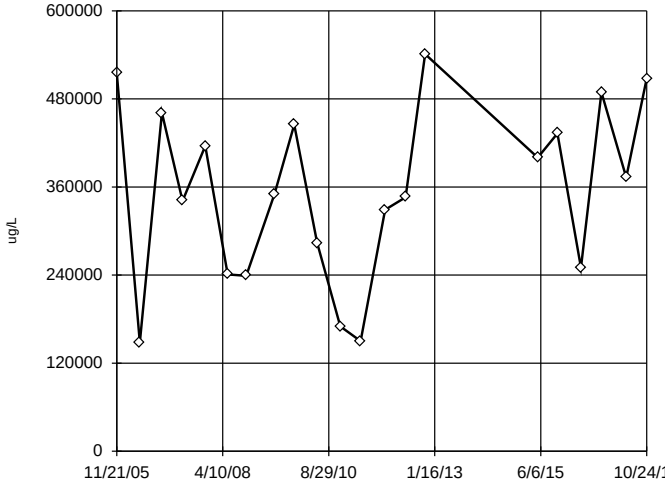
No statistical outliers.
Testing for 1 low outlier.
Mean = 500000.
Std. Dev. = 26745.
432000: c = 0.382
tabl = 0.44.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9428
Critical = 0.92
The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 353762, std. dev. 121576, critical Tn 2.58

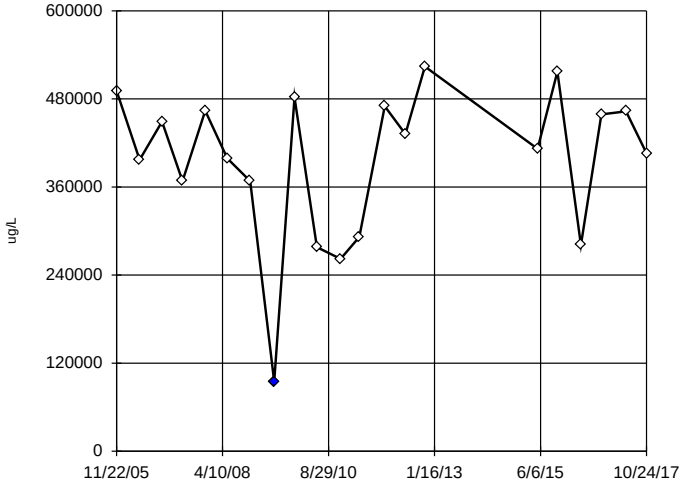
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9553
Critical = 0.923
The distribution was found to be normally distrib-uted.

Constituent: Calcium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-23ox (bg)




n = 21

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 395652.
Std. Dev. = 104581.
94700: c = 0.4625
tabl = 0.44.
Alpha = 0.05.

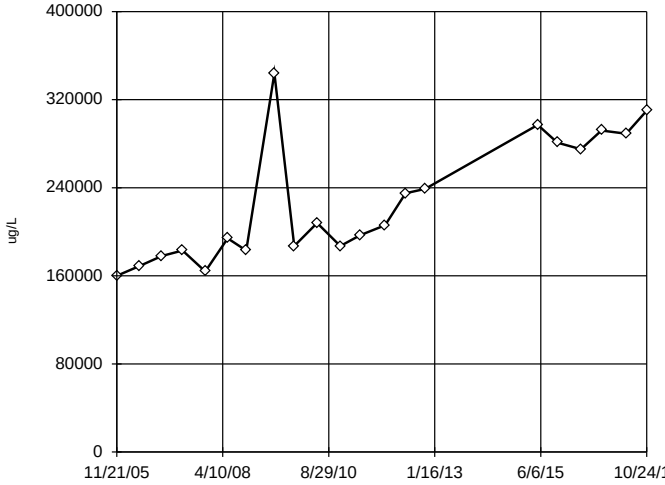
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9202
Critical = 0.92
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Calcium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

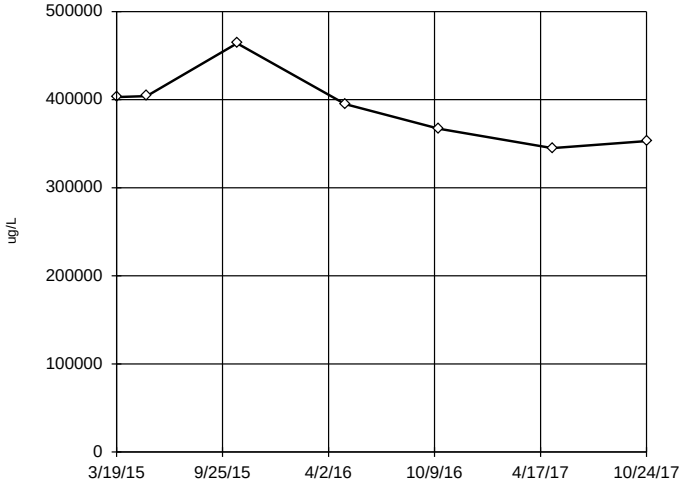
High cutoff = 1076106, low cutoff = 48462, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 390143, std. dev. 40392, critical Tn 1.938

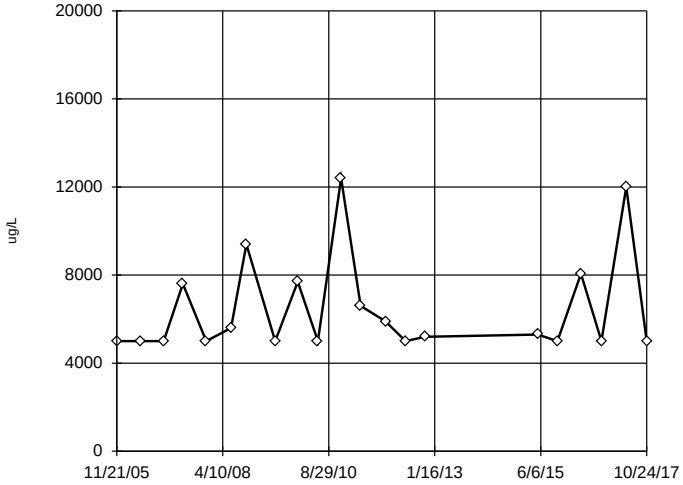
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9157
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Calcium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 27397, low cutoff = 1396, based on IQR multiplier of 3.

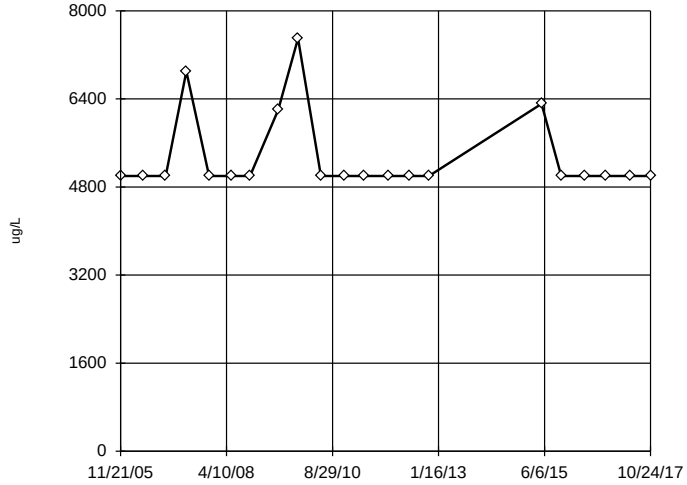
Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

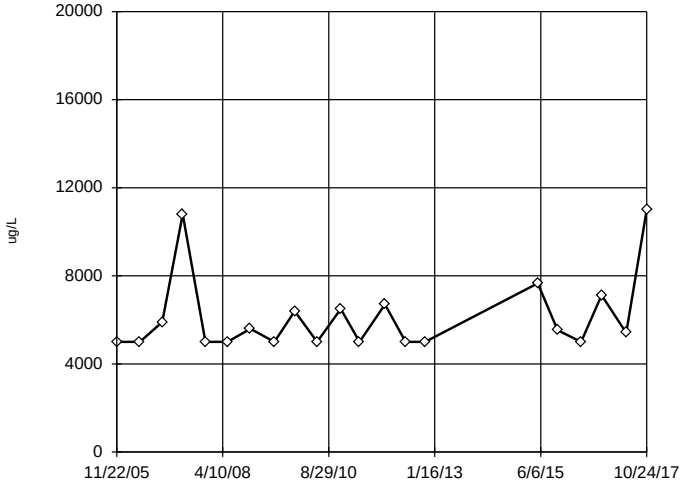
Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 15173, low cutoff = 2175, based on IQR multiplier of 3.

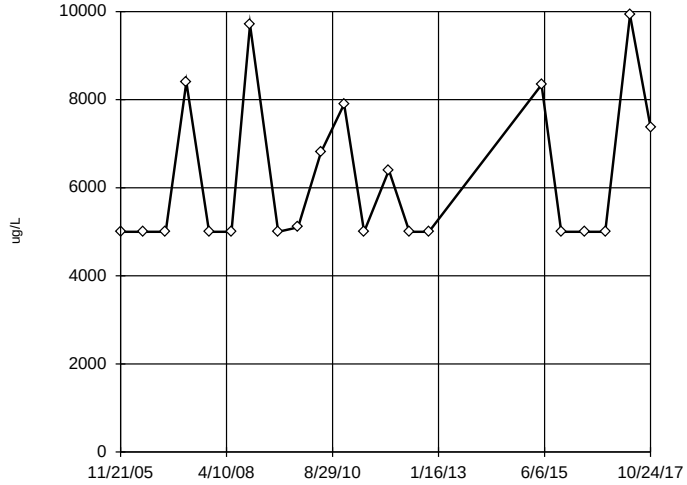
Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

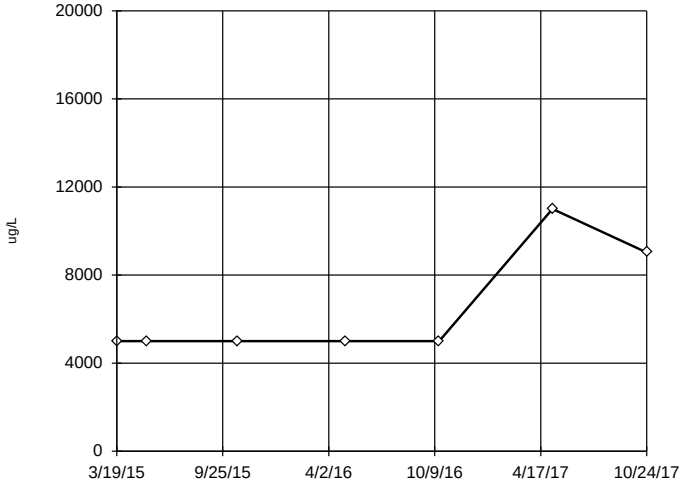
High cutoff = 20734, low cutoff = 809.7, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

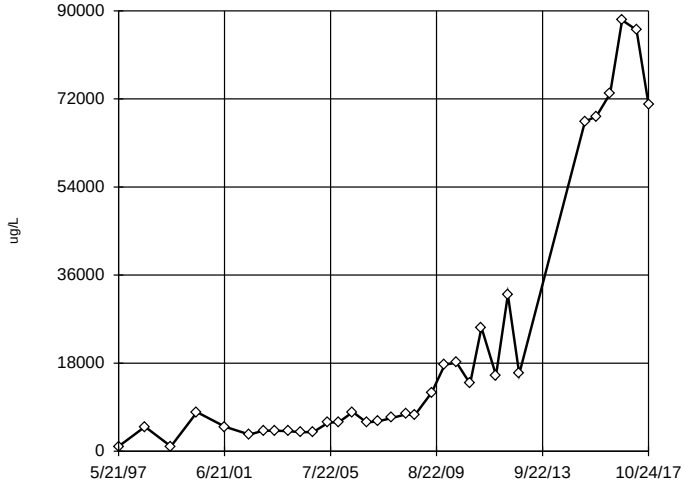
High cutoff = 15848, low cutoff = -12026, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 33

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

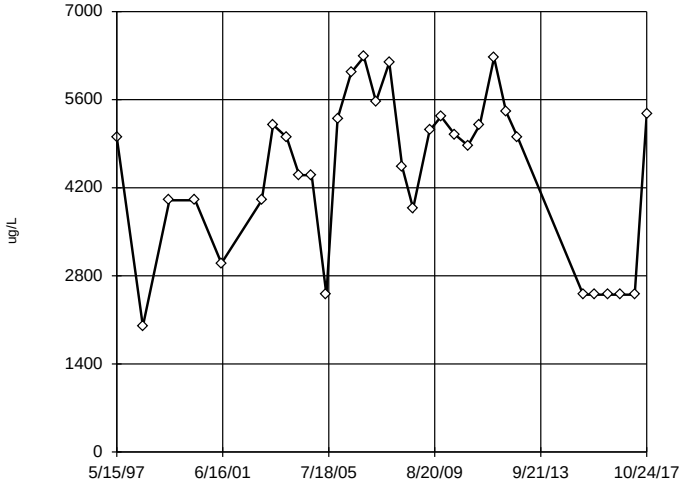
High cutoff = 2179060, low cutoff = 45, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 32

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

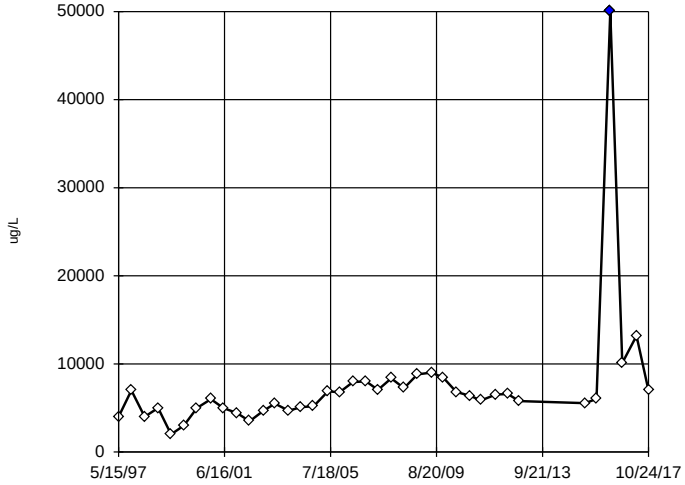
High cutoff = 8777, low cutoff = -6066, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-23ox (bg)




n = 38

Statistical outlier is drawn as solid.

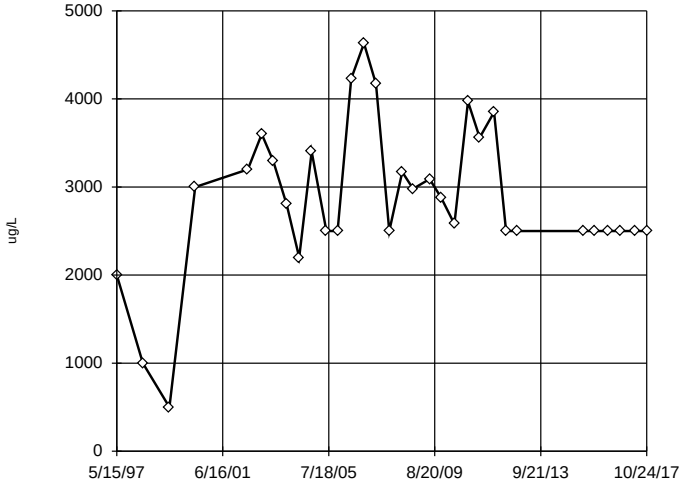
k = 2
r = 5.76
Tabulated value = 2.968
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9628
Critical = 0.946 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Constituent: Chloride Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 32

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

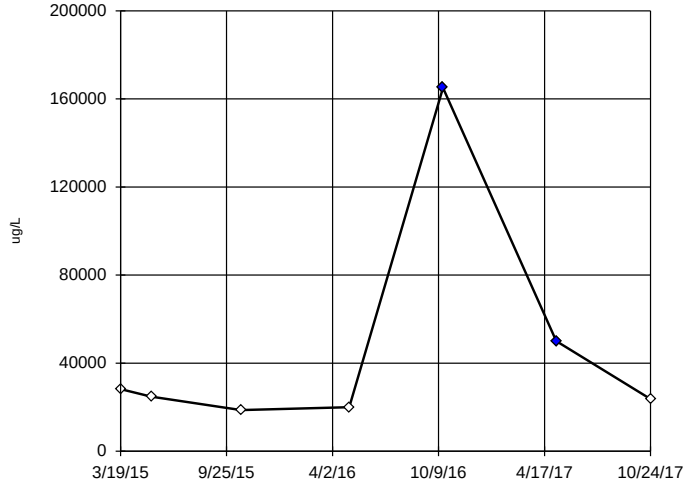
High cutoff = 5900, low cutoff = -50, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Dixon's Outlier Test

MW-61ox (bg)




n = 7

Statistical outliers are drawn as solid.
Testing for 2 high outliers.
Mean = 47200.
Std. Dev. = 52997.
<100000: c = 0.6965
tabl = 0.507.
Alpha = 0.05.

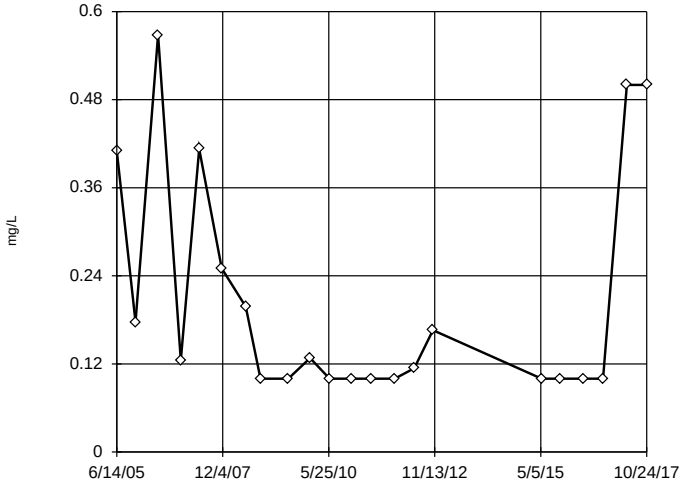
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9588
Critical = 0.806
The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Chloride Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Tukey's Outlier Screening

MW-11 (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

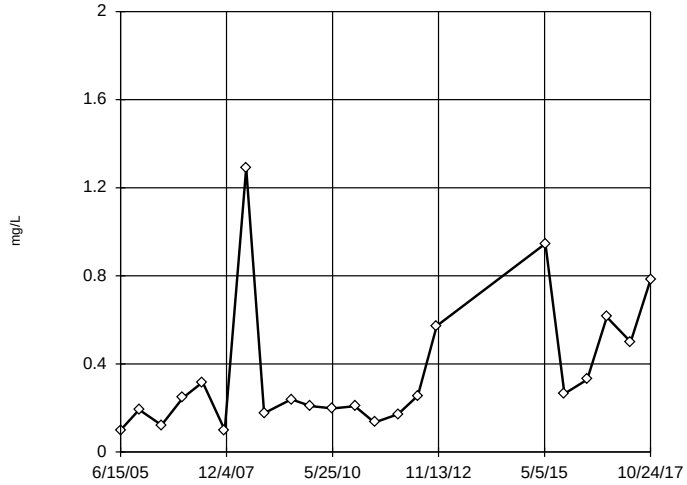
High cutoff = 10.51, low cutoff = 0.003047, based on IQR multiplier of 3.

Constituent: Iron [total] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3621, std. dev. 0.3069, critical Tn 2.603

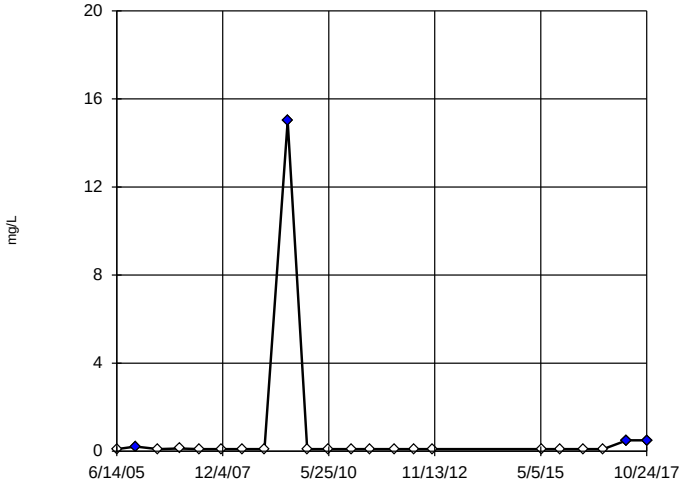
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.944
Critical = 0.926 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Iron [total] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 22

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

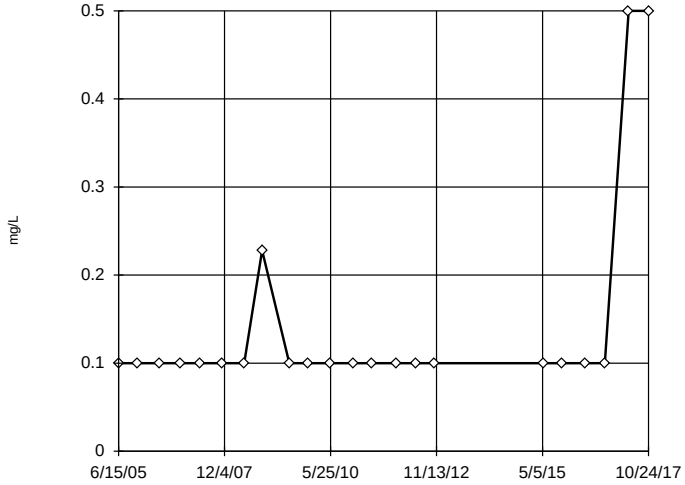
High cutoff = 0.1664, low cutoff = 0.06825, based on IQR multiplier of 3.

Constituent: Iron [total] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

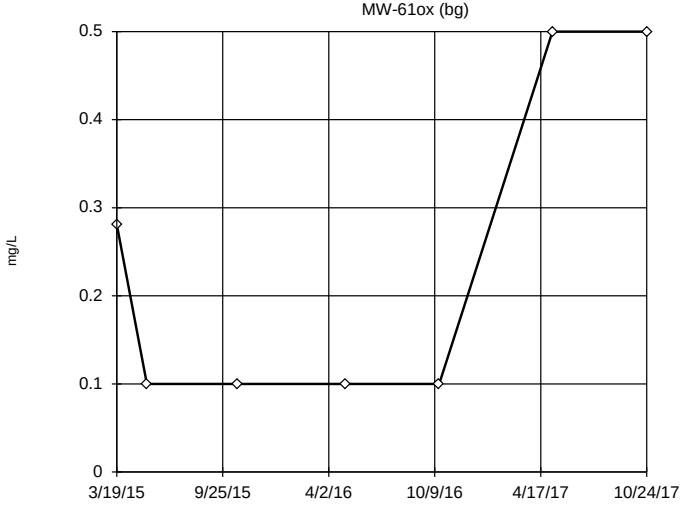
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Iron [total] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

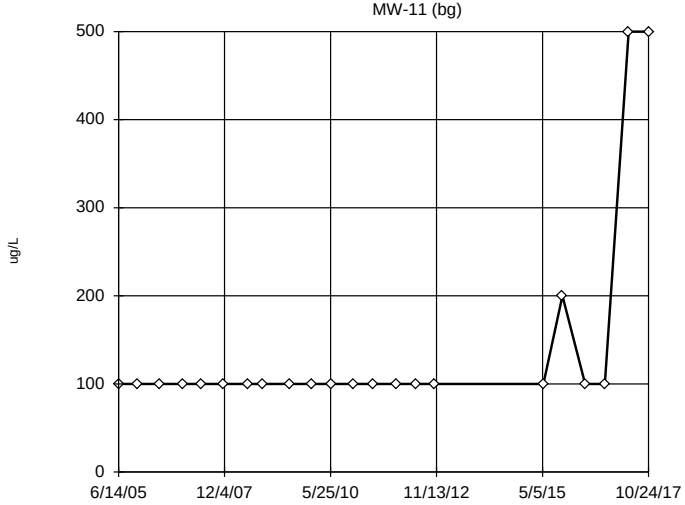
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Iron [total] Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

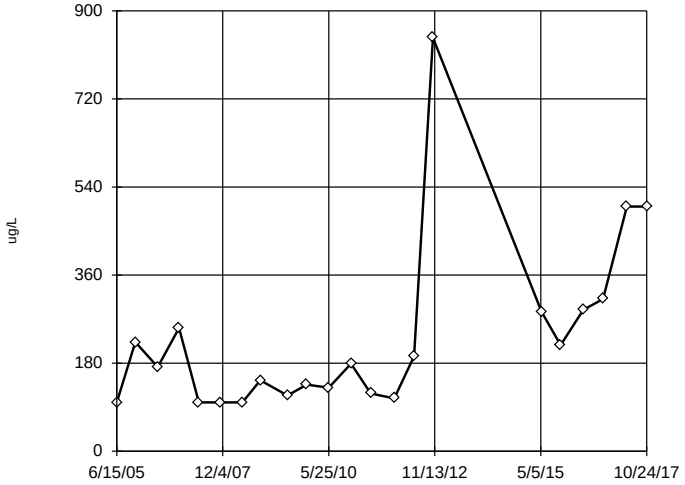
Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-21ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 4966, low cutoff = 6.413, based on IQR multiplier of 3.

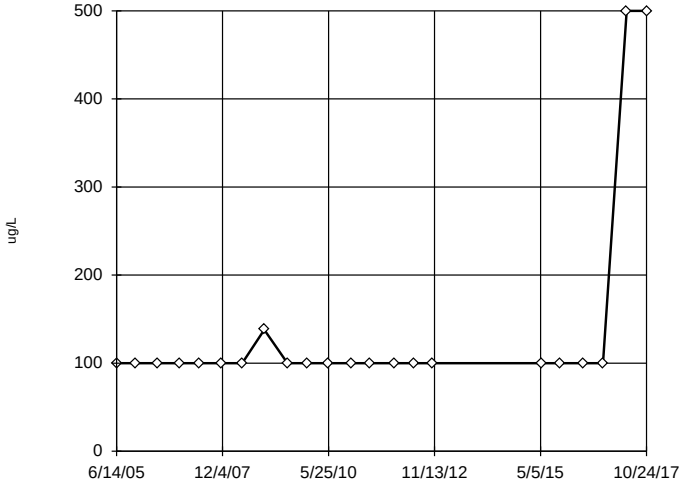
Constituent: Iron, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

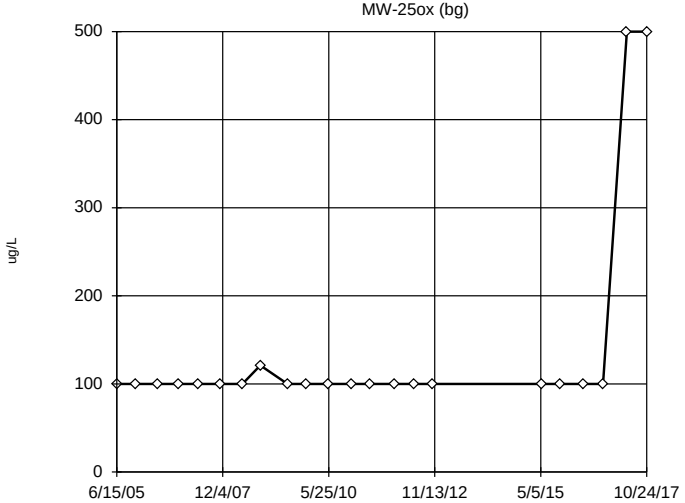
Constituent: Iron, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

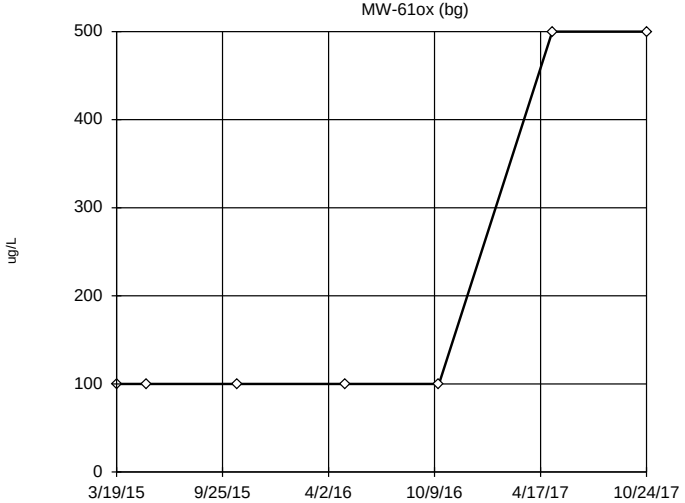
Constituent: Iron, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube transformed to achieve best W statistic (graph shown in original units).

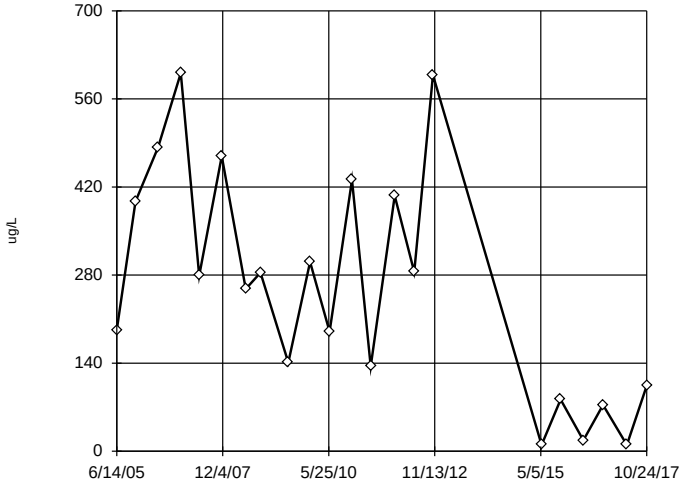
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-11 (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 261.3, std. dev. 183.9, critical Tn 2.603

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9458
Critical = 0.926
The distribution was found to be normally distrib-uted.

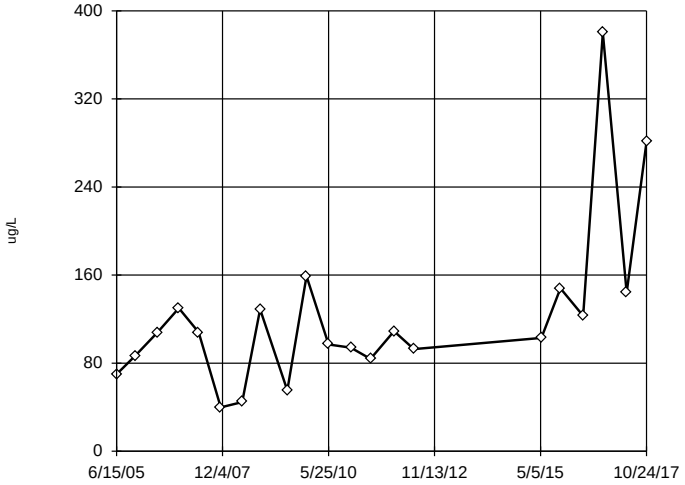
Constituent: Manganese Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 123.1, std. dev. 77.54, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9468
Critical = 0.923 (after natural log transforma-tion)
The distribution was found to be log-normal.

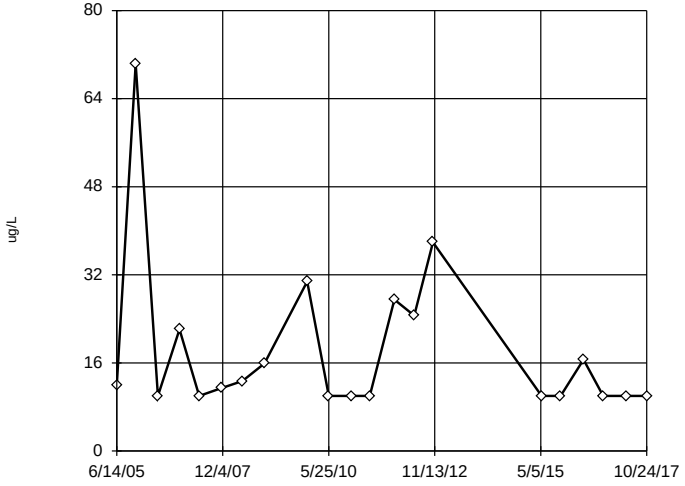
Constituent: Manganese Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 295.6, low cutoff = 0.7889, based on IQR multiplier of 3.

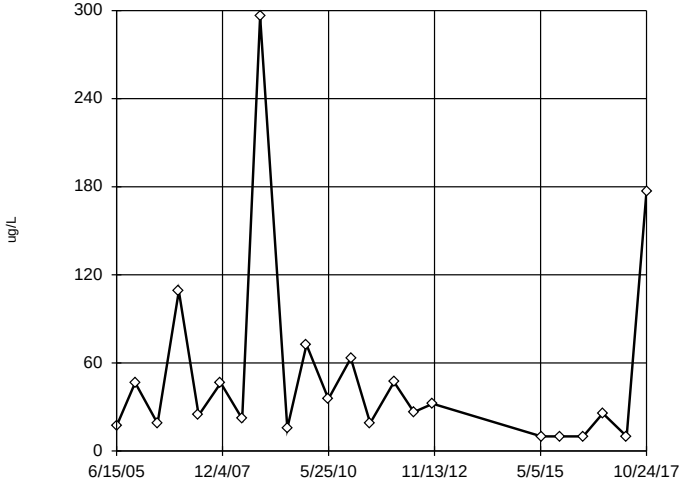
Constituent: Manganese Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-25ox (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 51.55, std. dev. 67.09, critical Tn 2.603

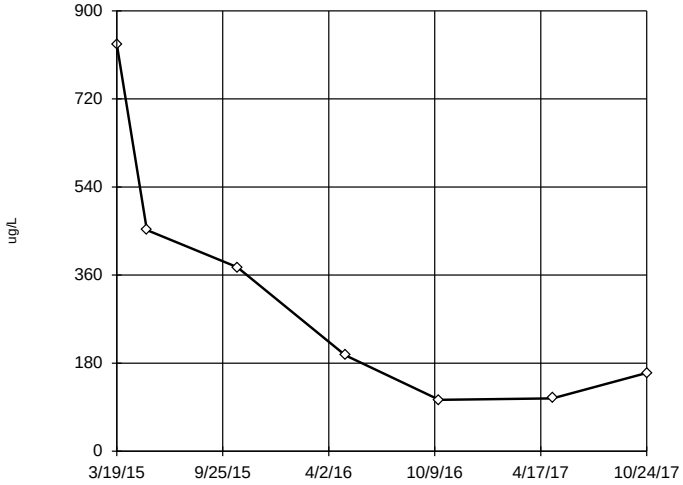
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.934
Critical = 0.926 (after natural log transforma-tion)
The distribution was found to be log-normal.

Constituent: Manganese Analysis Run 2/14/2020 6:07 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 318.4, std. dev. 262.9, critical Tn 1.938

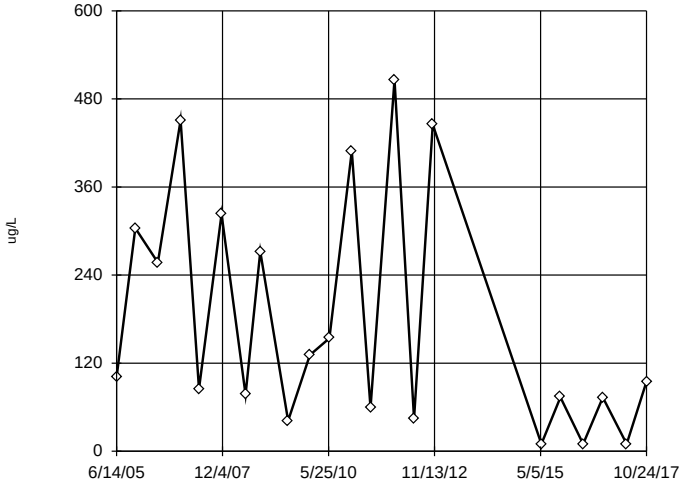
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9255
Critical = 0.838 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Manganese Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

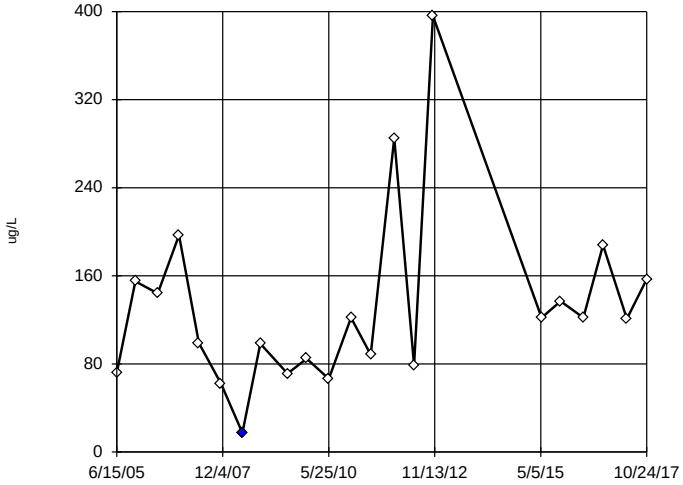
High cutoff = 4106, low cutoff = -166.5, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-21ox (bg)




n = 22

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 131.1.
Std. Dev. = 81.94.
2.851: c = 0.5529
tabl = 0.43.
Alpha = 0.05.

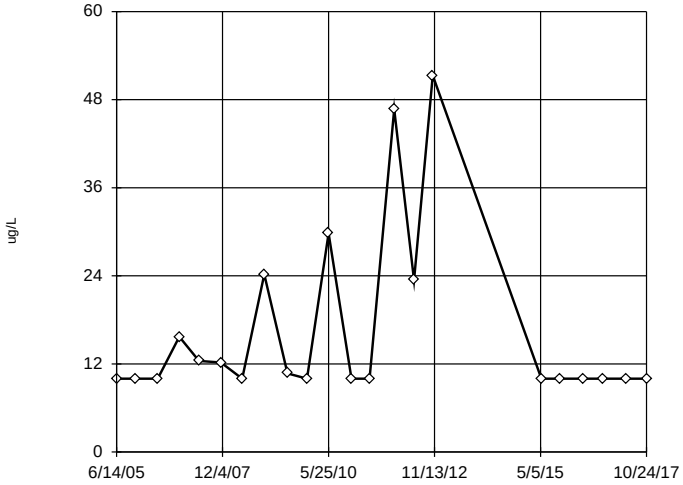
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9459
Critical = 0.923 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

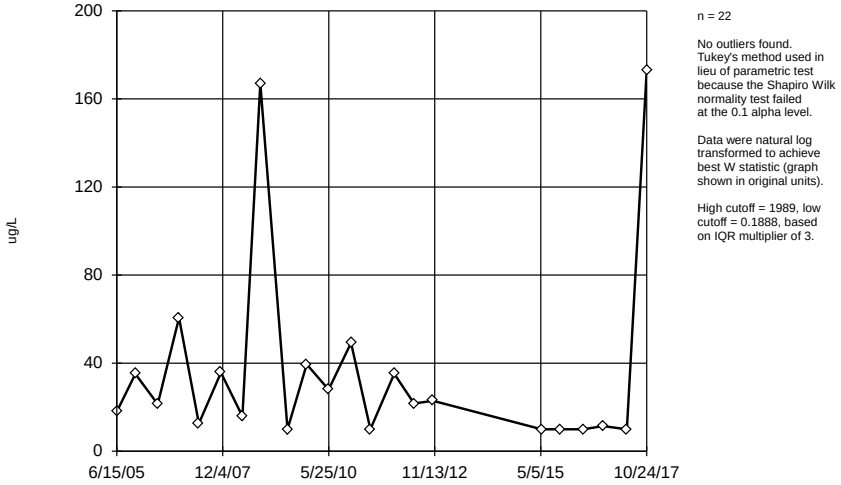
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 135, low cutoff = 1.42, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

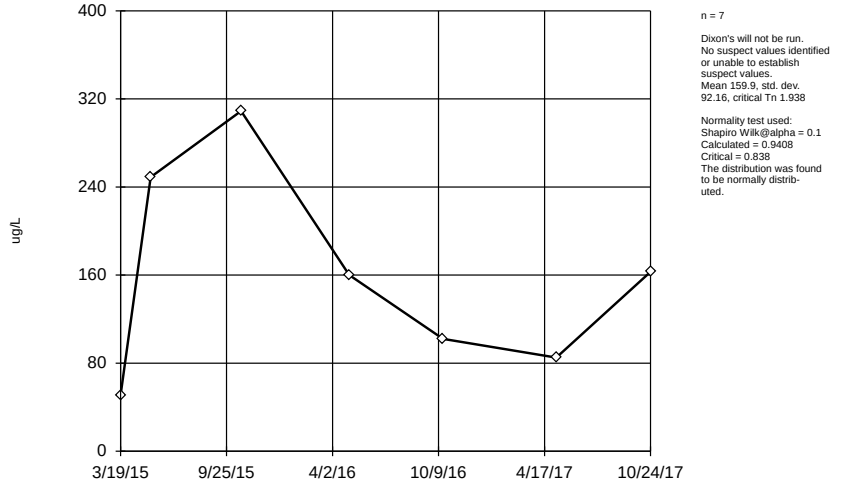
High cutoff = 1989, low cutoff = 0.1888, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 159.9, std. dev. 92.16, critical Tn 1.938

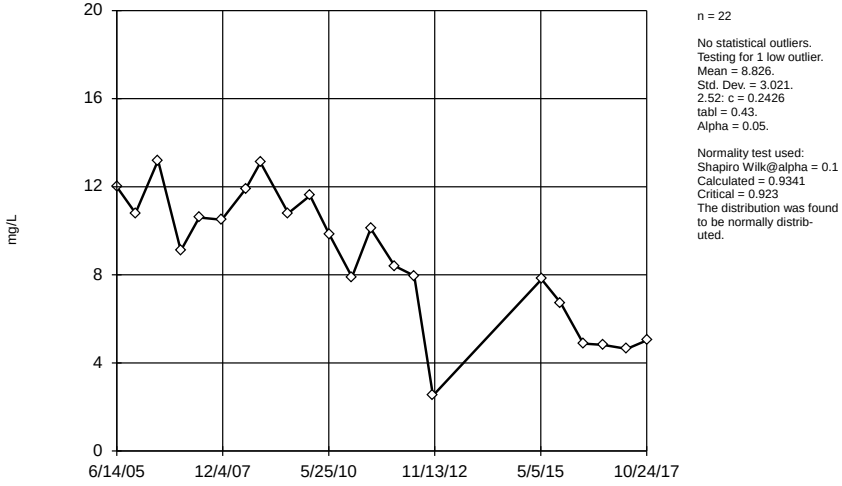
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9408
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-11 (bg)




n = 22

No statistical outliers.
Testing for 1 low outlier.
Mean = 8.826.
Std. Dev. = 3.021.
2.52: c = 0.2426
tabl = 0.43.
Alpha = 0.05.

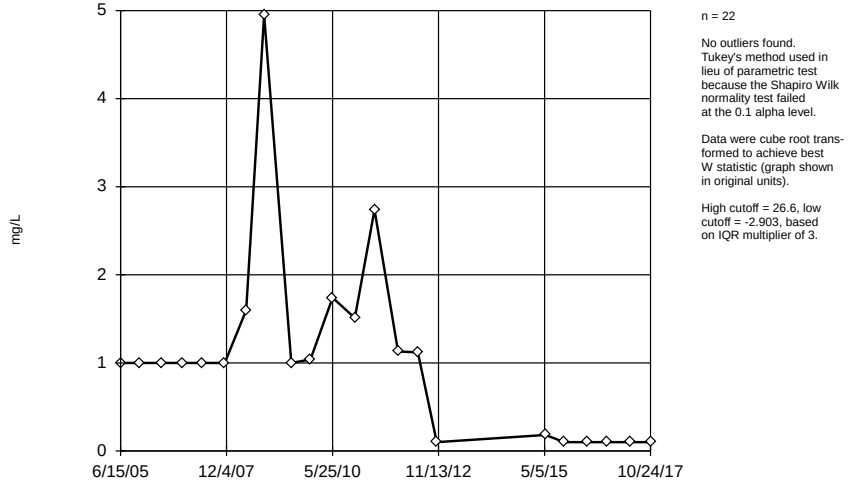
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9341
Critical = 0.923
The distribution was found to be normally distrib-uted.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

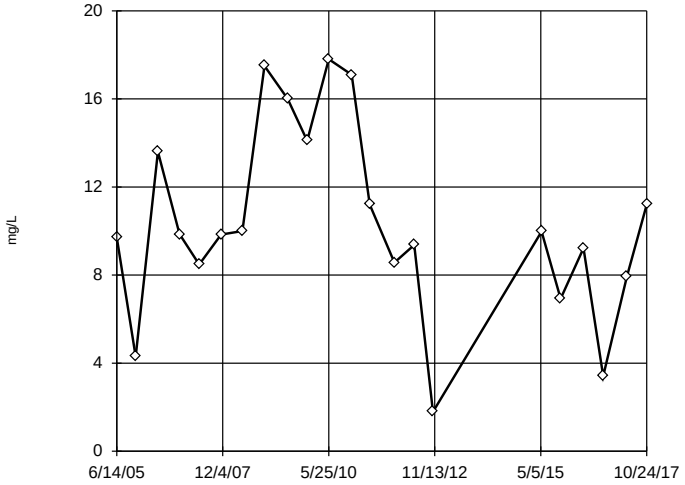
Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

High cutoff = 26.6, low cutoff = -2.903, based on IQR multiplier of 3.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Dixon's Outlier Test

MW-23ox (bg)




n = 22

No statistical outliers.
Testing for 1 low outlier.
Mean = 10.36.
Std. Dev. = 4.342.
1.79: c = 0.1639
tabl = 0.43.
Alpha = 0.05.

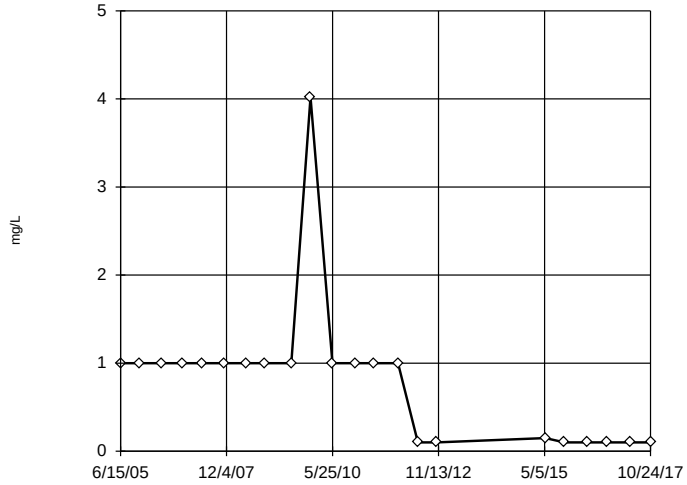
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9362
Critical = 0.923
The distribution was found to be normally distrib-uted.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

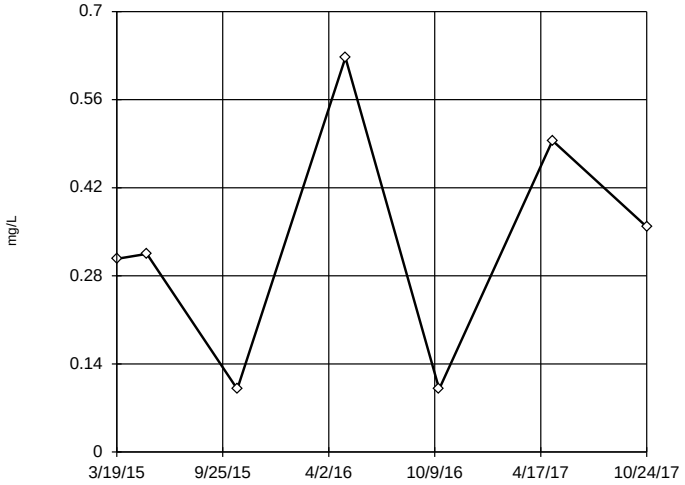
The results were invalid-ated, because both the lower and upper quartiles represent reporting limits.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3289, std. dev. 0.1927, critical Tn 1.938

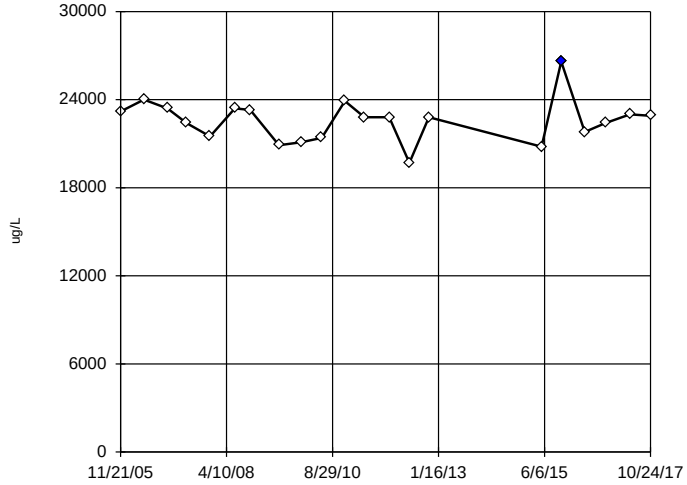
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9308
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-11 (bg)




n = 21

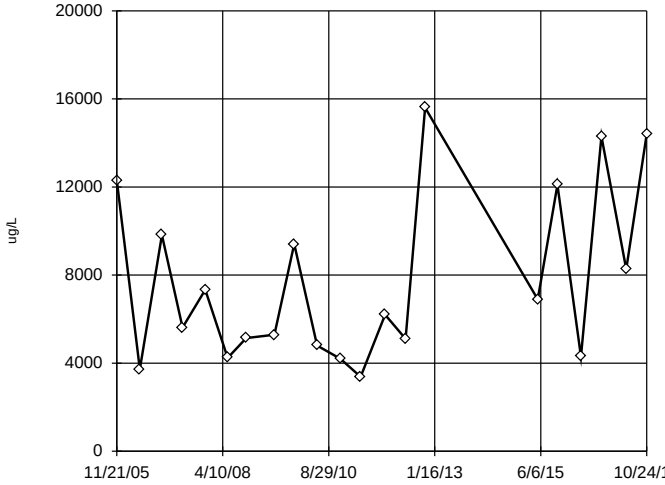
Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 22576.
Std. Dev. = 1454.
26600: c = 0.4737
tabl = 0.44.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9387
Critical = 0.92
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Potassium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7734, std. dev. 3900, critical Tn 2.58

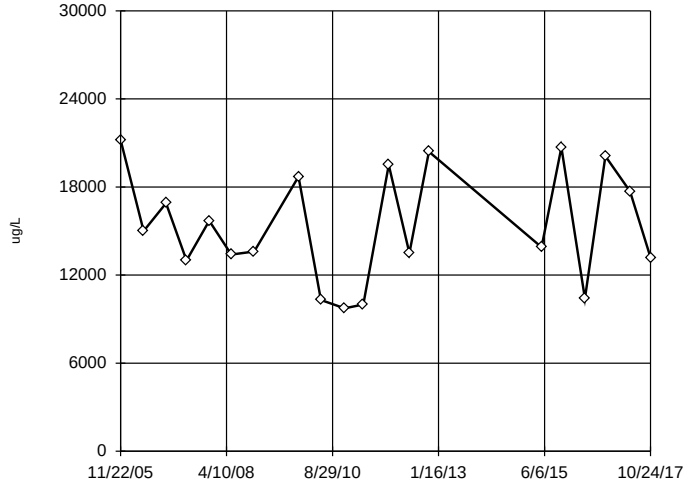
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9342
Critical = 0.923 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Potassium Analysis Run 2/14/2020 6:07 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-23ox (bg)




n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 15347, std. dev. 3840, critical Tn 2.557

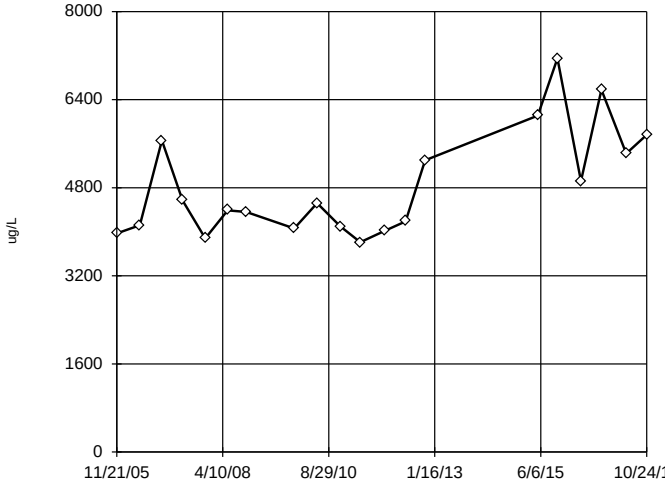
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9235
Critical = 0.92
The distribution was found to be normally distributed.

Constituent: Potassium Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 20

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

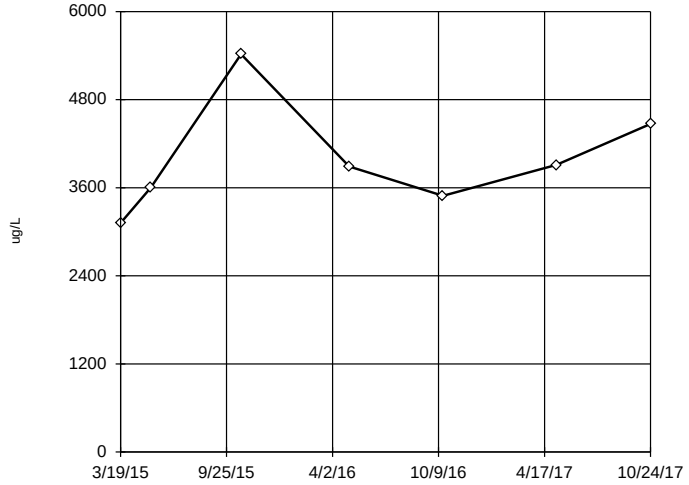
High cutoff = 13857, low cutoff = 1631, based on IQR multiplier of 3.

Constituent: Potassium Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

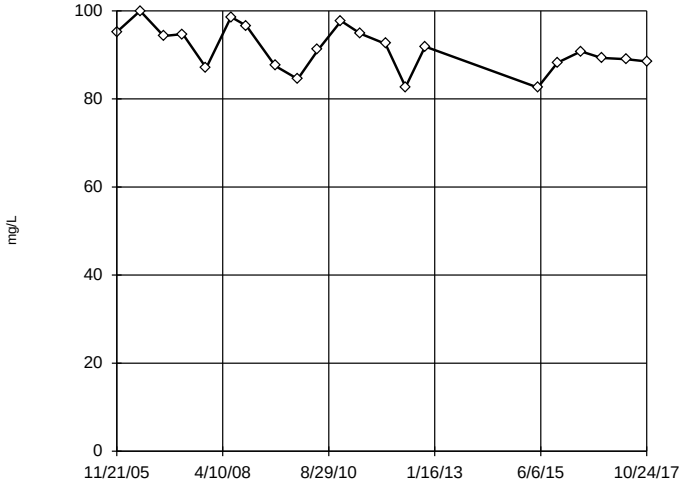
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 3986, std. dev. 758.4, critical Tn 1.938

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9121
Critical = 0.838
The distribution was found to be normally distributed.

Constituent: Potassium Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

EPA Screening (suspected outliers for Dixon's Test)

MW-11 (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 91.31, std. dev. 5.018, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9733
Critical = 0.923
The distribution was found to be normally distrib-uted.

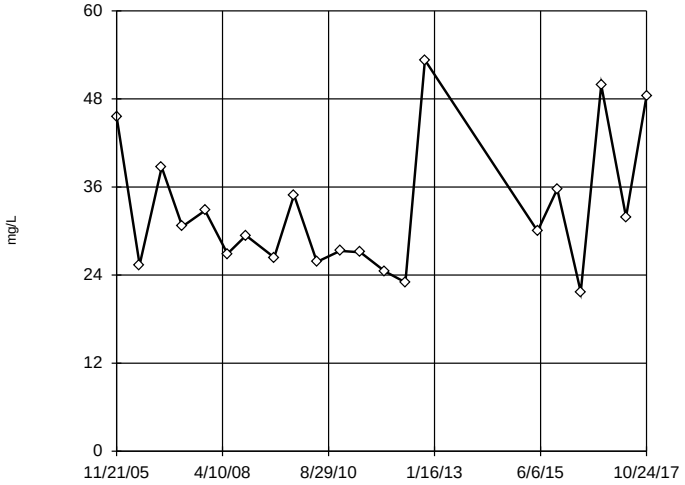
Constituent: Sodium [total] Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 32.82, std. dev. 9.282, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9284
Critical = 0.923 (after natural log transforma-tion)
The distribution was found to be log-normal.

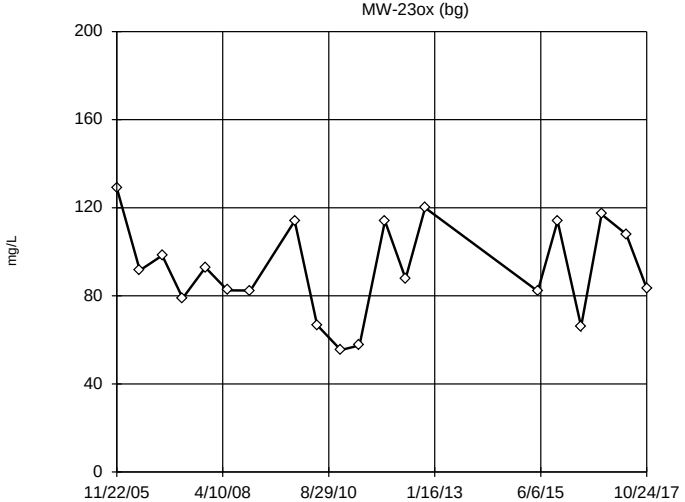
Constituent: Sodium [total] Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-23ox (bg)




n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 92.08, std. dev. 21.66, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9534
Critical = 0.92
The distribution was found to be normally distrib-uted.

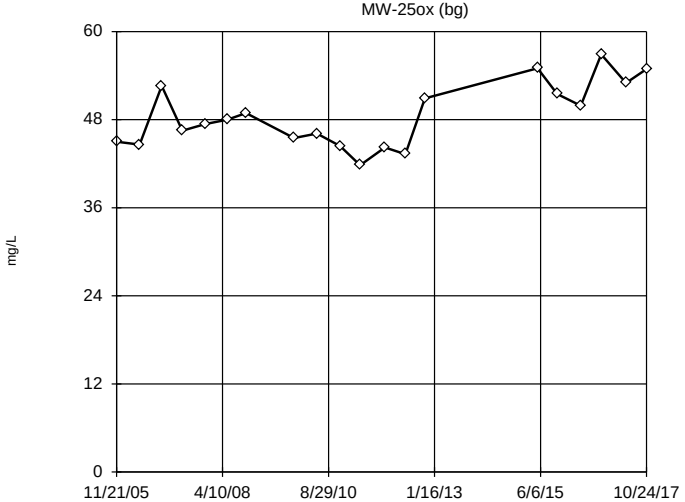
Constituent: Sodium [total] Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-25ox (bg)




n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 48.52, std. dev. 4.369, critical Tn 2.557

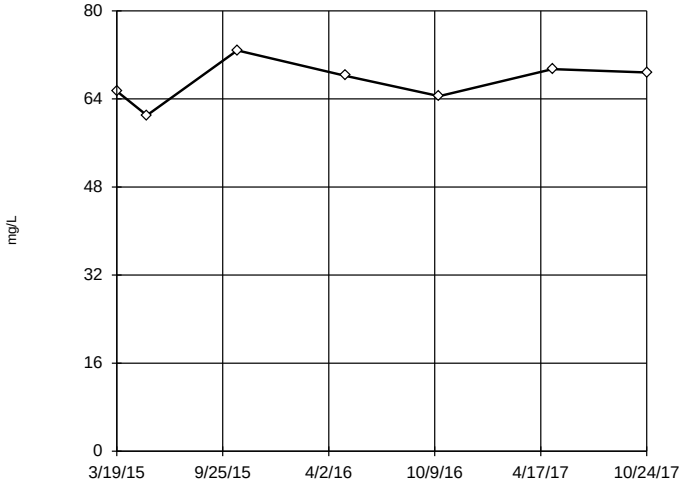
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9526
Critical = 0.92
The distribution was found to be normally distrib-uted.

Constituent: Sodium [total] Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 67.16, std. dev. 3.845, critical Tn 1.938

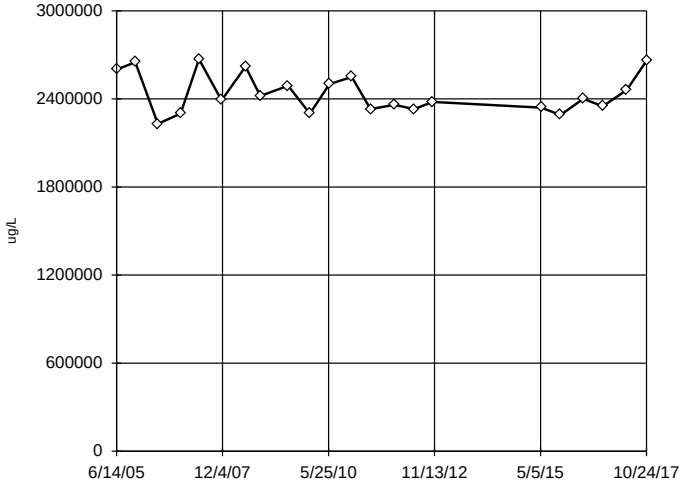
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9784
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Sodium [total] Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-11 (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2437273, std. dev. 135301, critical Tn 2.603

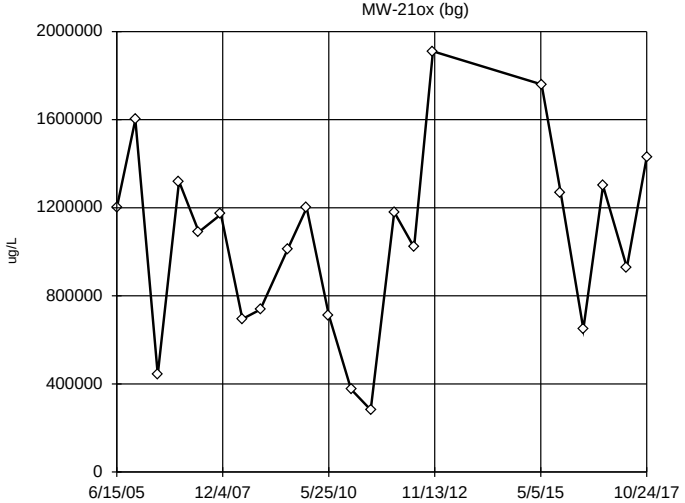
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9269
Critical = 0.926 (after natural log transforma-tion)
The distribution was found to be log-normal.

Constituent: Sulfate Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-21ox (bg)




n = 22

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1058409, std. dev. 429738, critical Tn 2.603

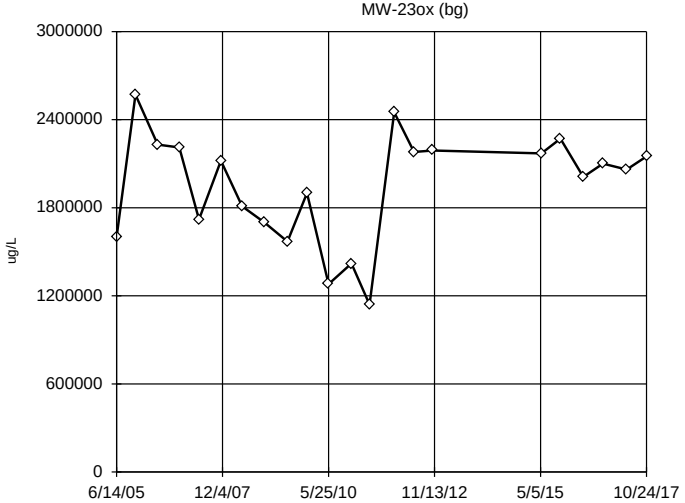
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9769
Critical = 0.926
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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EPA Screening (suspected outliers for Dixon's Test)

MW-23ox (bg)




n = 22

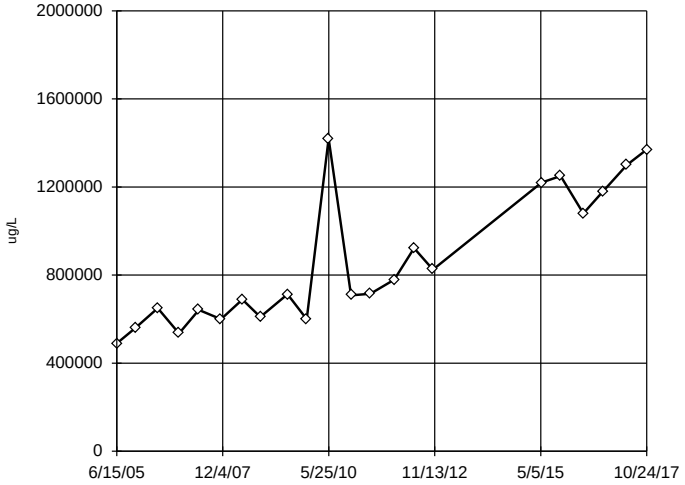
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1947727, std. dev. 374101, critical Tn 2.603

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9462
Critical = 0.926
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

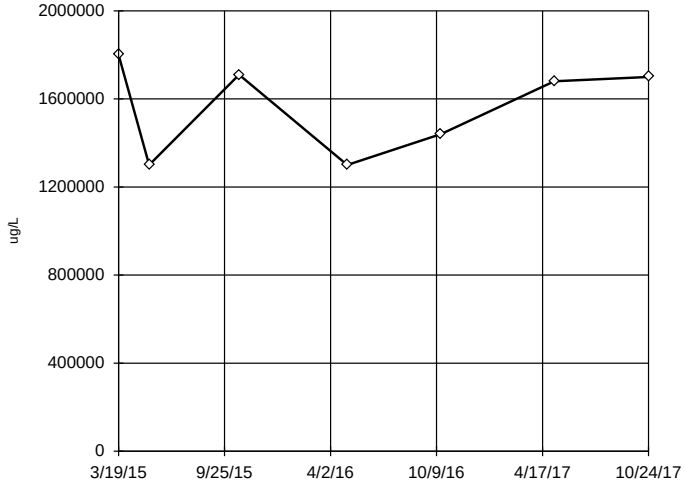
High cutoff = 9359703, low cutoff = 77553, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1561429, std. dev. 209637, critical Tn 1.938

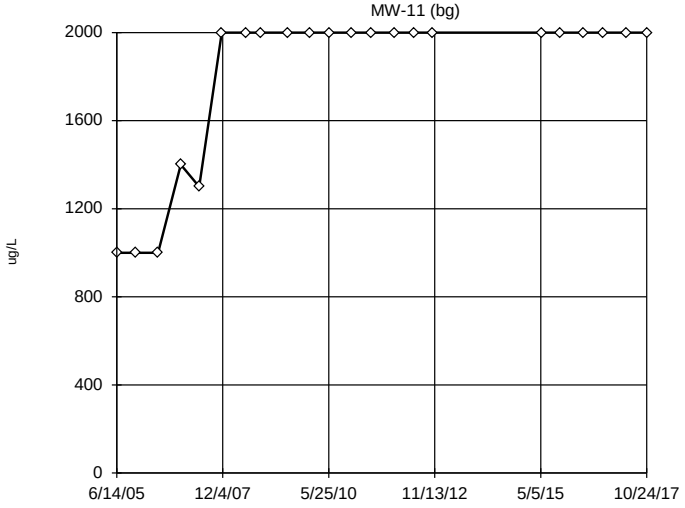
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8461
Critical = 0.838
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-11 (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers trans-formations did not im-prove normality; analy-sis run on raw data.

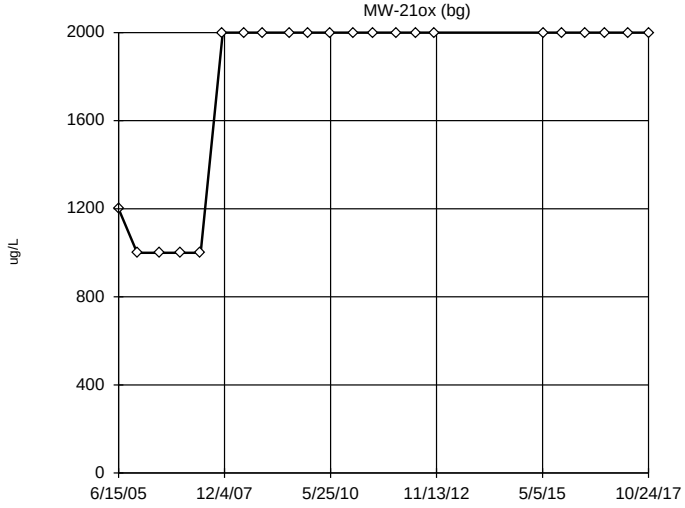
High cutoff = 2900, low cutoff = 800, based on IQR multiplier of 3.

Constituent: Sulfide Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

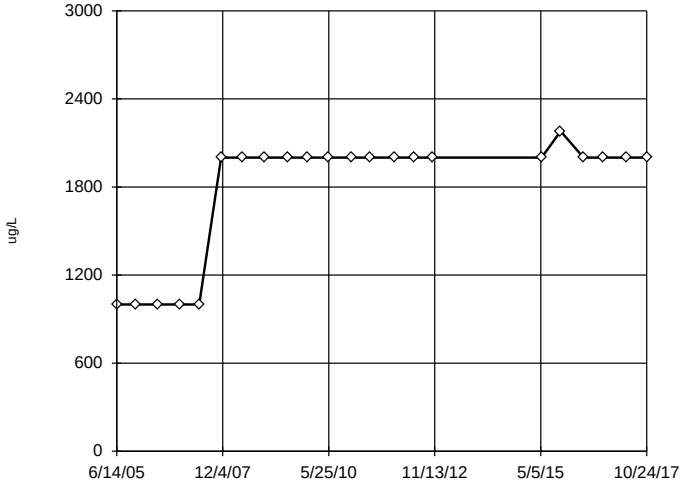
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 4303, low cutoff = 720, based on IQR multiplier of 3.

Constituent: Sulfide Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-23ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^6 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2326, low cutoff = -1989, based on IQR multiplier of 3.

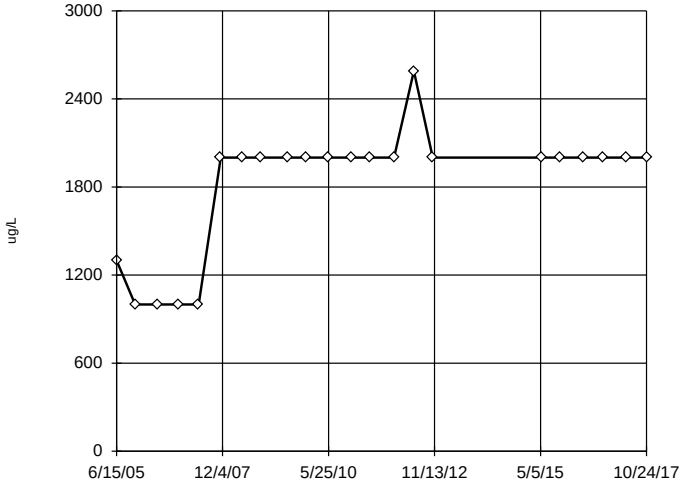
Constituent: Sulfide Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2732, low cutoff = -787.4, based on IQR multiplier of 3.

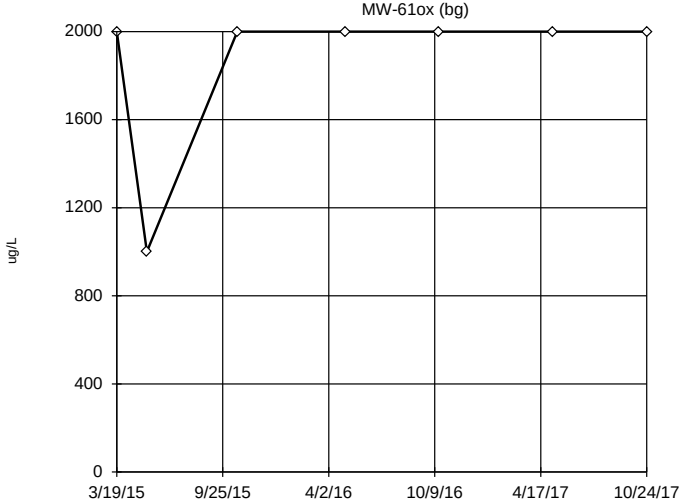
Constituent: Sulfide Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 7

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^6 transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

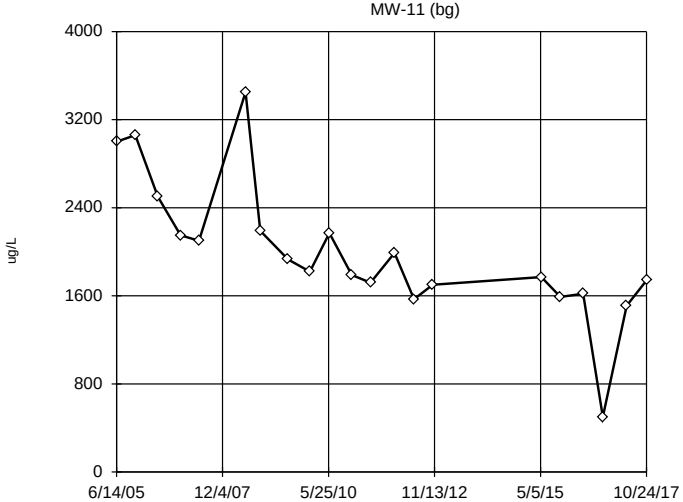
Constituent: Sulfide Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-11 (bg)




n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

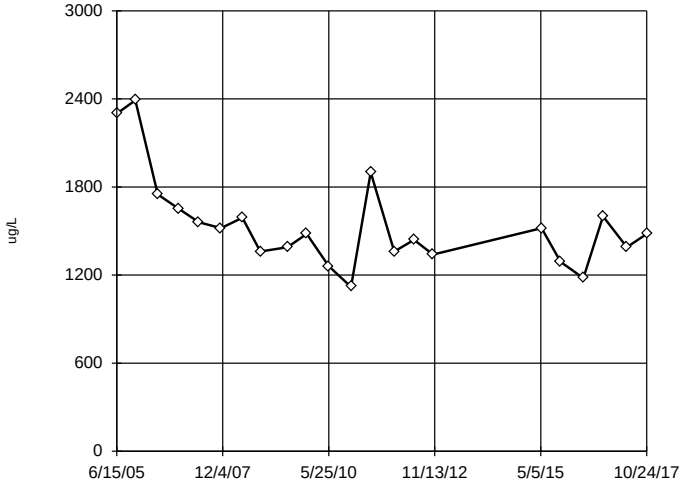
High cutoff = 3740, low cutoff = 100, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 6:08 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-21ox (bg)




n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

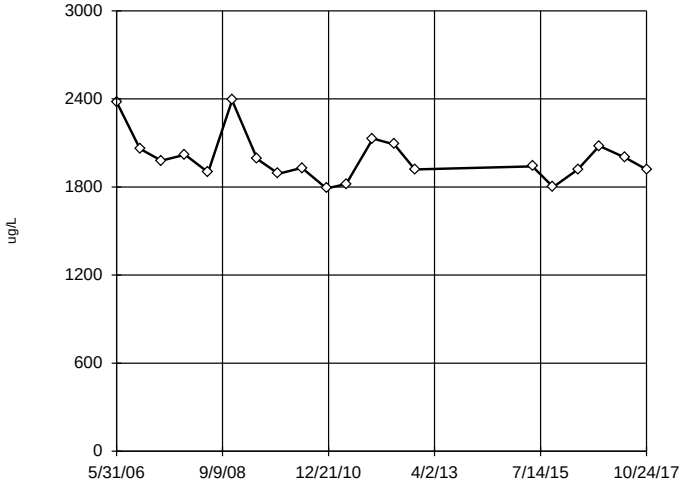
High cutoff = 2833, low cutoff = 774.3, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 20

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

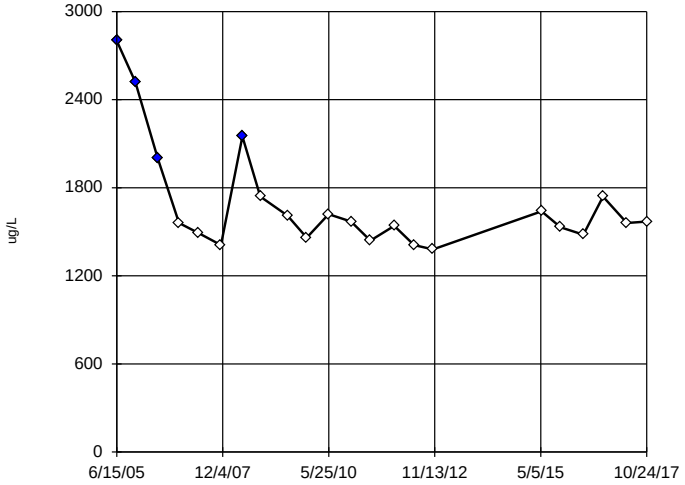
High cutoff = 2635, low cutoff = 1500, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Dixon's Outlier Test

MW-25ox (bg)




n = 22

Statistical outliers are drawn as solid.
Testing for 4 high outliers.
Mean = 1692.
Std. Dev. = 365.8.
2000: c = 0.4407
tabl = 0.43.
Alpha = 0.05.

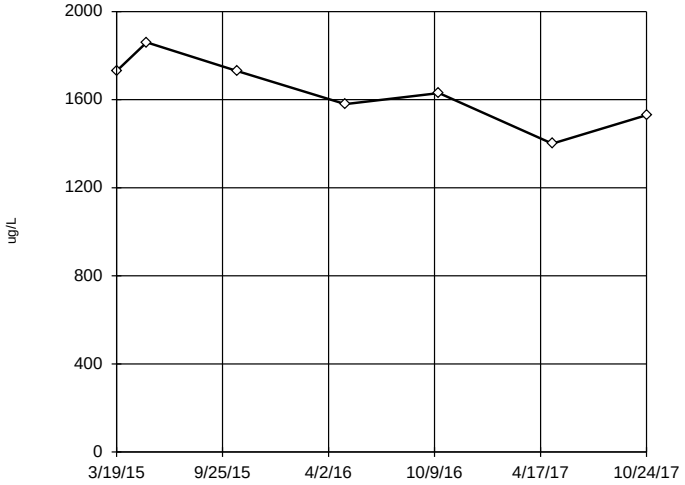
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9561
Critical = 0.914
The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 7

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1637, std. dev. 151.6, critical Tn 1.938

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9836
Critical = 0.838
The distribution was found to be normally distributed.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 6:08 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Box & Whiskers Plot

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 3/13/2020, 4:28 PM

| Constituent | Well | N | Mean | Std. Dev. | Std. Err. | Median | Min. | Max. | %NDs |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-11 (bg) | 22 | 263909 | 13673 | 2915 | 261500 | 238000 | 295000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-21ox (bg) | 22 | 339955 | 63185 | 13471 | 320500 | 255000 | 489000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | 21 | 353143 | 21270 | 4642 | 350000 | 304000 | 402000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-25ox (bg) | 22 | 341500 | 17930 | 3823 | 343500 | 304000 | 373000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-61ox (bg) | 7 | 310143 | 13717 | 5184 | 310000 | 294000 | 330000 | 0 |
| Ammonia as N (ug/L) | MW-11 (bg) | 22 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Ammonia as N (ug/L) | MW-21ox (bg) | 22 | 206.8 | 31.98 | 6.818 | 200 | 200 | 350 | 95.45 |
| Ammonia as N (ug/L) | MW-23ox (bg) | 22 | 200.1 | 0.6396 | 0.1364 | 200 | 200 | 203 | 95.45 |
| Ammonia as N (ug/L) | MW-25ox (bg) | 22 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Ammonia as N (ug/L) | MW-61ox (bg) | 7 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | 21 | 3.714 | 2.101 | 0.4585 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | 21 | 3.857 | 2.151 | 0.4695 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | 21 | 3.714 | 2.101 | 0.4585 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | 21 | 3.857 | 2.151 | 0.4695 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | 7 | 5.571 | 3.207 | 1.212 | 6 | 3 | 12 | 100 |
| Calcium (ug/L) | MW-11 (bg) | 21 | 500000 | 26745 | 5836 | 501000 | 432000 | 562000 | 0 |
| Calcium (ug/L) | MW-21ox (bg) | 21 | 353762 | 121576 | 26530 | 350000 | 148000 | 541000 | 0 |
| Calcium (ug/L) | MW-23ox (bg) | 21 | 395652 | 104581 | 22821 | 412000 | 94700 | 524000 | 0 |
| Calcium (ug/L) | MW-25ox (bg) | 21 | 227524 | 56149 | 12253 | 206000 | 160000 | 344000 | 0 |
| Calcium (ug/L) | MW-61ox (bg) | 7 | 390143 | 40392 | 15267 | 395000 | 345000 | 464000 | 0 |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | 21 | 6465 | 2295 | 500.8 | 5200 | 5000 | 12400 | 47.62 |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | 21 | 5329 | 732.9 | 159.9 | 5000 | 5000 | 7500 | 80.95 |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | 21 | 6125 | 1780 | 388.4 | 5410 | 5000 | 11000 | 47.62 |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | 21 | 6188 | 1713 | 373.8 | 5000 | 5000 | 9920 | 57.14 |
| Chemical Oxygen Demand (ug/L) | MW-61ox (bg) | 7 | 6433 | 2512 | 949.6 | 5000 | 5000 | 11000 | 71.43 |
| Chloride (ug/L) | MW-11 (bg) | 33 | 21256 | 27134 | 4723 | 7530 | 1000 | 88100 | 0 |
| Chloride (ug/L) | MW-21ox (bg) | 32 | 4418 | 1290 | 228 | 4935 | 2000 | 6280 | 18.75 |
| Chloride (ug/L) | MW-23ox (bg) | 37 | 6284 | 2107 | 346.3 | 6020 | 2000 | 13200 | 0 |
| Chloride (ug/L) | MW-25ox (bg) | 32 | 2863 | 851.4 | 150.5 | 2690 | 500 | 4630 | 37.5 |
| Chloride (ug/L) | MW-61ox (bg) | 5 | 23080 | 3815 | 1706 | 23700 | 18700 | 28200 | 0 |
| Iron [total] (mg/L) | MW-11 (bg) | 22 | 0.2068 | 0.1583 | 0.03375 | 0.1195 | 0.1 | 0.568 | 54.55 |
| Iron [total] (mg/L) | MW-21ox (bg) | 22 | 0.3621 | 0.3069 | 0.06543 | 0.2425 | 0.1 | 1.29 | 13.64 |
| Iron [total] (mg/L) | MW-23ox (bg) | 22 | 0.8202 | 3.169 | 0.6757 | 0.1 | 0.1 | 15 | 86.36 |
| Iron [total] (mg/L) | MW-25ox (bg) | 22 | 0.1422 | 0.119 | 0.02536 | 0.1 | 0.1 | 0.5 | 95.45 |
| Iron [total] (mg/L) | MW-61ox (bg) | 7 | 0.2401 | 0.1894 | 0.07159 | 0.1 | 0.1 | 0.5 | 85.71 |
| Iron, Dissolved (ug/L) | MW-11 (bg) | 22 | 140.9 | 118.2 | 25.19 | 100 | 100 | 500 | 100 |
| Iron, Dissolved (ug/L) | MW-21ox (bg) | 22 | 232.6 | 179.9 | 38.35 | 175.5 | 100 | 845 | 27.27 |
| Iron, Dissolved (ug/L) | MW-23ox (bg) | 22 | 138.1 | 117.4 | 25.03 | 100 | 100 | 500 | 95.45 |
| Iron, Dissolved (ug/L) | MW-25ox (bg) | 22 | 137.3 | 117.5 | 25.05 | 100 | 100 | 500 | 95.45 |
| Iron, Dissolved (ug/L) | MW-61ox (bg) | 7 | 214.3 | 195.2 | 73.77 | 100 | 100 | 500 | 100 |
| Manganese (ug/L) | MW-11 (bg) | 22 | 261.3 | 183.9 | 39.21 | 268.5 | 10 | 601 | 9.091 |
| Manganese (ug/L) | MW-21ox (bg) | 21 | 123.1 | 77.54 | 16.92 | 108 | 39.8 | 380 | 0 |
| Manganese (ug/L) | MW-23ox (bg) | 21 | 18.18 | 14.49 | 3.162 | 11.4 | 10 | 70.3 | 42.86 |
| Manganese (ug/L) | MW-25ox (bg) | 22 | 51.55 | 67.09 | 14.3 | 26.05 | 10 | 296 | 18.18 |
| Manganese (ug/L) | MW-61ox (bg) | 7 | 318.4 | 262.9 | 99.38 | 196 | 105 | 832 | 0 |
| Manganese, Dissolved (ug/L) | MW-11 (bg) | 22 | 178.7 | 161.9 | 34.52 | 97.9 | 10 | 506 | 13.64 |
| Manganese, Dissolved (ug/L) | MW-21ox (bg) | 22 | 131.1 | 81.94 | 17.47 | 121.5 | 17.3 | 396 | 0 |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | 22 | 16.2 | 12 | 2.558 | 10 | 10 | 51.3 | 59.09 |
| Manganese, Dissolved (ug/L) | MW-25ox (bg) | 22 | 36.69 | 45.41 | 9.681 | 21.55 | 10 | 173 | 27.27 |
| Manganese, Dissolved (ug/L) | MW-61ox (bg) | 7 | 159.9 | 92.16 | 34.83 | 160 | 51.1 | 309 | 0 |

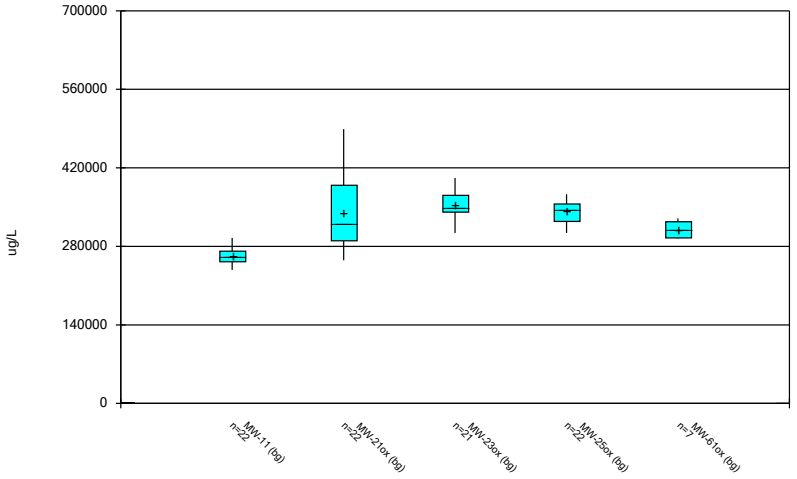
# Box & Whiskers Plot

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 3/13/2020, 4:28 PM

| Constituent | Well | N | Mean | Std. Dev. | Std. Err. | Median | Min. | Max. | %NDs |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate Nitrite as N (mg/L) | MW-11 (bg) | 22 | 8.826 | 3.021 | 0.6441 | 9.455 | 2.52 | 13.2 | 0 |
| Nitrate Nitrite as N (mg/L) | MW-21ox (bg) | 22 | 1.073 | 1.096 | 0.2337 | 1 | 0.1 | 4.95 | 59.09 |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | 22 | 10.36 | 4.342 | 0.9257 | 9.85 | 1.79 | 17.8 | 0 |
| Nitrate Nitrite as N (mg/L) | MW-25ox (bg) | 22 | 0.8122 | 0.8378 | 0.1786 | 1 | 0.1 | 4.02 | 90.91 |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | 7 | 0.3289 | 0.1927 | 0.07283 | 0.315 | 0.1 | 0.627 | 28.57 |
| Potassium (ug/L) | MW-11 (bg) | 21 | 22576 | 1454 | 317.3 | 22800 | 19700 | 26600 | 0 |
| Potassium (ug/L) | MW-21ox (bg) | 21 | 7734 | 3900 | 851.1 | 6200 | 3380 | 15600 | 0 |
| Potassium (ug/L) | MW-23ox (bg) | 20 | 15347 | 3840 | 858.6 | 14450 | 9740 | 21200 | 0 |
| Potassium (ug/L) | MW-25ox (bg) | 20 | 4845 | 977.8 | 218.6 | 4455 | 3810 | 7150 | 0 |
| Potassium (ug/L) | MW-61ox (bg) | 7 | 3986 | 758.4 | 286.6 | 3890 | 3120 | 5420 | 0 |
| Sodium [total] (mg/L) | MW-11 (bg) | 21 | 91.31 | 5.018 | 1.095 | 91.1 | 82.6 | 100 | 0 |
| Sodium [total] (mg/L) | MW-21ox (bg) | 21 | 32.82 | 9.282 | 2.025 | 30 | 21.7 | 53.3 | 0 |
| Sodium [total] (mg/L) | MW-23ox (bg) | 20 | 92.08 | 21.66 | 4.842 | 89.7 | 55.4 | 129 | 0 |
| Sodium [total] (mg/L) | MW-25ox (bg) | 20 | 48.52 | 4.369 | 0.9769 | 47.7 | 41.8 | 56.9 | 0 |
| Sodium [total] (mg/L) | MW-61ox (bg) | 7 | 67.16 | 3.845 | 1.453 | 68.2 | 61 | 72.8 | 0 |
| Sulfate (ug/L) | MW-11 (bg) | 22 | 2437273 | 135301 | 28846 | 2395000 | 2230000 | 2670000 | 0 |
| Sulfate (ug/L) | MW-21ox (bg) | 22 | 1058409 | 429738 | 91620 | 1130000 | 282000 | 1910000 | 0 |
| Sulfate (ug/L) | MW-23ox (bg) | 22 | 1947727 | 374101 | 79759 | 2080000 | 1140000 | 2570000 | 0 |
| Sulfate (ug/L) | MW-25ox (bg) | 22 | 857182 | 303007 | 64601 | 714000 | 490000 | 1420000 | 0 |
| Sulfate (ug/L) | MW-61ox (bg) | 7 | 1561429 | 209637 | 79235 | 1680000 | 1300000 | 1800000 | 0 |
| Sulfide (ug/L) | MW-11 (bg) | 22 | 1805 | 378.6 | 80.71 | 2000 | 1000 | 2000 | 90.91 |
| Sulfide (ug/L) | MW-21ox (bg) | 22 | 1782 | 413.6 | 88.18 | 2000 | 1000 | 2000 | 95.45 |
| Sulfide (ug/L) | MW-23ox (bg) | 22 | 1781 | 435.1 | 92.77 | 2000 | 1000 | 2180 | 90.91 |
| Sulfide (ug/L) | MW-25ox (bg) | 22 | 1813 | 440.3 | 93.86 | 2000 | 1000 | 2590 | 90.91 |
| Sulfide (ug/L) | MW-61ox (bg) | 7 | 1857 | 378 | 142.9 | 2000 | 1000 | 2000 | 100 |
| Total Organic Carbon (ug/L) | MW-11 (bg) | 21 | 1994 | 629.7 | 137.4 | 1820 | 500 | 3450 | 9.524 |
| Total Organic Carbon (ug/L) | MW-21ox (bg) | 22 | 1540 | 316.8 | 67.53 | 1480 | 1120 | 2390 | 0 |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | 20 | 1998 | 162 | 36.22 | 1960 | 1790 | 2390 | 0 |
| Total Organic Carbon (ug/L) | MW-25ox (bg) | 22 | 1692 | 365.8 | 78 | 1565 | 1380 | 2800 | 0 |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | 7 | 1637 | 151.6 | 57.31 | 1630 | 1400 | 1860 | 0 |

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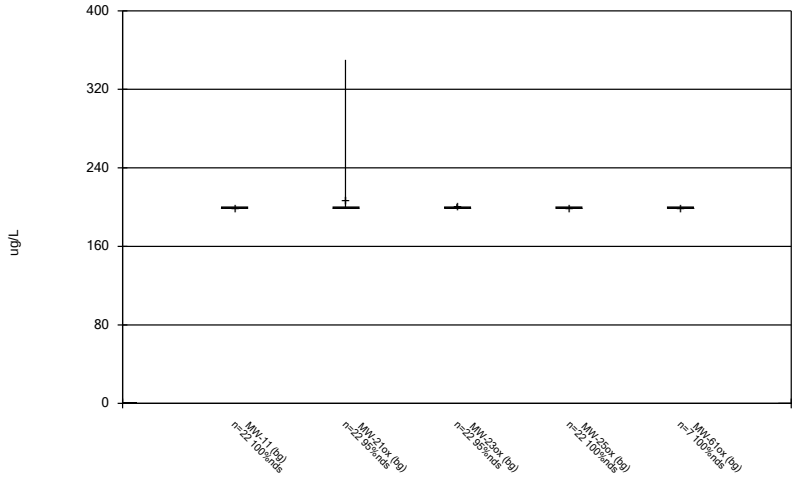
## Box & Whiskers Plot




Constituent: Alkalinity, Total [CaCO3] Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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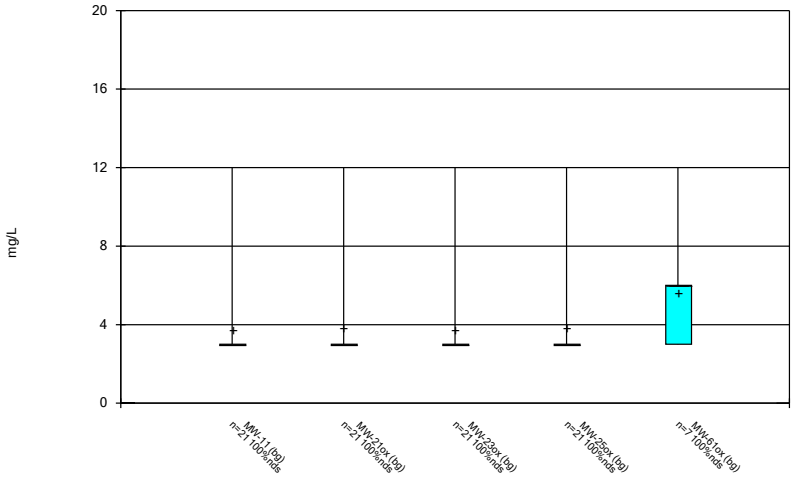
## Box & Whiskers Plot




Constituent: Ammonia as N Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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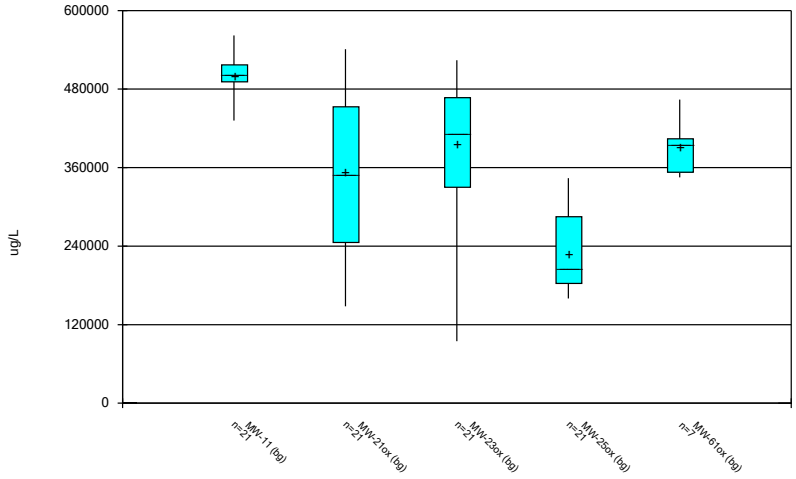
## Box & Whiskers Plot




Constituent: Biochemical Oxygen Demand Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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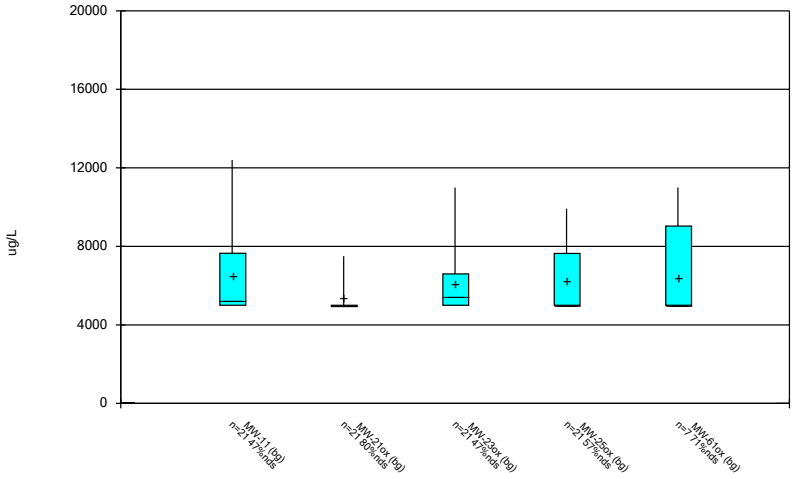
## Box & Whiskers Plot




Constituent: Calcium Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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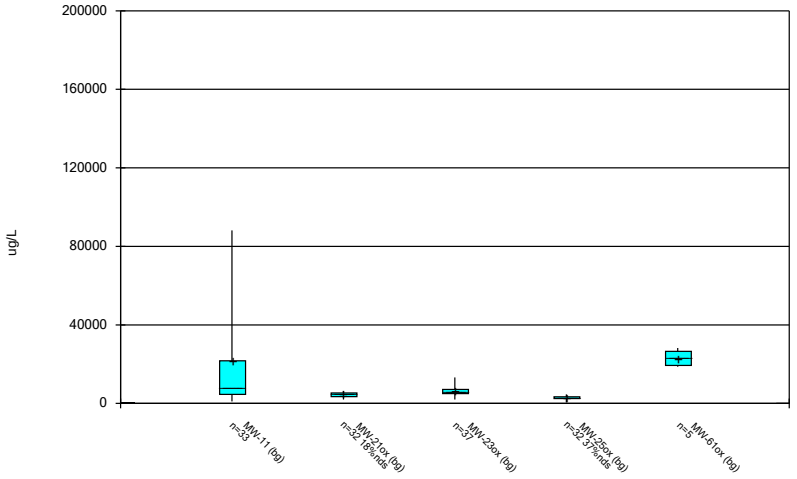
## Box & Whiskers Plot




Constituent: Chemical Oxygen Demand Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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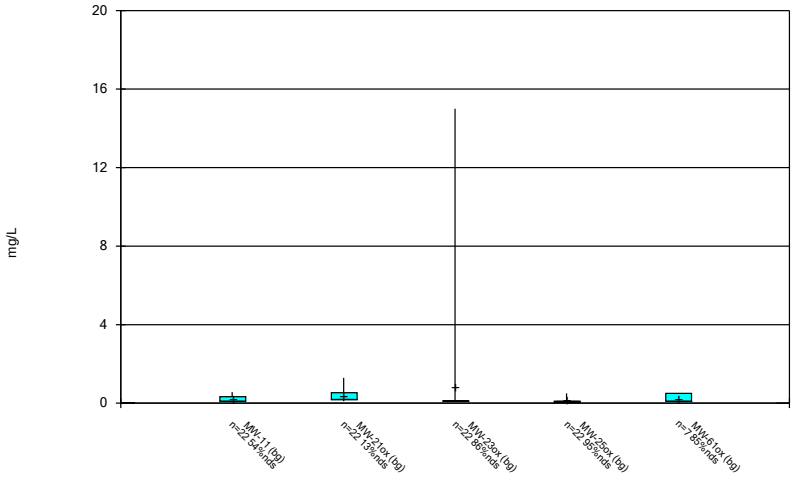
## Box & Whiskers Plot




Constituent: Chloride Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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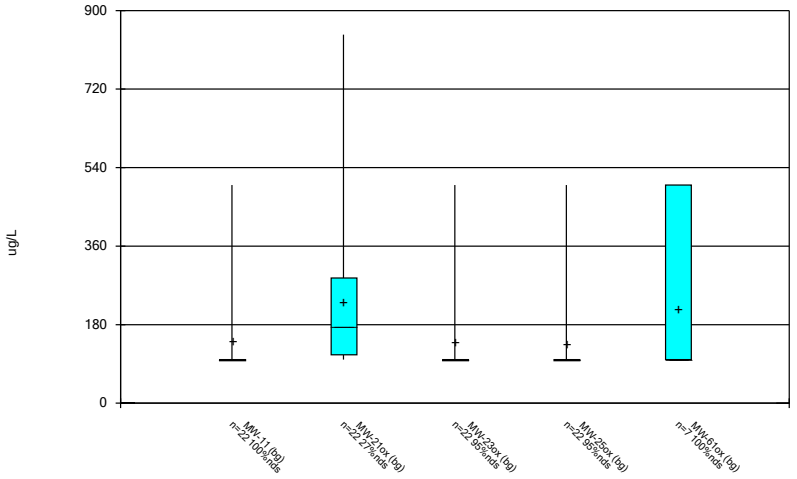
## Box & Whiskers Plot




Constituent: Iron [total] Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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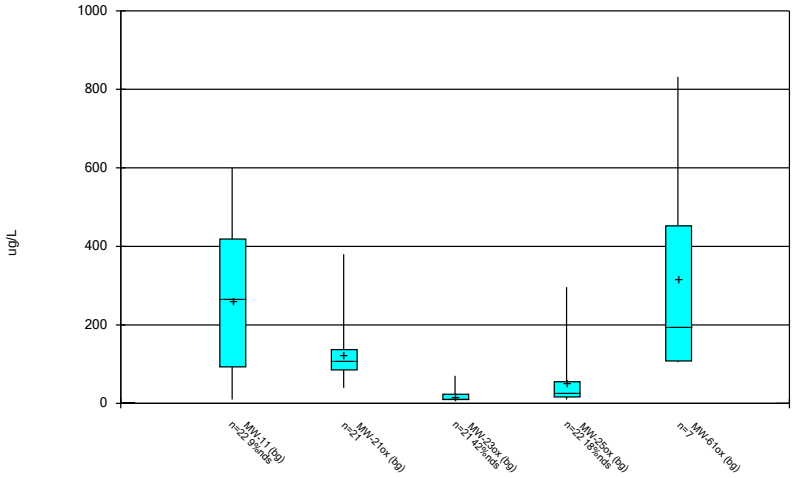
## Box & Whiskers Plot




Constituent: Iron, Dissolved Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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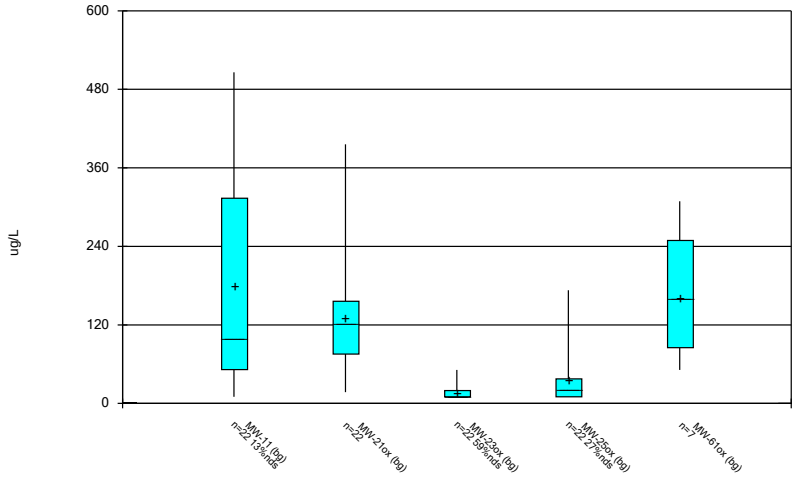
## Box & Whiskers Plot




Constituent: Manganese Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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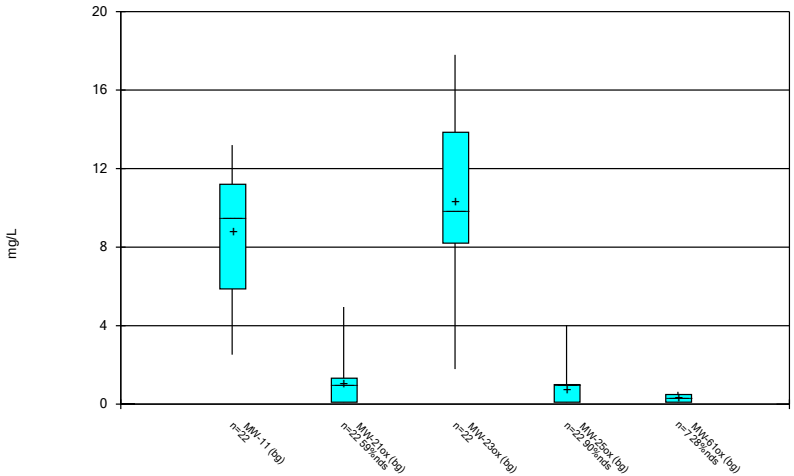
## Box & Whiskers Plot




Constituent: Manganese, Dissolved Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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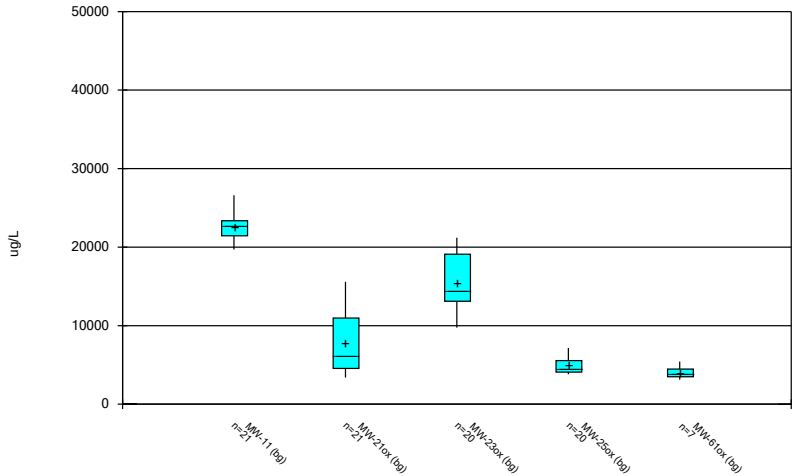
## Box & Whiskers Plot




Constituent: Nitrate Nitrite as N Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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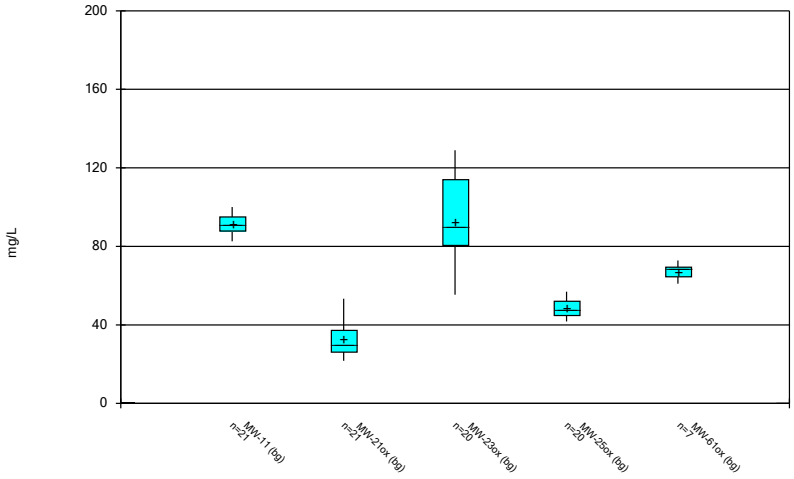
## Box & Whiskers Plot




Constituent: Potassium Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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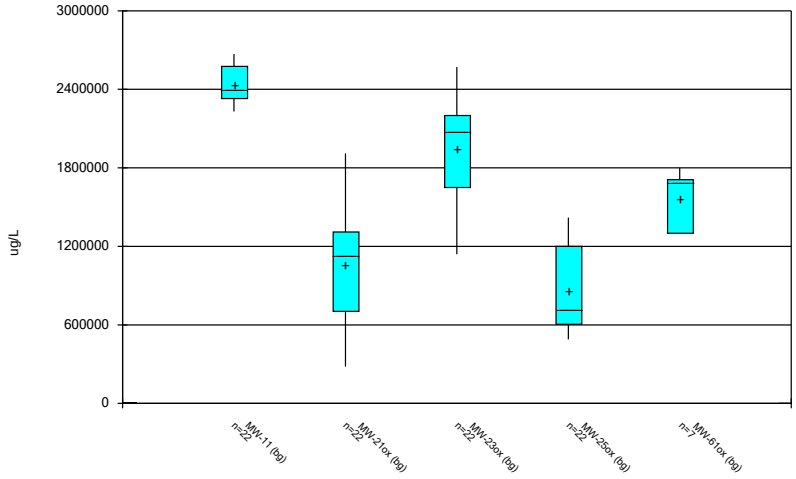
## Box & Whiskers Plot




Constituent: Sodium [total] Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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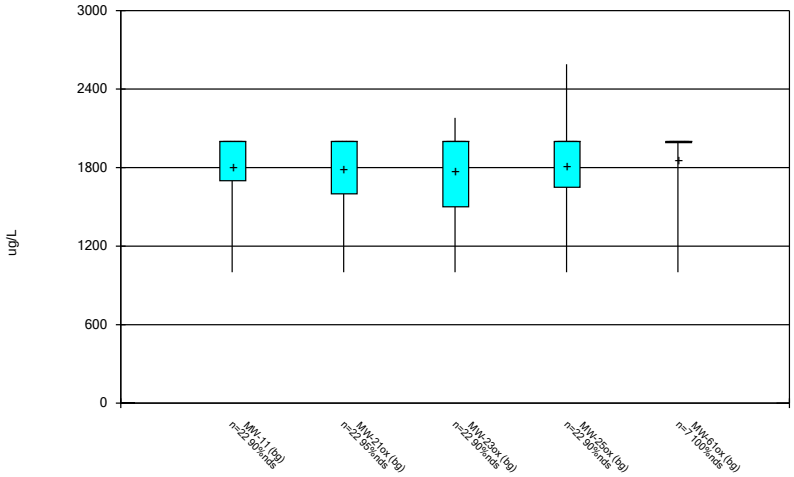
## Box & Whiskers Plot




Constituent: Sulfate Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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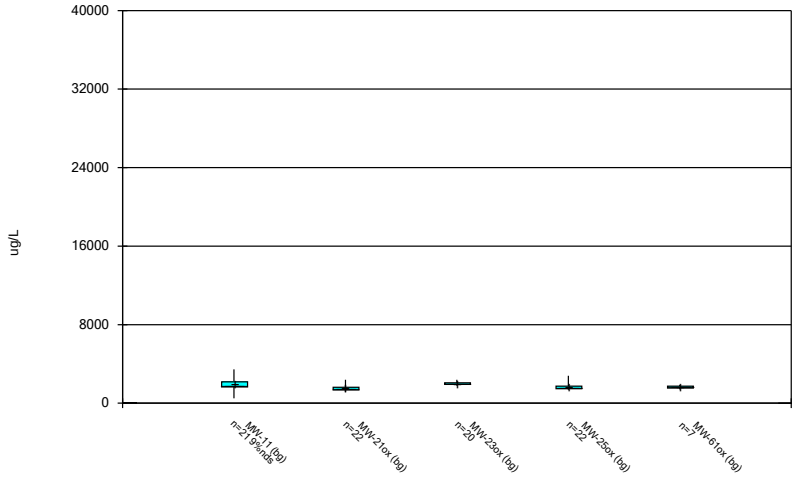
## Box & Whiskers Plot




Constituent: Sulfide Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Box & Whiskers Plot




Constituent: Total Organic Carbon Analysis Run 3/13/2020 4:26 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Trend Test

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/14/2020, 5:32 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-11 (bg)** | **-2659** | **-148** | **-71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-21ox (bg)** | **9784** | **129** | **71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | -695.2 | -27 | -66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-25ox (bg)** | **-2440** | **-86** | **-71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-61ox (bg) | -11526 | -15 | -15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-11 (bg) | 0 | 0 | 71 | No | 22 | 100 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-21ox (bg) | 0 | 3 | 71 | No | 22 | 95.45 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-23ox (bg) | 0 | -19 | -71 | No | 22 | 95.45 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-25ox (bg) | 0 | 0 | 71 | No | 22 | 100 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-61ox (bg) | 0 | 0 | 15 | No | 7 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | 0 | 46 | 66 | No | 21 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | 0 | 39 | 66 | No | 21 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | 0 | 46 | 66 | No | 21 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | 0 | 39 | 66 | No | 21 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | 0 | -1 | -15 | No | 7 | 100 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-11 (bg) | -451 | -21 | -66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-21ox (bg) | 8024 | 32 | 66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-23ox (bg) | 1177 | 11 | 66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| **Calcium (ug/L)** | **MW-25ox (bg)** | **11681** | **152** | **66** | **Yes** | **21** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Calcium (ug/L) | MW-61ox (bg) | -25773 | -13 | -15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | 0 | 19 | 66 | No | 21 | 47.62 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | 0 | -14 | -66 | No | 21 | 80.95 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | 9.575 | 45 | 66 | No | 21 | 47.62 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | 0 | 26 | 66 | No | 21 | 57.14 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-61ox (bg) | 0 | 9 | 15 | No | 7 | 71.43 | n/a | n/a | 0.05 | NP |
| **Chloride (ug/L)** | **MW-11 (bg)** | **1980** | **414** | **128** | **Yes** | **33** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Chloride (ug/L) | MW-21ox (bg) | 0.3232 | 21 | 123 | No | 32 | 18.75 | n/a | n/a | 0.05 | NP |
| **Chloride (ug/L)** | **MW-23ox (bg)** | **200.7** | **307** | **151** | **Yes** | **37** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Chloride (ug/L) | MW-25ox (bg) | 0 | -25 | -123 | No | 32 | 37.5 | n/a | n/a | 0.05 | NP |
| Chloride (ug/L) | MW-61ox (bg) | -3332 | -4 | -10 | No | 5 | 0 | n/a | n/a | 0.05 | NP |
| Iron [total] (mg/L) | MW-11 (bg) | -0.00282 | -55 | -71 | No | 22 | 54.55 | n/a | n/a | 0.05 | NP |
| **Iron [total] (mg/L)** | **MW-21ox (bg)** | **0.02397** | **104** | **71** | **Yes** | **22** | **13.64** | **n/a** | **n/a** | **0.05** | **NP** |
| Iron [total] (mg/L) | MW-23ox (bg) | 0 | 4 | 71 | No | 22 | 86.36 | n/a | n/a | 0.05 | NP |
| Iron [total] (mg/L) | MW-25ox (bg) | 0 | 35 | 71 | No | 22 | 95.45 | n/a | n/a | 0.05 | NP |
| Iron [total] (mg/L) | MW-61ox (bg) | 0 | 6 | 15 | No | 7 | 85.71 | n/a | n/a | 0.05 | NP |
| Iron, Dissolved (ug/L) | MW-11 (bg) | 0 | 55 | 71 | No | 22 | 100 | n/a | n/a | 0.05 | NP |
| **Iron, Dissolved (ug/L)** | **MW-21ox (bg)** | **18.66** | **114** | **71** | **Yes** | **22** | **27.27** | **n/a** | **n/a** | **0.05** | **NP** |
| Iron, Dissolved (ug/L) | MW-23ox (bg) | 0 | 35 | 71 | No | 22 | 95.45 | n/a | n/a | 0.05 | NP |
| Iron, Dissolved (ug/L) | MW-25ox (bg) | 0 | 35 | 71 | No | 22 | 95.45 | n/a | n/a | 0.05 | NP |
| Iron, Dissolved (ug/L) | MW-61ox (bg) | 0 | 10 | 15 | No | 7 | 100 | n/a | n/a | 0.05 | NP |
| **Manganese (ug/L)** | **MW-11 (bg)** | **-26.31** | **-96** | **-71** | **Yes** | **22** | **9.091** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-21ox (bg)** | **7.865** | **83** | **66** | **Yes** | **21** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Manganese (ug/L) | MW-23ox (bg) | 0 | -35 | -66 | No | 21 | 42.86 | n/a | n/a | 0.05 | NP |
| Manganese (ug/L) | MW-25ox (bg) | -1.089 | -39 | -71 | No | 22 | 18.18 | n/a | n/a | 0.05 | NP |
| Manganese (ug/L) | MW-61ox (bg) | -197.7 | -15 | -15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-11 (bg) | -9.178 | -70 | -71 | No | 22 | 13.64 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-21ox (bg) | 5.073 | 50 | 71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | 0 | -15 | -71 | No | 22 | 59.09 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-25ox (bg) | -0.7946 | -46 | -71 | No | 22 | 27.27 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-61ox (bg) | -30.39 | -1 | -15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |

# Trend Test

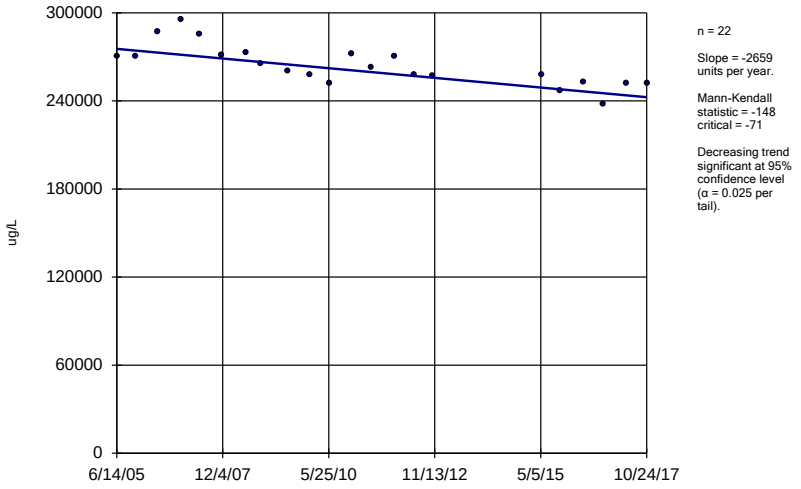
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:32 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nitrate Nitrite as N (mg/L)** | **MW-11 (bg)** | **-0.6198** | **-156** | **-71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Nitrate Nitrite as N (mg/L) | MW-21ox (bg) | -0.08252 | -65 | -71 | No | 22 | 59.09 | n/a | n/a | 0.05 | NP |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | -0.1837 | -34 | -71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| **Nitrate Nitrite as N (mg/L)** | **MW-25ox (bg)** | **-0.07543** | **-110** | **-71** | **Yes** | **22** | **90.91** | **n/a** | **n/a** | **0.05** | **NP** |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | 0.01959 | 4 | 15 | No | 7 | 28.57 | n/a | n/a | 0.05 | NP |
| Potassium (ug/L) | MW-11 (bg) | -49.7 | -25 | -66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| Potassium (ug/L) | MW-21ox (bg) | 263.8 | 36 | 66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| Potassium (ug/L) | MW-23ox (bg) | -2.184 | 0 | 62 | No | 20 | 0 | n/a | n/a | 0.05 | NP |
| **Potassium (ug/L)** | **MW-25ox (bg)** | **131.3** | **72** | **62** | **Yes** | **20** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Potassium (ug/L) | MW-61ox (bg) | 354.4 | 9 | 15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| **Sodium [total] (mg/L)** | **MW-11 (bg)** | **-0.6808** | **-78** | **-66** | **Yes** | **21** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Sodium [total] (mg/L) | MW-21ox (bg) | 0.07911 | 2 | 66 | No | 21 | 0 | n/a | n/a | 0.05 | NP |
| Sodium [total] (mg/L) | MW-23ox (bg) | -0.05185 | -5 | -62 | No | 20 | 0 | n/a | n/a | 0.05 | NP |
| Sodium [total] (mg/L) | MW-25ox (bg) | 0.6736 | 58 | 62 | No | 20 | 0 | n/a | n/a | 0.05 | NP |
| Sodium [total] (mg/L) | MW-61ox (bg) | 1.306 | 5 | 15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-11 (bg) | -5764 | -19 | -71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-21ox (bg) | 11818 | 14 | 71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-23ox (bg) | -2243 | -1 | -71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| **Sulfate (ug/L)** | **MW-25ox (bg)** | **63437** | **170** | **71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Sulfate (ug/L) | MW-61ox (bg) | 0 | 0 | 15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |
| **Sulfide (ug/L)** | **MW-11 (bg)** | **0** | **90** | **71** | **Yes** | **22** | **90.91** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-21ox (bg)** | **0** | **81** | **71** | **Yes** | **22** | **95.45** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-23ox (bg)** | **0** | **93** | **71** | **Yes** | **22** | **90.91** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-25ox (bg)** | **0** | **83** | **71** | **Yes** | **22** | **90.91** | **n/a** | **n/a** | **0.05** | **NP** |
| Sulfide (ug/L) | MW-61ox (bg) | 0 | 4 | 15 | No | 7 | 100 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-11 (bg)** | **-102.4** | **-148** | **-66** | **Yes** | **21** | **9.524** | **n/a** | **n/a** | **0.05** | **NP** |
| **Total Organic Carbon (ug/L)** | **MW-21ox (bg)** | **-40.41** | **-93** | **-71** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | -10.85 | -39 | -62 | No | 20 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-25ox (bg) | -27.16 | -65 | -71 | No | 22 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | -133.5 | -14 | -15 | No | 7 | 0 | n/a | n/a | 0.05 | NP |

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## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = -2659 units per year.

Mann-Kendall statistic = -148 critical = -71

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

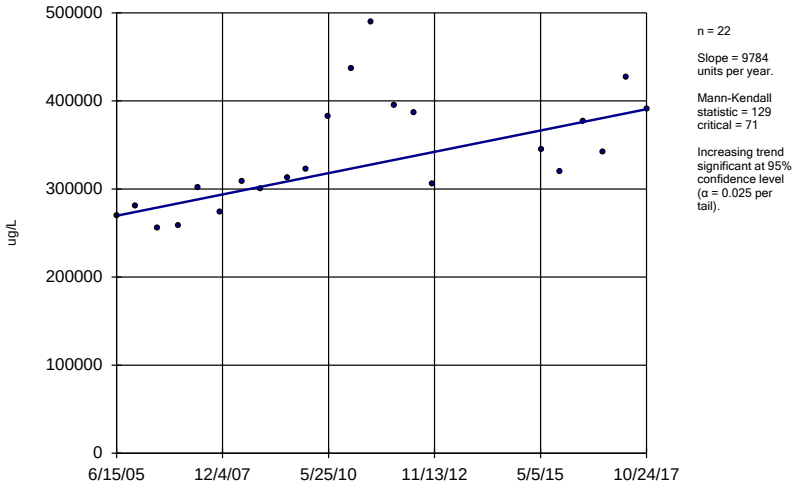
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = 9784 units per year.

Mann-Kendall statistic = 129 critical = 71

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

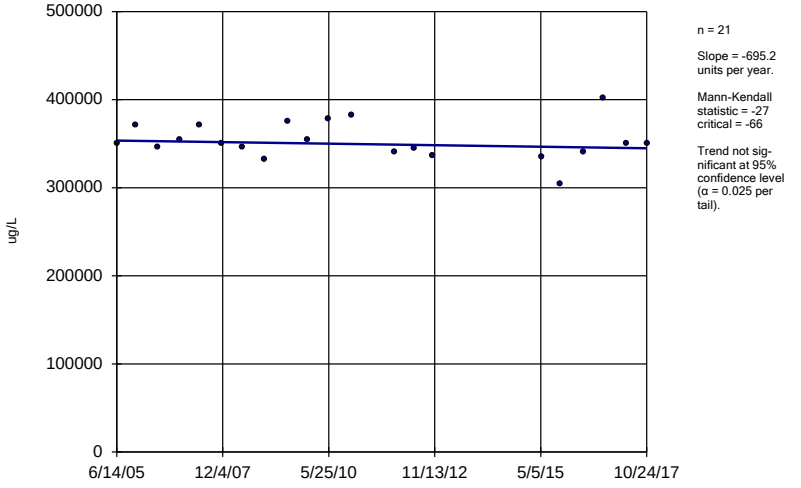
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-23ox (bg)




n = 21

Slope = -695.2 units per year.

Mann-Kendall statistic = -27 critical = -66

Trend not significant at 95% confidence level (α = 0.025 per tail).

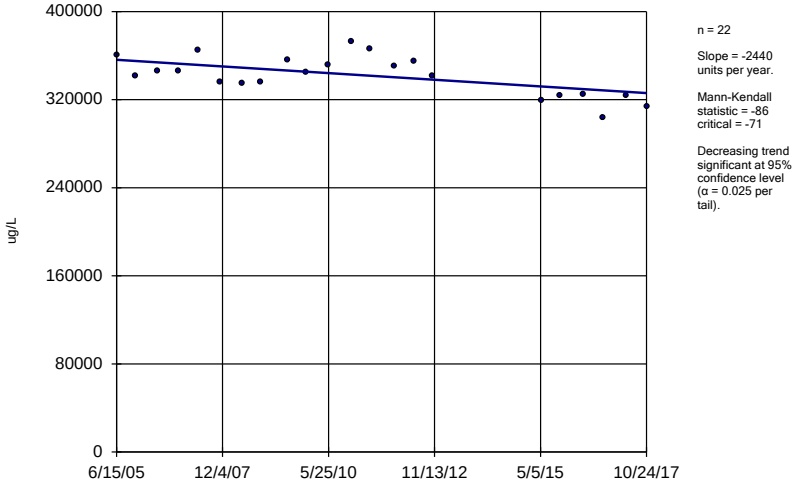
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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = -2440 units per year.

Mann-Kendall statistic = -86 critical = -71

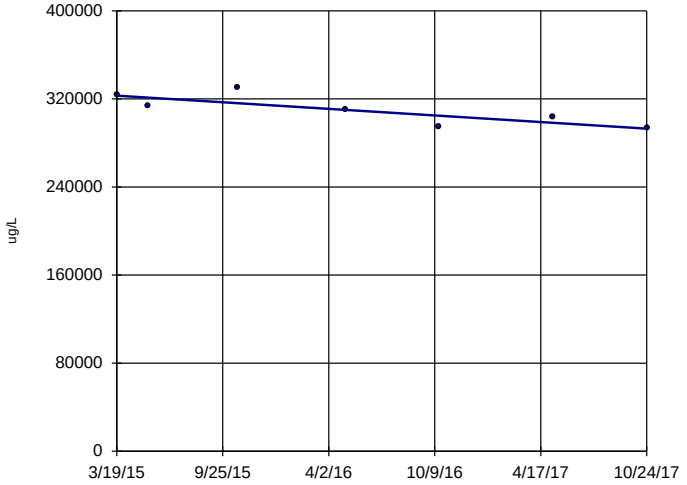
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-61ox (bg)



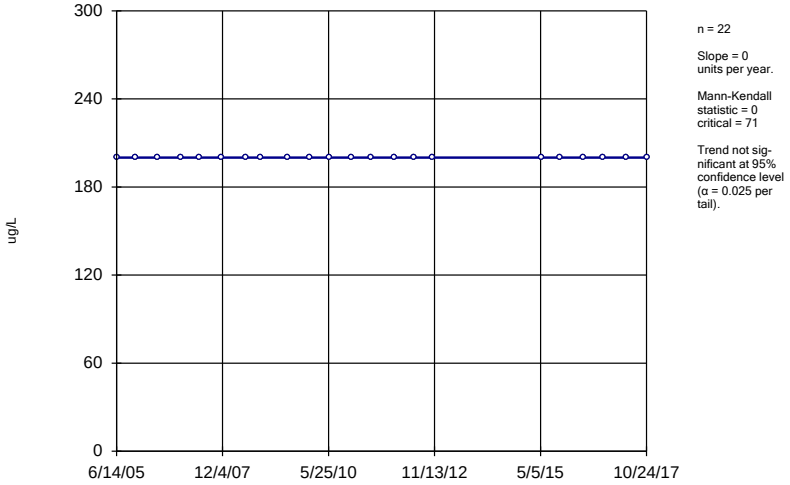

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-11 (bg)



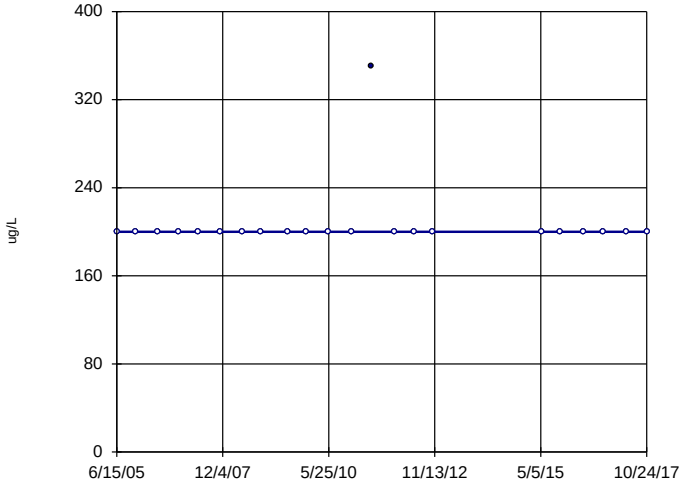

Constituent: Ammonia as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-21ox (bg)



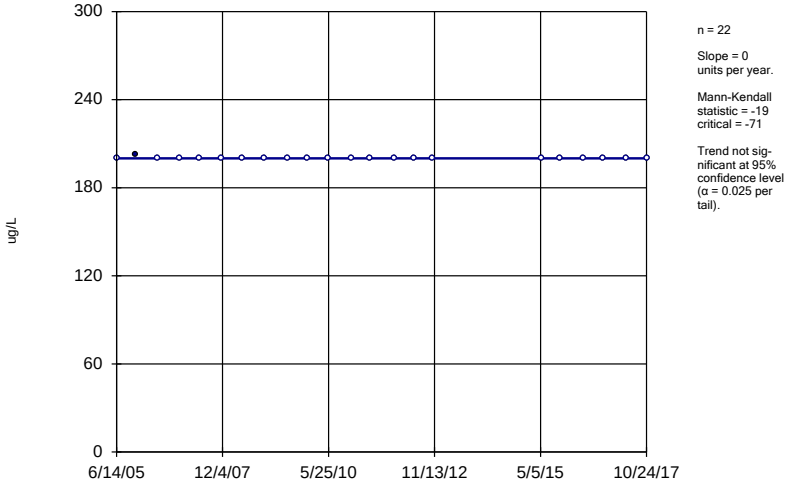

Constituent: Ammonia as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-23ox (bg)



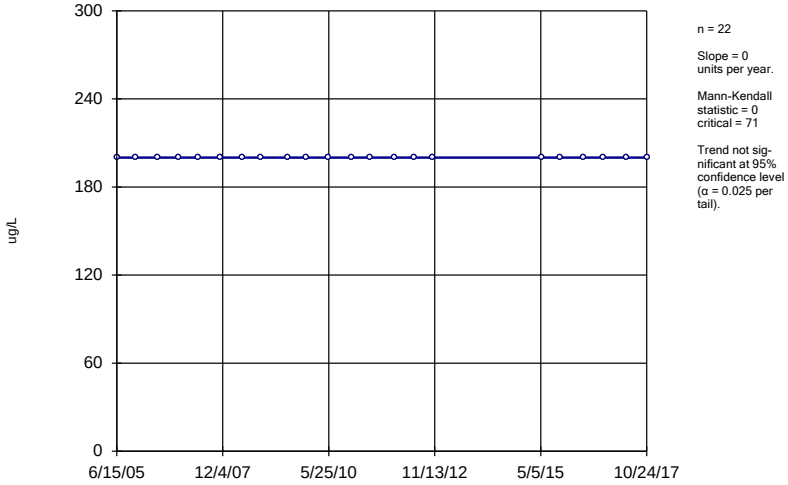

Constituent: Ammonia as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

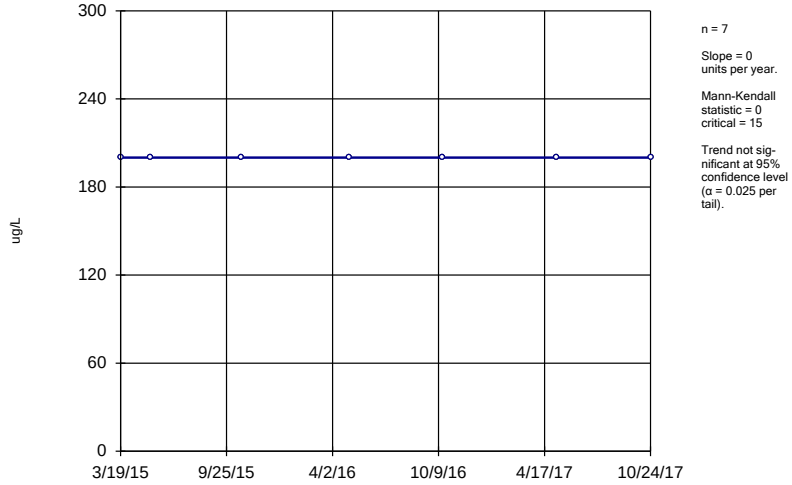



Constituent: Ammonia as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)

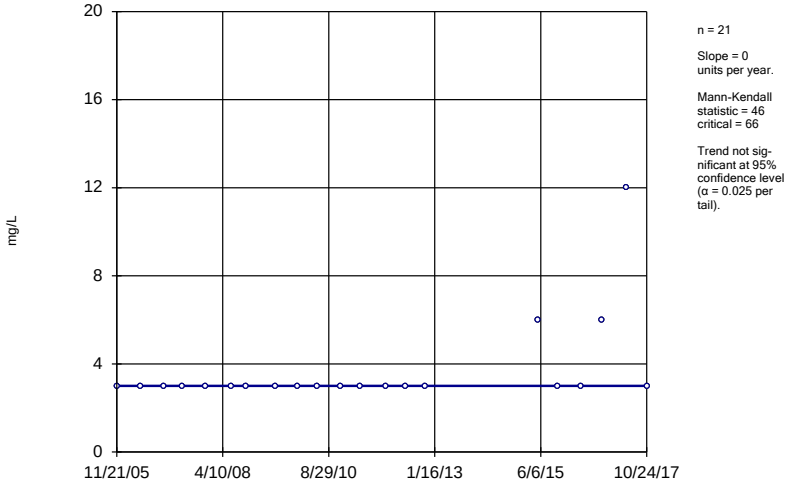



Constituent: Ammonia as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)

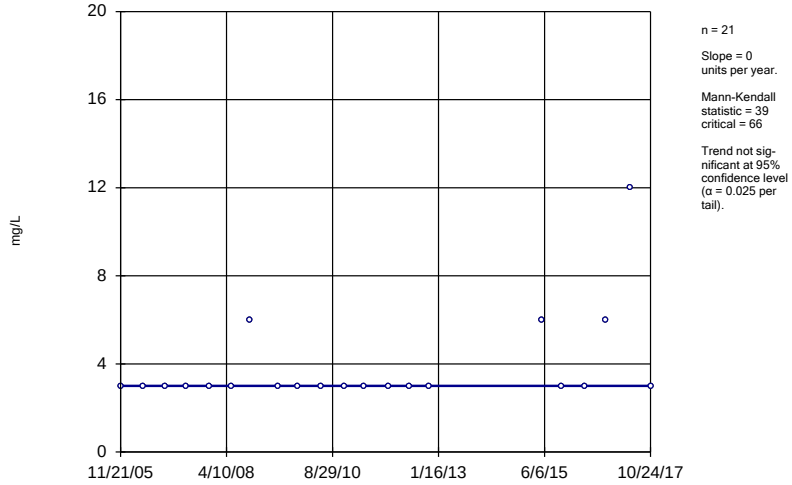



Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)

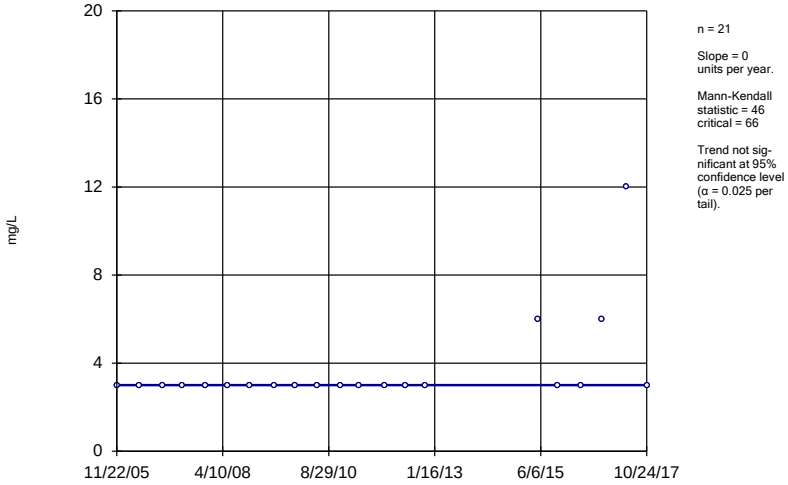



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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-23ox (bg)

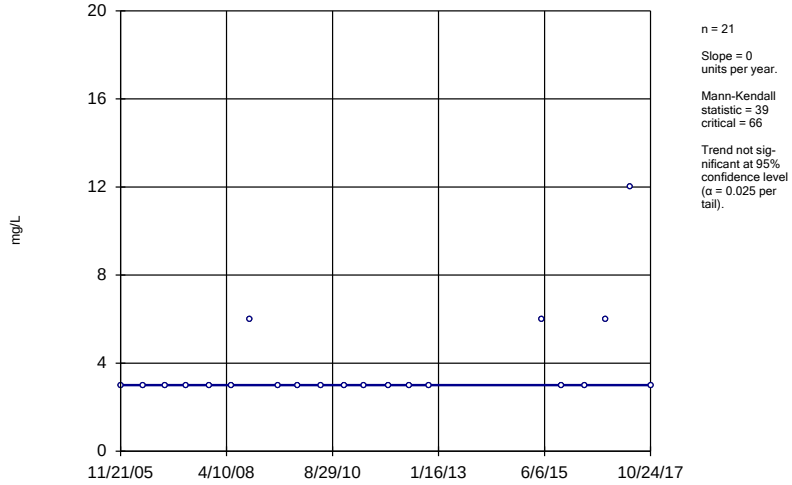



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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

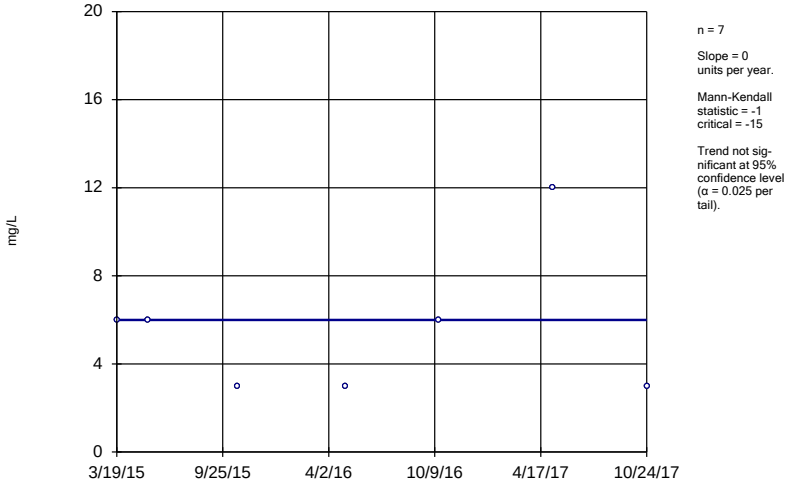



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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)

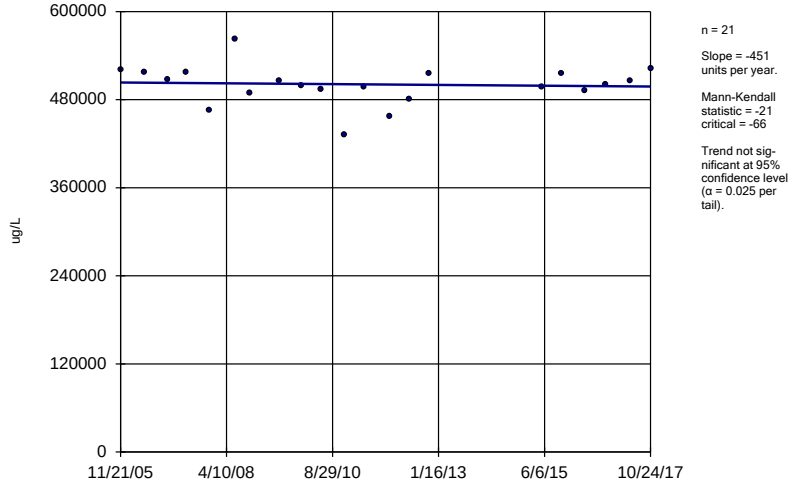



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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-11 (bg)

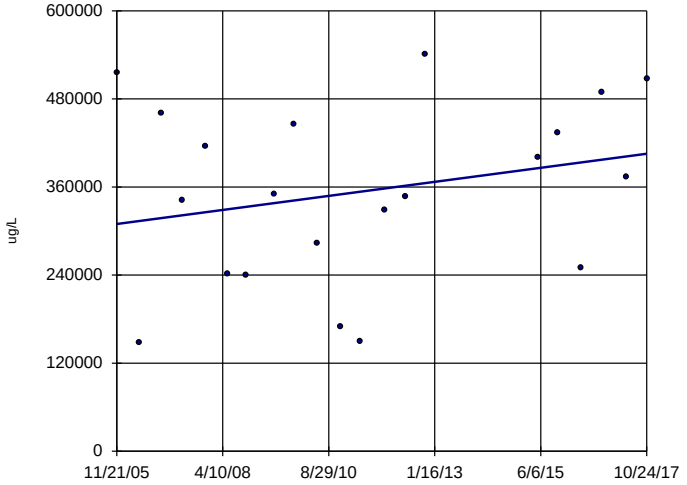



Constituent: Calcium Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 21

Slope = 8024 units per year.

Mann-Kendall statistic = 32 critical = 66

Trend not significant at 95% confidence level (α = 0.025 per tail).

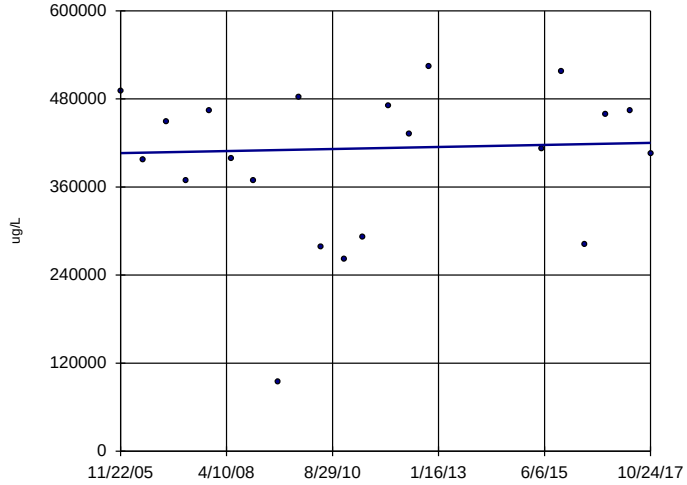
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Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 21

Slope = 1177 units per year.

Mann-Kendall statistic = 11 critical = 66

Trend not significant at 95% confidence level (α = 0.025 per tail).

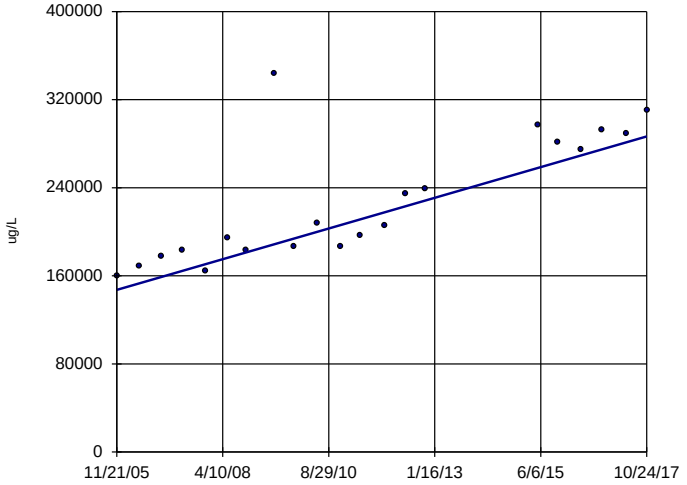
Constituent: Calcium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-25ox (bg)




n = 21

Slope = 11681 units per year.

Mann-Kendall statistic = 152 critical = 66

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

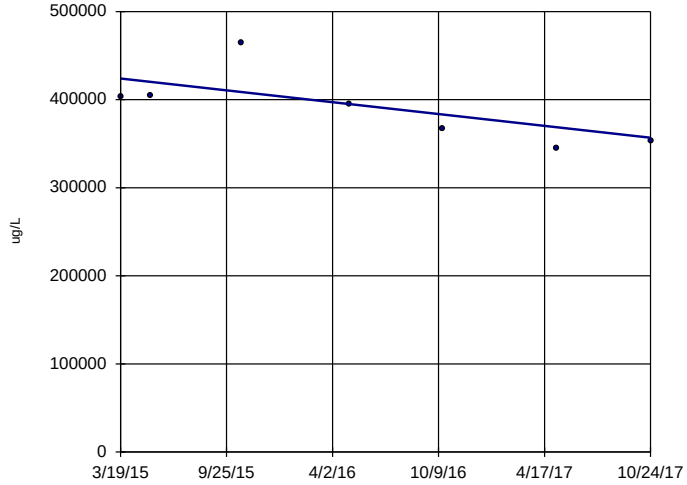
Constituent: Calcium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = -25773 units per year.

Mann-Kendall statistic = -13 critical = -15

Trend not significant at 95% confidence level (α = 0.025 per tail).

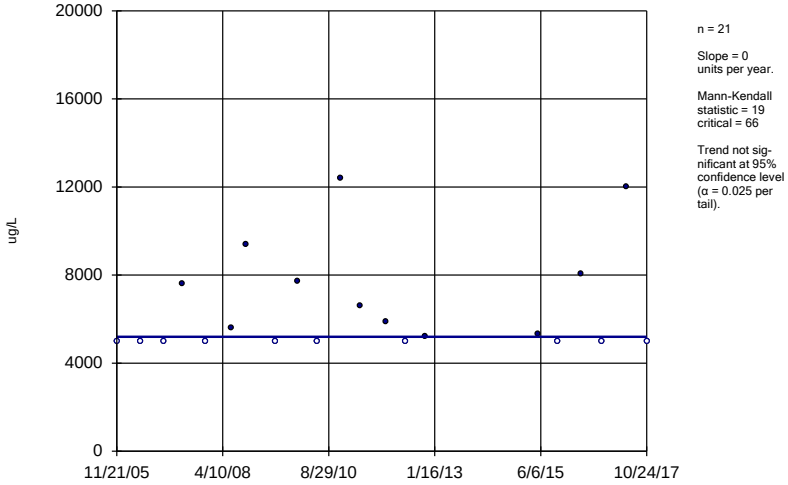
Constituent: Calcium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)

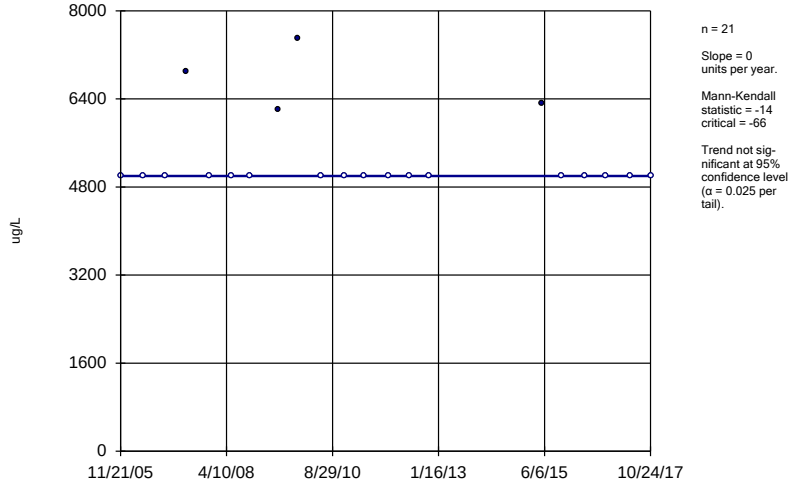



Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)

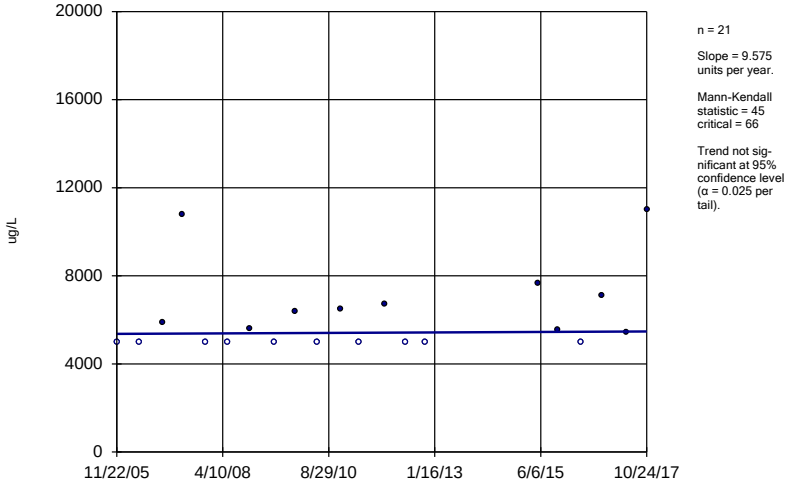



Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)

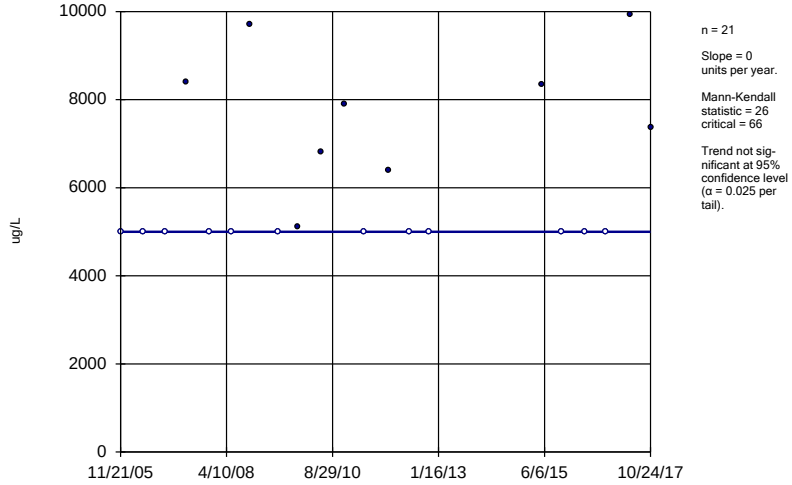



Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

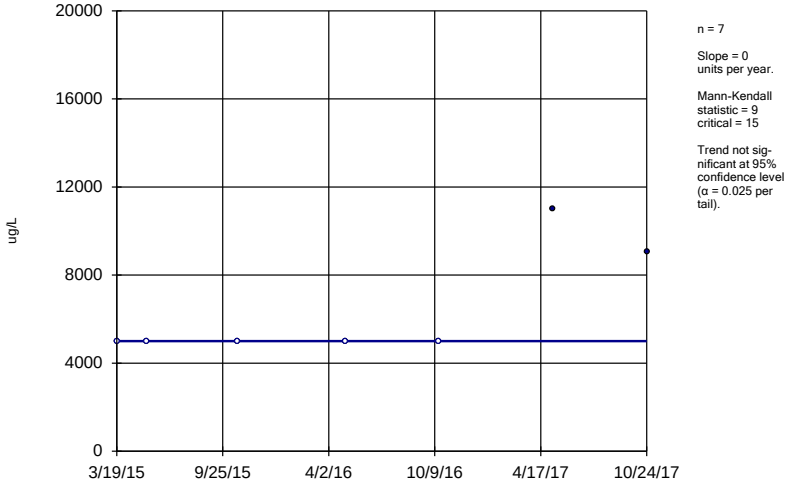



Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-61ox (bg)

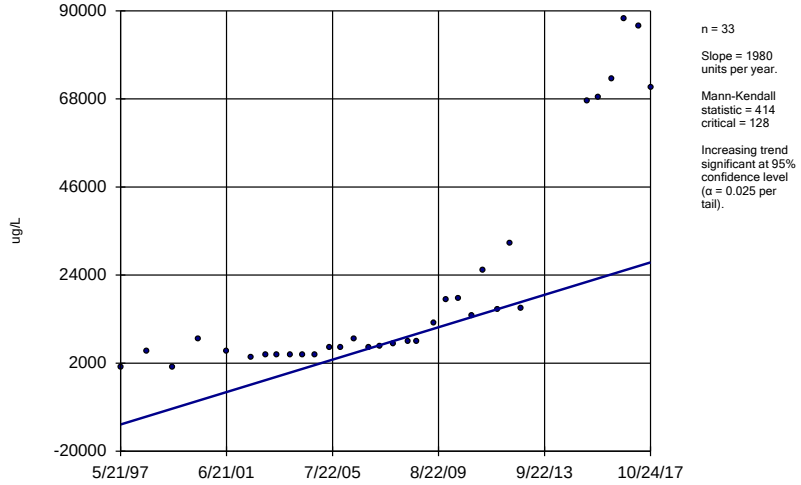



Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-11 (bg)

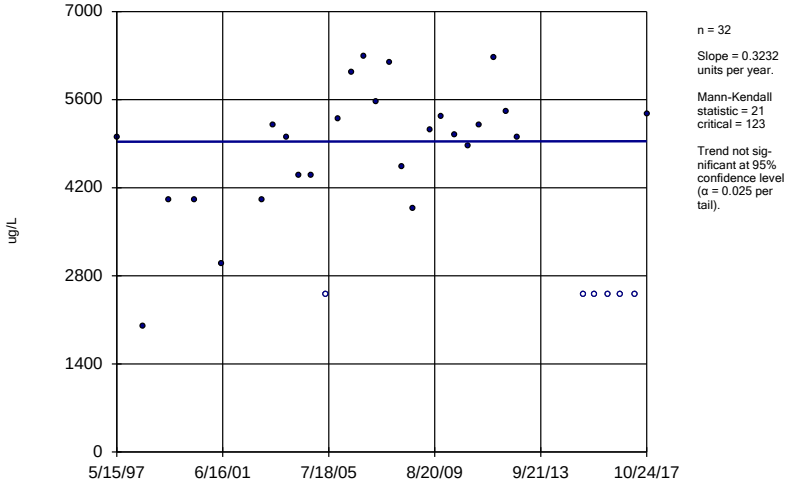



Constituent: Chloride Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21ox (bg)

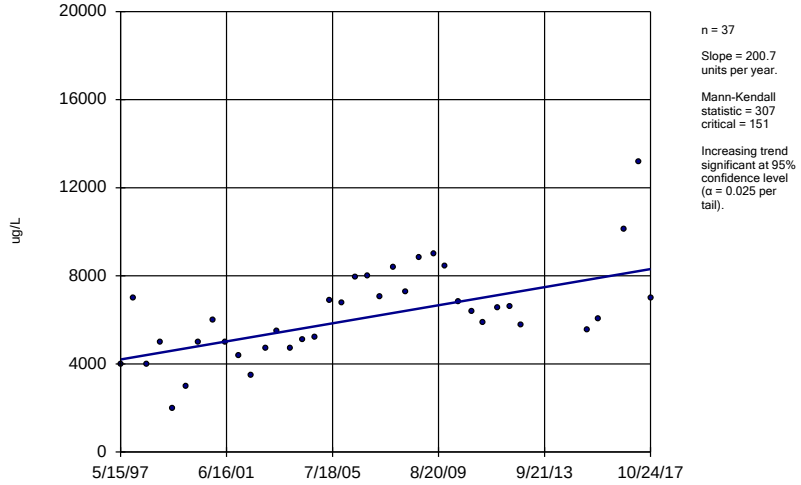



Constituent: Chloride Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-23ox (bg)

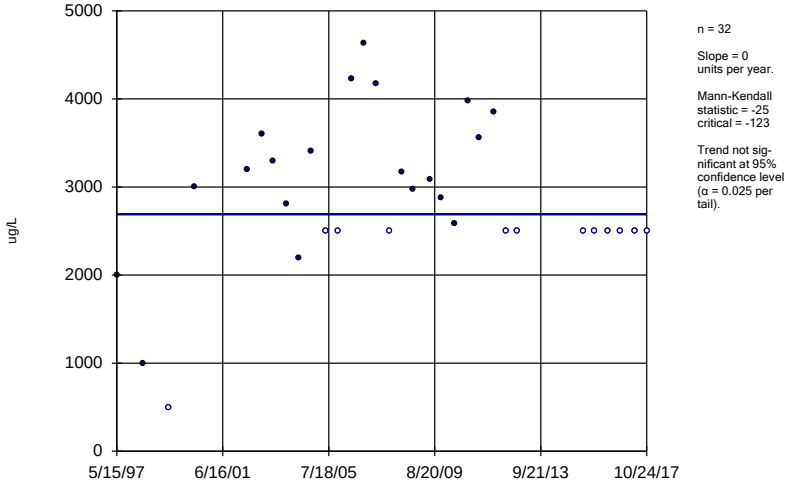



Constituent: Chloride Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 32

Slope = 0 units per year.

Mann-Kendall statistic = -25 critical = -123

Trend not significant at 95% confidence level (α = 0.025 per tail).

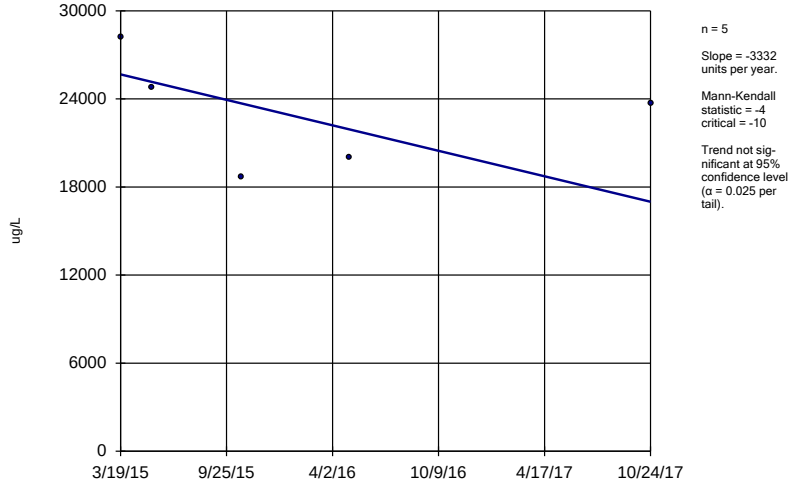
Constituent: Chloride Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 5

Slope = -3332 units per year.

Mann-Kendall statistic = -4 critical = -10

Trend not significant at 95% confidence level (α = 0.025 per tail).

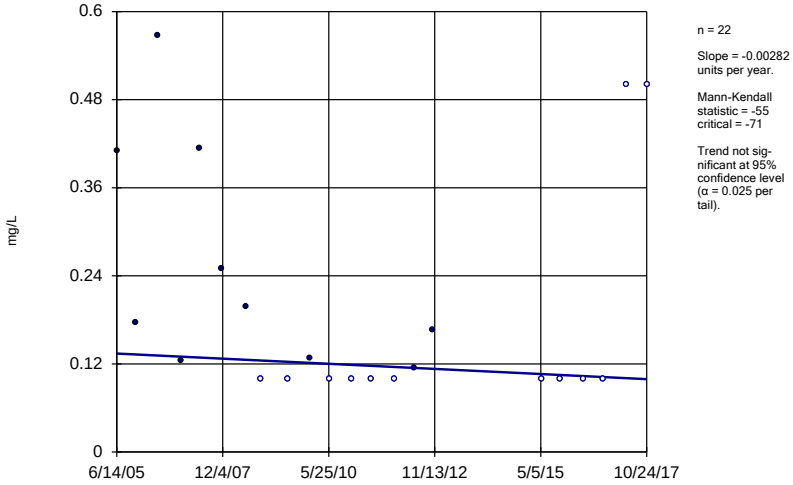
Constituent: Chloride Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = -0.00282 units per year.

Mann-Kendall statistic = -55 critical = -71

Trend not significant at 95% confidence level (α = 0.025 per tail).

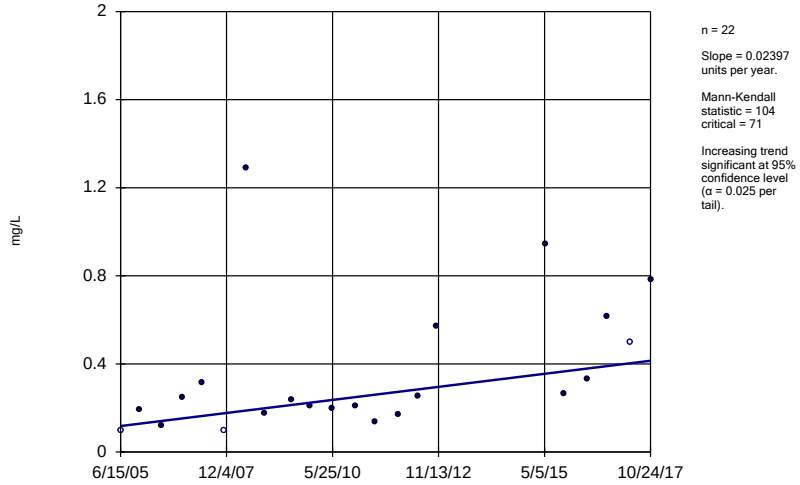
Constituent: Iron [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = 0.02397 units per year.

Mann-Kendall statistic = 104 critical = 71

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

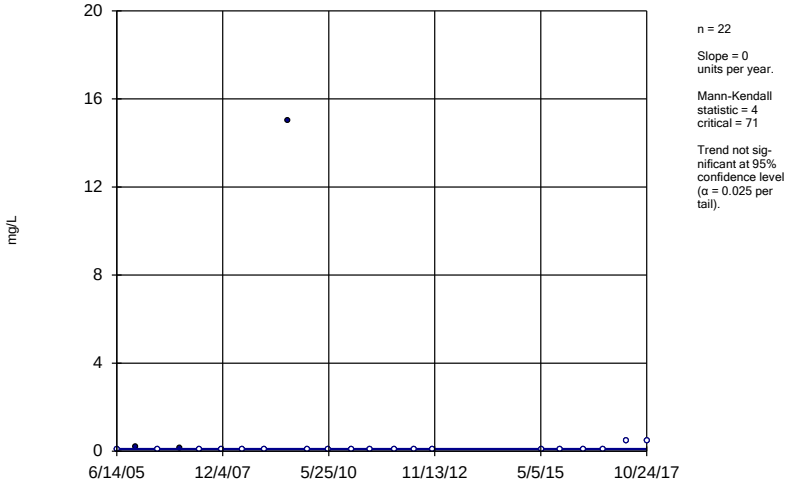
Constituent: Iron [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)

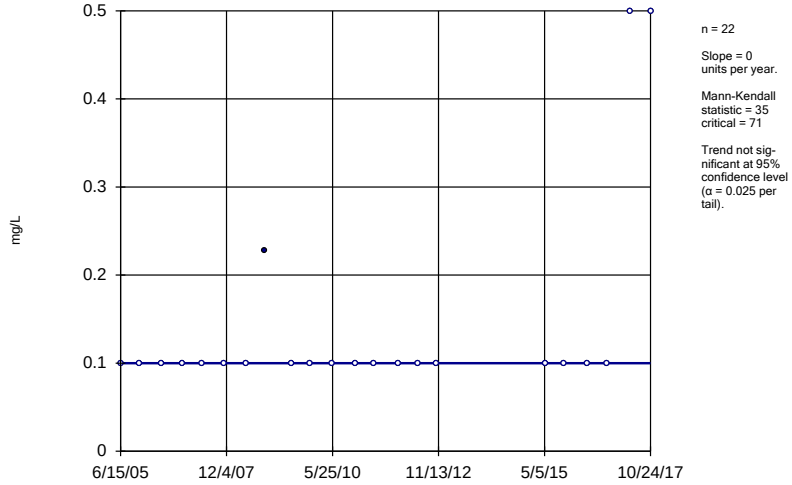



Constituent: Iron [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

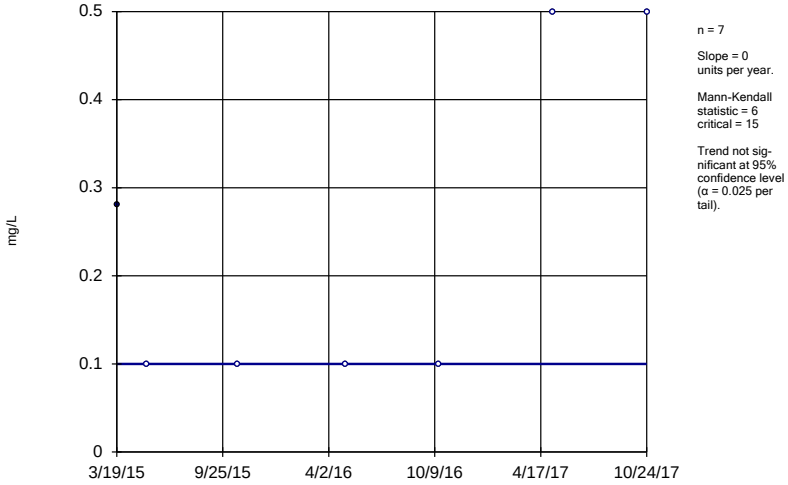



Constituent: Iron [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)

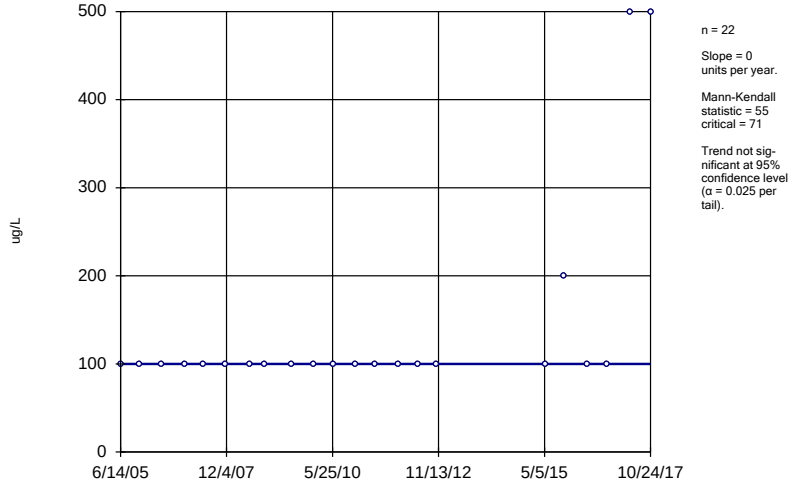



Constituent: Iron [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)

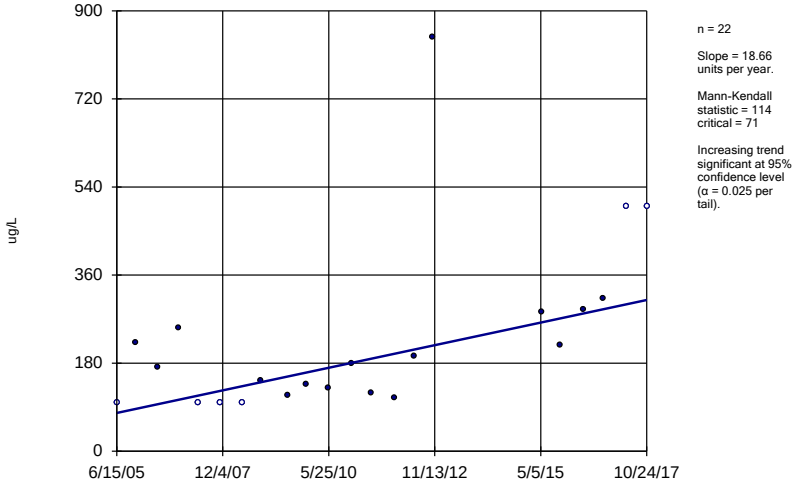



Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)

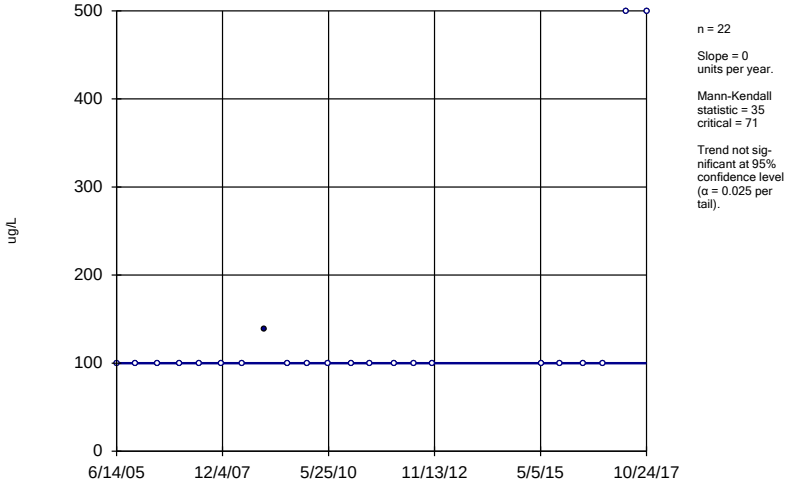



Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)

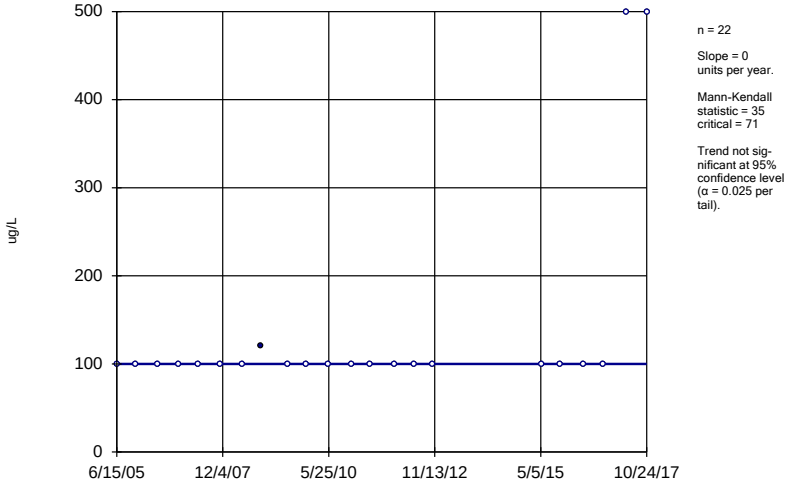



Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

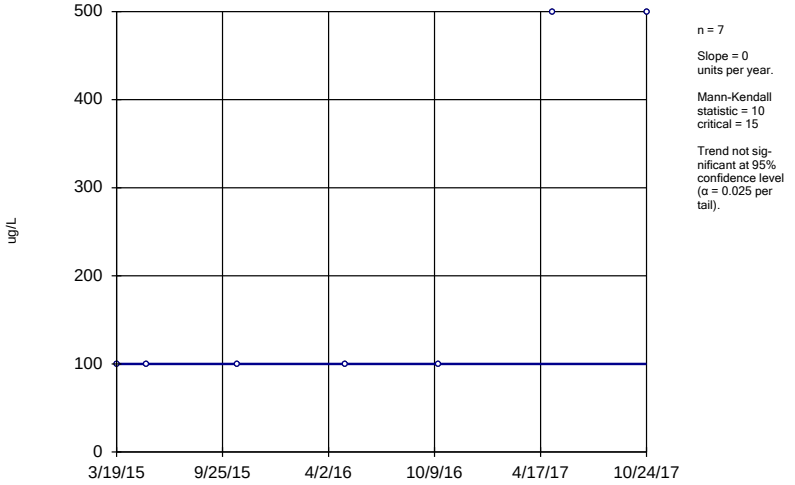



Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)

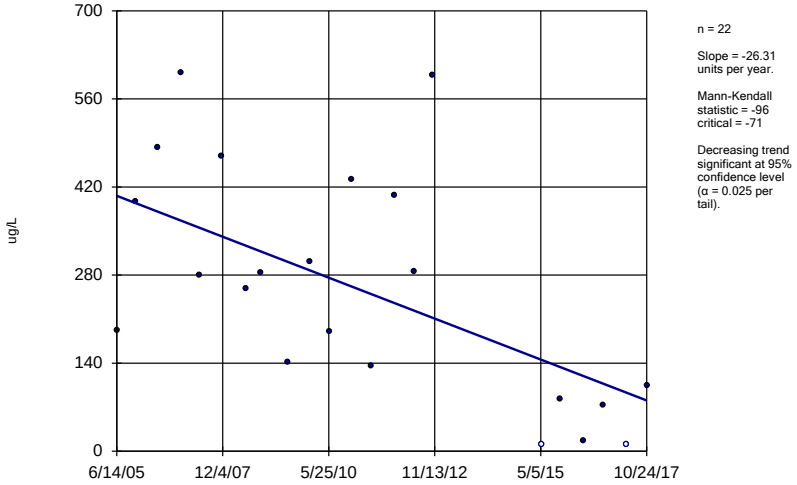



Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = -26.31 units per year.

Mann-Kendall statistic = -96
critical = -71

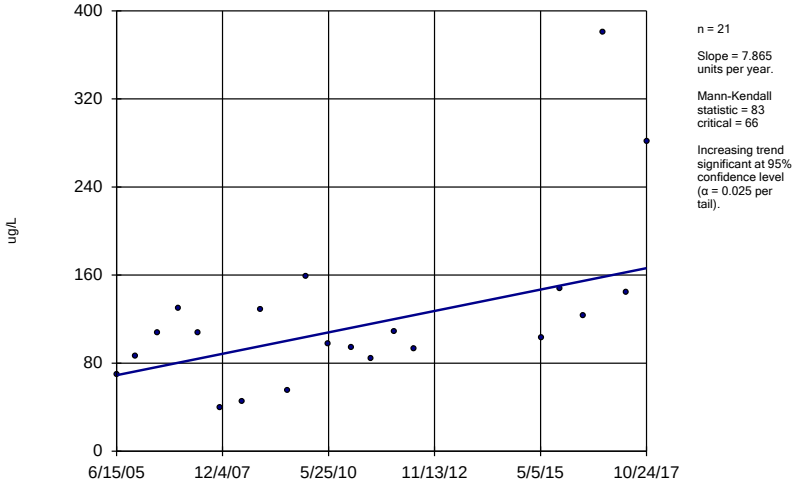
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 21

Slope = 7.865 units per year.

Mann-Kendall statistic = 83
critical = 66

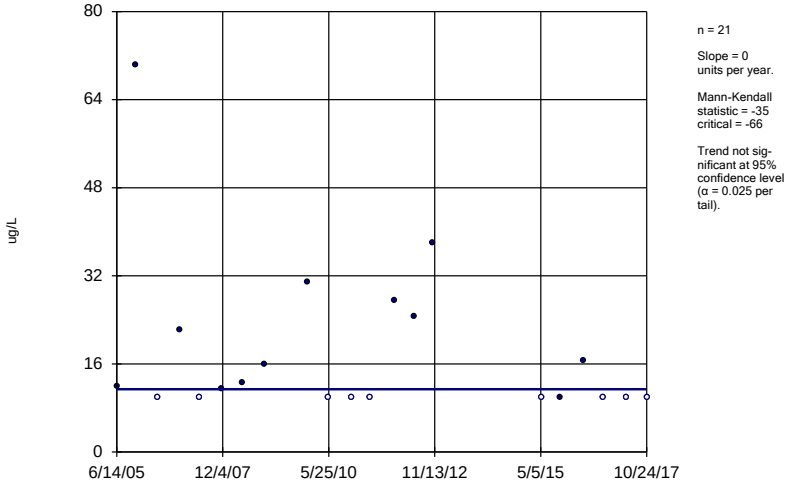
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 21

Slope = 0 units per year.

Mann-Kendall statistic = -35
critical = -66

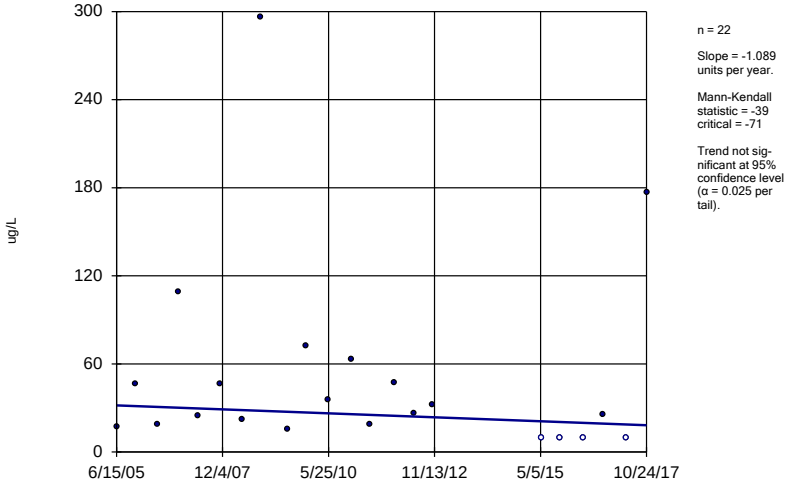
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = -1.089 units per year.

Mann-Kendall statistic = -39
critical = -71

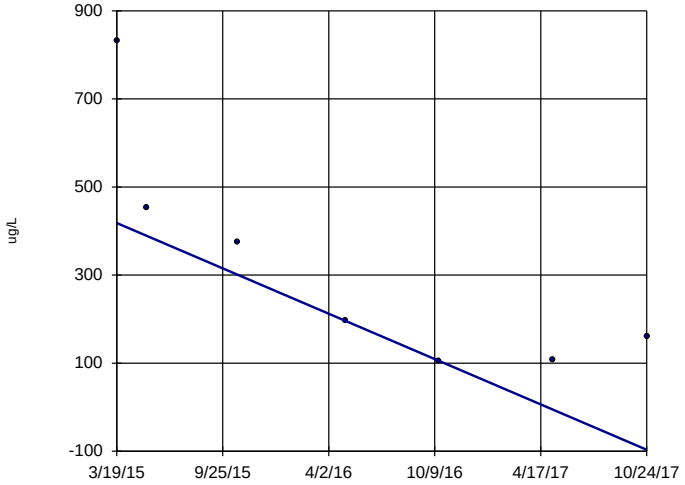
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = -197.7 units per year.

Mann-Kendall statistic = -15 critical = -15

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:30 PM View: Background Analysis

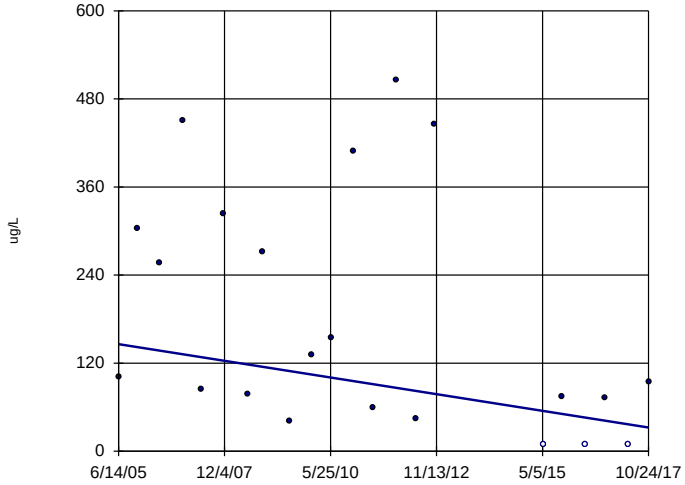
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = -9.178 units per year.

Mann-Kendall statistic = -70 critical = -71

Trend not significant at 95% confidence level (α = 0.025 per tail).

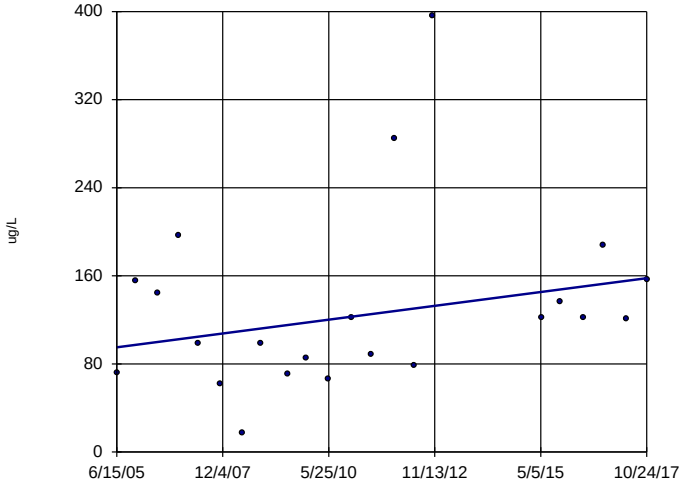
Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = 5.073 units per year.

Mann-Kendall statistic = 50 critical = 71

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis

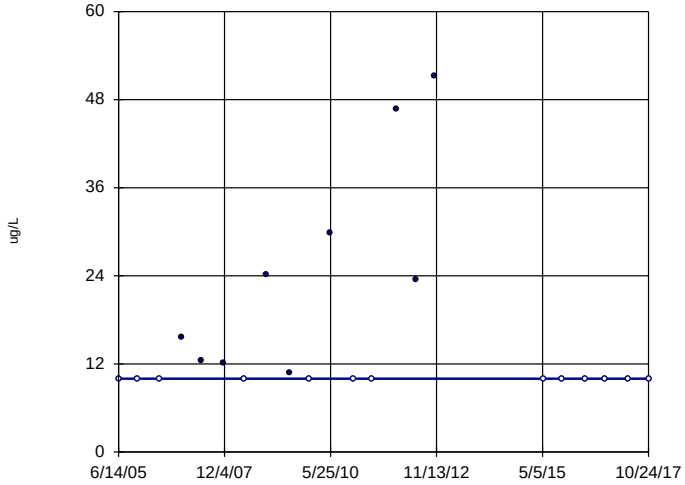
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 22

Slope = 0 units per year.

Mann-Kendall statistic = -15 critical = -71

Trend not significant at 95% confidence level (α = 0.025 per tail).

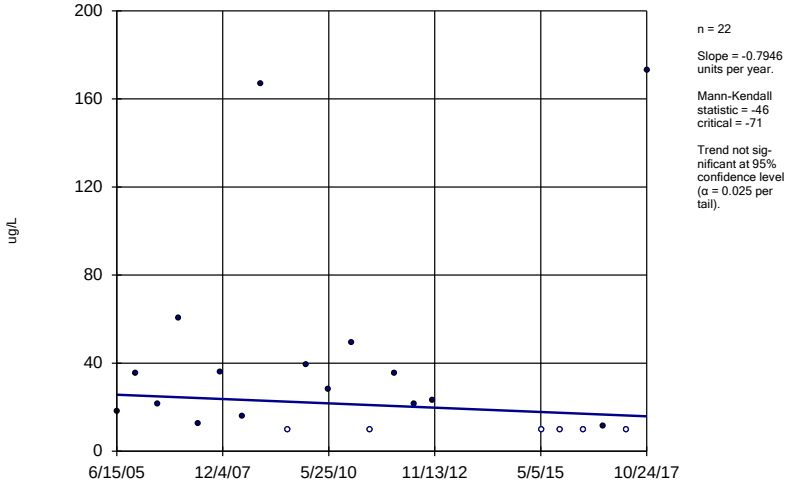
Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-25ox (bg)



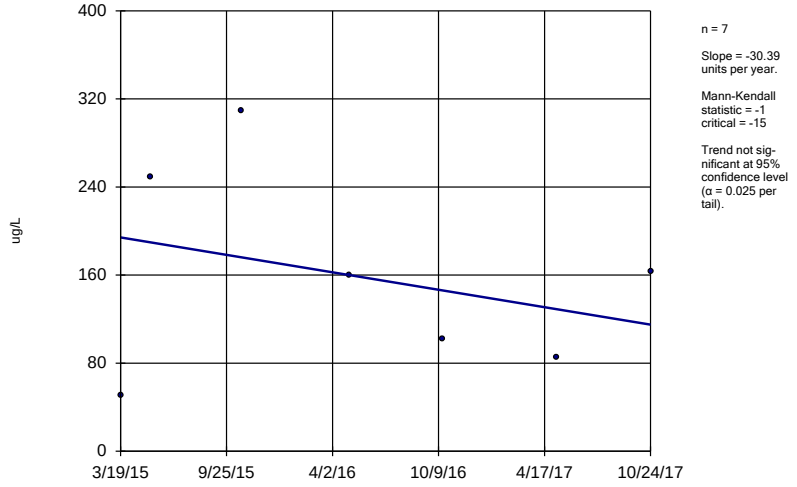

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-61ox (bg)



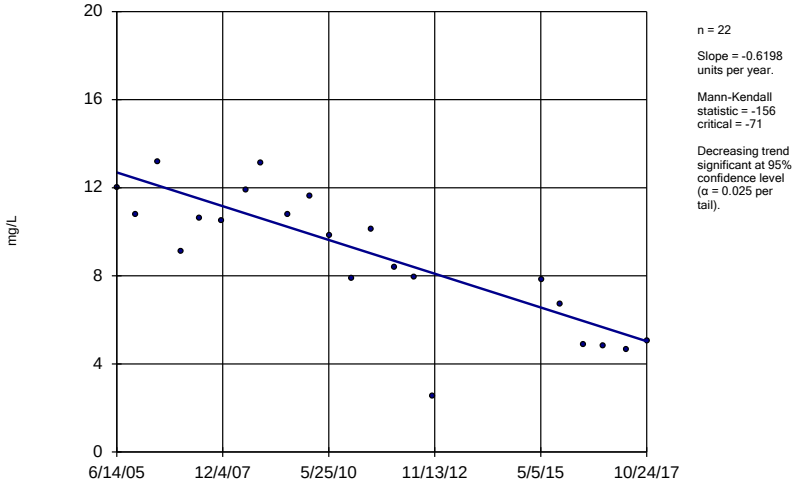

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-11 (bg)



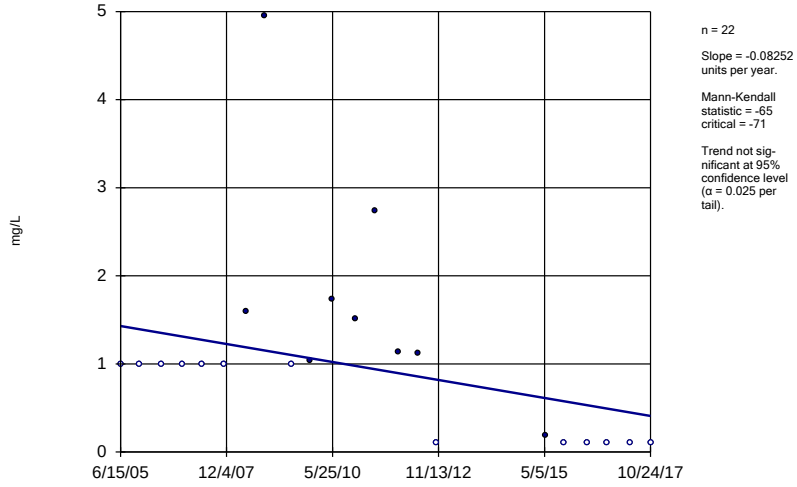

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21ox (bg)

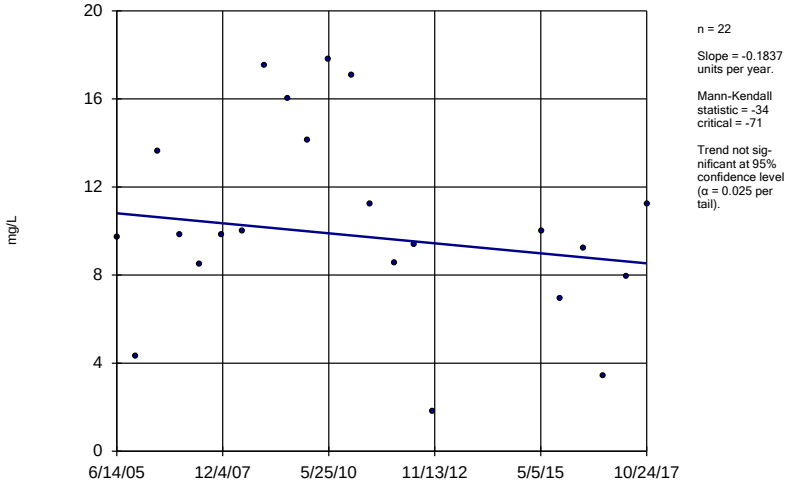



Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-23ox (bg)




n = 22

Slope = -0.1837 units per year.

Mann-Kendall statistic = -34
critical = -71

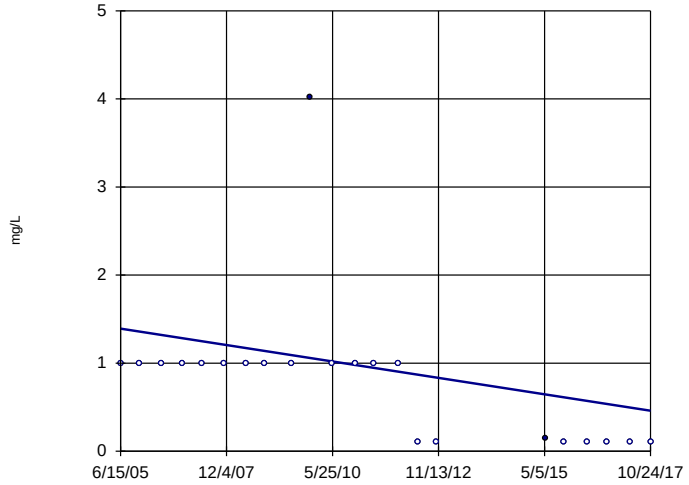
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master


Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = -0.07543 units per year.

Mann-Kendall statistic = -110
critical = -71

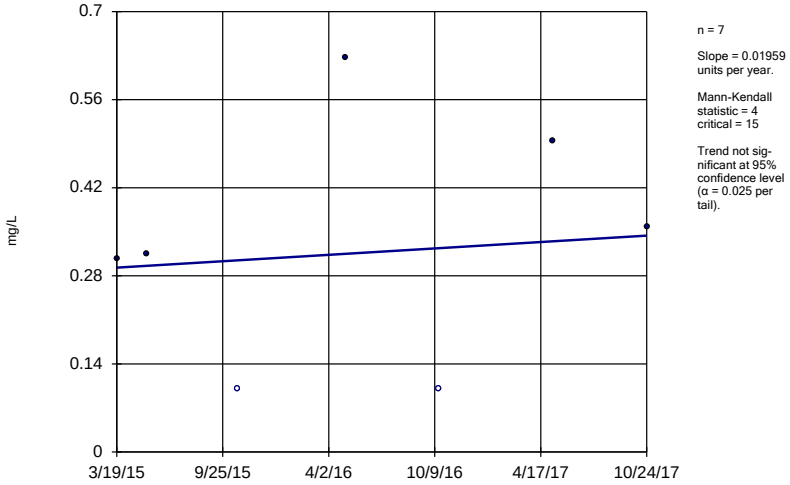
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master


Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = 0.01959 units per year.

Mann-Kendall statistic = 4
critical = 15

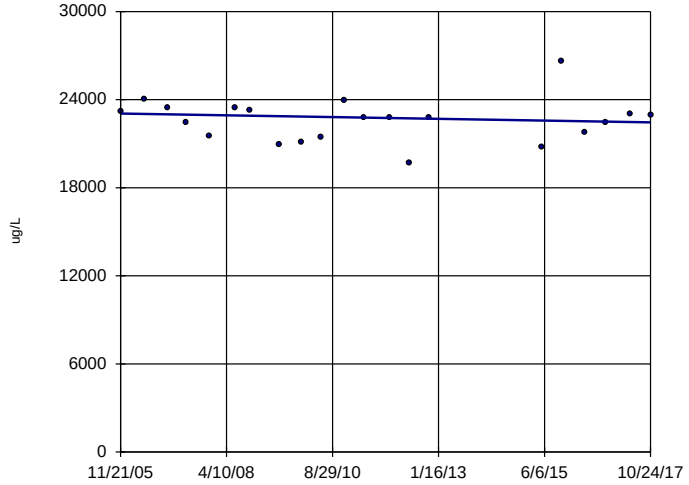
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-11 (bg)




n = 21

Slope = -49.7 units per year.

Mann-Kendall statistic = -25
critical = -66

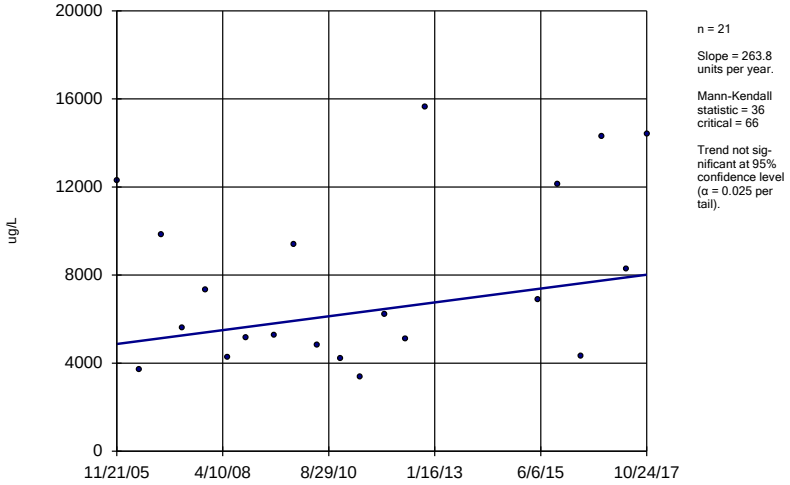
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Potassium Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-21ox (bg)




n = 21

Slope = 263.8 units per year.

Mann-Kendall statistic = 36 critical = 66

Trend not significant at 95% confidence level (α = 0.025 per tail).

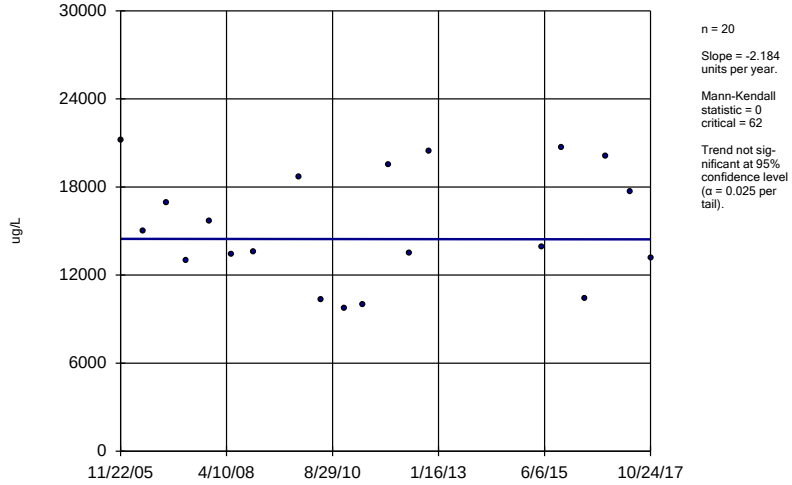
Constituent: Potassium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 20

Slope = -2.184 units per year.

Mann-Kendall statistic = 0 critical = 62

Trend not significant at 95% confidence level (α = 0.025 per tail).

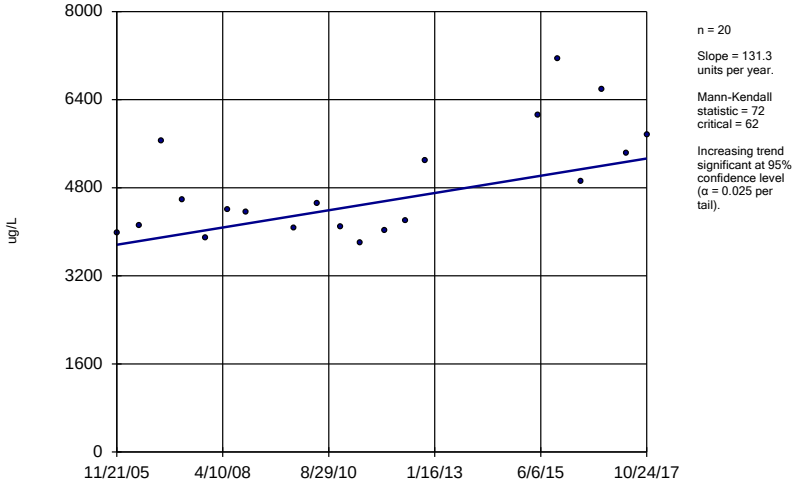
Constituent: Potassium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-25ox (bg)




n = 20

Slope = 131.3 units per year.

Mann-Kendall statistic = 72 critical = 62

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

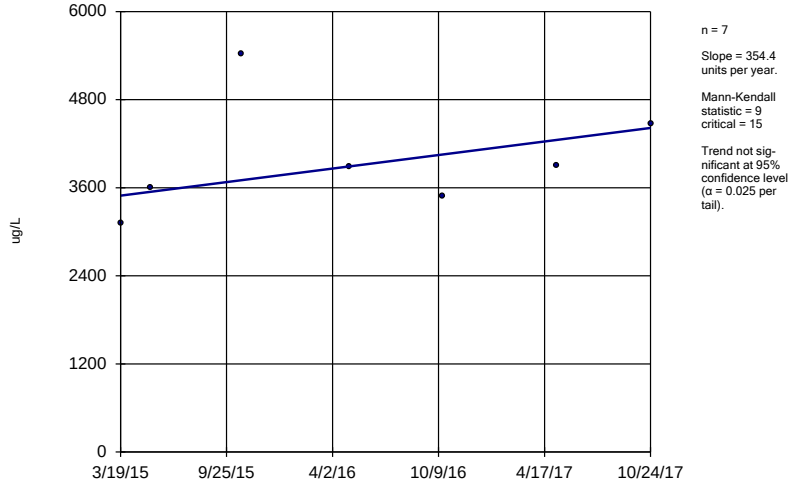
Constituent: Potassium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = 354.4 units per year.

Mann-Kendall statistic = 9 critical = 15

Trend not significant at 95% confidence level (α = 0.025 per tail).

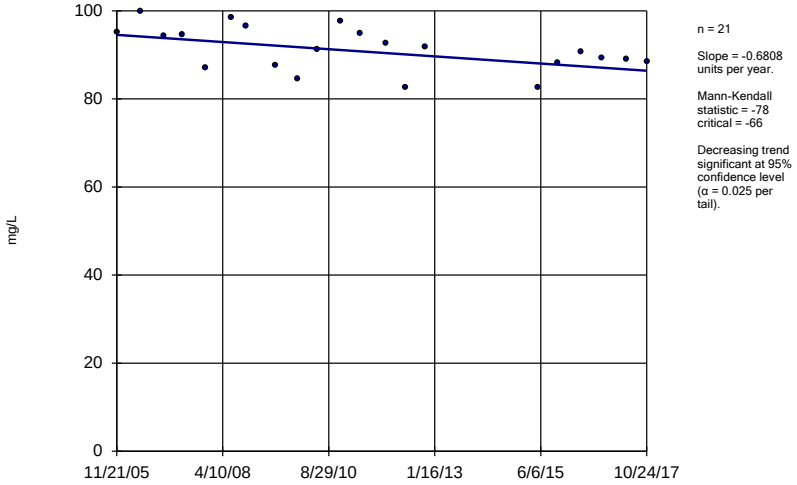
Constituent: Potassium Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-11 (bg)




n = 21

Slope = -0.6808 units per year.

Mann-Kendall statistic = -78
critical = -66

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

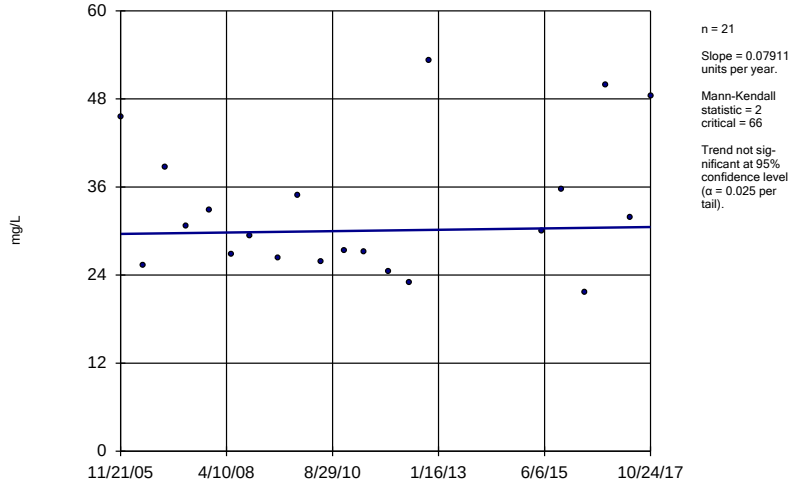
Constituent: Sodium [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-21ox (bg)




n = 21

Slope = 0.07911 units per year.

Mann-Kendall statistic = 2
critical = 66

Trend not significant at 95% confidence level (α = 0.025 per tail).

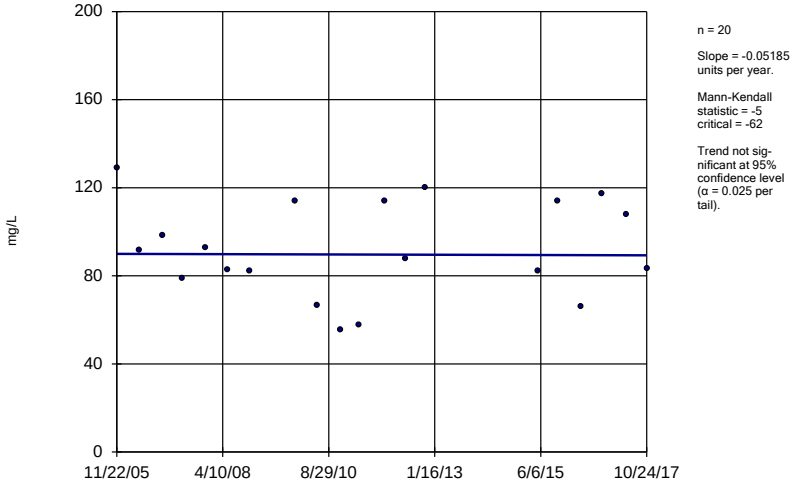
Constituent: Sodium [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 20

Slope = -0.05185 units per year.

Mann-Kendall statistic = -5
critical = -62

Trend not significant at 95% confidence level (α = 0.025 per tail).

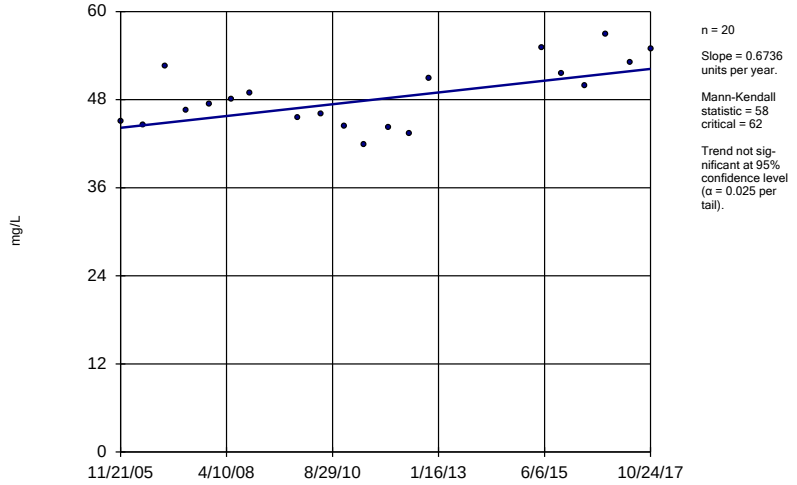
Constituent: Sodium [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 20

Slope = 0.6736 units per year.

Mann-Kendall statistic = 58
critical = 62

Trend not significant at 95% confidence level (α = 0.025 per tail).

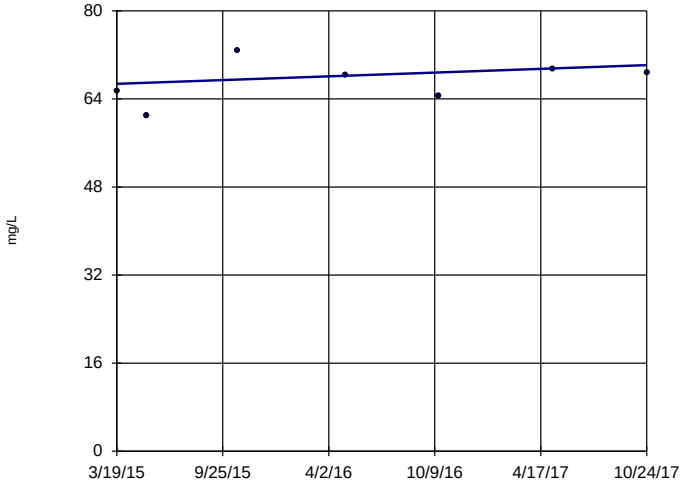
Constituent: Sodium [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = 1.306 units per year.

Mann-Kendall statistic = 5
critical = 15

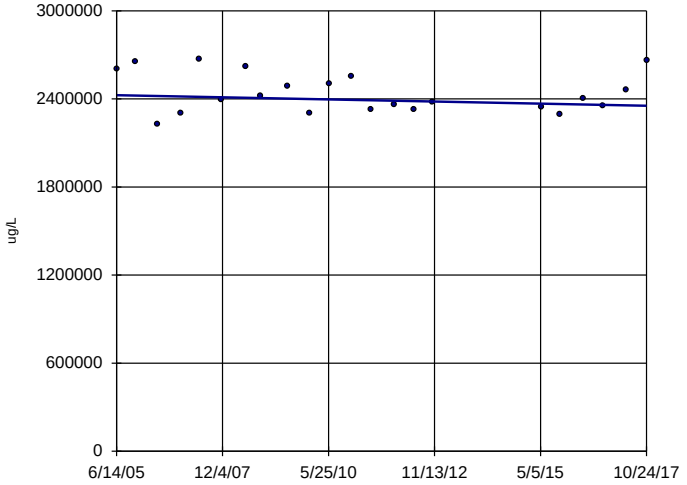
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sodium [total] Analysis Run 2/14/2020 5:30 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = -5764 units per year.

Mann-Kendall statistic = -19
critical = -71

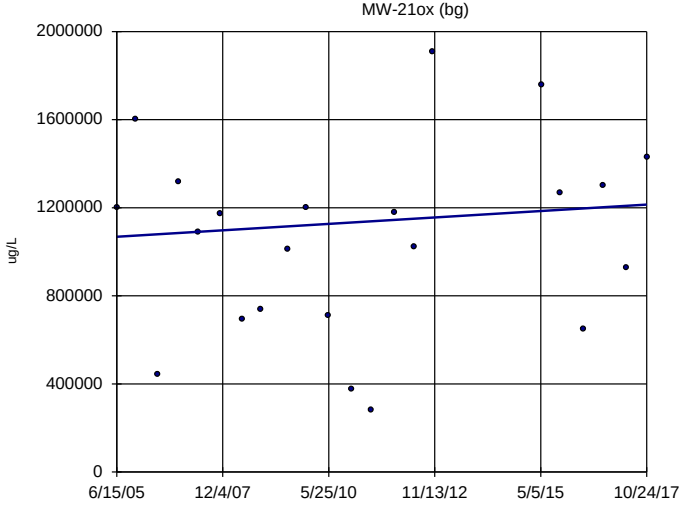
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfate Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = 11818 units per year.

Mann-Kendall statistic = 14
critical = 71

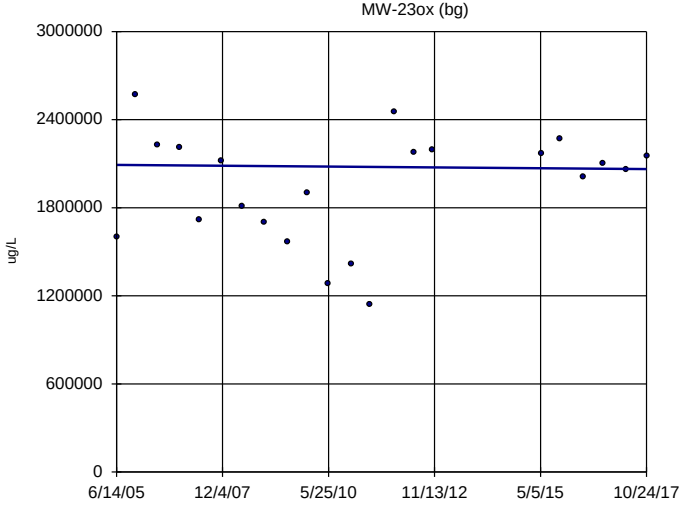
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfate Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-23ox (bg)




n = 22

Slope = -2243 units per year.

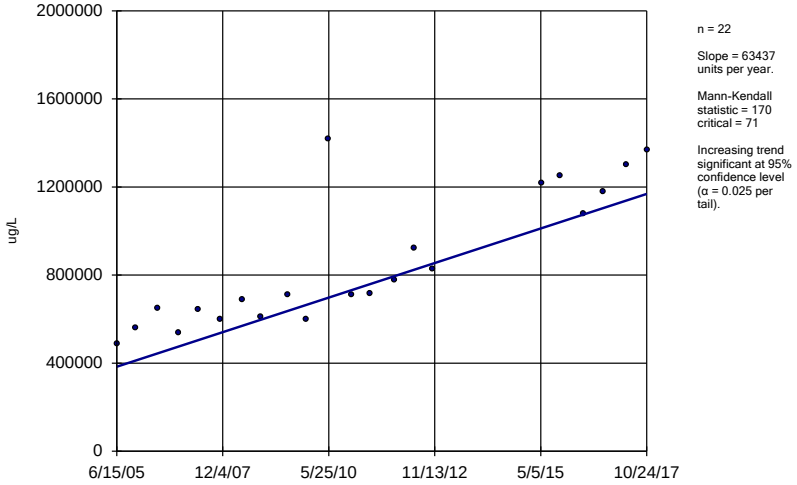
Mann-Kendall statistic = -1
critical = -71

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfate Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = 63437 units per year.

Mann-Kendall statistic = 170 critical = 71

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

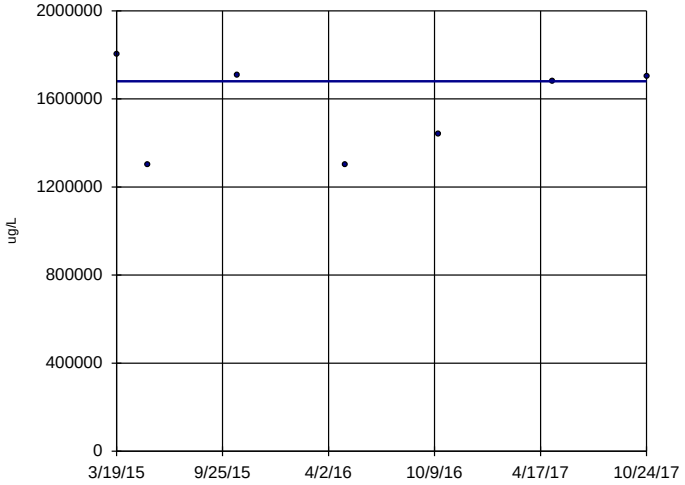
Constituent: Sulfate Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 15

Trend not significant at 95% confidence level (α = 0.025 per tail).

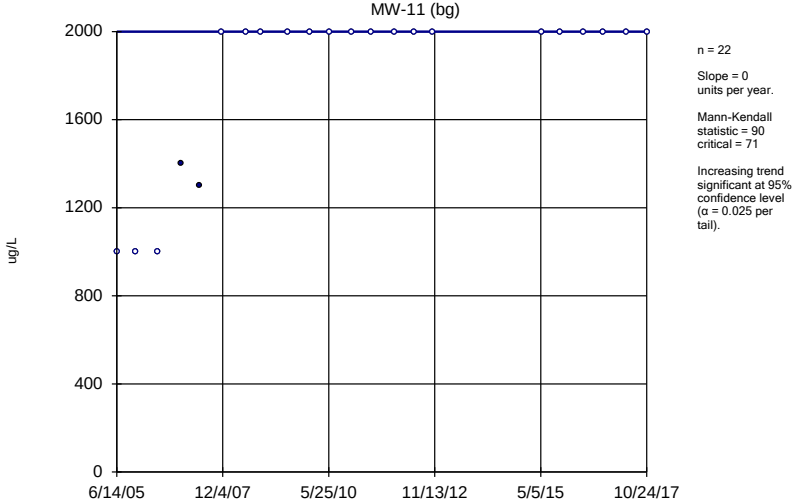
Constituent: Sulfate Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-11 (bg)




n = 22

Slope = 0 units per year.

Mann-Kendall statistic = 90 critical = 71

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

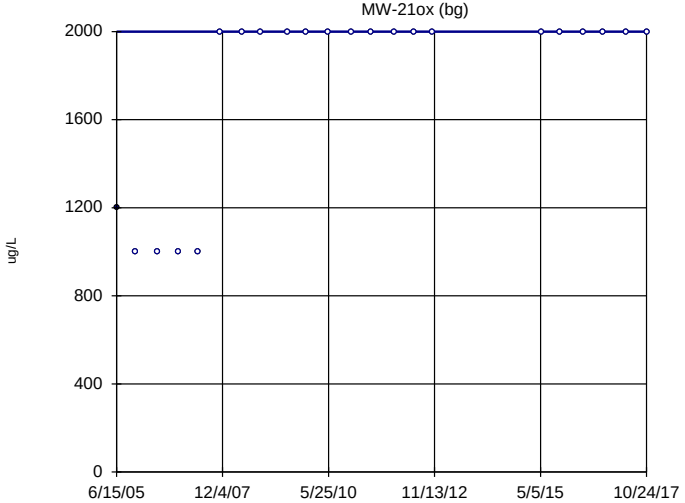
Constituent: Sulfide Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master



## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = 0 units per year.

Mann-Kendall statistic = 81 critical = 71

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

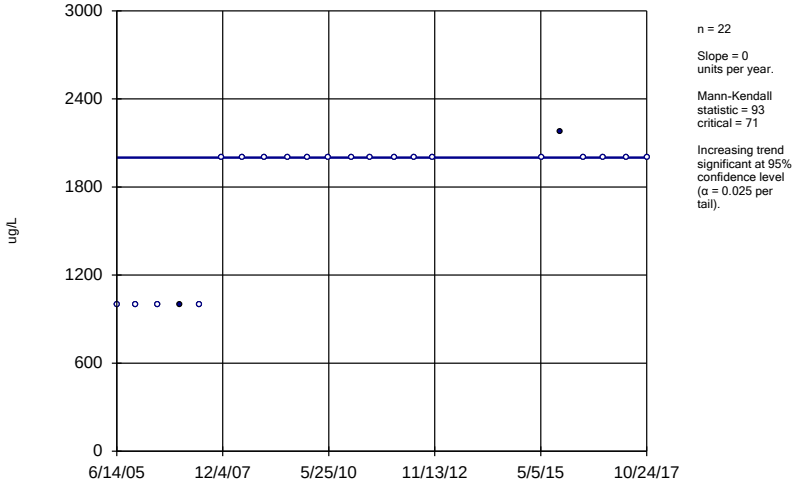
Constituent: Sulfide Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 22

Slope = 0 units per year.

Mann-Kendall statistic = 93
critical = 71

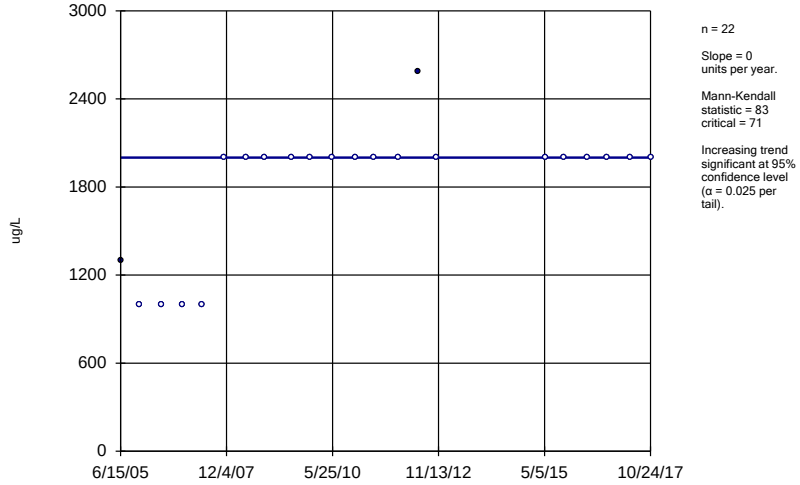
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfide Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = 0 units per year.

Mann-Kendall statistic = 83
critical = 71

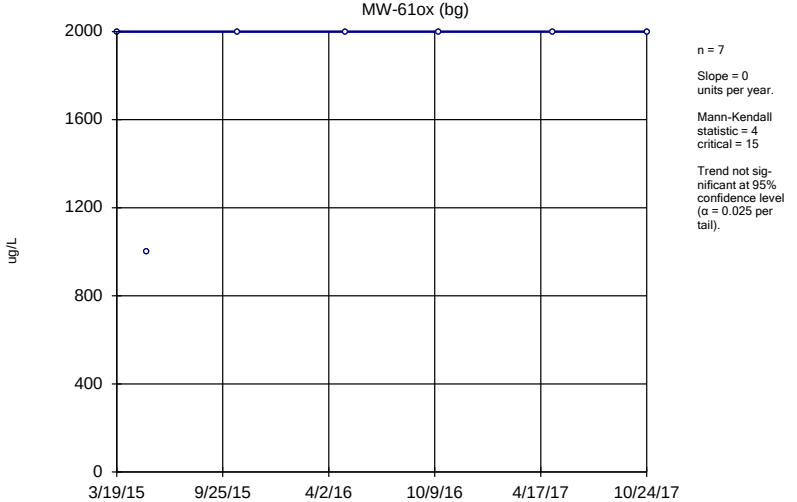
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfide Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = 0 units per year.

Mann-Kendall statistic = 4
critical = 15

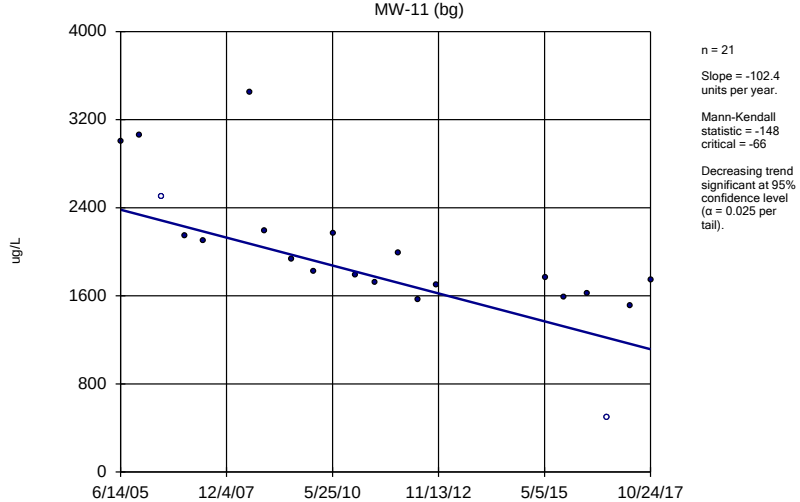
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfide Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 21

Slope = -102.4 units per year.

Mann-Kendall statistic = -148
critical = -66

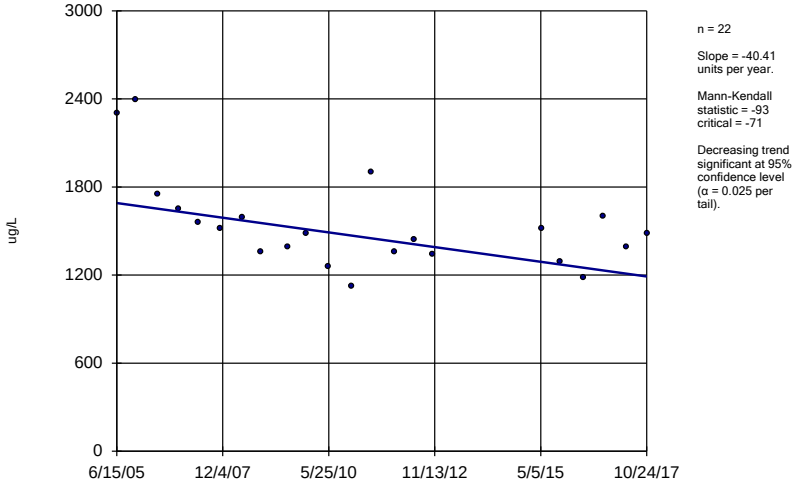
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:31 PM View: Background Analysis
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 22

Slope = -40.41 units per year.

Mann-Kendall statistic = -93 critical = -71

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

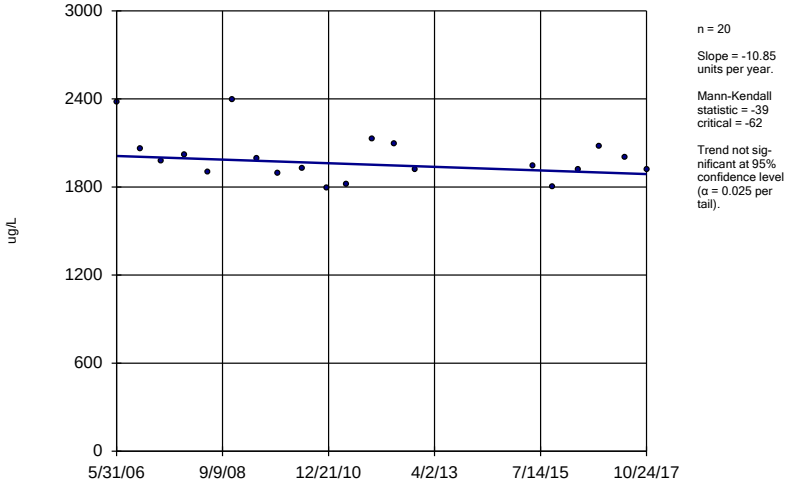
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 20

Slope = -10.85 units per year.

Mann-Kendall statistic = -39 critical = -62

Trend not significant at 95% confidence level (α = 0.025 per tail).

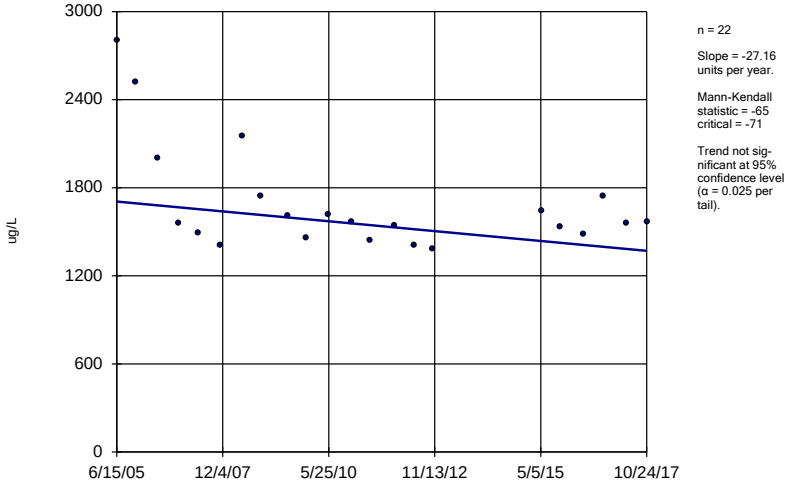
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-25ox (bg)




n = 22

Slope = -27.16 units per year.

Mann-Kendall statistic = -65 critical = -71

Trend not significant at 95% confidence level (α = 0.025 per tail).

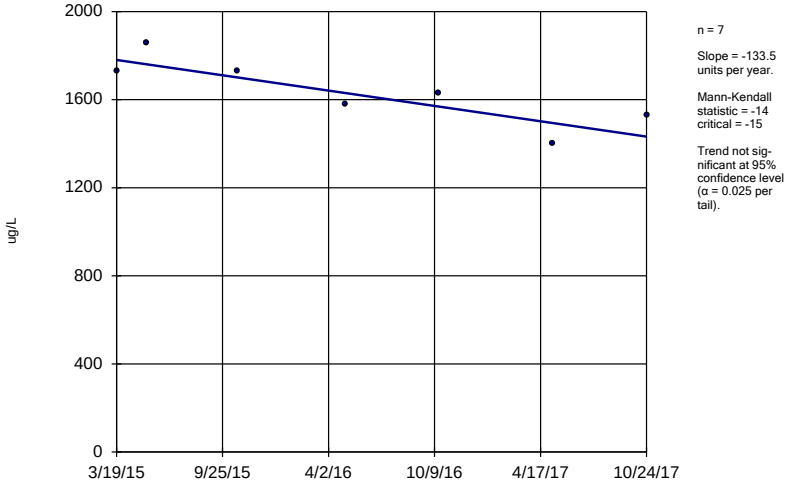
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 7

Slope = -133.5 units per year.

Mann-Kendall statistic = -14 critical = -15

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:31 PM View: Background Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Current Upgradient Data Evaluation

# Outlier Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:43 PM

| Constituent | Well | Outlier | Value(s) | Date(s) | Method | Alpha | N | Mean | Std. Dev. | Distribution | Normality Test |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-11 (bg)** | **Yes** | **311000** | **5/21/2013** | **Rosner`s** | **0.01** | **30** | **262700** | **15946** | **normal** | **ShapiroWilk** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 350633 | 63757 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 28 | 349643 | 20440 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 338300 | 16865 | normal | ShapiroWilk |
| Alkalinity, Total [CaCO3] (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 304571 | 13552 | normal | ShapiroWilk |
| Ammonia as N (ug/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 200 | 0 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 205 | 27.39 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 200.1 | 0.5477 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 200 | 0 | unknown | ShapiroWilk |
| Ammonia as N (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 14 | 200 | 0 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 29 | 3.828 | 2.391 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 29 | 3.931 | 2.419 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 29 | 3.828 | 2.391 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 29 | 3.931 | 2.419 | unknown | ShapiroWilk |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 14 | 4.286 | 2.555 | unknown | ShapiroWilk |
| Calcium (ug/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 29 | 496690 | 25984 | normal | ShapiroWilk |
| Calcium (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 29 | 360414 | 106437 | normal | ShapiroWilk |
| **Calcium (ug/L)** | **MW-23ox (bg)** | **Yes** | **94700** | **6/9/2009** | **Rosner`s** | **0.01** | **29** | **392403** | **92430** | **normal** | **ShapiroWilk** |
| Calcium (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 239034 | 53201 | unknown | ShapiroWilk |
| Calcium (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 369214 | 40857 | normal | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 6295 | 2097 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 29 | 5238 | 637.2 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 5814 | 1589 | unknown | ShapiroWilk |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 5936 | 1555 | unknown | ShapiroWilk |
| **Chemical Oxygen Demand (ug/L)** | **MW-61ox (bg)** | **Yes** | **11000** | **5/8/2017** | **NP (nrm)** | **NaN** | **14** | **5861** | **1873** | **unknown** | **ShapiroWilk** |
| Iron [total] (mg/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 0.2316 | 0.1759 | unknown | ShapiroWilk |
| Iron [total] (mg/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 0.3598 | 0.2764 | ln(x) | ShapiroWilk |
| **Iron [total] (mg/L)** | **MW-23ox (bg)** | **Yes** | **15** | **6/9/2009** | **NP (nrm)** | **NaN** | **30** | **0.6815** | **2.709** | **unknown** | **ShapiroWilk** |
| Iron [total] (mg/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 0.1843 | 0.1622 | unknown | ShapiroWilk |
| Iron [total] (mg/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 14 | 0.4594 | 0.5966 | unknown | ShapiroWilk |
| **Iron, Dissolved (ug/L)** | **MW-11 (bg)** | **Yes** | **500,500,5...** | **5/8/2017,...** | **NP (nrm)** | **NaN** | **30** | **183.3** | **162.1** | **unknown** | **ShapiroWilk** |
| Iron, Dissolved (ug/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 262.4 | 187.9 | unknown | ShapiroWilk |
| **Iron, Dissolved (ug/L)** | **MW-23ox (bg)** | **Yes** | **500,500,5...** | **5/8/2017,...** | **NP (nrm)** | **NaN** | **30** | **181.3** | **162.2** | **unknown** | **ShapiroWilk** |
| **Iron, Dissolved (ug/L)** | **MW-25ox (bg)** | **Yes** | **500,500,5...** | **5/8/2017,...** | **NP (nrm)** | **NaN** | **30** | **180.7** | **162.4** | **unknown** | **ShapiroWilk** |
| Iron, Dissolved (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 14 | 271.4 | 205.4 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 211 | 180.4 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 29 | 117.4 | 70.09 | ln(x) | ShapiroWilk |
| Manganese (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 16.53 | 12.8 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 40.72 | 59.95 | unknown | ShapiroWilk |
| Manganese (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 450.2 | 424.8 | ln(x) | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 145.4 | 150.6 | unknown | ShapiroWilk |
| **Manganese, Dissolved (ug/L)** | **MW-21ox (bg)** | **Yes** | **396** | **10/29/2012** | **Rosner`s** | **0.01** | **30** | **122.3** | **76.26** | **ln(x)** | **ShapiroWilk** |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 15.56 | 11.14 | unknown | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 29.64 | 40.43 | unknown | ShapiroWilk |
| Manganese, Dissolved (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 243.4 | 250.9 | ln(x) | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-11 (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 7.724 | 3.301 | normal | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 0.8331 | 1.019 | unknown | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | No | n/a | n/a | Rosner`s | 0.01 | 30 | 10.04 | 4.13 | normal | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 0.6223 | 0.7816 | unknown | ShapiroWilk |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 0.281 | 0.1464 | normal | ShapiroWilk |

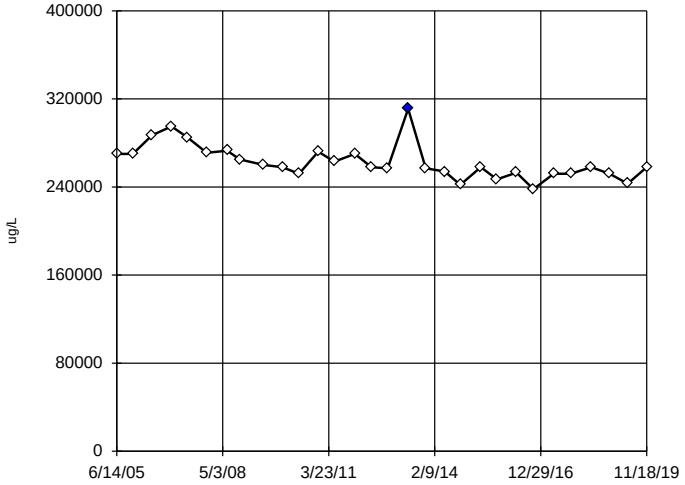
# Outlier Analysis

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:43 PM

| Constituent | Well | Outlier | Value(s) | Date(s) | Method | Alpha | N | Mean | Std. Dev. | Distribution | Normality Test |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Potassium (ug/L)** | **MW-11 (bg)** | **Yes** | **26600** | **10/21/2015** | **Rosner`s** | **0.01** | **29** | **22334** | **1397** | **normal** | **ShapiroWilk** |
| Potassium (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 29 | 7596 | 3371 | ln(x) | ShapiroWilk |
| Potassium (ug/L) | MW-23ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 28 | 14636 | 3654 | ln(x) | ShapiroWilk |
| Potassium (ug/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 28 | 5016 | 898.8 | normal | ShapiroWilk |
| Potassium (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 4864 | 1428 | ln(x) | ShapiroWilk |
| Sodium [total] (mg/L) | MW-11 (bg) | No | n/a | n/a | Rosner`s | 0.01 | 29 | 90.41 | 5.441 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-21ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 31.41 | 8.427 | unknown | ShapiroWilk |
| **Sodium [total] (mg/L)** | **MW-23ox (bg)** | **Yes** | **10.9** | **11/11/2013** | **Rosner`s** | **0.01** | **28** | **85.42** | **24.58** | **normal** | **ShapiroWilk** |
| Sodium [total] (mg/L) | MW-25ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 28 | 49.53 | 4.313 | normal | ShapiroWilk |
| Sodium [total] (mg/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 70.81 | 7.221 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 2436333 | 128934 | unknown | ShapiroWilk |
| Sulfate (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 1063133 | 413478 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-23ox (bg) | No | n/a | n/a | Rosner`s | 0.01 | 30 | 1985667 | 333101 | normal | ShapiroWilk |
| Sulfate (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 925200 | 294898 | unknown | ShapiroWilk |
| Sulfate (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 1611429 | 182961 | normal | ShapiroWilk |
| Sulfide (ug/L) | MW-11 (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 1857 | 333.9 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-21ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 1840 | 365.4 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-23ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 1839 | 383.2 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-25ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 30 | 1863 | 383.9 | unknown | ShapiroWilk |
| Sulfide (ug/L) | MW-61ox (bg) | n/a | n/a | n/a | NP (nrm) | NaN | 14 | 1929 | 267.3 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-11 (bg) | No | n/a | n/a | NP (nrm) | NaN | 29 | 1945 | 560.1 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-21ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 30 | 1522 | 319.9 | ln(x) | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 28 | 2007 | 245 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-25ox (bg) | No | n/a | n/a | NP (nrm) | NaN | 30 | 1692 | 358 | unknown | ShapiroWilk |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | No | n/a | n/a | EPA 1989 | 0.05 | 14 | 1711 | 221.5 | normal | ShapiroWilk |

## Rosner's Outlier Test

MW-11 (bg)




n = 30

Statistical outlier is drawn as solid.

k = 1
r = 3.029
Tabulated value = 2.92
Alpha = 0.01

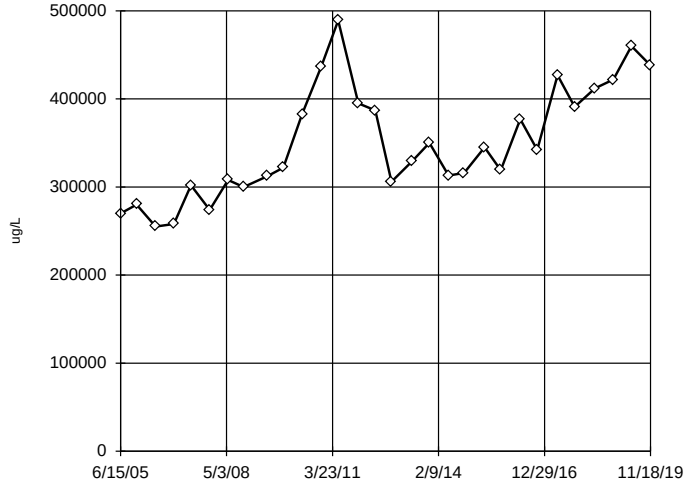
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9458
Critical = 0.937
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 30

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 350633, std. dev. 63757, critical Tn 2.745

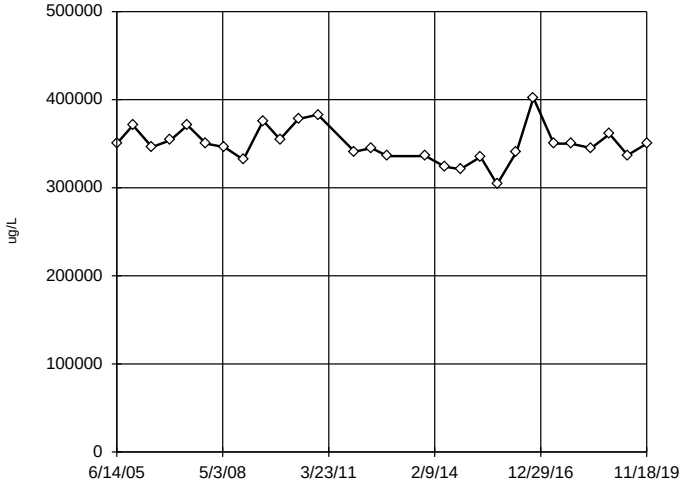
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9498
Critical = 0.939
The distribution was found to be normally distributed.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-23ox (bg)




n = 28

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 349643, std. dev. 20440, critical Tn 2.714

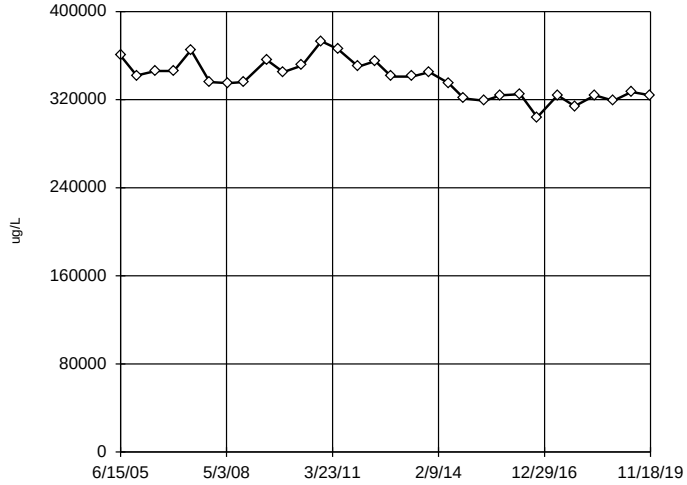
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9661
Critical = 0.936
The distribution was found to be normally distributed.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-25ox (bg)




n = 30

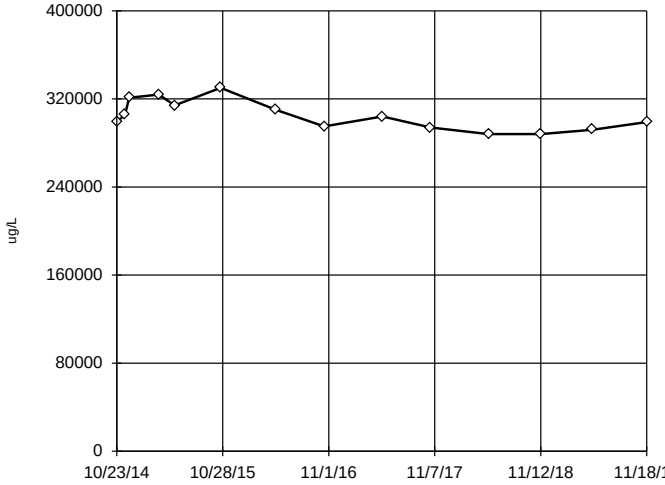
Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 338300, std. dev. 16865, critical Tn 2.745

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9776
Critical = 0.939
The distribution was found to be normally distributed.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 304571, std. dev. 13552, critical Tn 2.371

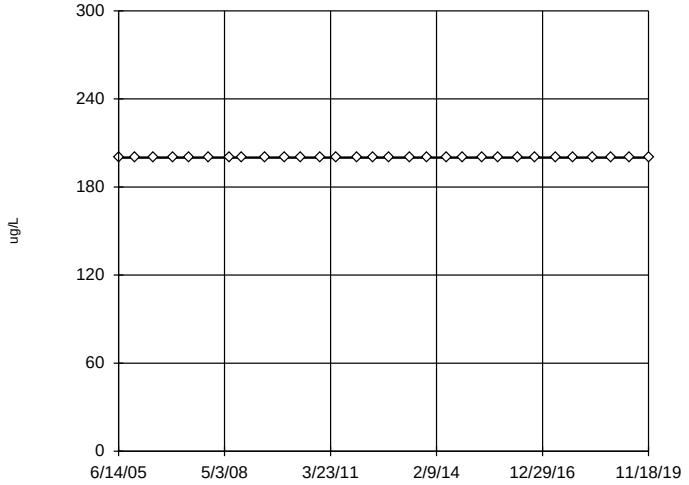
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9342
Critical = 0.895
The distribution was found to be normally distrib-uted.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

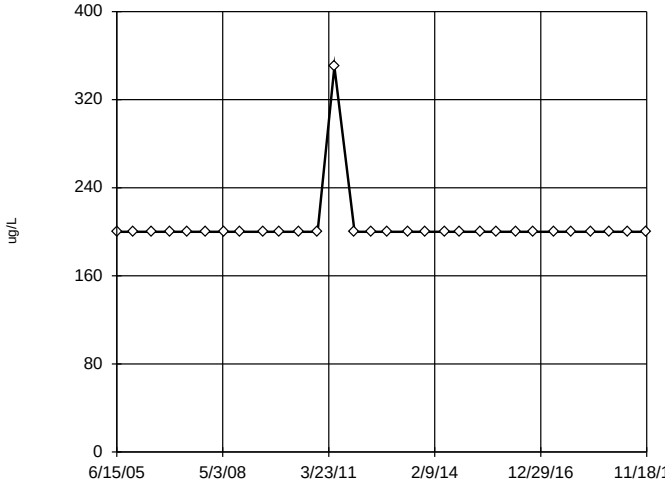
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^4 transform-ed to achieve best W stat-istic (graph shown in original units).

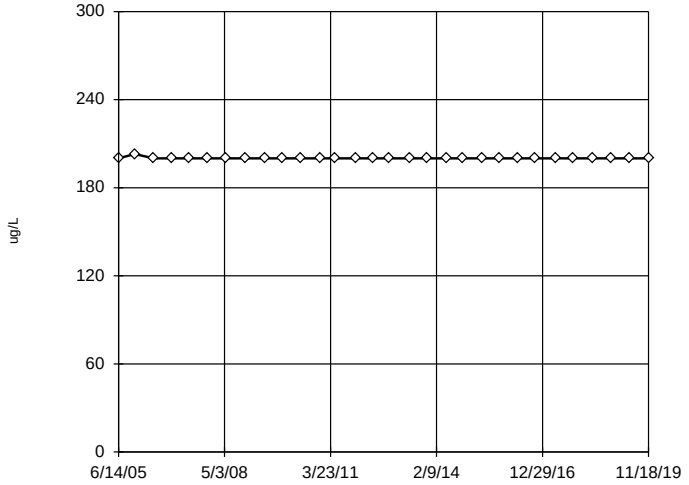
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

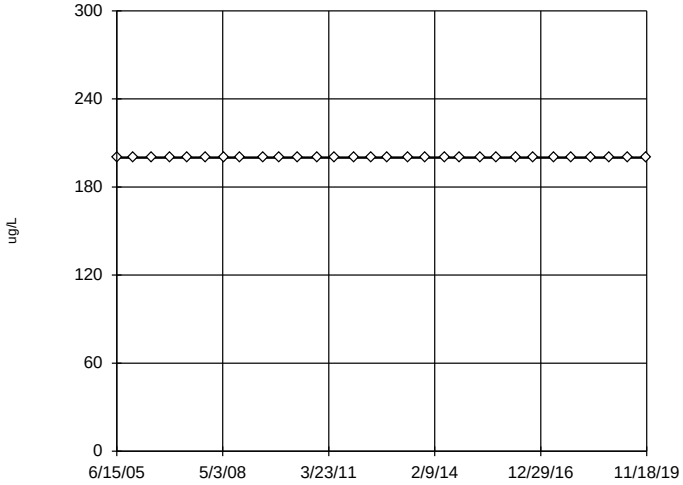
Ladder of Powers trans-formations did not im-prove normality; analy-sis run on raw data.

The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Ammonia as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

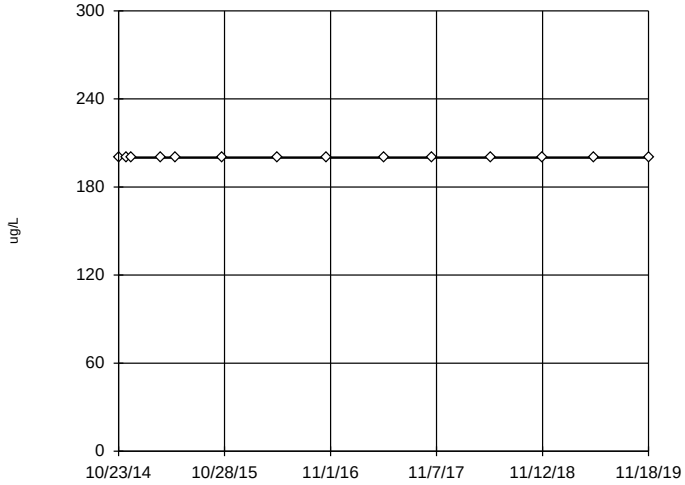
Constituent: Ammonia as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

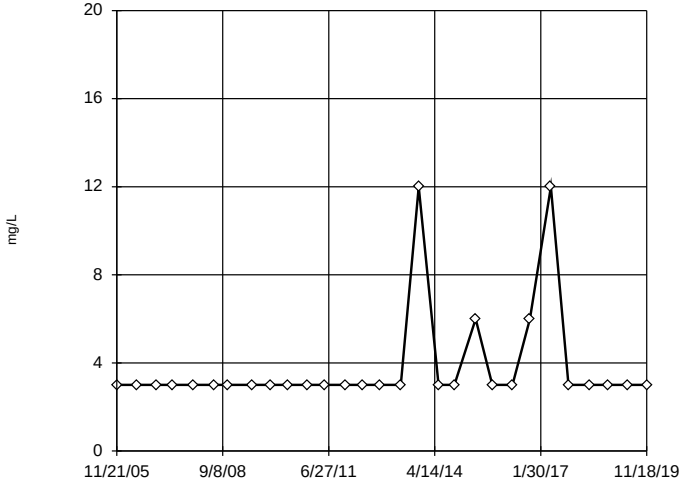
Constituent: Ammonia as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 29

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

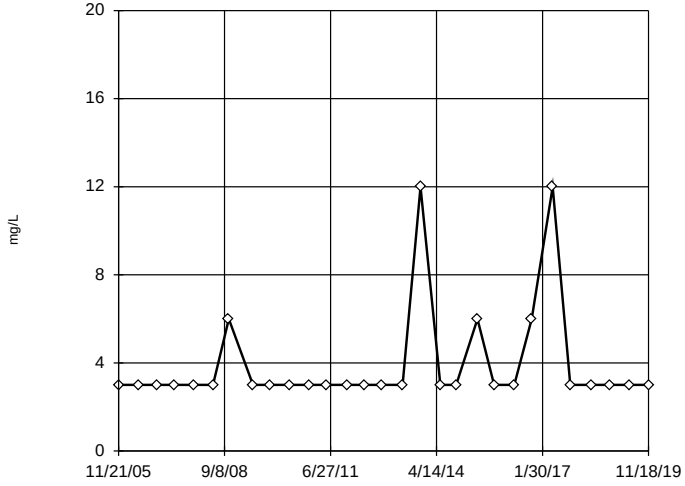
Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-21ox (bg)




n = 29

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

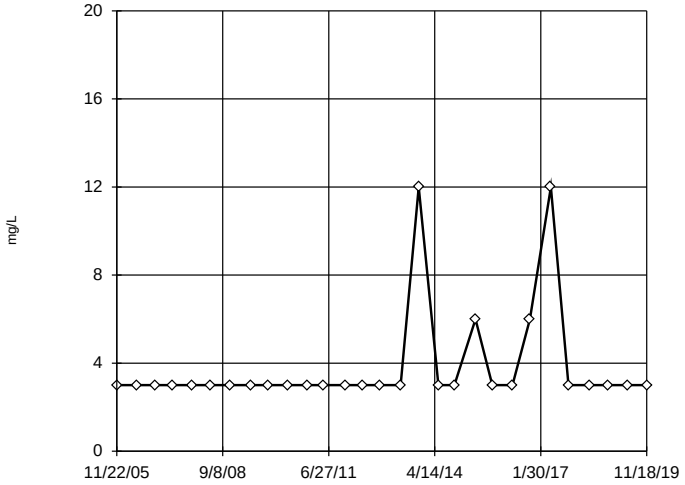
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-23ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

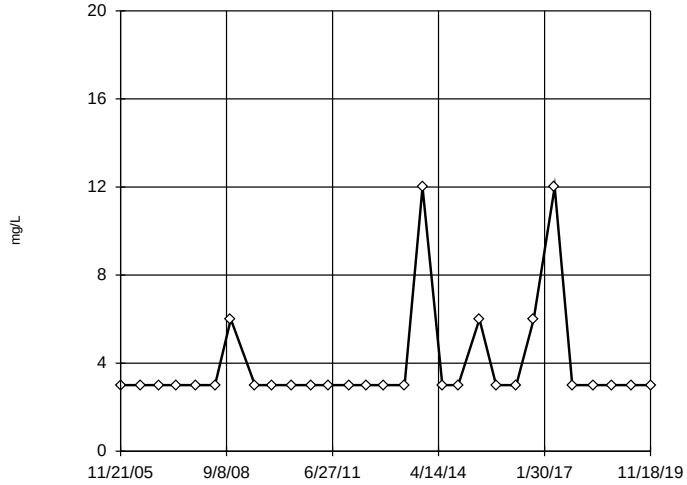
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-25ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

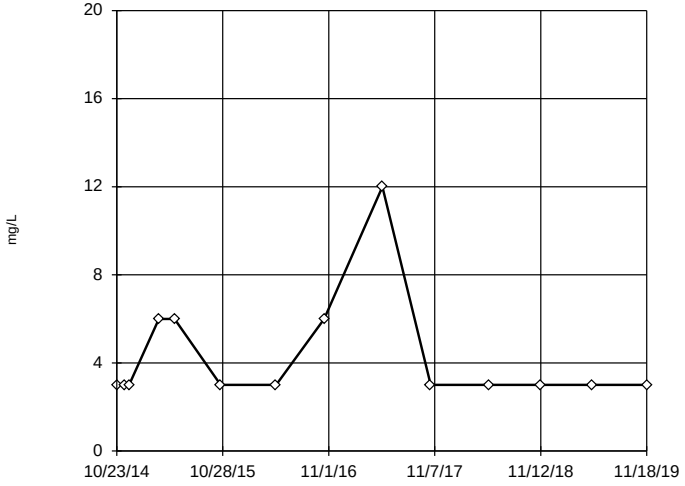
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

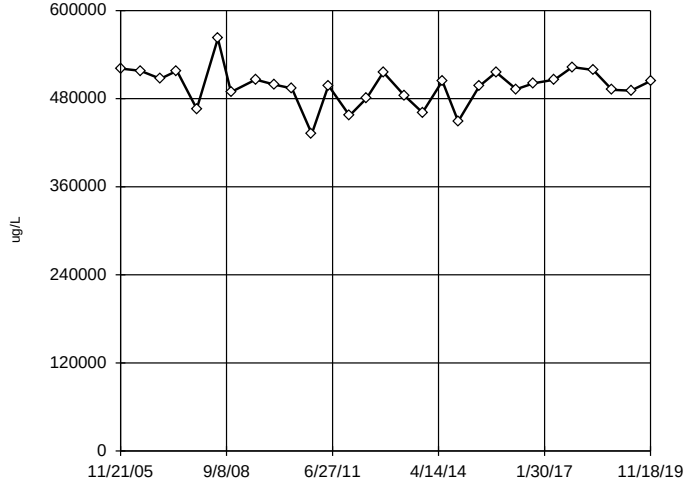
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-11 (bg)




n = 29

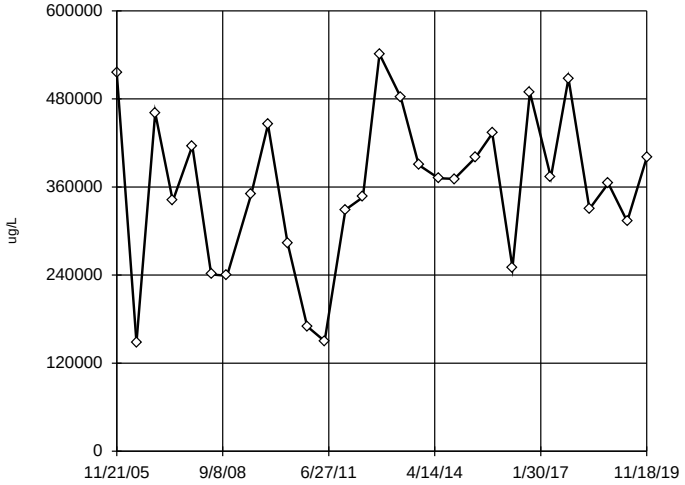
Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 496690, std. dev. 25984, critical Tn 2.73

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9487
Critical = 0.937
The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 29

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 360414, std. dev. 106437, critical Tn 2.73

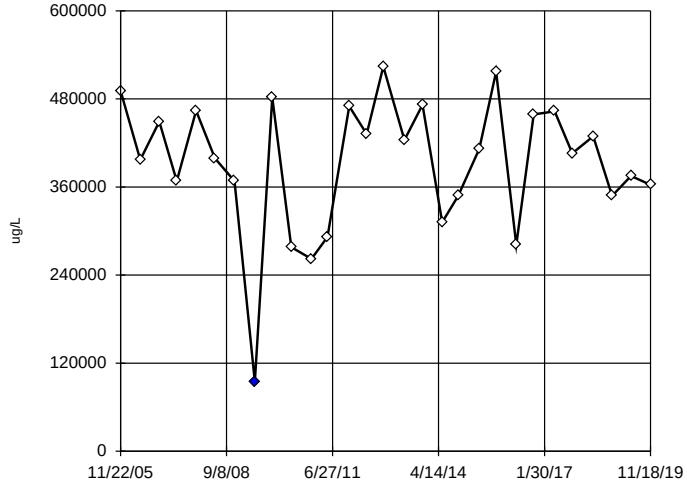
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9614
Critical = 0.937
The distribution was found to be normally distrib-uted.

Constituent: Calcium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-23ox (bg)




n = 29

Statistical outlier is drawn as solid.

k = 1
r = 3.221
Tabulated value = 2.904
Alpha = 0.01

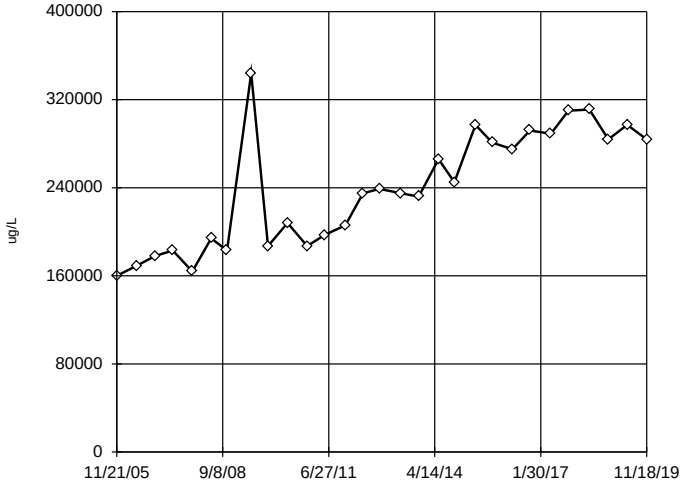
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9579
Critical = 0.936
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Calcium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

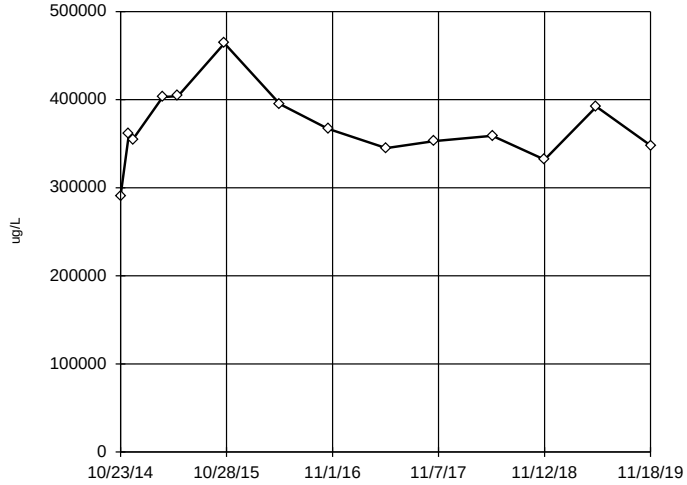
High cutoff = 711834, low cutoff = 15372, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 369214, std. dev. 40857, critical Tn 2.371

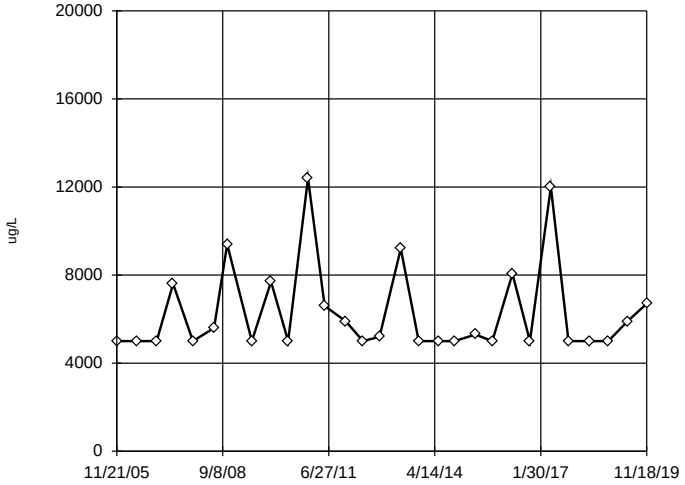
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9453
Critical = 0.895
The distribution was found to be normally distrib-uted.

Constituent: Calcium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

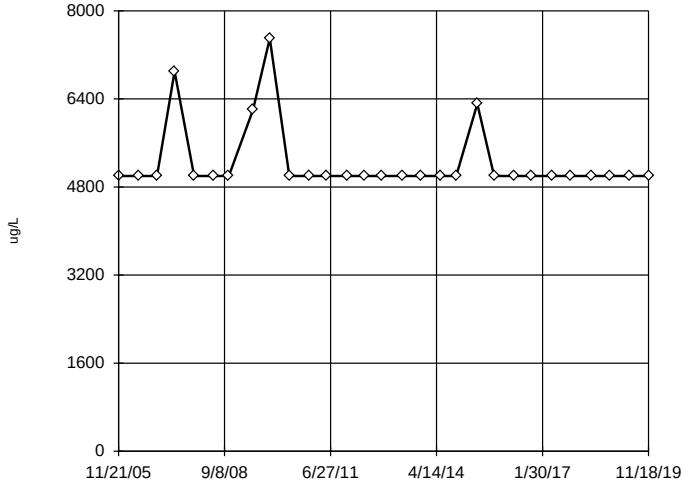
High cutoff = 20743, low cutoff = 1720, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-21ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

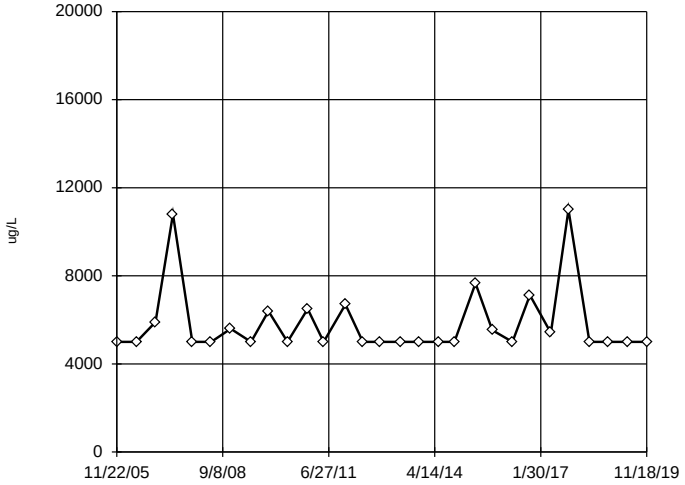
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

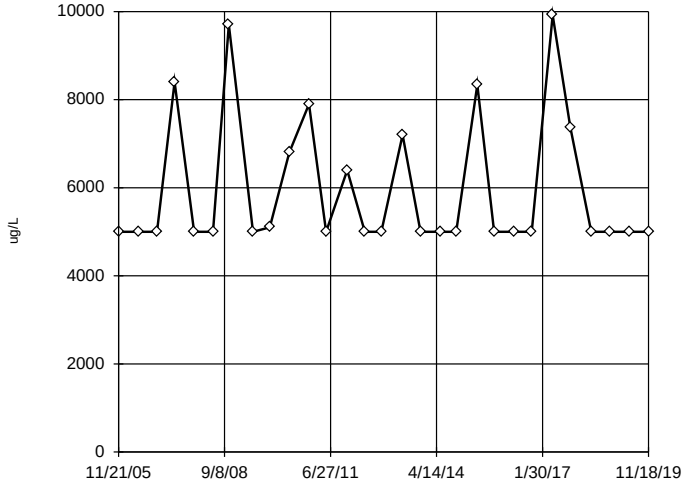
High cutoff = 11407, low cutoff = 2694, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

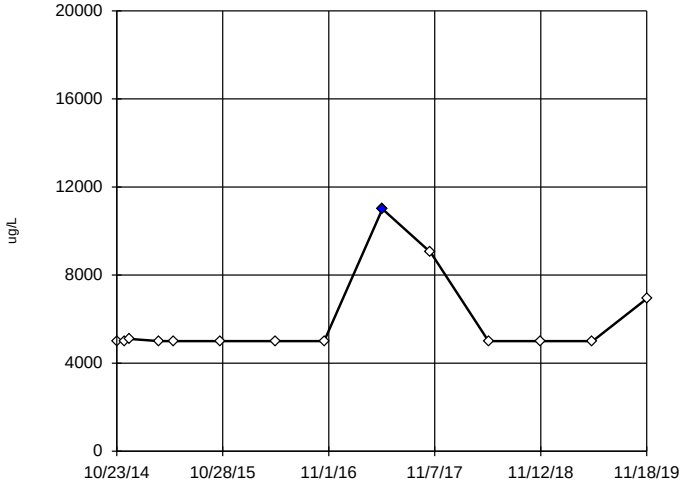
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 19177, low cutoff = 1824, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

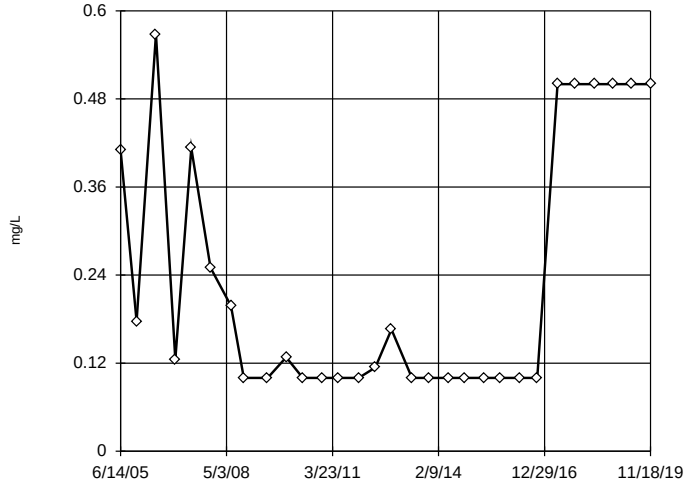
High cutoff = 9993, low cutoff = 2975, based on IQR multiplier of 3.

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

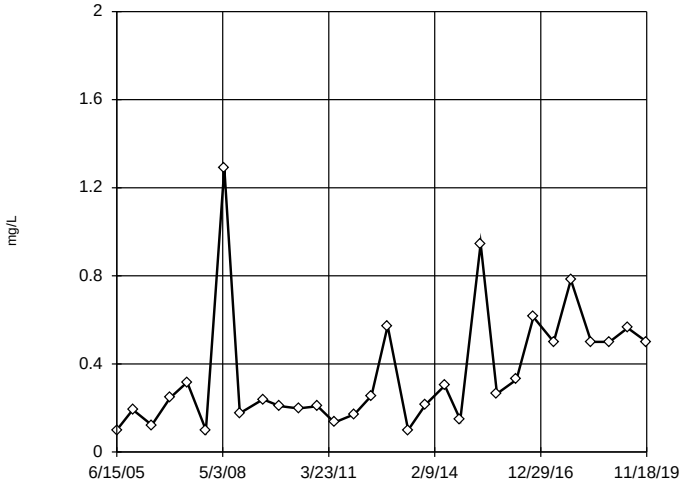
High cutoff = 42.64, low cutoff = 0.001066, based on IQR multiplier of 3.

Constituent: Iron [total] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 30

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3598, std. dev. 0.2764, critical Tn 2.745

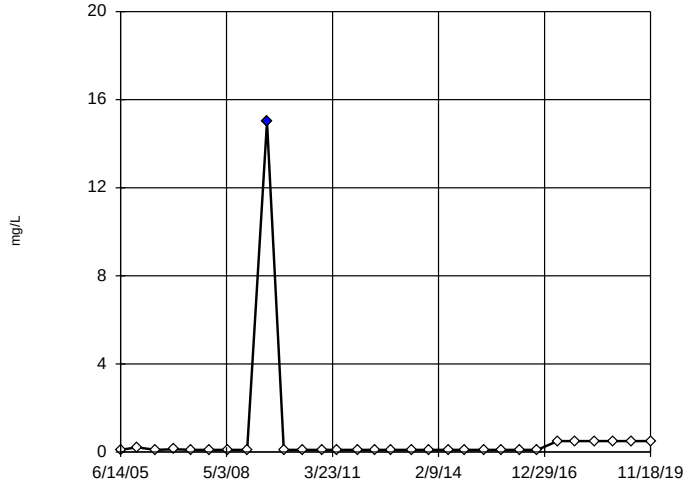
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9585
Critical = 0.939 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Iron [total] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-23ox (bg)




n = 30

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

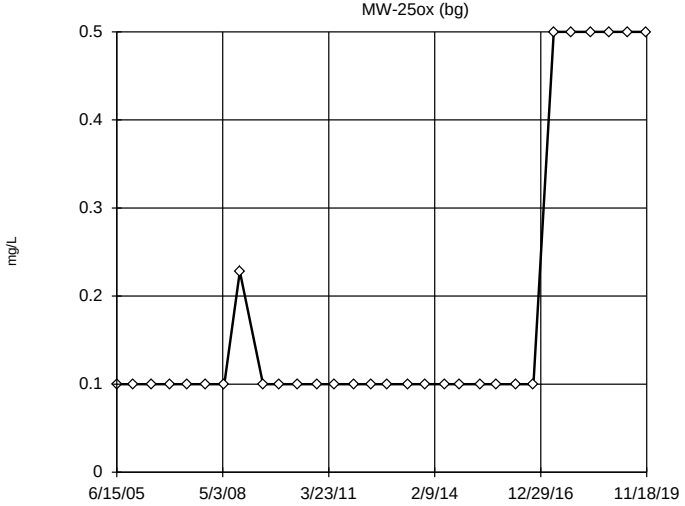
High cutoff = 11.56, low cutoff = 0.002837, based on IQR multiplier of 3.

Constituent: Iron [total] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

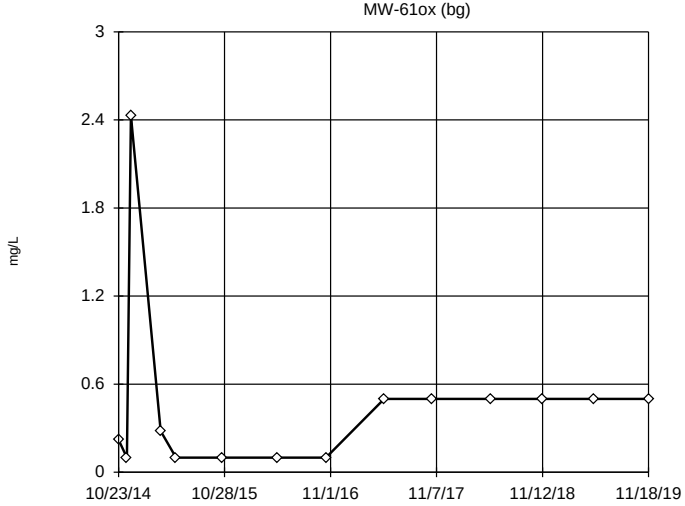
High cutoff = 0.5198, low cutoff = 0.02905, based on IQR multiplier of 3.

Constituent: Iron [total] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

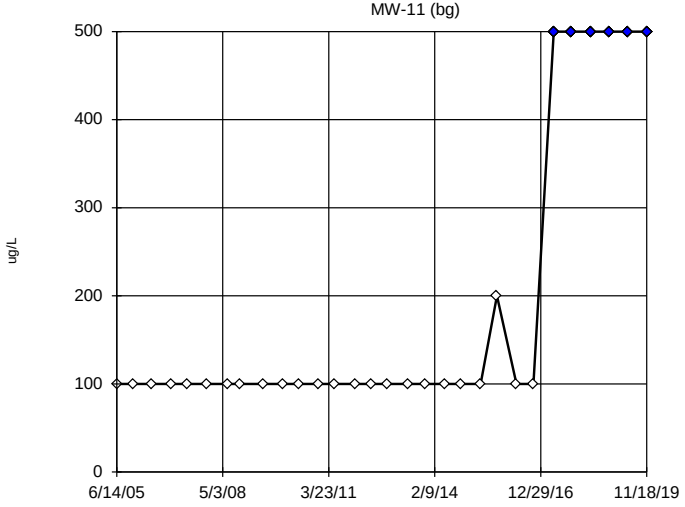
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Iron [total] Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-11 (bg)




n = 30

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

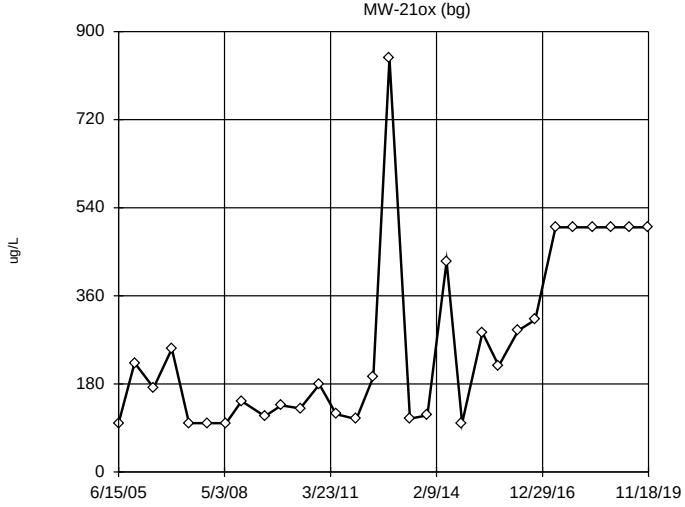
High cutoff = 400, low cutoff = 35.36, based on IQR multiplier of 3.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-21ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

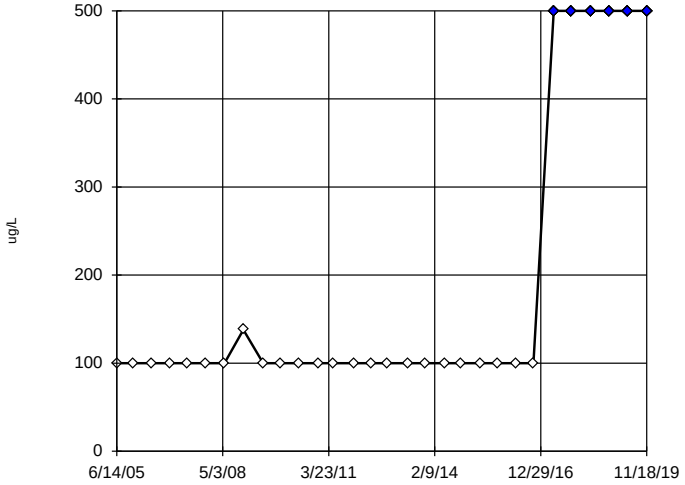
High cutoff = 33372, low cutoff = 1.549, based on IQR multiplier of 3.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-23ox (bg)




n = 30

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

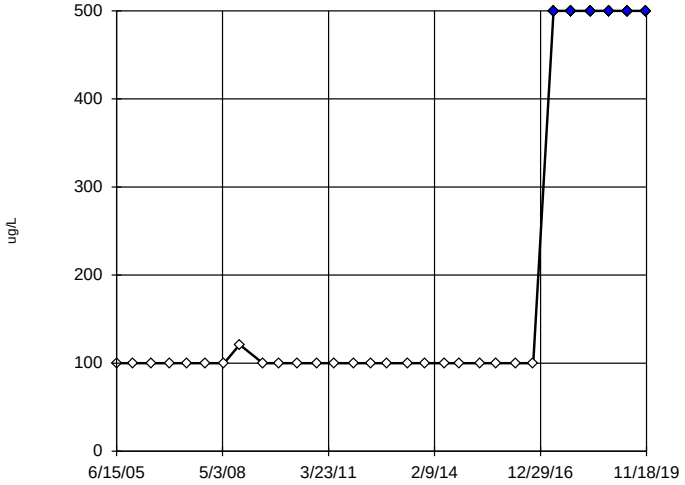
High cutoff = 190.4, low cutoff = 61.69, based on IQR multiplier of 3.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

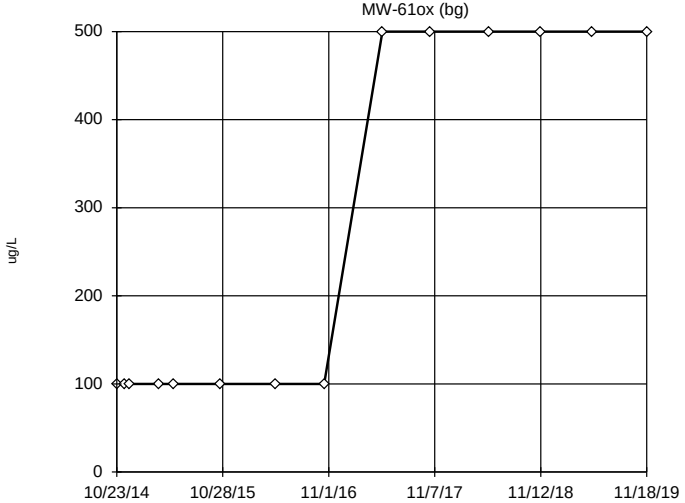
High cutoff = 146.4, low cutoff = 75.13, based on IQR multiplier of 3.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

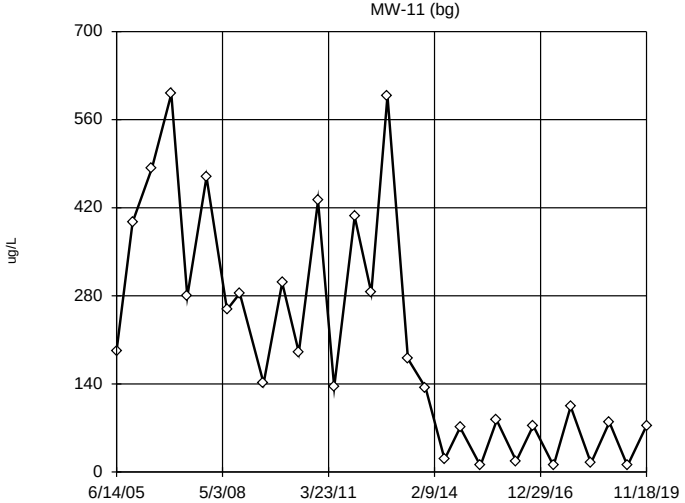
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

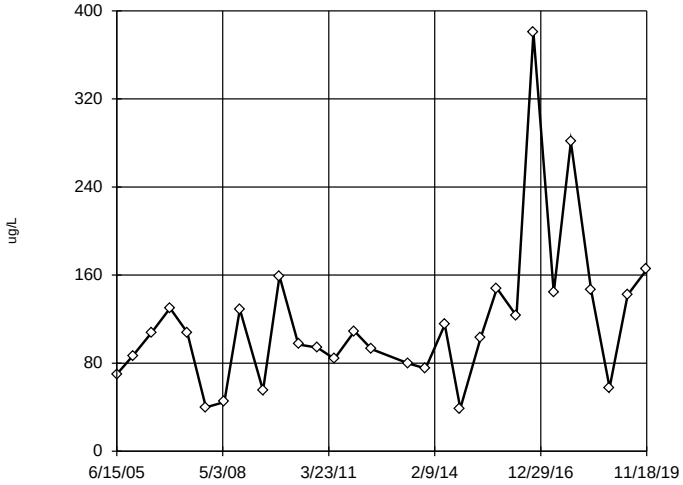
Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2406, low cutoff = -480.2, based on IQR multiplier of 3.

Constituent: Manganese Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 29

Rosner's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 117.4, std. dev.
70.09, critical Tn 2.73

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9633
Critical = 0.937 (after
natural log transforma-
tion)
The distribution was found
to be log-normal.

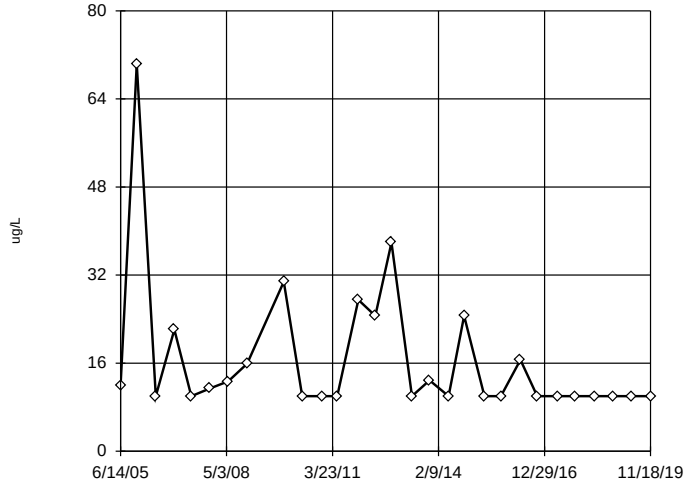
Constituent: Manganese Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 29

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Data were natural log
transformed to achieve
best W statistic (graph
shown in original units).

High cutoff = 134.6, low
cutoff = 1.423, based
on IQR multiplier of 3.

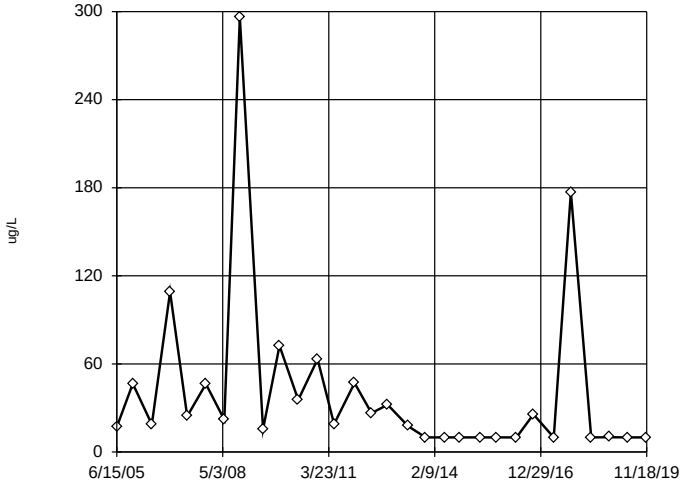
Constituent: Manganese Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Data were natural log
transformed to achieve
best W statistic (graph
shown in original units).

High cutoff = 4675, low
cutoff = 0.09946, based
on IQR multiplier of 3.

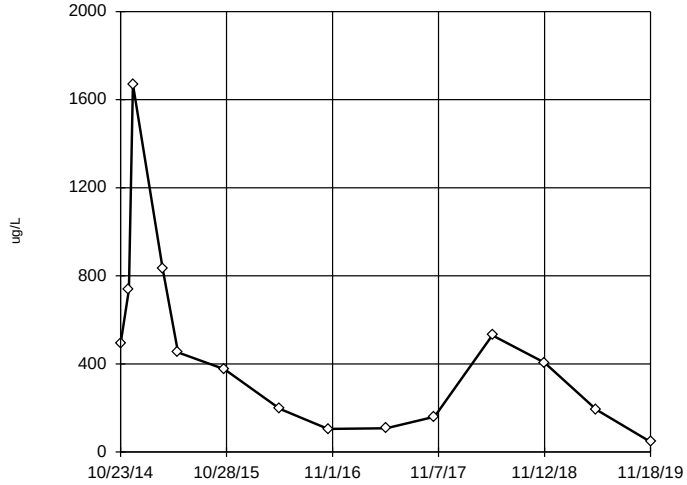
Constituent: Manganese Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 450.2, std. dev.
424.8, critical Tn 2.371

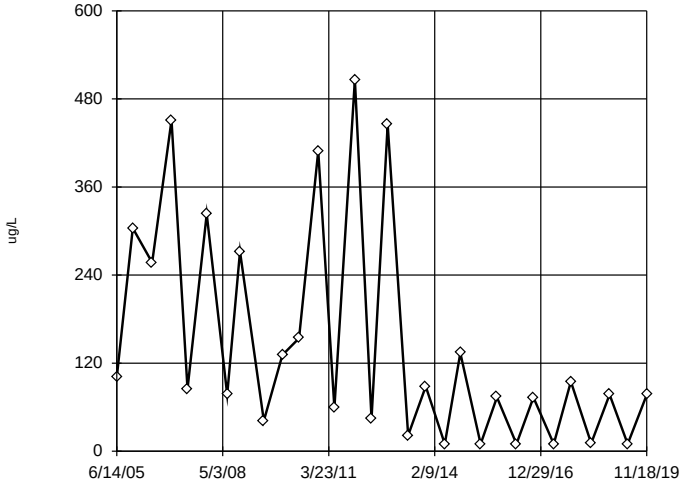
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9775
Critical = 0.895 (after
natural log transforma-
tion)
The distribution was found
to be log-normal.

Constituent: Manganese Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

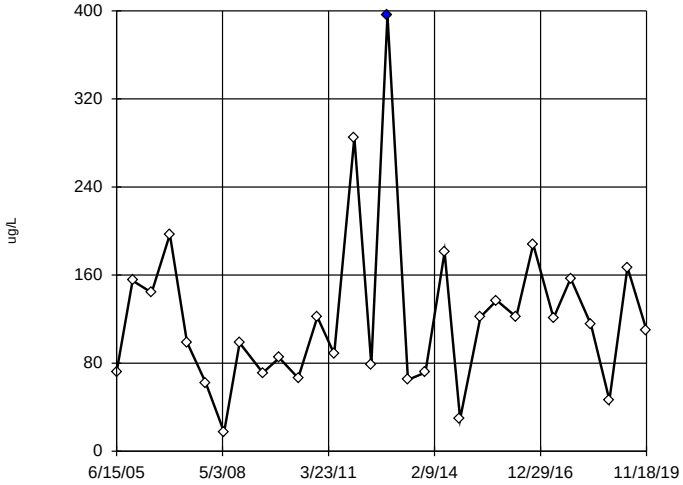
High cutoff = 4332, low cutoff = -308.7, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-21ox (bg)




n = 30

Statistical outlier is drawn as solid.

k = 1
r = 3.589
Tabulated value = 2.92
Alpha = 0.01

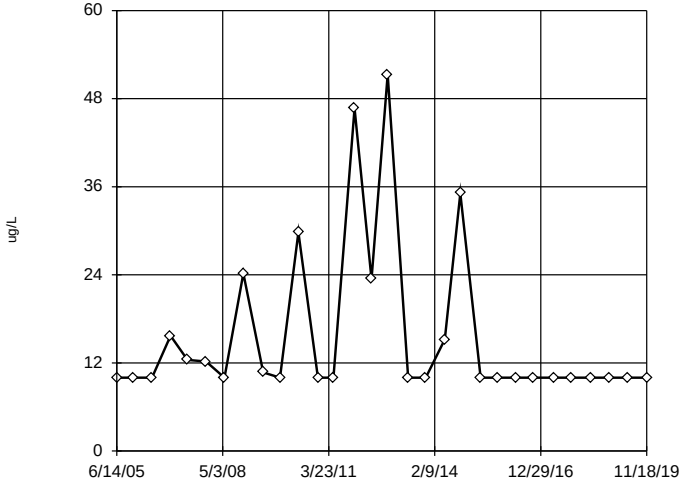
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9524
Critical = 0.937 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-23ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

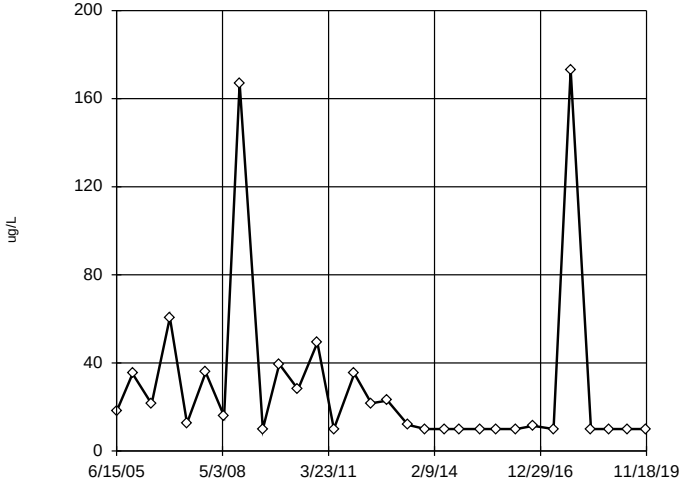
High cutoff = 56.95, low cutoff = 2.713, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

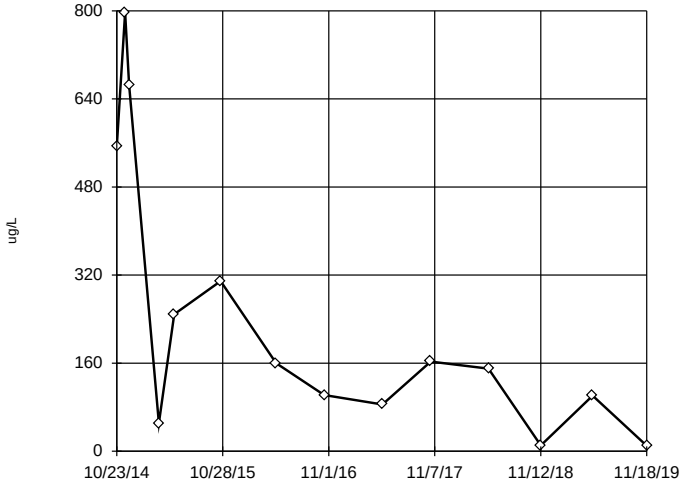
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1527, low cutoff = 0.2303, based on IQR multiplier of 3.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 243.4, std. dev. 250.9, critical Tn 2.371

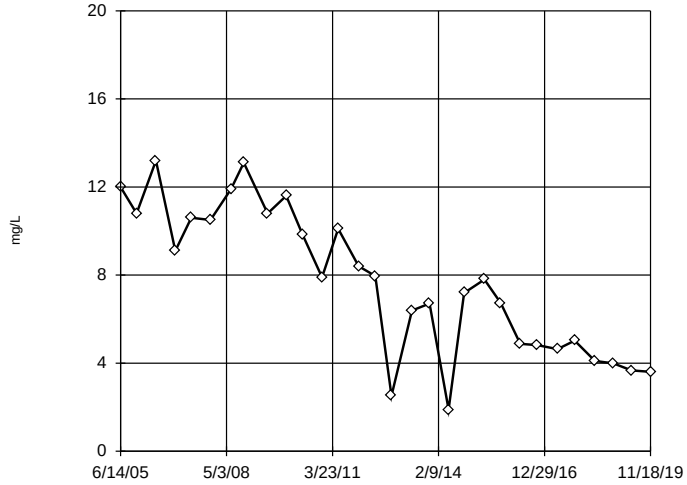
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.921
Critical = 0.895 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-11 (bg)




n = 30

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.724, std. dev. 3.301, critical Tn 2.745

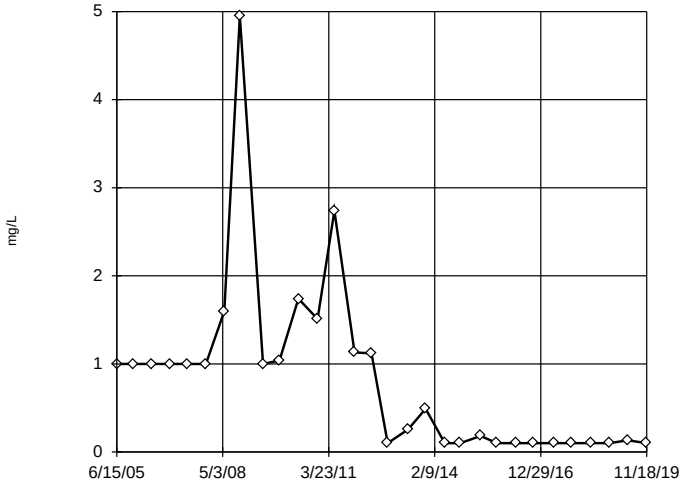
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9517
Critical = 0.939
The distribution was found to be normally distributed.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-21ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

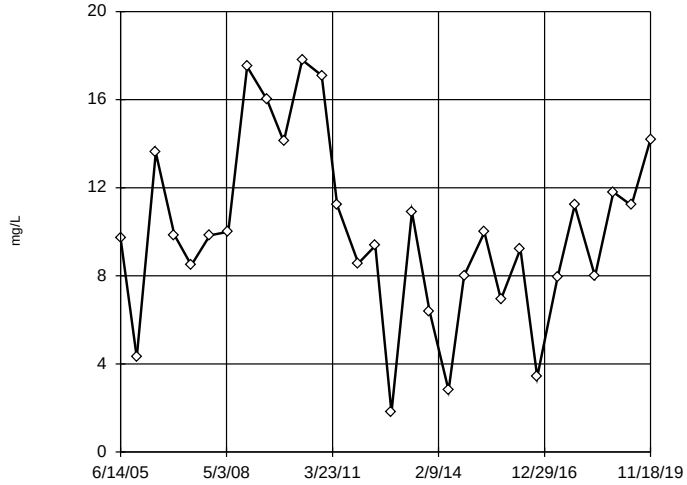
High cutoff = 19.92, low cutoff = -1.82, based on IQR multiplier of 3.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-23ox (bg)




n = 30

No statistical outliers.

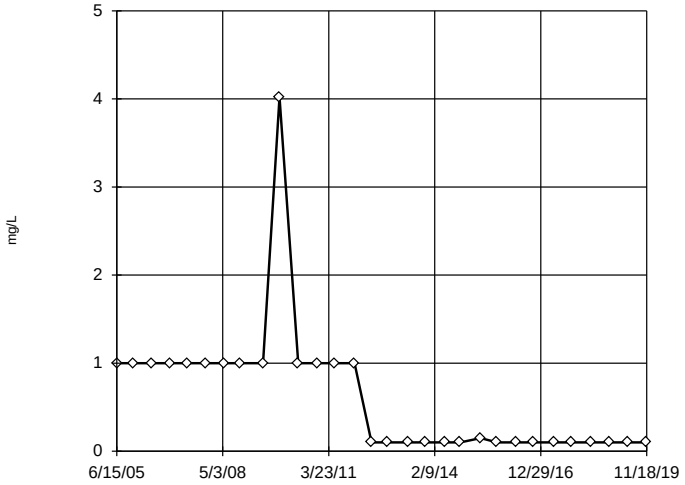
k = 3
r = 1.997
Tabulated value = 2.75
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9592
Critical = 0.937
The distribution was found to be normally distributed.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

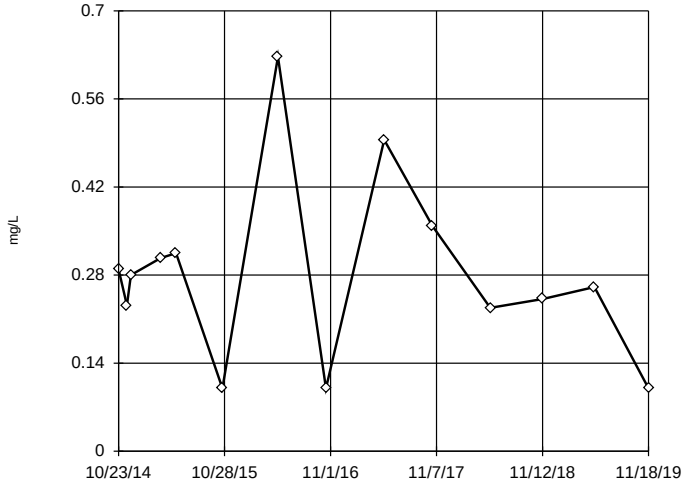
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.281, std. dev. 0.1464, critical Tn 2.371

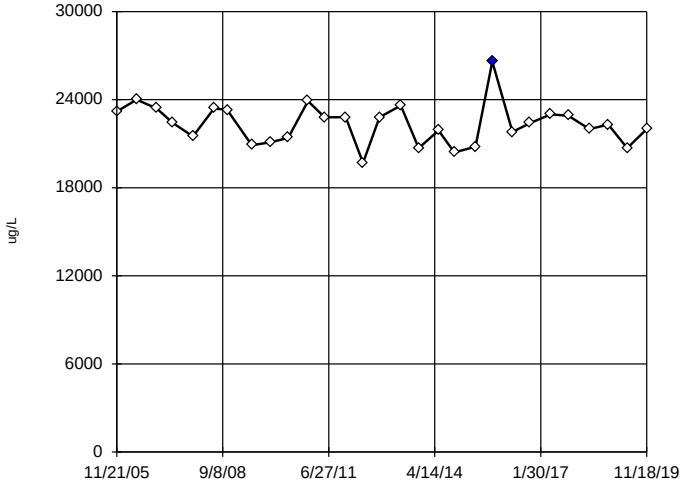
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8972
Critical = 0.895
The distribution was found to be normally distributed.

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-11 (bg)




n = 29

Statistical outlier is drawn as solid.

k = 1
r = 3.054
Tabulated value = 2.904
Alpha = 0.01

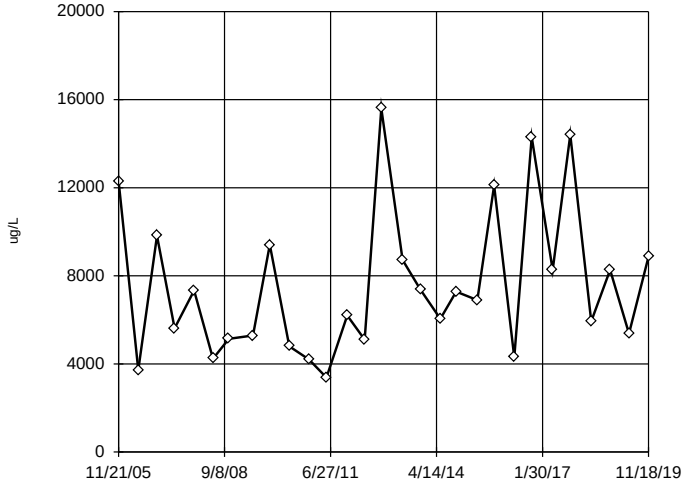
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9629
Critical = 0.936
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Potassium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 29

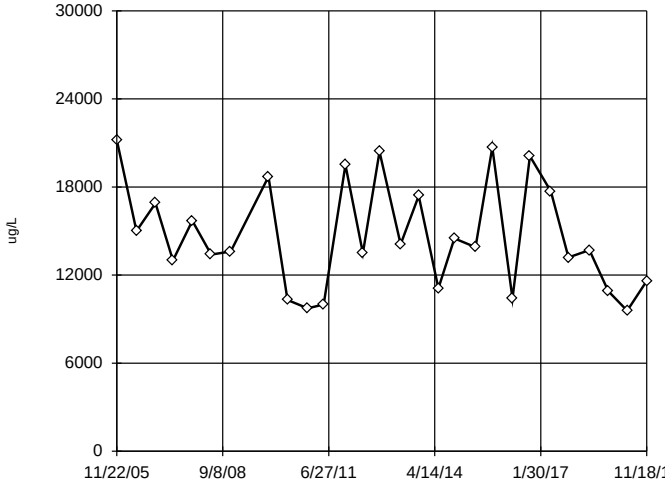
Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7596, std. dev. 3371, critical Tn 2.73

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9647
Critical = 0.937 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Potassium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Rosner's Test)

MW-23ox (bg)




n = 28

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 14636, std. dev. 3654, critical Tn 2.714

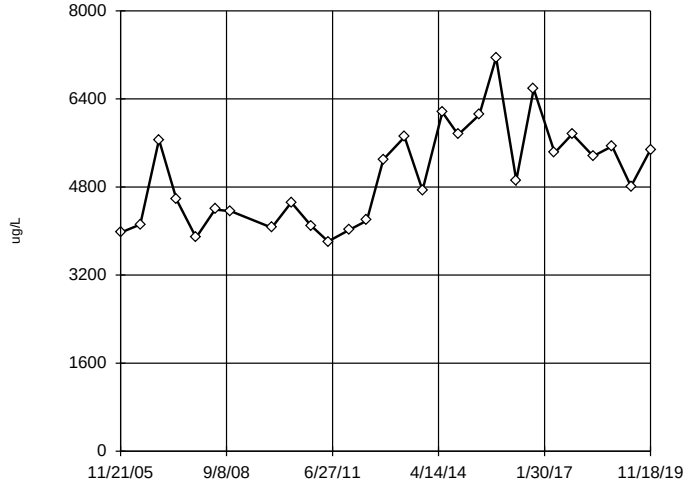
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9398
Critical = 0.936 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Potassium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-25ox (bg)




n = 28

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 5016, std. dev. 898.8, critical Tn 2.714

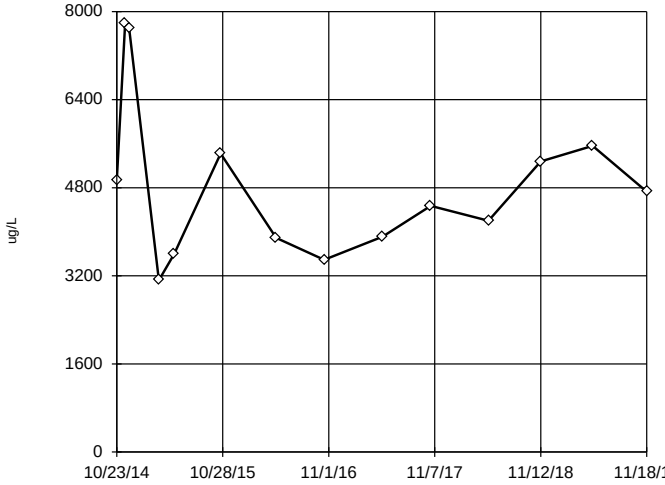
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9378
Critical = 0.936
The distribution was found to be normally distributed.

Constituent: Potassium Analysis Run 2/14/2020 5:41 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 4864, std. dev. 1428, critical Tn 2.371

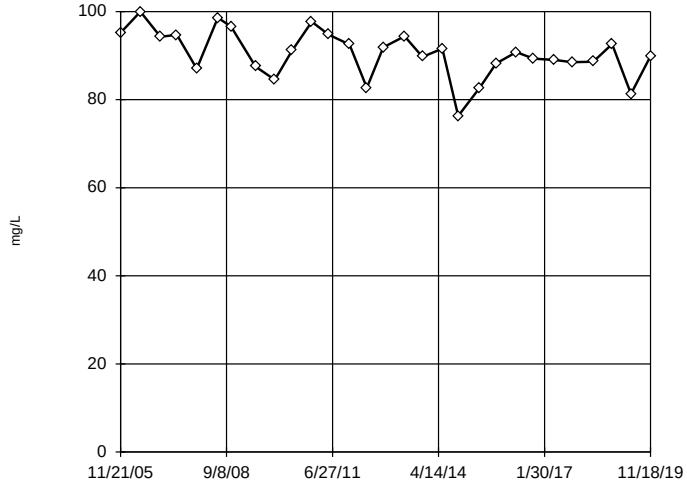
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9445
Critical = 0.895 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Potassium Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Rosner's Outlier Test

MW-11 (bg)




n = 29

No statistical outliers.

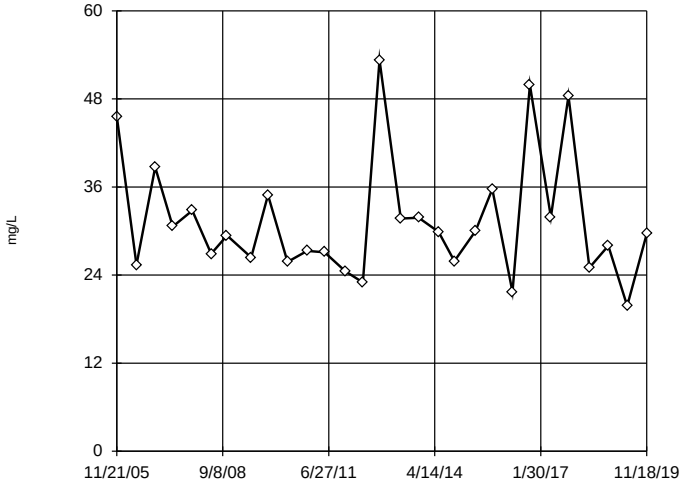
k = 1
r = 2.593
Tabulated value = 2.904
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9779
Critical = 0.936
The distribution was found to be normally distributed.

Constituent: Sodium [total] Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-21ox (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

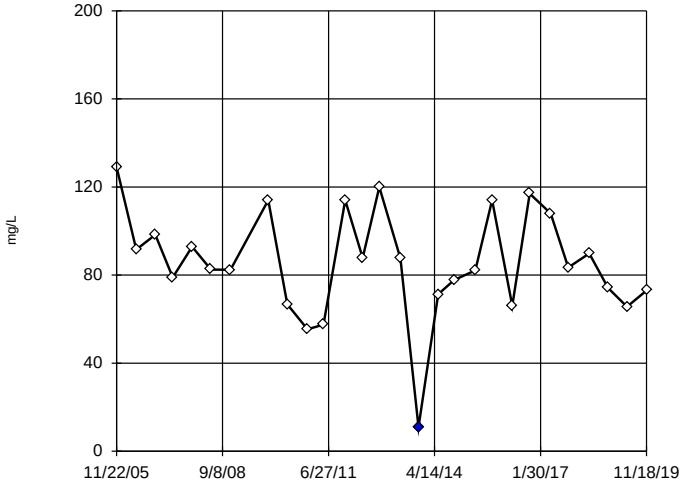
High cutoff = 75.86, low cutoff = 11.53, based on IQR multiplier of 3.

Constituent: Sodium [total] Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Rosner's Outlier Test

MW-23ox (bg)




n = 28

Statistical outlier is drawn as solid.

k = 1
r = 3.032
Tabulated value = 2.888
Alpha = 0.01

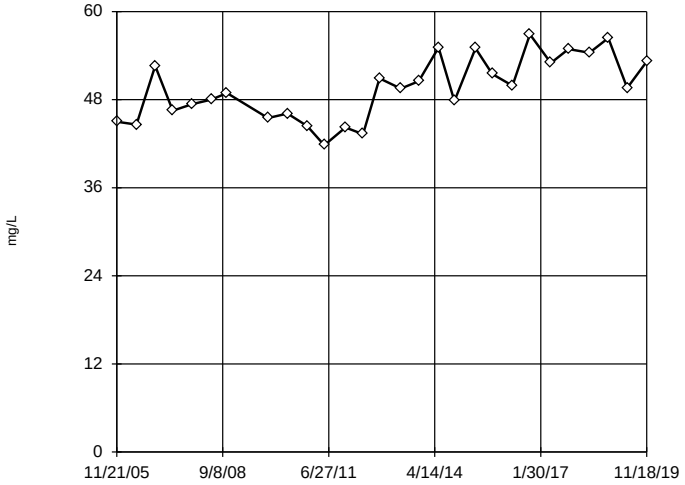
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9523
Critical = 0.935
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Sodium [total] Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## EPA Screening (suspected outliers for Rosner's Test)

MW-25ox (bg)




n = 28

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 49.53, std. dev. 4.313, critical Tn 2.714

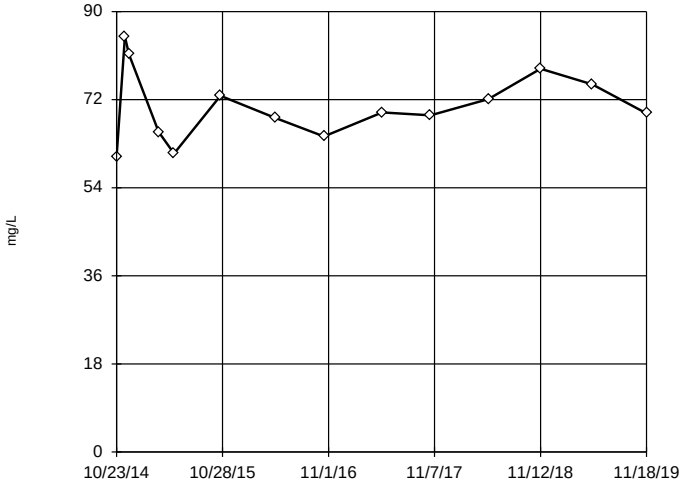
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.961
Critical = 0.936
The distribution was found to be normally distributed.

Constituent: Sodium [total] Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

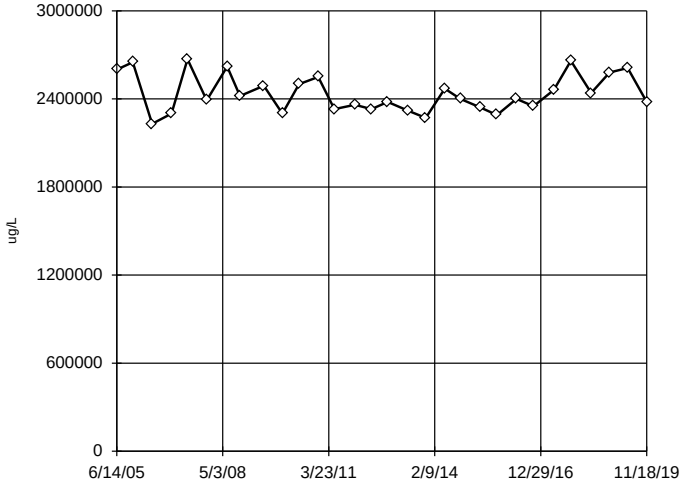
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 70.81, std. dev. 7.221, critical Tn 2.371

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9637
Critical = 0.895
The distribution was found to be normally distributed.

Constituent: Sodium [total] Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

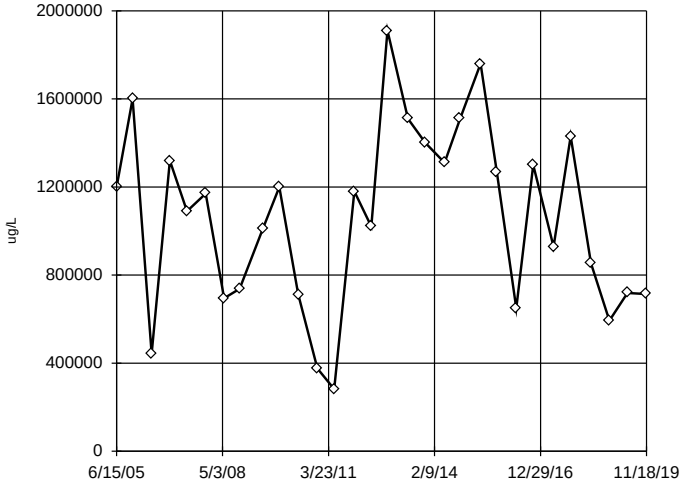
High cutoff = 3421779, low cutoff = 1746561, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 30

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1063133, std. dev. 413478, critical Tn 2.745

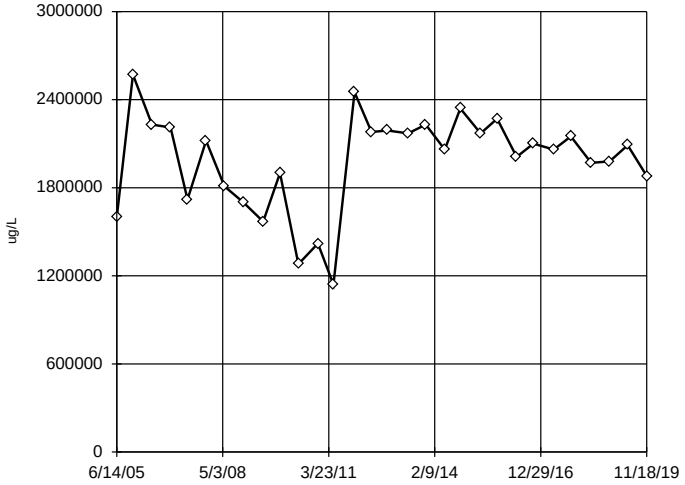
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9774
Critical = 0.939
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Rosner's Outlier Test

MW-23ox (bg)




n = 30

No statistical outliers.

k = 2
r = 2.539
Tabulated value = 2.92
Alpha = 0.01

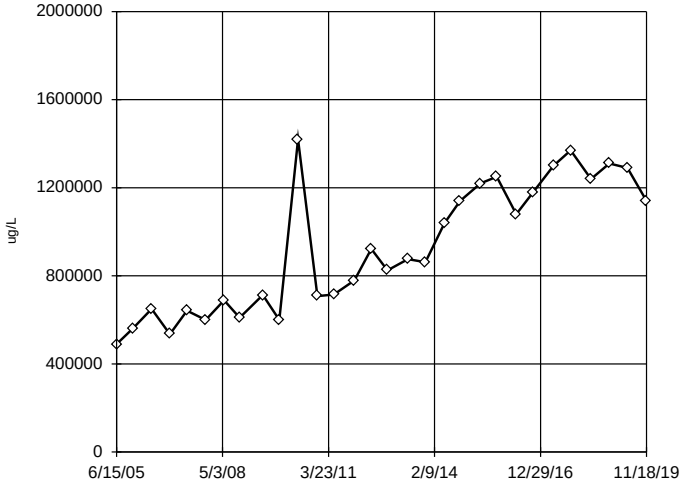
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9519
Critical = 0.937
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

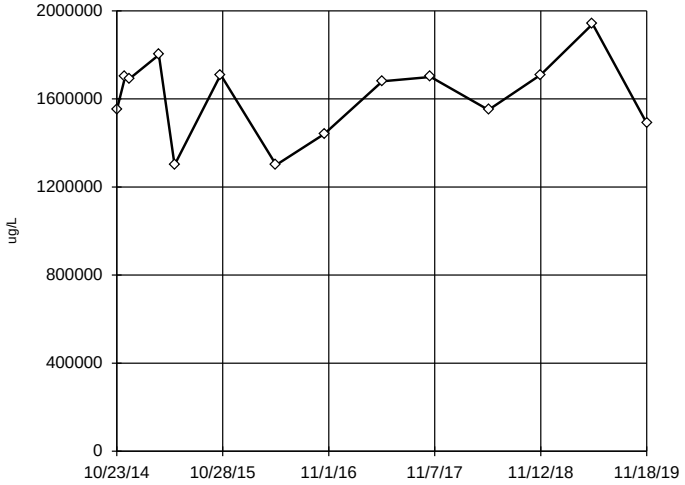
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 8489663, low cutoff = 93589, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1611429, std. dev. 182961, critical Tn 2.371

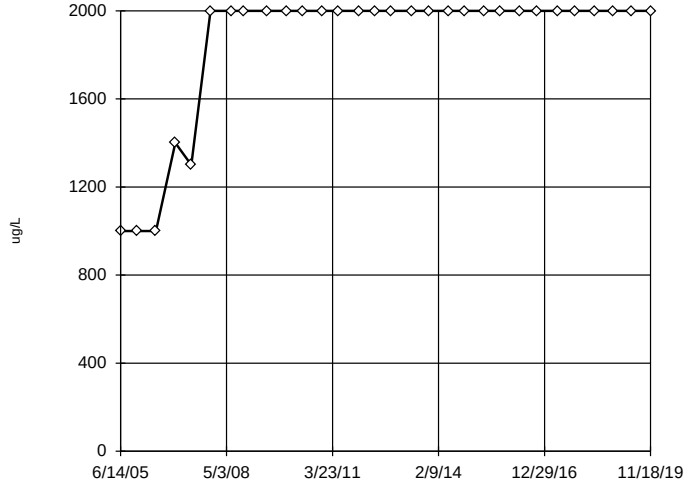
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9347
Critical = 0.895
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers trans-formations did not im-prove normality; analy-sis run on raw data.

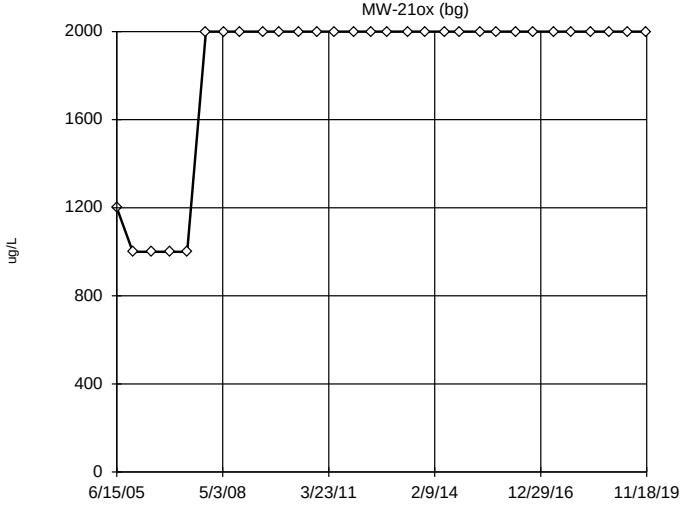
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Sulfide Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-21ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

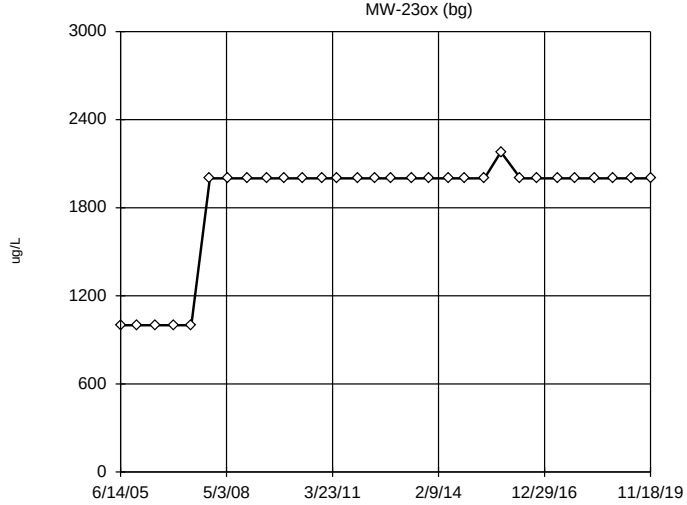
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Sulfide Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-23ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^6 transform-ed to achieve best W stat-istic (graph shown in original units).

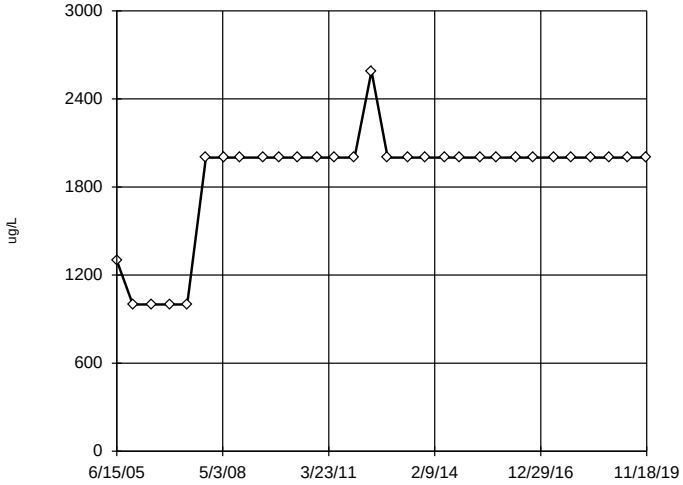
The results were invalid-ated, because the lower and upper quartiles are equal.

Constituent: Sulfide Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube transformed to achieve best W statistic (graph shown in original units).

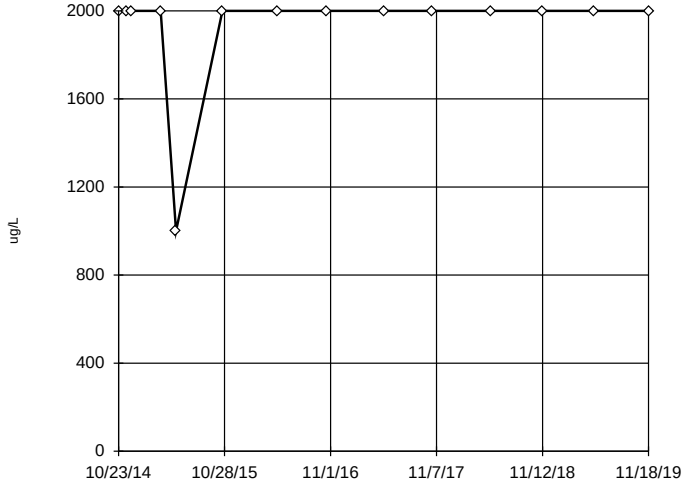
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Sulfide Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-61ox (bg)




n = 14

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

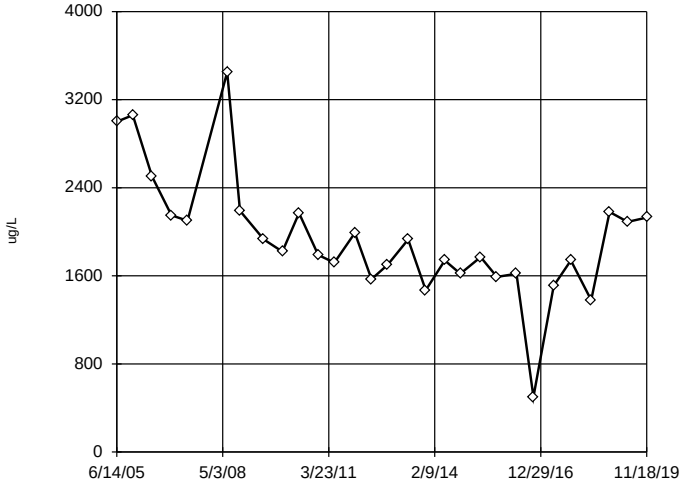
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Sulfide Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-11 (bg)




n = 29

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

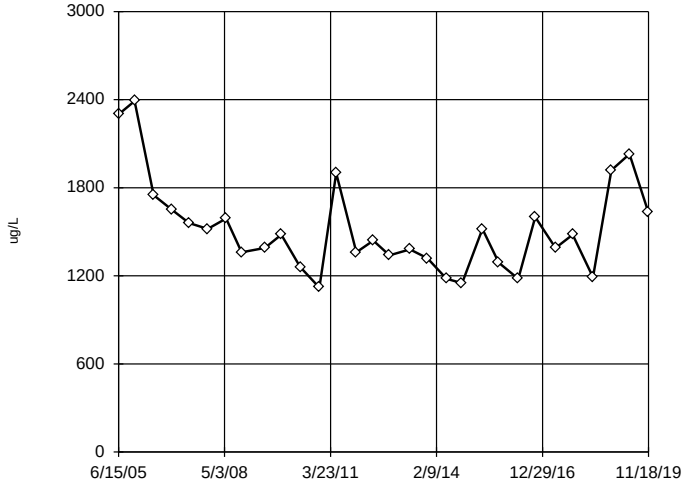
High cutoff = 3780, low cutoff = 0, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Rosner's Test)

MW-21ox (bg)




n = 30

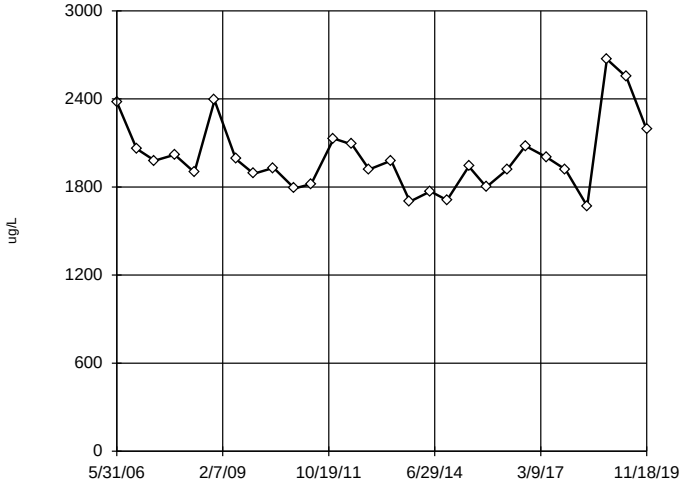
Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1522, std. dev. 319.9, critical Tn 2.745

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9415
Critical = 0.939 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Tukey's Outlier Screening

MW-23ox (bg)




n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

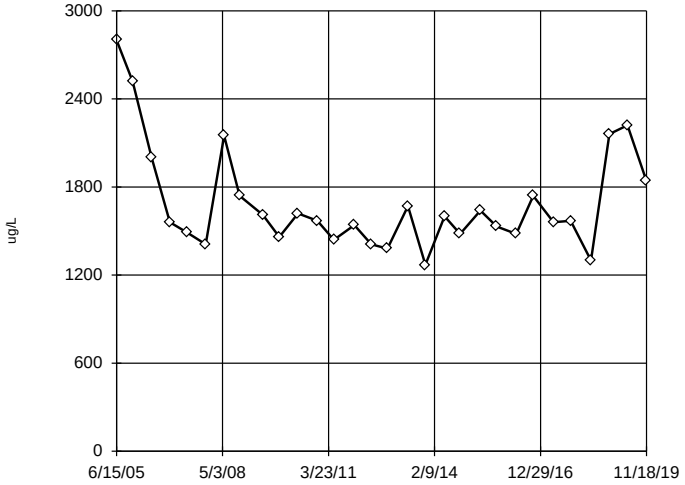
High cutoff = 2962, low cutoff = 1305, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Tukey's Outlier Screening

MW-25ox (bg)




n = 30

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

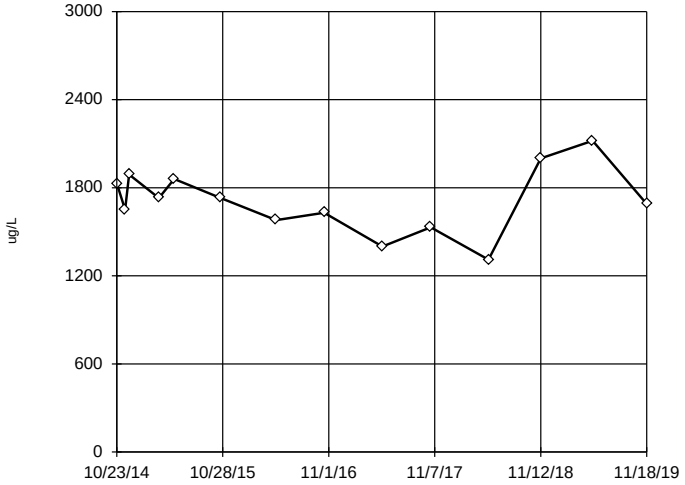
High cutoff = 3227, low cutoff = 815, based on IQR multiplier of 3.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## EPA Screening (suspected outliers for Dixon's Test)

MW-61ox (bg)




n = 14

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1711, std. dev. 221.5, critical Tn 2.371

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9905
Critical = 0.895
The distribution was found to be normally distrib-uted.

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:42 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Box & Whiskers Plot

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/14/2020, 5:40 PM

| Constituent | Well | N | Mean | Std. Dev. | Std. Err. | Median | Min. | Max. | %NDs |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-11 (bg) | 30 | 262700 | 15946 | 2911 | 258000 | 238000 | 311000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-21ox (bg) | 30 | 350633 | 63757 | 11640 | 335500 | 255000 | 489000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | 28 | 349643 | 20440 | 3863 | 348000 | 304000 | 402000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-25ox (bg) | 30 | 338300 | 16865 | 3079 | 338500 | 304000 | 373000 | 0 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-61ox (bg) | 14 | 304571 | 13552 | 3622 | 301500 | 288000 | 330000 | 0 |
| Ammonia as N (ug/L) | MW-11 (bg) | 30 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Ammonia as N (ug/L) | MW-21ox (bg) | 30 | 205 | 27.39 | 5 | 200 | 200 | 350 | 96.67 |
| Ammonia as N (ug/L) | MW-23ox (bg) | 30 | 200.1 | 0.5477 | 0.1 | 200 | 200 | 203 | 96.67 |
| Ammonia as N (ug/L) | MW-25ox (bg) | 30 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Ammonia as N (ug/L) | MW-61ox (bg) | 14 | 200 | 0 | 0 | 200 | 200 | 200 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | 29 | 3.828 | 2.391 | 0.4441 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | 29 | 3.931 | 2.419 | 0.4492 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | 29 | 3.828 | 2.391 | 0.4441 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | 29 | 3.931 | 2.419 | 0.4492 | 3 | 3 | 12 | 100 |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | 14 | 4.286 | 2.555 | 0.6828 | 3 | 3 | 12 | 100 |
| Calcium (ug/L) | MW-11 (bg) | 29 | 496690 | 25984 | 4825 | 499000 | 432000 | 562000 | 0 |
| Calcium (ug/L) | MW-21ox (bg) | 29 | 360414 | 106437 | 19765 | 371000 | 148000 | 541000 | 0 |
| Calcium (ug/L) | MW-23ox (bg) | 29 | 392403 | 92430 | 17164 | 406000 | 94700 | 524000 | 0 |
| Calcium (ug/L) | MW-25ox (bg) | 29 | 239034 | 53201 | 9879 | 235000 | 160000 | 344000 | 0 |
| Calcium (ug/L) | MW-61ox (bg) | 14 | 369214 | 40857 | 10919 | 360000 | 291000 | 464000 | 0 |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | 29 | 6295 | 2097 | 389.4 | 5000 | 5000 | 12400 | 51.72 |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | 29 | 5238 | 637.2 | 118.3 | 5000 | 5000 | 7500 | 86.21 |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | 29 | 5814 | 1589 | 295.1 | 5000 | 5000 | 11000 | 62.07 |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | 29 | 5936 | 1555 | 288.8 | 5000 | 5000 | 9920 | 65.52 |
| Chemical Oxygen Demand (ug/L) | MW-61ox (bg) | 14 | 5861 | 1873 | 500.5 | 5000 | 5000 | 11000 | 71.43 |
| Iron [total] (mg/L) | MW-11 (bg) | 30 | 0.2316 | 0.1759 | 0.03211 | 0.1195 | 0.1 | 0.568 | 66.67 |
| Iron [total] (mg/L) | MW-21ox (bg) | 30 | 0.3598 | 0.2764 | 0.05047 | 0.251 | 0.1 | 1.29 | 23.33 |
| Iron [total] (mg/L) | MW-23ox (bg) | 30 | 0.6815 | 2.709 | 0.4946 | 0.1 | 0.1 | 15 | 90 |
| Iron [total] (mg/L) | MW-25ox (bg) | 30 | 0.1843 | 0.1622 | 0.02962 | 0.1 | 0.1 | 0.5 | 96.67 |
| Iron [total] (mg/L) | MW-61ox (bg) | 14 | 0.4594 | 0.5966 | 0.1595 | 0.3905 | 0.1 | 2.43 | 78.57 |
| Iron, Dissolved (ug/L) | MW-11 (bg) | 30 | 183.3 | 162.1 | 29.59 | 100 | 100 | 500 | 100 |
| Iron, Dissolved (ug/L) | MW-21ox (bg) | 30 | 262.4 | 187.9 | 34.31 | 186.5 | 100 | 845 | 36.67 |
| Iron, Dissolved (ug/L) | MW-23ox (bg) | 30 | 181.3 | 162.2 | 29.62 | 100 | 100 | 500 | 96.67 |
| Iron, Dissolved (ug/L) | MW-25ox (bg) | 30 | 180.7 | 162.4 | 29.65 | 100 | 100 | 500 | 96.67 |
| Iron, Dissolved (ug/L) | MW-61ox (bg) | 14 | 271.4 | 205.4 | 54.9 | 100 | 100 | 500 | 100 |
| Manganese (ug/L) | MW-11 (bg) | 30 | 211 | 180.4 | 32.94 | 160.5 | 10 | 601 | 10 |
| Manganese (ug/L) | MW-21ox (bg) | 29 | 117.4 | 70.09 | 13.02 | 108 | 38.8 | 380 | 0 |
| Manganese (ug/L) | MW-23ox (bg) | 29 | 16.53 | 12.8 | 2.378 | 10 | 10 | 70.3 | 51.72 |
| Manganese (ug/L) | MW-25ox (bg) | 30 | 40.72 | 59.95 | 10.95 | 18.9 | 10 | 296 | 33.33 |
| Manganese (ug/L) | MW-61ox (bg) | 14 | 450.2 | 424.8 | 113.5 | 391 | 46.4 | 1670 | 0 |
| Manganese, Dissolved (ug/L) | MW-11 (bg) | 30 | 145.4 | 150.6 | 27.49 | 81.05 | 10 | 506 | 16.67 |
| Manganese, Dissolved (ug/L) | MW-21ox (bg) | 30 | 122.3 | 76.26 | 13.92 | 112.5 | 17.3 | 396 | 0 |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | 30 | 15.56 | 11.14 | 2.034 | 10 | 10 | 51.3 | 63.33 |
| Manganese, Dissolved (ug/L) | MW-25ox (bg) | 30 | 29.64 | 40.43 | 7.382 | 12.25 | 10 | 173 | 43.33 |
| Manganese, Dissolved (ug/L) | MW-61ox (bg) | 14 | 243.4 | 250.9 | 67.05 | 155 | 10 | 797 | 7.143 |
| Nitrate Nitrite as N (mg/L) | MW-11 (bg) | 30 | 7.724 | 3.301 | 0.6026 | 7.85 | 1.89 | 13.2 | 0 |
| Nitrate Nitrite as N (mg/L) | MW-21ox (bg) | 30 | 0.8331 | 1.019 | 0.1861 | 0.7455 | 0.1 | 4.95 | 60 |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | 30 | 10.04 | 4.13 | 0.754 | 9.85 | 1.79 | 17.8 | 0 |
| Nitrate Nitrite as N (mg/L) | MW-25ox (bg) | 30 | 0.6223 | 0.7816 | 0.1427 | 0.1245 | 0.1 | 4.02 | 93.33 |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | 14 | 0.281 | 0.1464 | 0.03914 | 0.2705 | 0.1 | 0.627 | 21.43 |

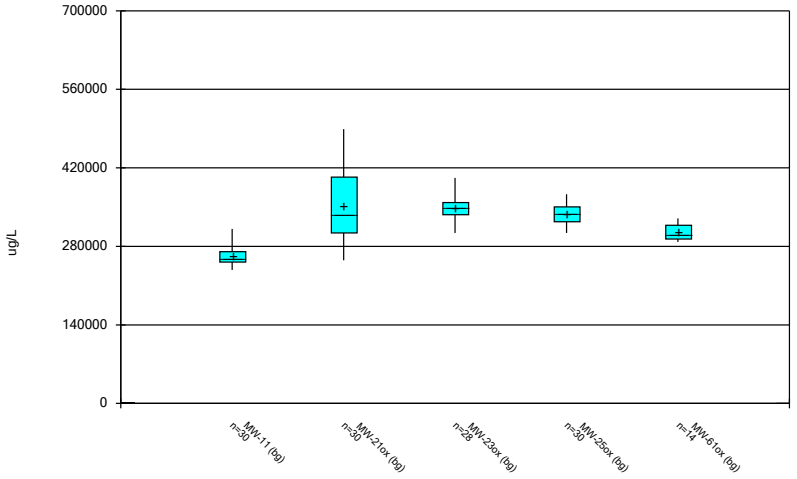
# Box & Whiskers Plot

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:40 PM

| Constituent | Well | N | Mean | Std. Dev. | Std. Err. | Median | Min. | Max. | %NDs |
|---|---|---|---|---|---|---|---|---|---|
| Potassium (ug/L) | MW-11 (bg) | 29 | 22334 | 1397 | 259.4 | 22400 | 19700 | 26600 | 0 |
| Potassium (ug/L) | MW-21ox (bg) | 29 | 7596 | 3371 | 626 | 6900 | 3380 | 15600 | 0 |
| Potassium (ug/L) | MW-23ox (bg) | 28 | 14636 | 3654 | 690.5 | 13800 | 9570 | 21200 | 0 |
| Potassium (ug/L) | MW-25ox (bg) | 28 | 5016 | 898.8 | 169.9 | 4865 | 3810 | 7150 | 0 |
| Potassium (ug/L) | MW-61ox (bg) | 14 | 4864 | 1428 | 381.7 | 4600 | 3120 | 7780 | 0 |
| Sodium [total] (mg/L) | MW-11 (bg) | 29 | 90.41 | 5.441 | 1.01 | 90.8 | 76.3 | 100 | 0 |
| Sodium [total] (mg/L) | MW-21ox (bg) | 29 | 31.41 | 8.427 | 1.565 | 29.6 | 19.8 | 53.3 | 0 |
| Sodium [total] (mg/L) | MW-23ox (bg) | 28 | 85.42 | 24.58 | 4.644 | 82.95 | 10.9 | 129 | 0 |
| Sodium [total] (mg/L) | MW-25ox (bg) | 28 | 49.53 | 4.313 | 0.8152 | 49.55 | 41.8 | 56.9 | 0 |
| Sodium [total] (mg/L) | MW-61ox (bg) | 14 | 70.81 | 7.221 | 1.93 | 69.3 | 60.4 | 84.9 | 0 |
| Sulfate (ug/L) | MW-11 (bg) | 30 | 2436333 | 128934 | 23540 | 2400000 | 2230000 | 2670000 | 0 |
| Sulfate (ug/L) | MW-21ox (bg) | 30 | 1063133 | 413478 | 75490 | 1130000 | 282000 | 1910000 | 0 |
| Sulfate (ug/L) | MW-23ox (bg) | 30 | 1985667 | 333101 | 60816 | 2075000 | 1140000 | 2570000 | 0 |
| Sulfate (ug/L) | MW-25ox (bg) | 30 | 925200 | 294898 | 53841 | 869000 | 490000 | 1420000 | 0 |
| Sulfate (ug/L) | MW-61ox (bg) | 14 | 1611429 | 182961 | 48898 | 1685000 | 1300000 | 1940000 | 0 |
| Sulfide (ug/L) | MW-11 (bg) | 30 | 1857 | 333.9 | 60.97 | 2000 | 1000 | 2000 | 93.33 |
| Sulfide (ug/L) | MW-21ox (bg) | 30 | 1840 | 365.4 | 66.71 | 2000 | 1000 | 2000 | 96.67 |
| Sulfide (ug/L) | MW-23ox (bg) | 30 | 1839 | 383.2 | 69.96 | 2000 | 1000 | 2180 | 93.33 |
| Sulfide (ug/L) | MW-25ox (bg) | 30 | 1863 | 383.9 | 70.1 | 2000 | 1000 | 2590 | 93.33 |
| Sulfide (ug/L) | MW-61ox (bg) | 14 | 1929 | 267.3 | 71.43 | 2000 | 1000 | 2000 | 100 |
| Total Organic Carbon (ug/L) | MW-11 (bg) | 29 | 1945 | 560.1 | 104 | 1820 | 500 | 3450 | 6.897 |
| Total Organic Carbon (ug/L) | MW-21ox (bg) | 30 | 1522 | 319.9 | 58.41 | 1460 | 1120 | 2390 | 0 |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | 28 | 2007 | 245 | 46.31 | 1960 | 1670 | 2670 | 0 |
| Total Organic Carbon (ug/L) | MW-25ox (bg) | 30 | 1692 | 358 | 65.35 | 1570 | 1270 | 2800 | 0 |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | 14 | 1711 | 221.5 | 59.21 | 1710 | 1310 | 2120 | 0 |

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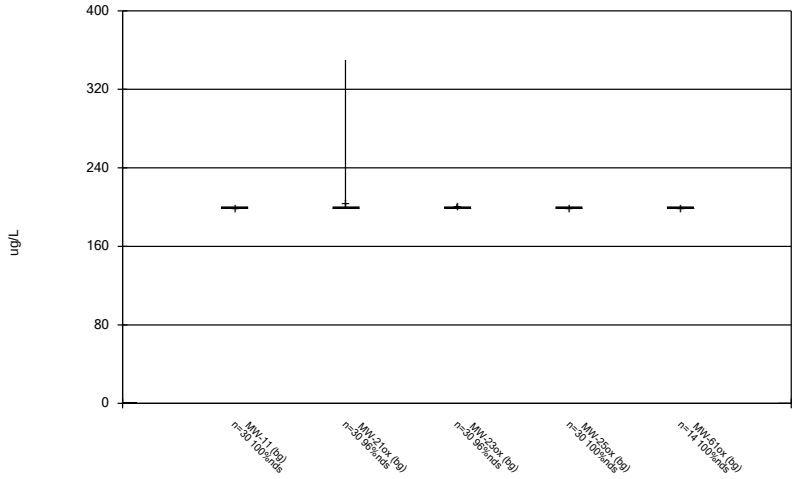
## Box & Whiskers Plot




Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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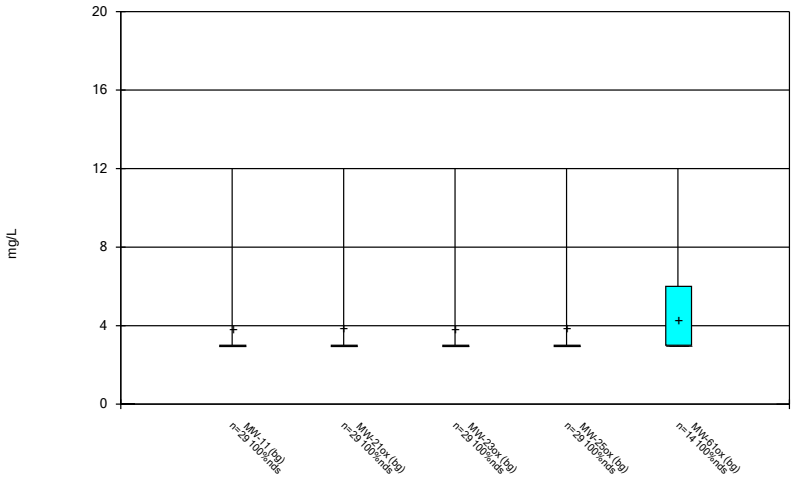
## Box & Whiskers Plot




Constituent: Ammonia as N Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

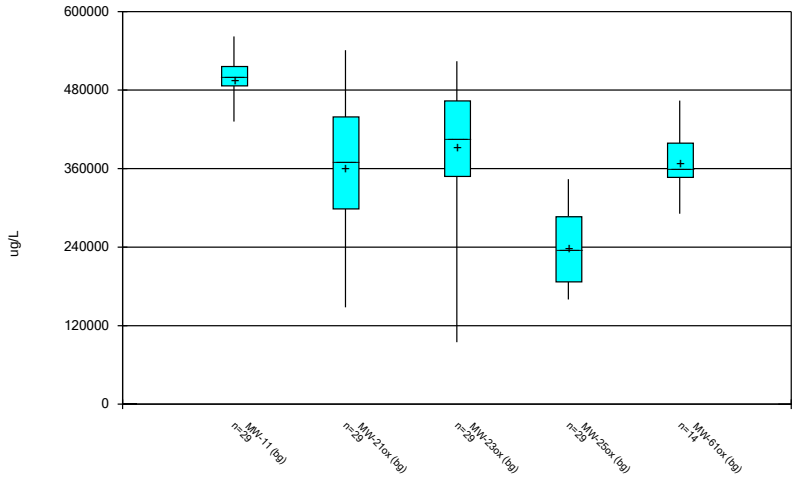
## Box & Whiskers Plot




Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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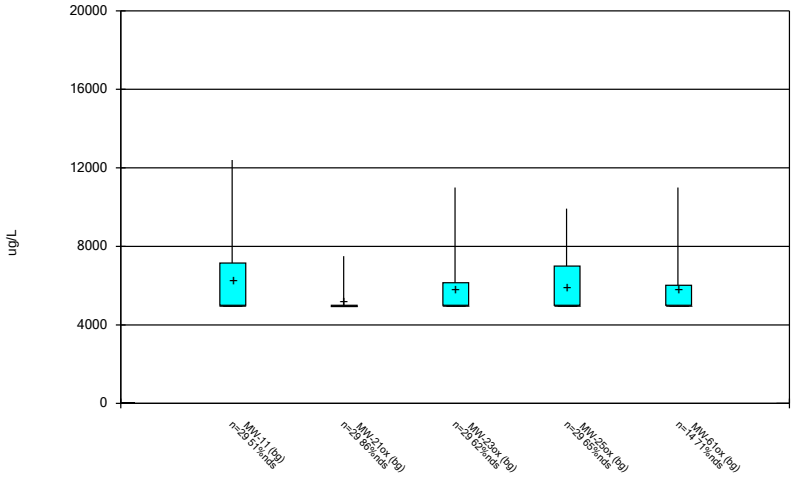
## Box & Whiskers Plot




Constituent: Calcium Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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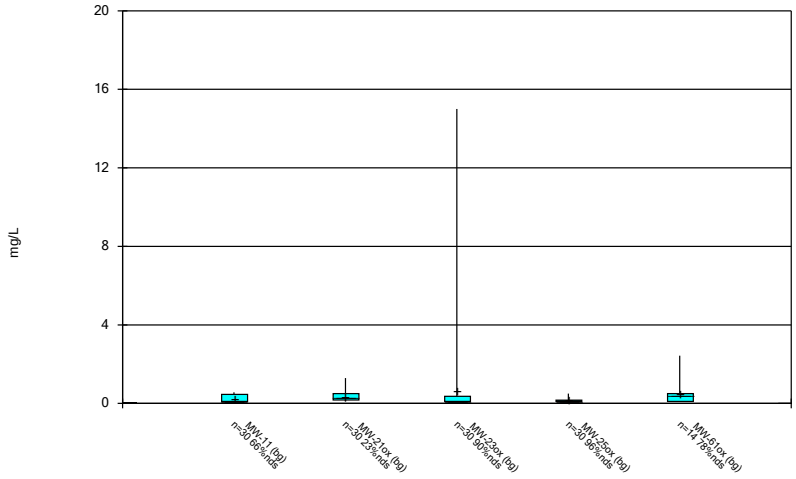
## Box & Whiskers Plot




Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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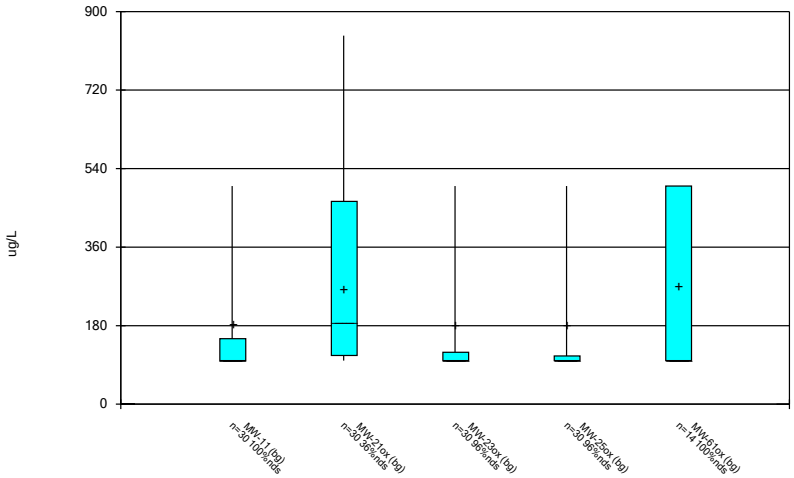
## Box & Whiskers Plot




Constituent: Iron [total] Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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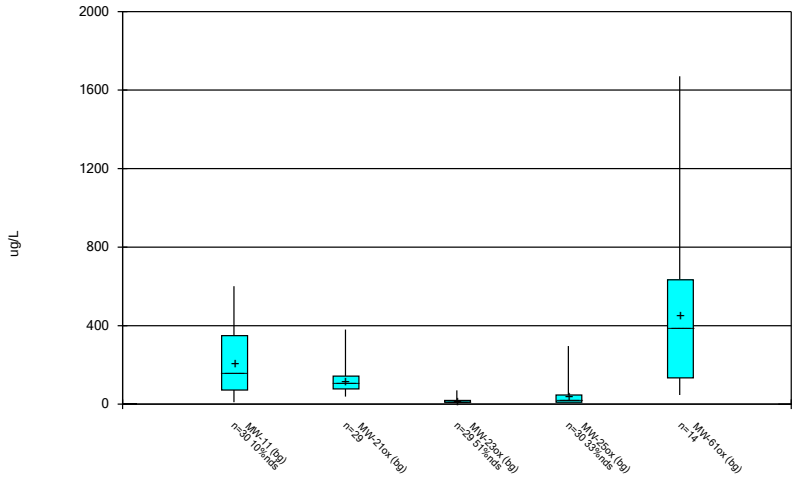
## Box & Whiskers Plot




Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

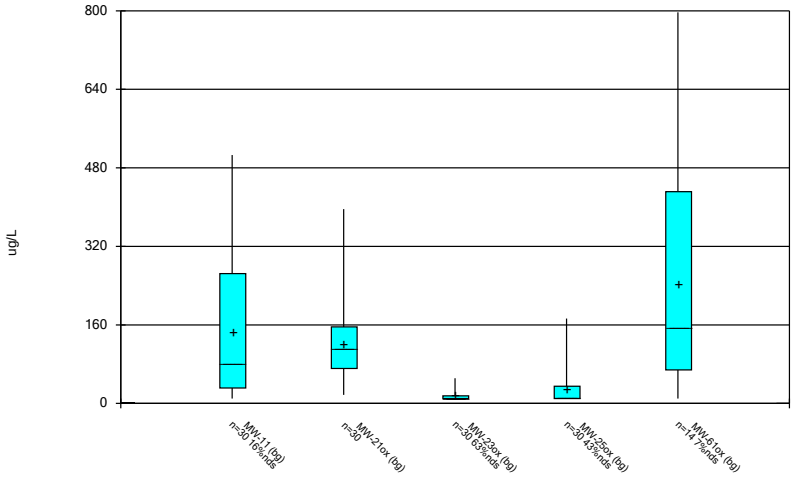
## Box & Whiskers Plot




Constituent: Manganese Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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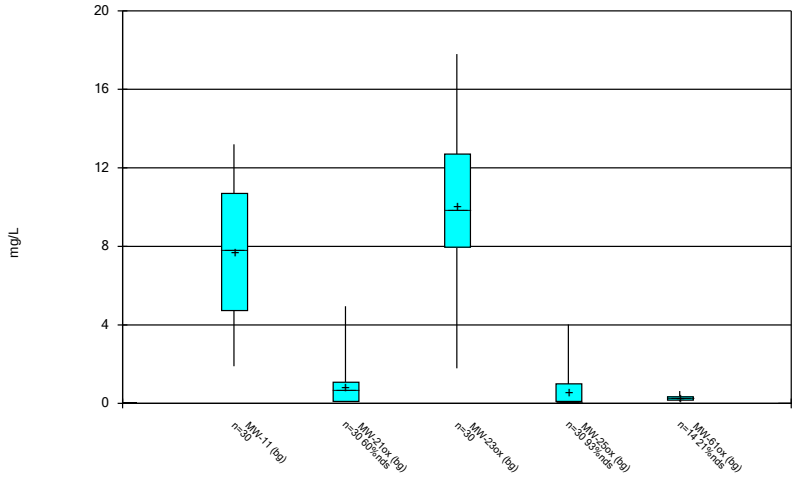
## Box & Whiskers Plot




Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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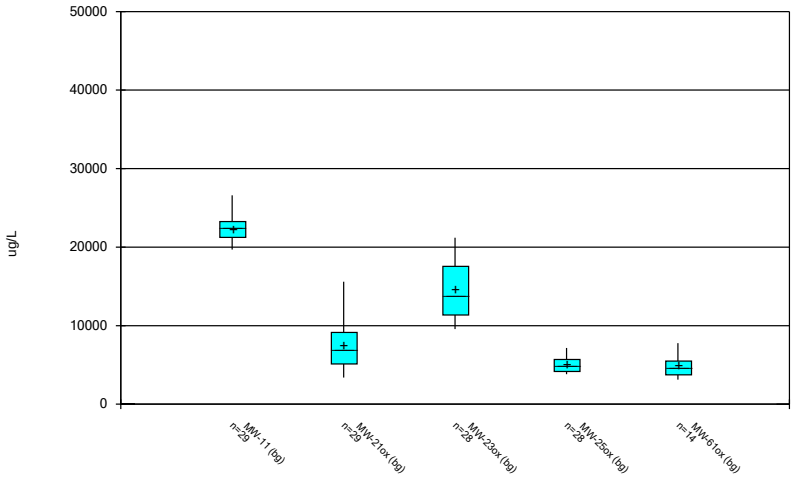
## Box & Whiskers Plot




Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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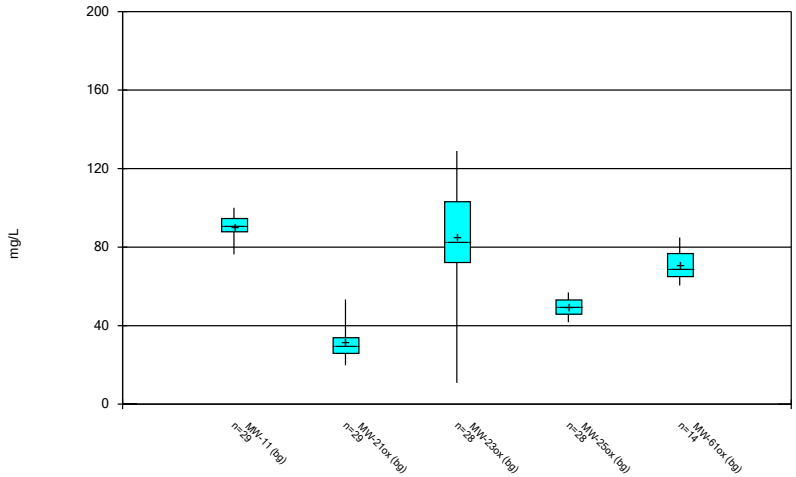
## Box & Whiskers Plot




Constituent: Potassium Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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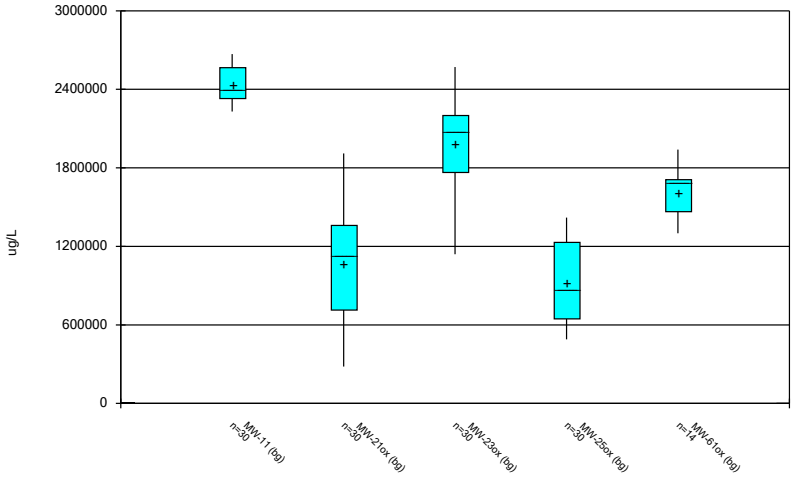
## Box & Whiskers Plot




Constituent: Sodium [total] Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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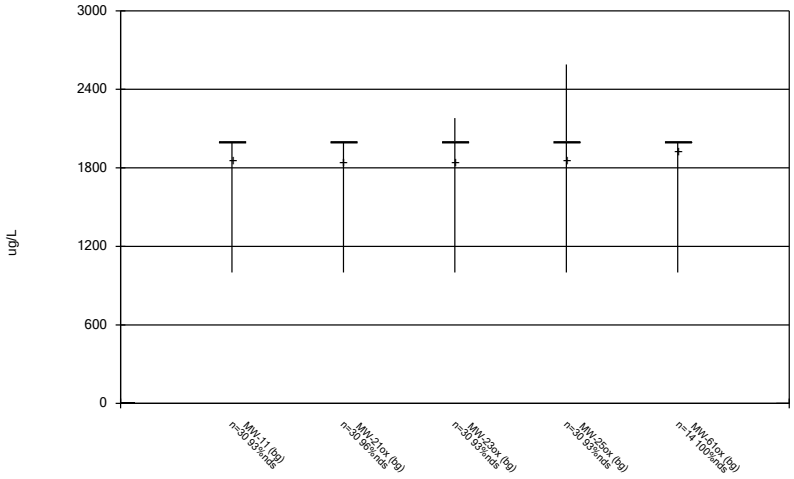
## Box & Whiskers Plot




Constituent: Sulfate Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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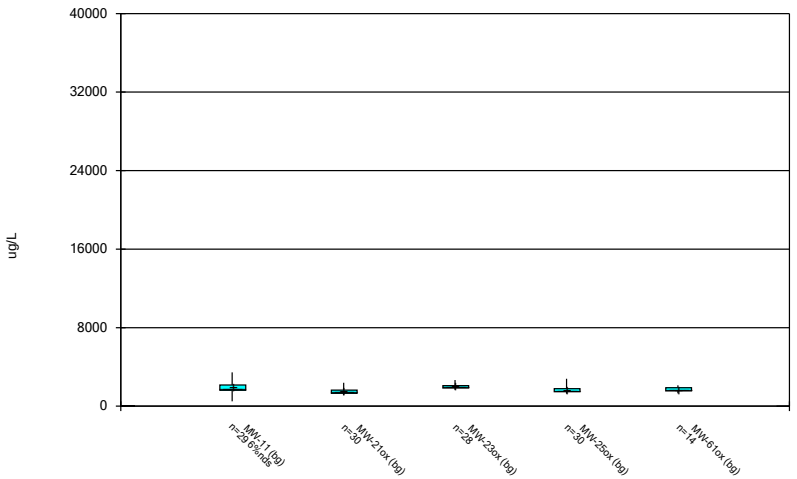
## Box & Whiskers Plot




Constituent: Sulfide Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Box & Whiskers Plot




Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:39 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Trend Test

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:45 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-11 (bg)** | **-2008** | **-237** | **-112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-21ox (bg)** | **10431** | **255** | **112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-23ox (bg) | -847.9 | -61 | -101 | No | 28 | 0 | n/a | n/a | 0.05 | NP |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-25ox (bg)** | **-2498** | **-217** | **-112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-61ox (bg)** | **-4522** | **-41** | **-37** | **Yes** | **14** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Ammonia as N (ug/L) | MW-11 (bg) | 0 | 0 | 112 | No | 30 | 100 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-21ox (bg) | 0 | -5 | -112 | No | 30 | 96.67 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-23ox (bg) | 0 | -27 | -112 | No | 30 | 96.67 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-25ox (bg) | 0 | 0 | 112 | No | 30 | 100 | n/a | n/a | 0.05 | NP |
| Ammonia as N (ug/L) | MW-61ox (bg) | 0 | 0 | 37 | No | 14 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-11 (bg) | 0 | 48 | 106 | No | 29 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-21ox (bg) | 0 | 34 | 106 | No | 29 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-23ox (bg) | 0 | 48 | 106 | No | 29 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-25ox (bg) | 0 | 34 | 106 | No | 29 | 100 | n/a | n/a | 0.05 | NP |
| Biochemical Oxygen Demand (mg/L) | MW-61ox (bg) | 0 | -5 | -37 | No | 14 | 100 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-11 (bg) | -396.3 | -32 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-21ox (bg) | 4328 | 45 | 106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-23ox (bg) | -1875 | -20 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| **Calcium (ug/L)** | **MW-25ox (bg)** | **11069** | **293** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Calcium (ug/L) | MW-61ox (bg) | -2648 | -13 | -37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-11 (bg) | 0 | 7 | 106 | No | 29 | 51.72 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-21ox (bg) | 0 | -38 | -106 | No | 29 | 86.21 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-23ox (bg) | 0 | -3 | -106 | No | 29 | 62.07 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-25ox (bg) | 0 | -17 | -106 | No | 29 | 65.52 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-61ox (bg) | 0 | 12 | 37 | No | 14 | 71.43 | n/a | n/a | 0.05 | NP |
| Iron [total] (mg/L) | MW-11 (bg) | 0 | 1 | 112 | No | 30 | 66.67 | n/a | n/a | 0.05 | NP |
| **Iron [total] (mg/L)** | **MW-21ox (bg)** | **0.02498** | **182** | **112** | **Yes** | **30** | **23.33** | **n/a** | **n/a** | **0.05** | **NP** |
| Iron [total] (mg/L) | MW-23ox (bg) | 0 | 88 | 112 | No | 30 | 90 | n/a | n/a | 0.05 | NP |
| **Iron [total] (mg/L)** | **MW-25ox (bg)** | **0** | **135** | **112** | **Yes** | **30** | **96.67** | **n/a** | **n/a** | **0.05** | **NP** |
| Iron [total] (mg/L) | MW-61ox (bg) | 0.04688 | 26 | 37 | No | 14 | 78.57 | n/a | n/a | 0.05 | NP |
| **Iron, Dissolved (ug/L)** | **MW-11 (bg)** | **0** | **163** | **112** | **Yes** | **30** | **100** | **n/a** | **n/a** | **0.05** | **NP** |
| **Iron, Dissolved (ug/L)** | **MW-21ox (bg)** | **23.14** | **210** | **112** | **Yes** | **30** | **36.67** | **n/a** | **n/a** | **0.05** | **NP** |
| **Iron, Dissolved (ug/L)** | **MW-23ox (bg)** | **0** | **135** | **112** | **Yes** | **30** | **96.67** | **n/a** | **n/a** | **0.05** | **NP** |
| **Iron, Dissolved (ug/L)** | **MW-25ox (bg)** | **0** | **135** | **112** | **Yes** | **30** | **96.67** | **n/a** | **n/a** | **0.05** | **NP** |
| **Iron, Dissolved (ug/L)** | **MW-61ox (bg)** | **80.71** | **48** | **37** | **Yes** | **14** | **100** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-11 (bg)** | **-26.56** | **-248** | **-112** | **Yes** | **30** | **10** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-21ox (bg)** | **4.936** | **121** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Manganese (ug/L) | MW-23ox (bg) | 0 | -105 | -106 | No | 29 | 51.72 | n/a | n/a | 0.05 | NP |
| **Manganese (ug/L)** | **MW-25ox (bg)** | **-1.367** | **-168** | **-112** | **Yes** | **30** | **33.33** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-61ox (bg)** | **-116.6** | **-45** | **-37** | **Yes** | **14** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-11 (bg)** | **-10.49** | **-165** | **-112** | **Yes** | **30** | **16.67** | **n/a** | **n/a** | **0.05** | **NP** |
| Manganese, Dissolved (ug/L) | MW-21ox (bg) | 2.203 | 34 | 112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Manganese, Dissolved (ug/L) | MW-23ox (bg) | 0 | -68 | -112 | No | 30 | 63.33 | n/a | n/a | 0.05 | NP |
| **Manganese, Dissolved (ug/L)** | **MW-25ox (bg)** | **-0.8071** | **-169** | **-112** | **Yes** | **30** | **43.33** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-61ox (bg)** | **-82.29** | **-55** | **-37** | **Yes** | **14** | **7.143** | **n/a** | **n/a** | **0.05** | **NP** |
| **Nitrate Nitrite as N (mg/L)** | **MW-11 (bg)** | **-0.6181** | **-308** | **-112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Nitrate Nitrite as N (mg/L)** | **MW-21ox (bg)** | **-0.08266** | **-199** | **-112** | **Yes** | **30** | **60** | **n/a** | **n/a** | **0.05** | **NP** |
| Nitrate Nitrite as N (mg/L) | MW-23ox (bg) | -0.08947 | -30 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Nitrate Nitrite as N (mg/L)** | **MW-25ox (bg)** | **-0.07209** | **-222** | **-112** | **Yes** | **30** | **93.33** | **n/a** | **n/a** | **0.05** | **NP** |
| Nitrate Nitrite as N (mg/L) | MW-61ox (bg) | -0.00... | -10 | -37 | No | 14 | 21.43 | n/a | n/a | 0.05 | NP |

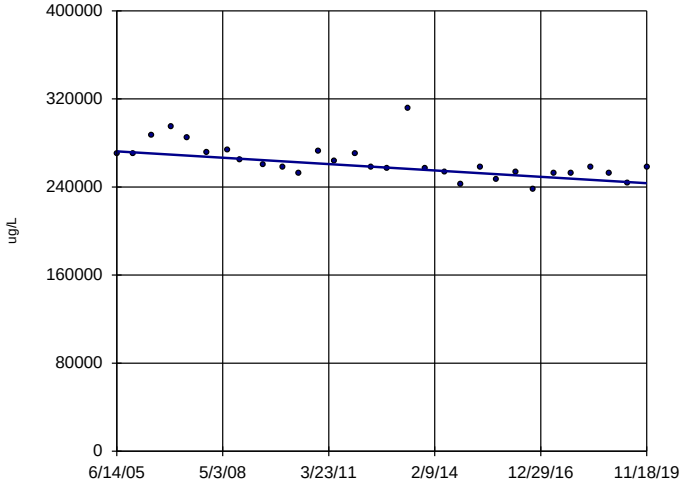
# Trend Test

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/14/2020, 5:45 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Potassium (ug/L) | MW-11 (bg) | -75.98 | -75 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Potassium (ug/L) | MW-21ox (bg) | 209.2 | 72 | 106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Potassium (ug/L) | MW-23ox (bg) | -231.4 | -58 | -101 | No | 28 | 0 | n/a | n/a | 0.05 | NP |
| **Potassium (ug/L)** | **MW-25ox (bg)** | **120.6** | **158** | **101** | **Yes** | **28** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Potassium (ug/L) | MW-61ox (bg) | 83.74 | 5 | 37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| **Sodium [total] (mg/L)** | **MW-11 (bg)** | **-0.5916** | **-146** | **-106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Sodium [total] (mg/L) | MW-21ox (bg) | -0.2393 | -34 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Sodium [total] (mg/L) | MW-23ox (bg) | -1.073 | -65 | -101 | No | 28 | 0 | n/a | n/a | 0.05 | NP |
| **Sodium [total] (mg/L)** | **MW-25ox (bg)** | **0.7118** | **166** | **101** | **Yes** | **28** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Sodium [total] (mg/L) | MW-61ox (bg) | 1.306 | 15 | 37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-11 (bg) | 0 | 3 | 112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-21ox (bg) | -5615 | -15 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Sulfate (ug/L) | MW-23ox (bg) | -2612 | -8 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Sulfate (ug/L)** | **MW-25ox (bg)** | **59372** | **319** | **112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Sulfate (ug/L) | MW-61ox (bg) | 5073 | 9 | 37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| **Sulfide (ug/L)** | **MW-11 (bg)** | **0** | **130** | **112** | **Yes** | **30** | **93.33** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-21ox (bg)** | **0** | **121** | **112** | **Yes** | **30** | **96.67** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-23ox (bg)** | **0** | **133** | **112** | **Yes** | **30** | **93.33** | **n/a** | **n/a** | **0.05** | **NP** |
| **Sulfide (ug/L)** | **MW-25ox (bg)** | **0** | **115** | **112** | **Yes** | **30** | **93.33** | **n/a** | **n/a** | **0.05** | **NP** |
| Sulfide (ug/L) | MW-61ox (bg) | 0 | 5 | 37 | No | 14 | 100 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-11 (bg)** | **-66.53** | **-183** | **-106** | **Yes** | **29** | **6.897** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-21ox (bg) | -23.66 | -86 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-23ox (bg) | -5.768 | -24 | -101 | No | 28 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-25ox (bg) | -8.739 | -36 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-61ox (bg) | -40.35 | -14 | -37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = -2008 units per year.

Mann-Kendall statistic = -237
critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

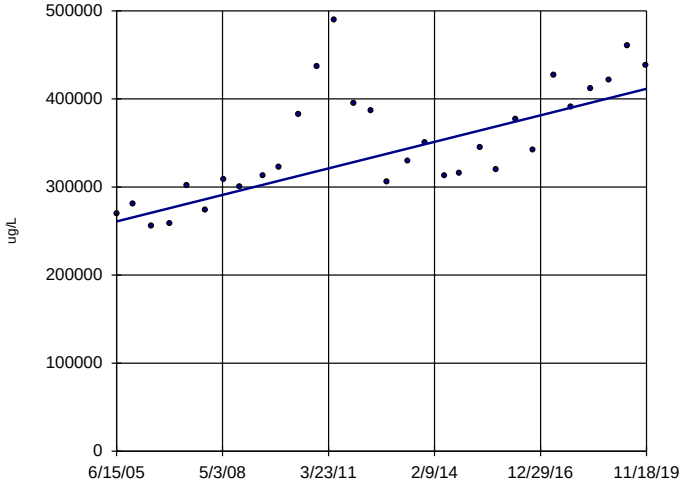
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 10431 units per year.

Mann-Kendall statistic = 255
critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

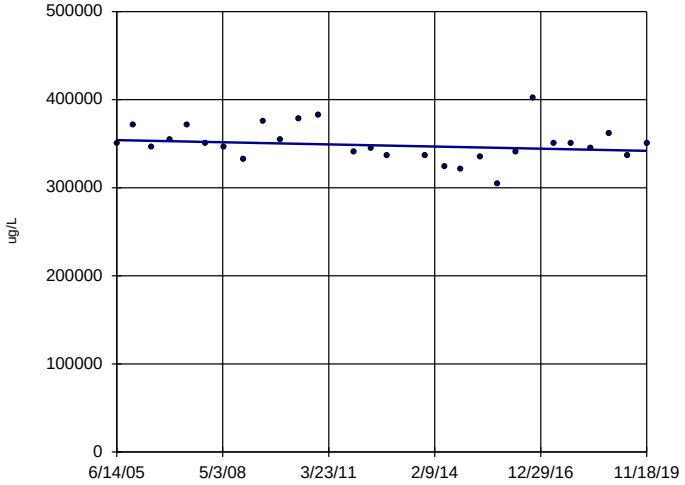
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-23ox (bg)




n = 28

Slope = -847.9 units per year.

Mann-Kendall statistic = -61
critical = -101

Trend not significant at 95% confidence level (α = 0.025 per tail).

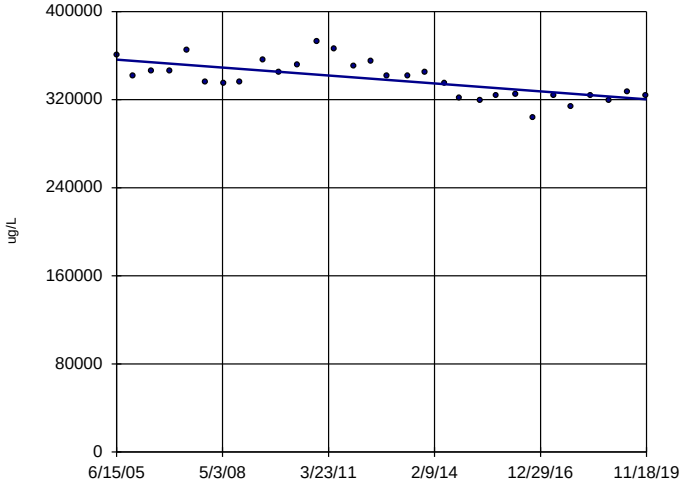
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = -2498 units per year.

Mann-Kendall statistic = -217
critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

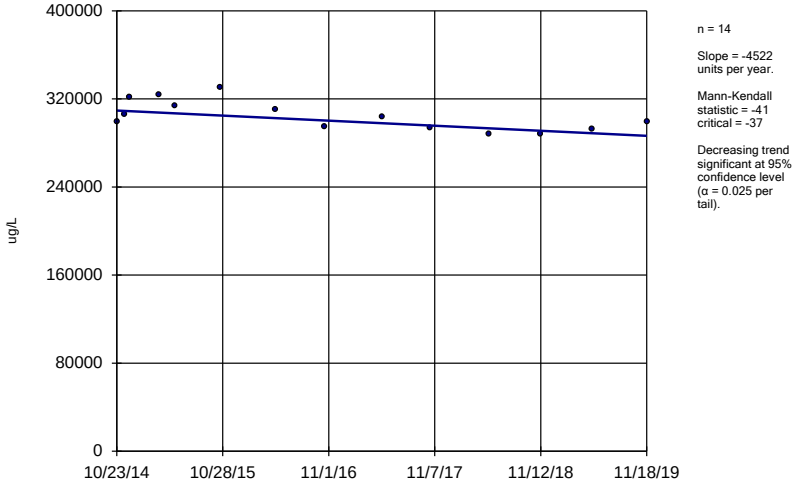
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -4522 units per year.

Mann-Kendall statistic = -41
critical = -37

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

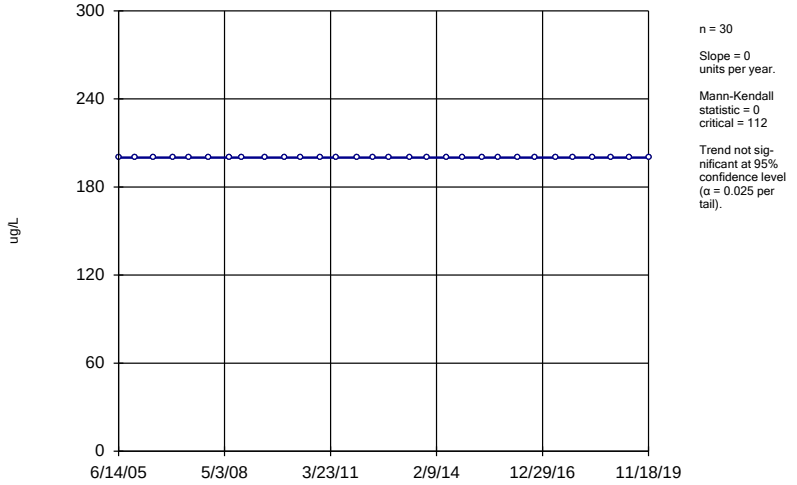
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

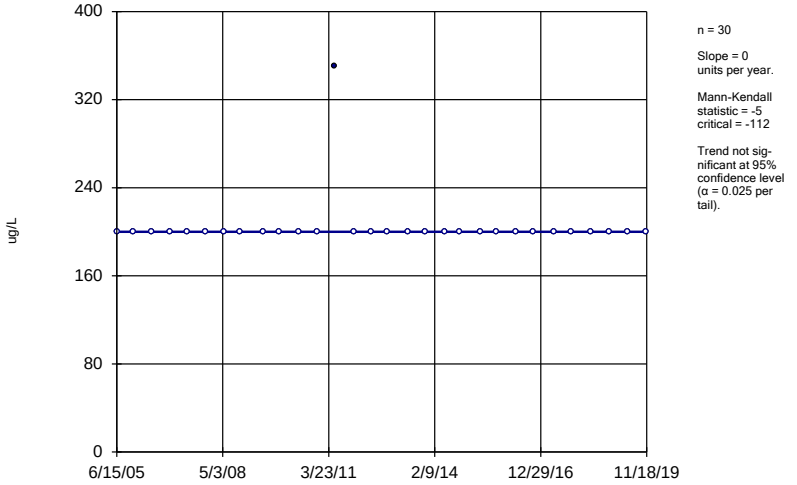
Constituent: Ammonia as N Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = -5
critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

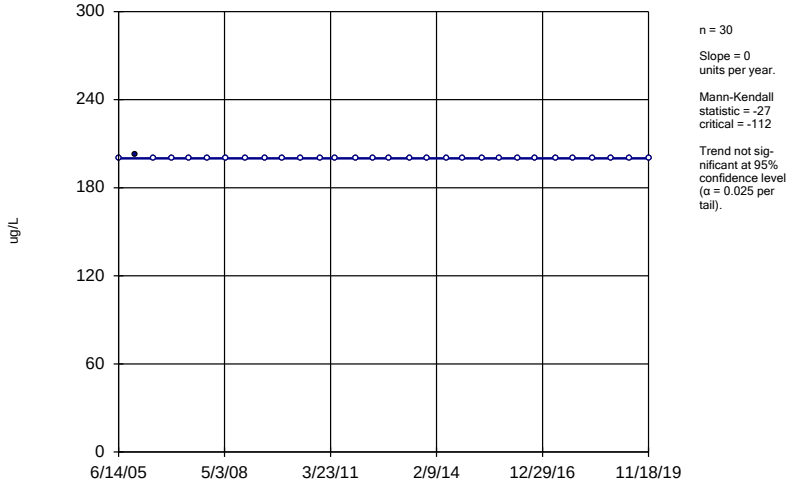
Constituent: Ammonia as N Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = -27
critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

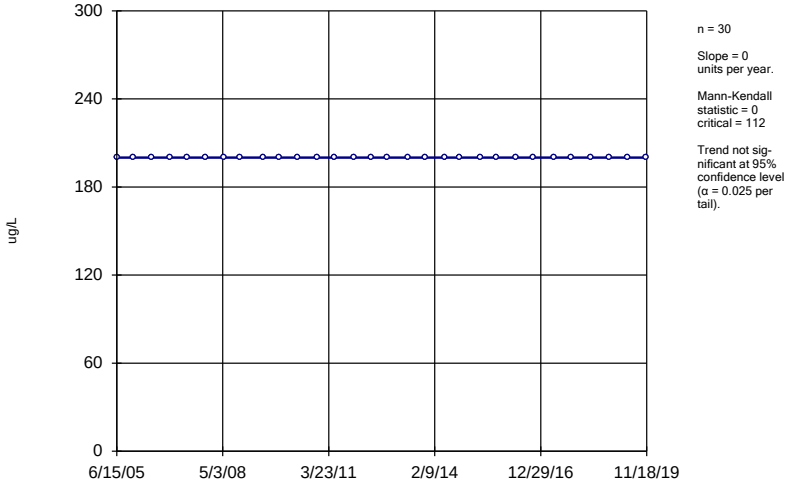
Constituent: Ammonia as N Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)

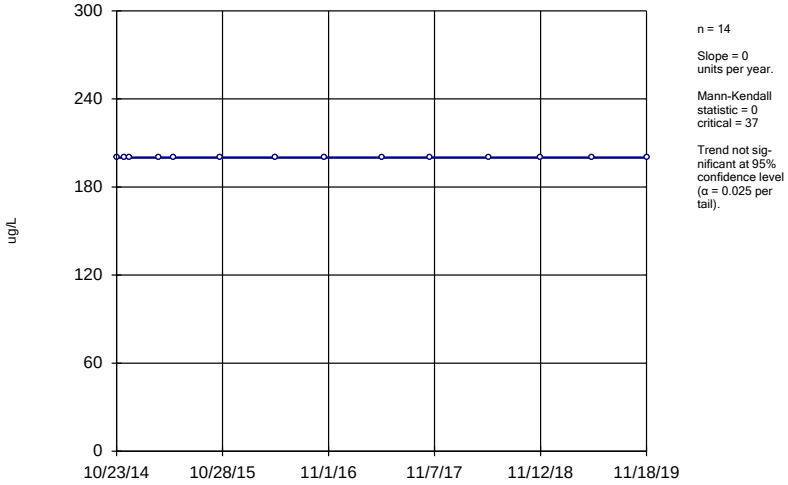



Constituent: Ammonia as N  Analysis Run 2/14/2020 5:43 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)

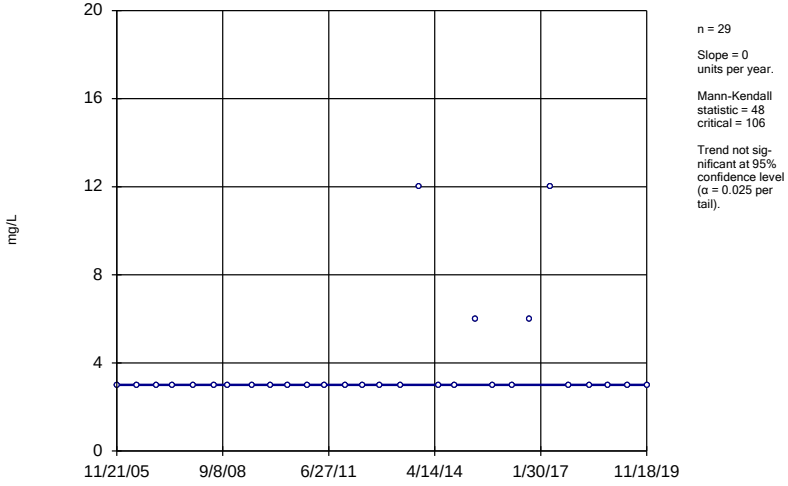



Constituent: Ammonia as N  Analysis Run 2/14/2020 5:43 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)

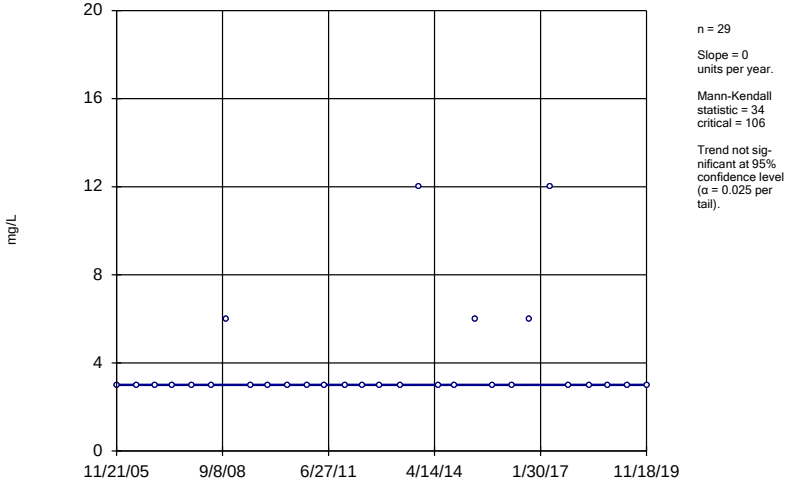



Constituent: Biochemical Oxygen Demand  Analysis Run 2/14/2020 5:43 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)

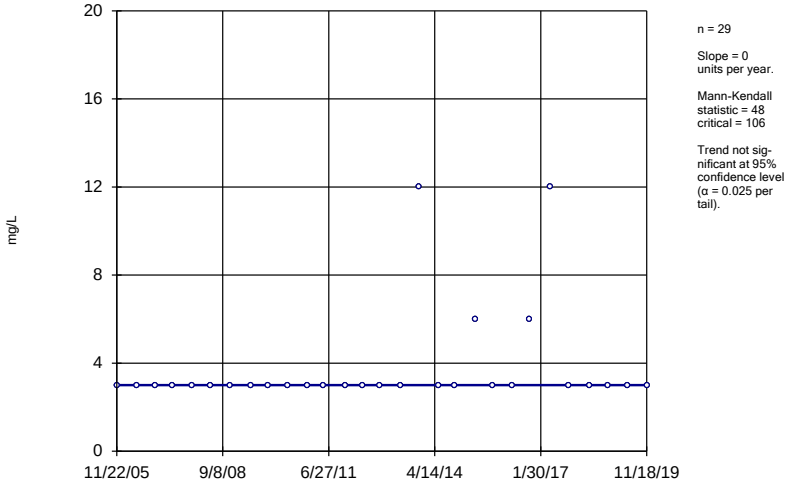



Constituent: Biochemical Oxygen Demand  Analysis Run 2/14/2020 5:43 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = 48
critical = 106

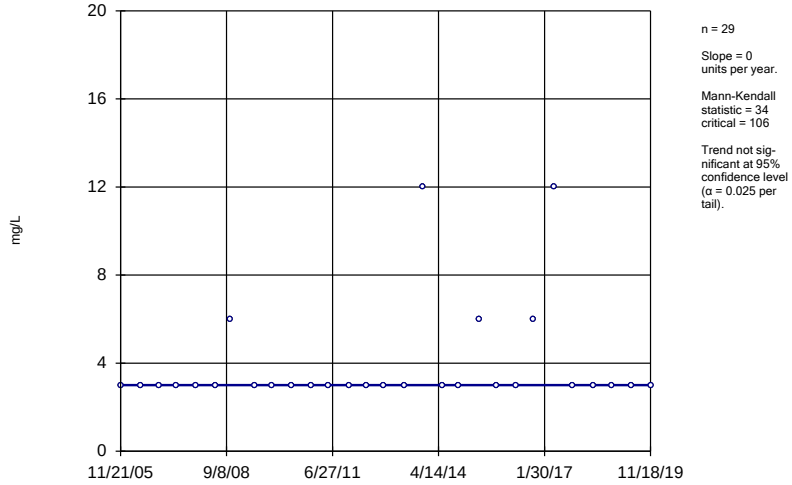
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = 34
critical = 106

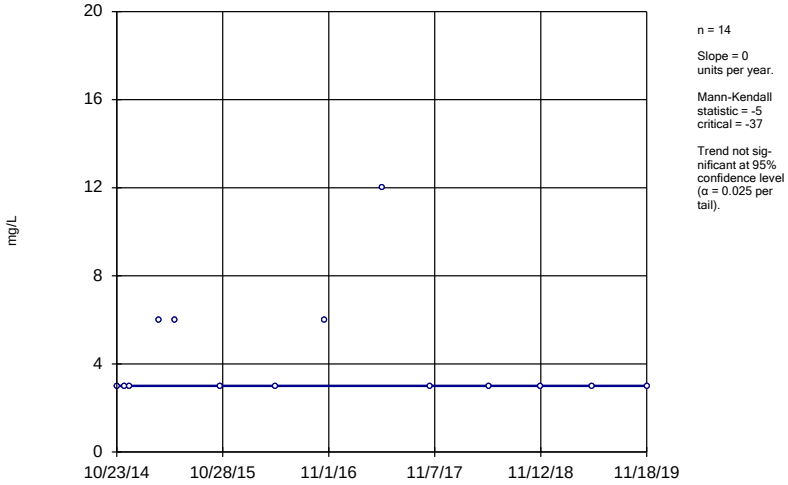
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -5
critical = -37

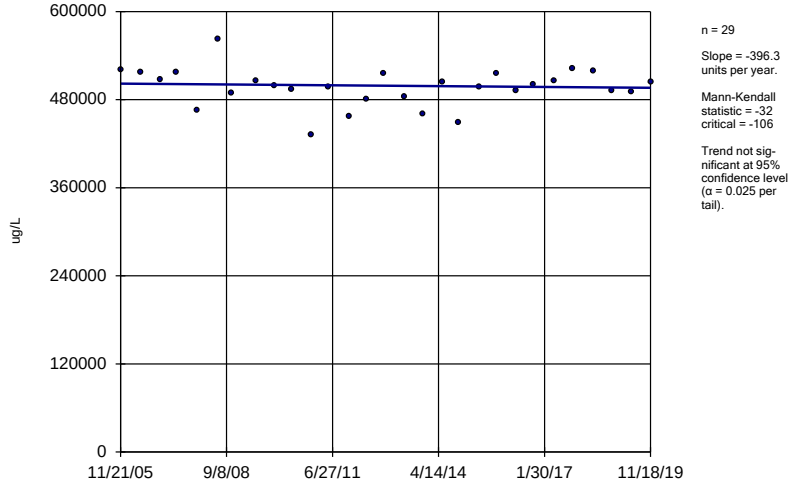
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Biochemical Oxygen Demand Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-11 (bg)




n = 29

Slope = -396.3 units per year.

Mann-Kendall statistic = -32
critical = -106

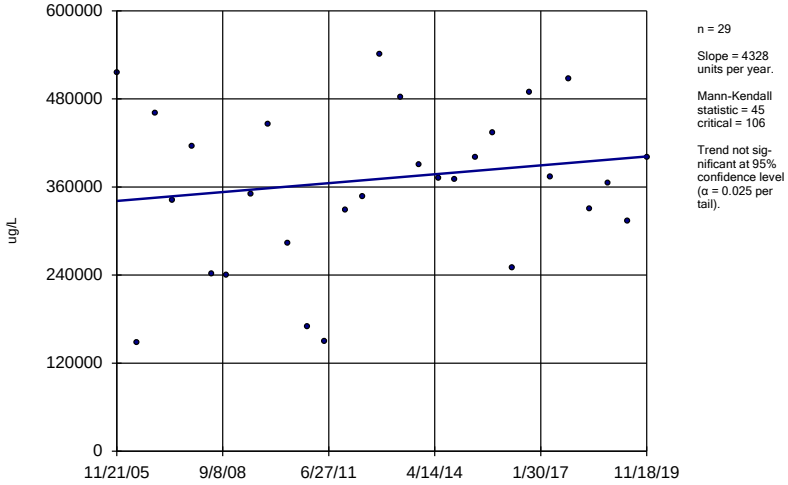
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Calcium Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 29

Slope = 4328 units per year.

Mann-Kendall statistic = 45 critical = 106

Trend not significant at 95% confidence level (α = 0.025 per tail).

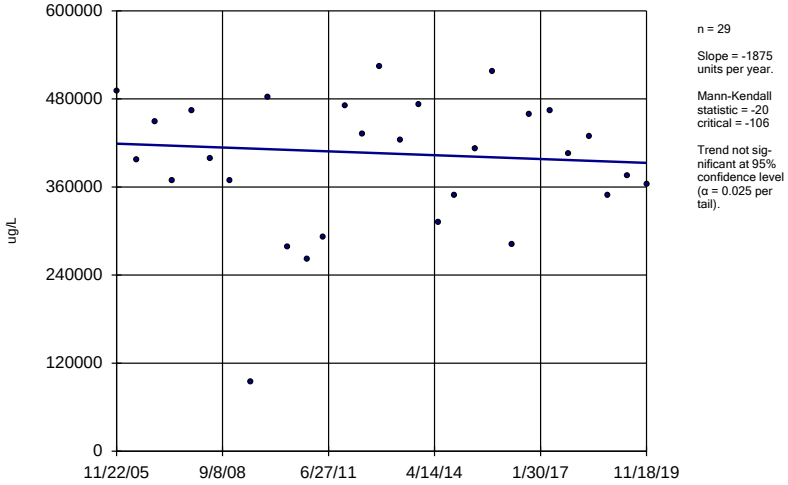
Constituent: Calcium Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 29

Slope = -1875 units per year.

Mann-Kendall statistic = -20 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

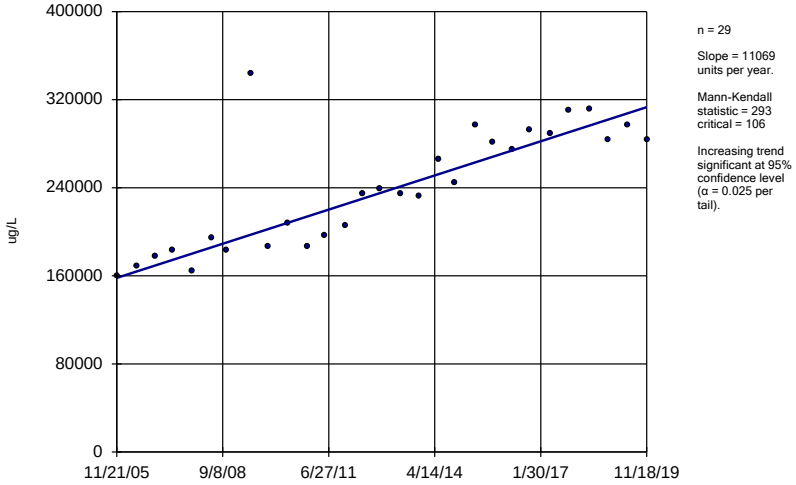
Constituent: Calcium Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 29

Slope = 11069 units per year.

Mann-Kendall statistic = 293 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

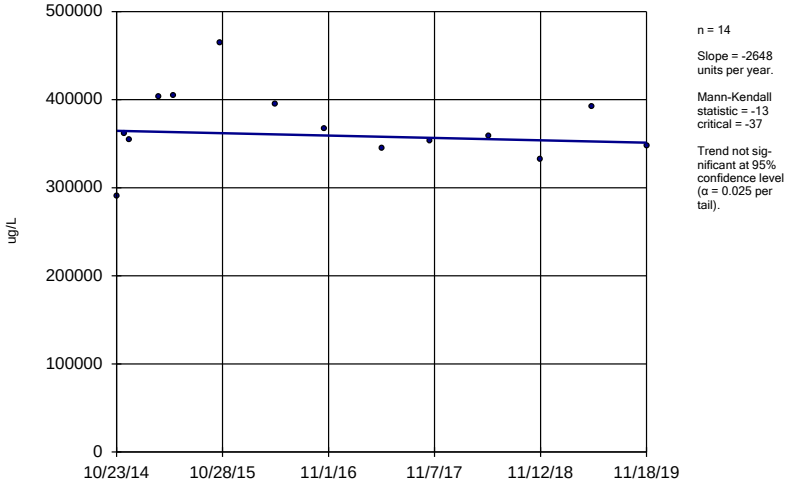
Constituent: Calcium Analysis Run 2/14/2020 5:43 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -2648 units per year.

Mann-Kendall statistic = -13 critical = -37

Trend not significant at 95% confidence level (α = 0.025 per tail).

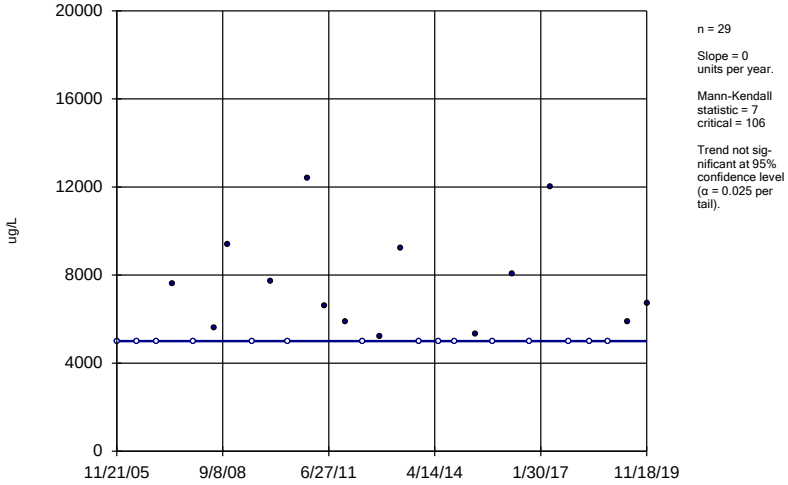
Constituent: Calcium Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = 7
critical = 106

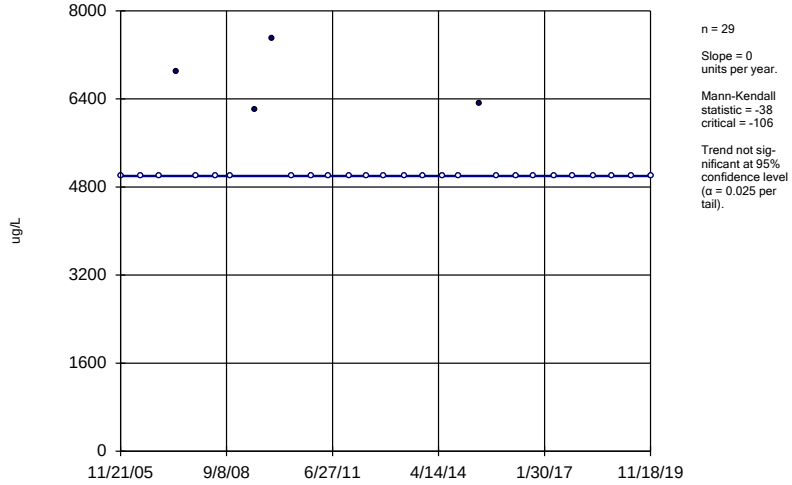
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -38
critical = -106

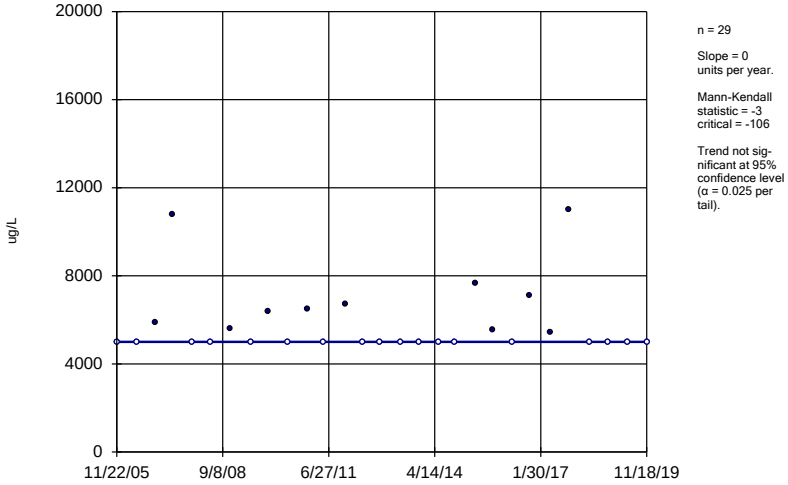
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -3
critical = -106

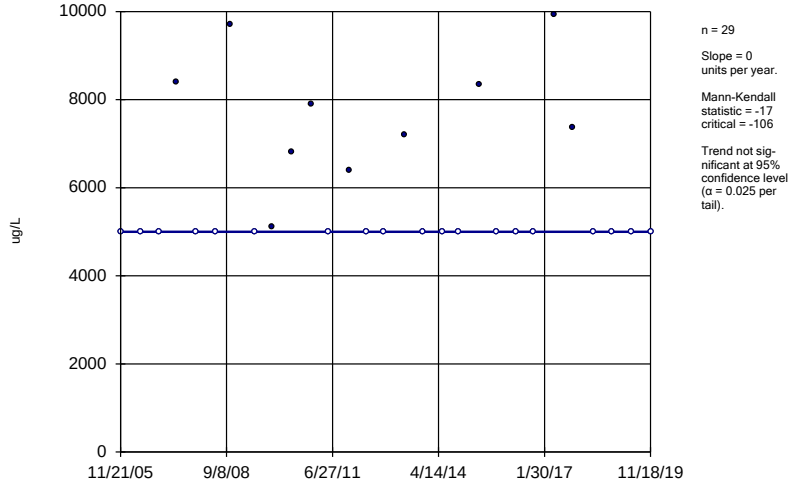
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -17
critical = -106

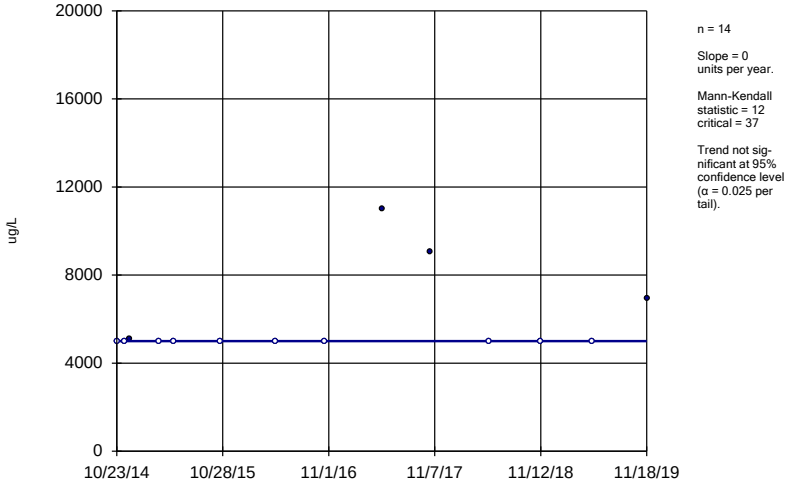
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 0 units per year.

Mann-Kendall statistic = 12
critical = 37

Trend not significant at 95% confidence level (α = 0.025 per tail).

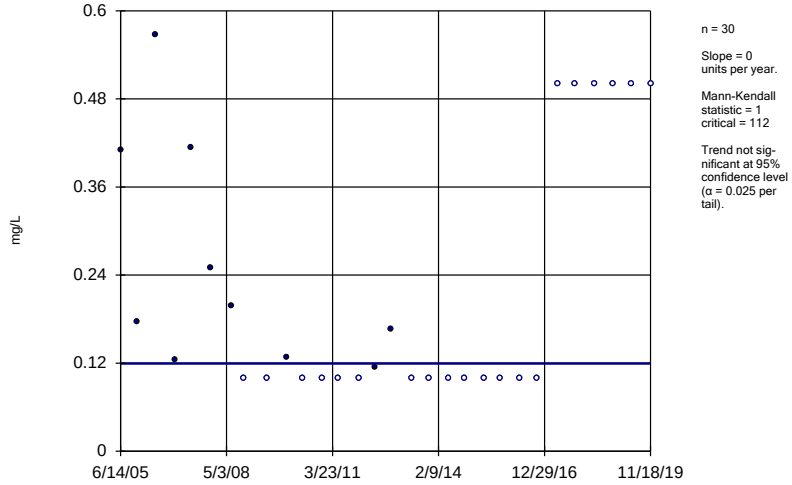
Constituent: Chemical Oxygen Demand Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 1
critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

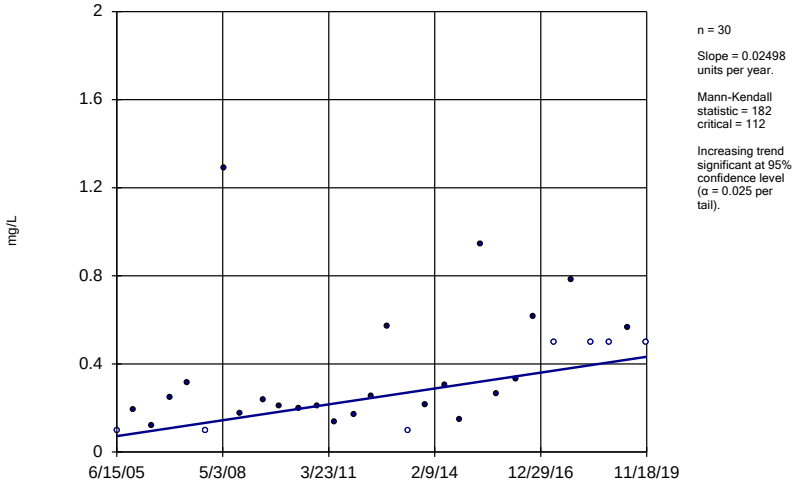
Constituent: Iron [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 0.02498 units per year.

Mann-Kendall statistic = 182
critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

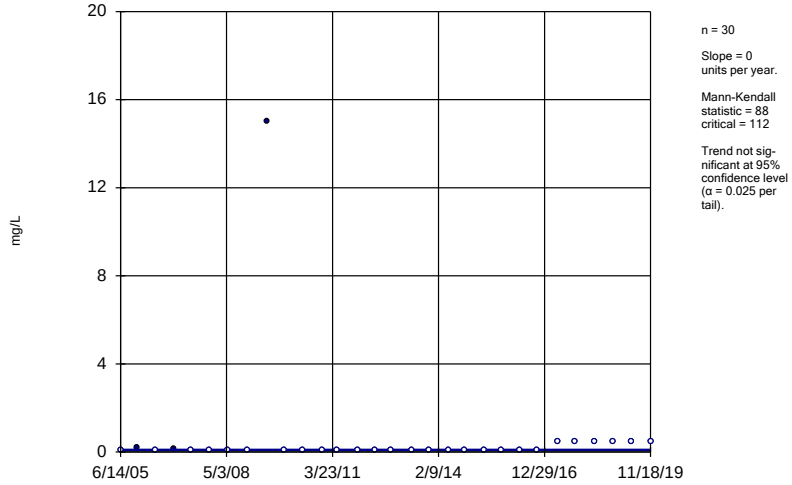
Constituent: Iron [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 88
critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

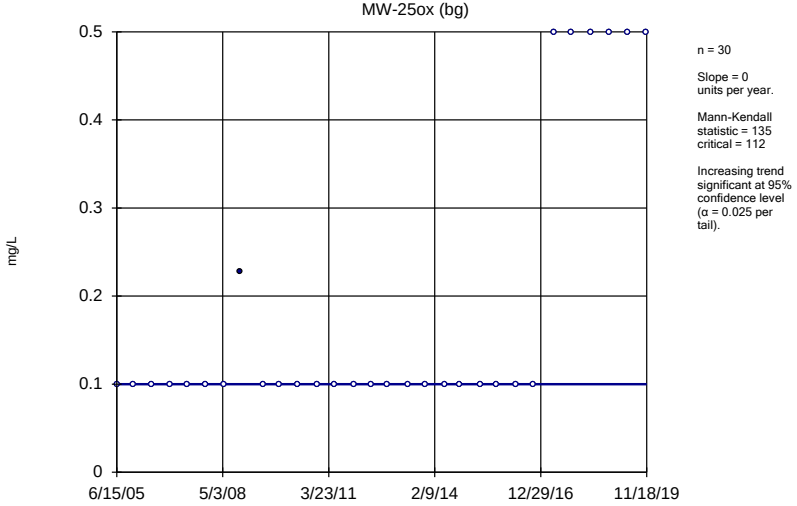
Constituent: Iron [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = 0
units per year.

Mann-Kendall
statistic = 135
critical = 112

Increasing trend
significant at 95%
confidence level
(α = 0.025 per
tail).

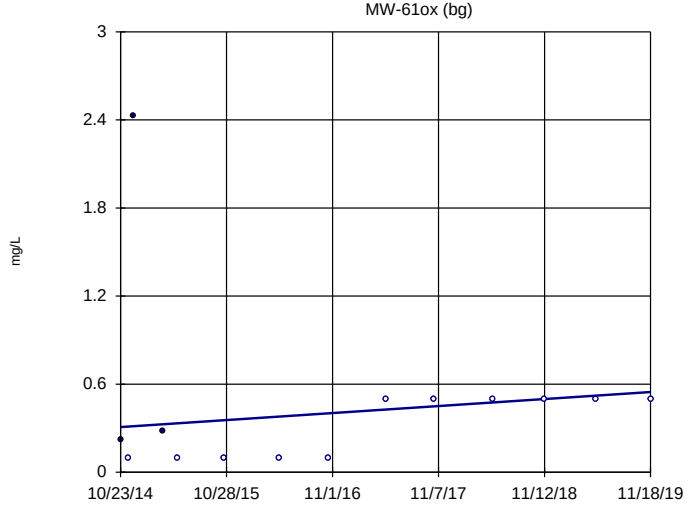
Constituent: Iron [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 0.04688
units per year.

Mann-Kendall
statistic = 26
critical = 37

Trend not sig-
nificant at 95%
confidence level
(α = 0.025 per
tail).

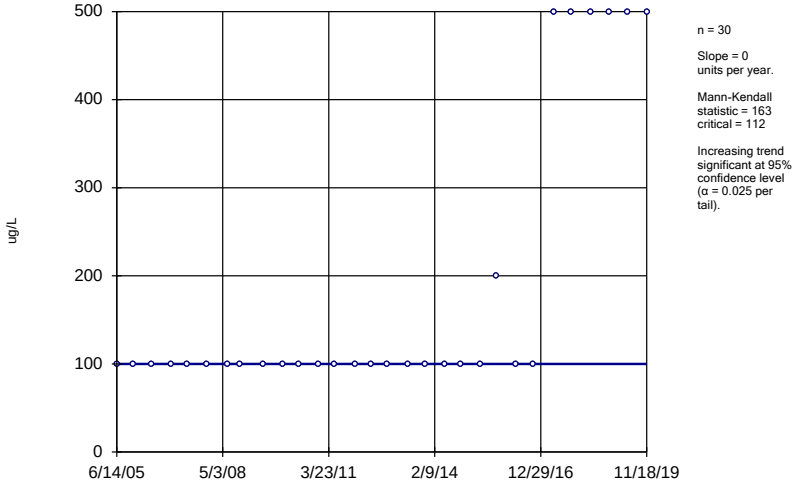
Constituent: Iron [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = 0
units per year.

Mann-Kendall
statistic = 163
critical = 112

Increasing trend
significant at 95%
confidence level
(α = 0.025 per
tail).

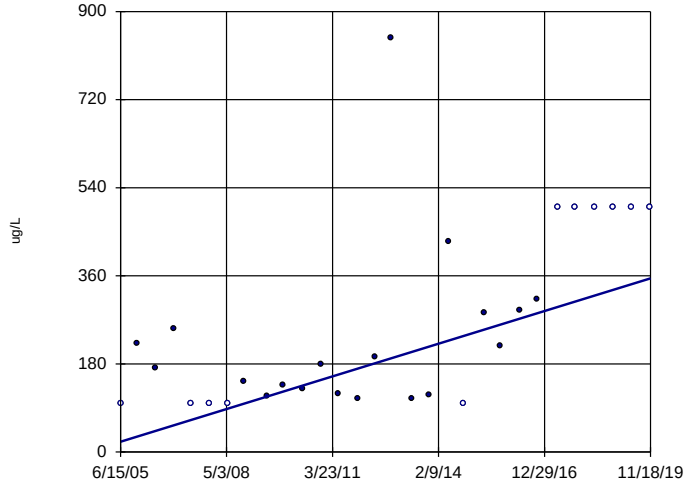
Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 23.14
units per year.

Mann-Kendall
statistic = 210
critical = 112

Increasing trend
significant at 95%
confidence level
(α = 0.025 per
tail).

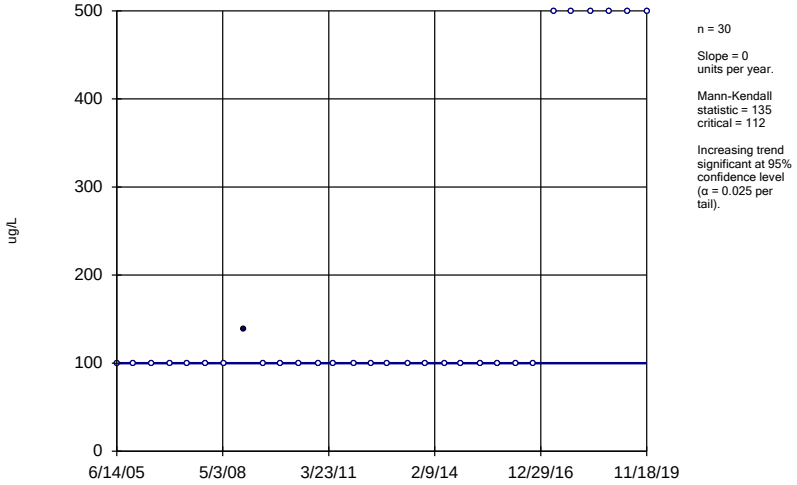
Constituent: Iron, Dissolved Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 135
critical = 112

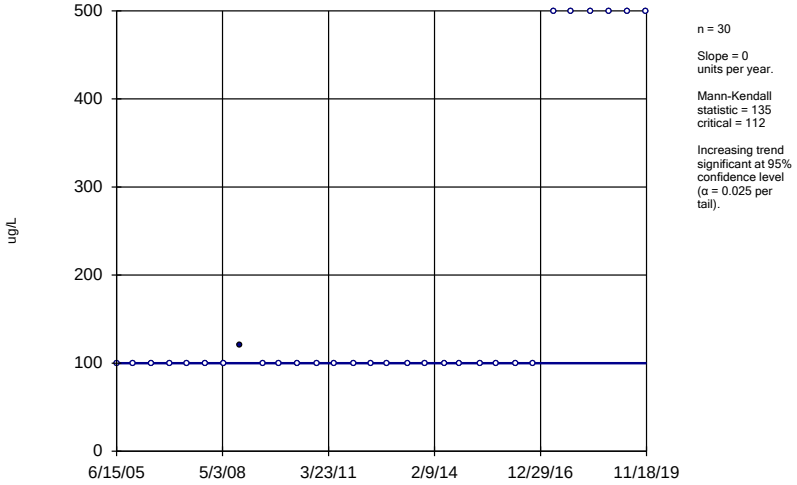
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Iron, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 135
critical = 112

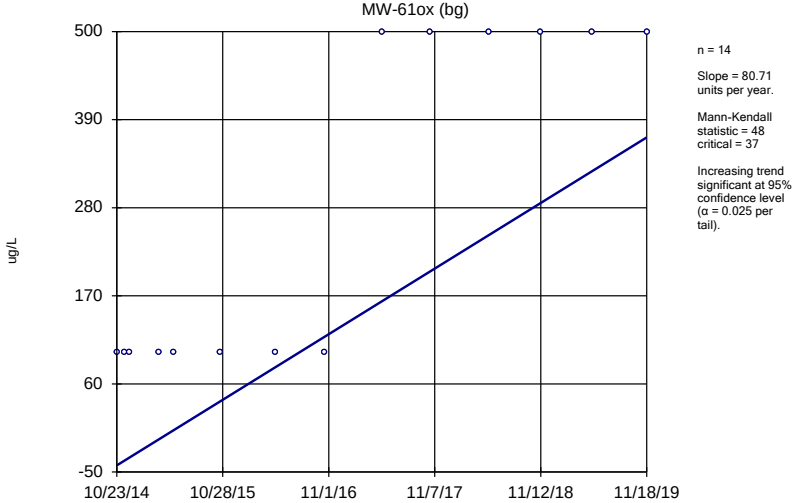
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Iron, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 80.71 units per year.

Mann-Kendall statistic = 48
critical = 37

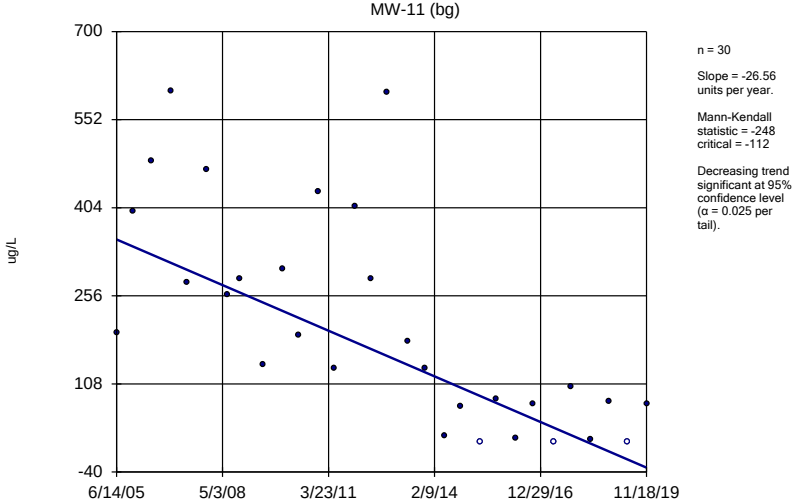
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Iron, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = -26.56 units per year.

Mann-Kendall statistic = -248
critical = -112

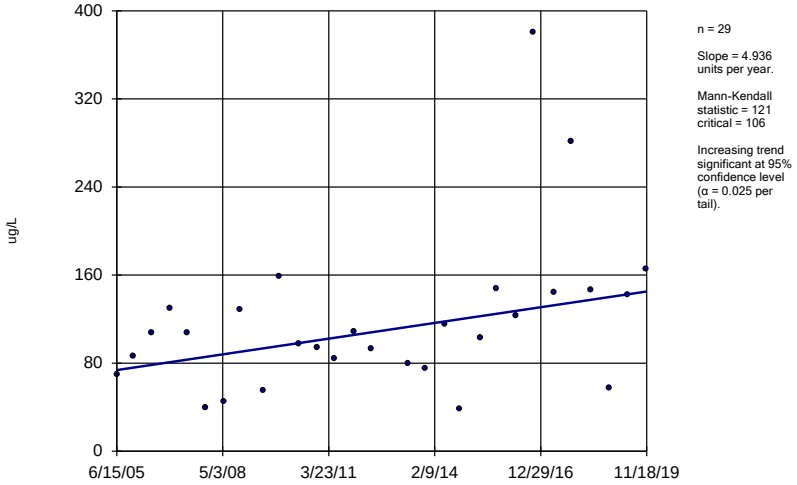
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 29

Slope = 4.936 units per year.

Mann-Kendall statistic = 121 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

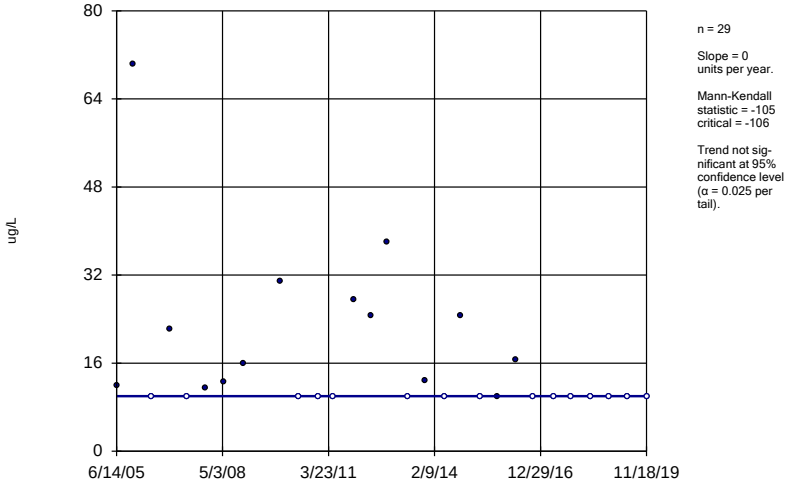
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -105 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

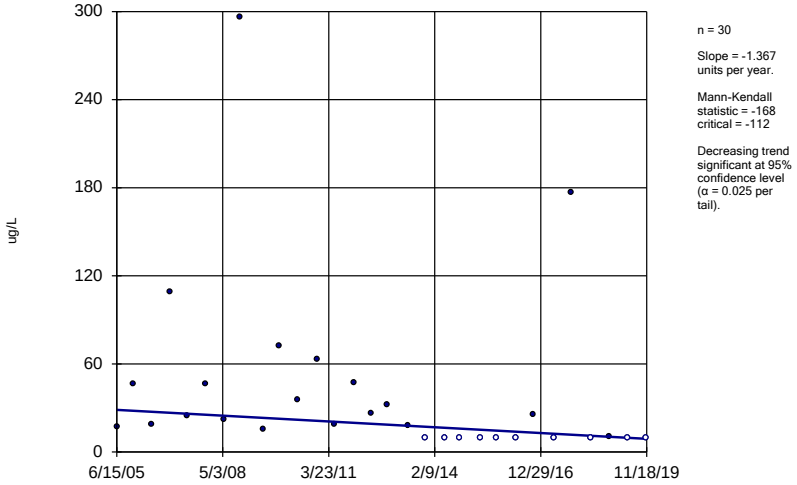
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = -1.367 units per year.

Mann-Kendall statistic = -168 critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

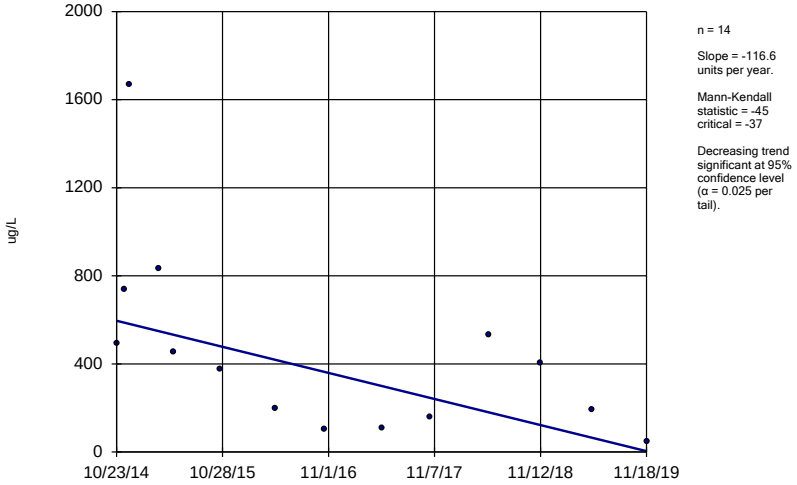
Constituent: Manganese Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -116.6 units per year.

Mann-Kendall statistic = -45 critical = -37

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

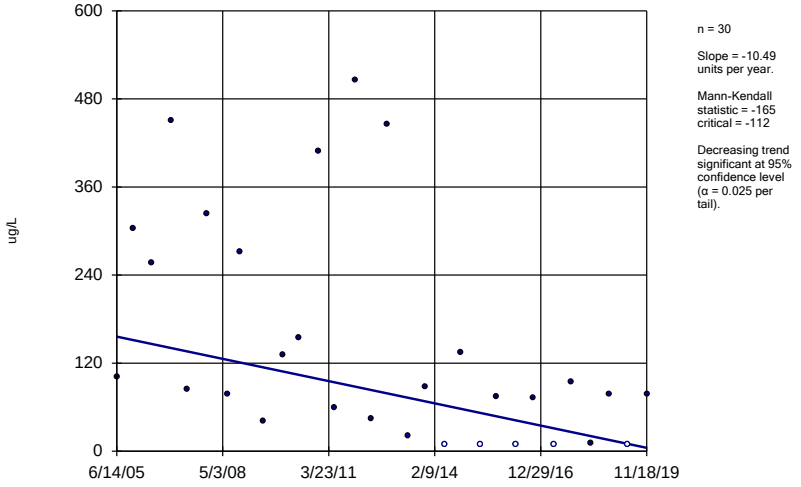
Constituent: Manganese Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = -10.49 units per year.

Mann-Kendall statistic = -165
critical = -112

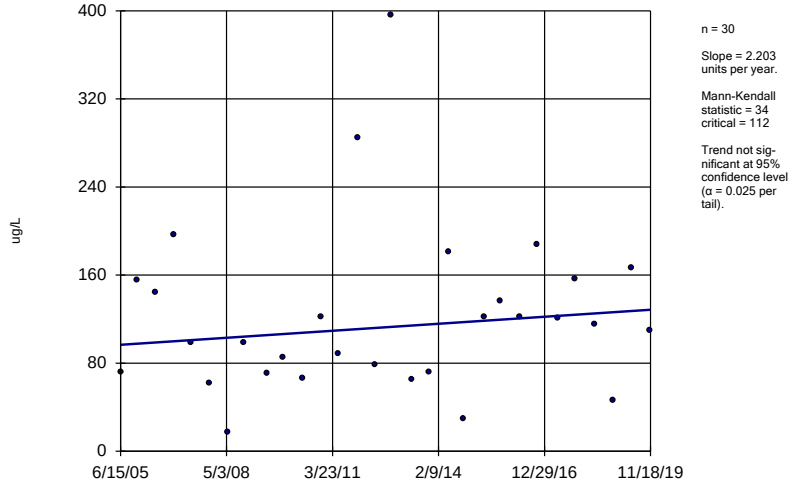
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 2.203 units per year.

Mann-Kendall statistic = 34
critical = 112

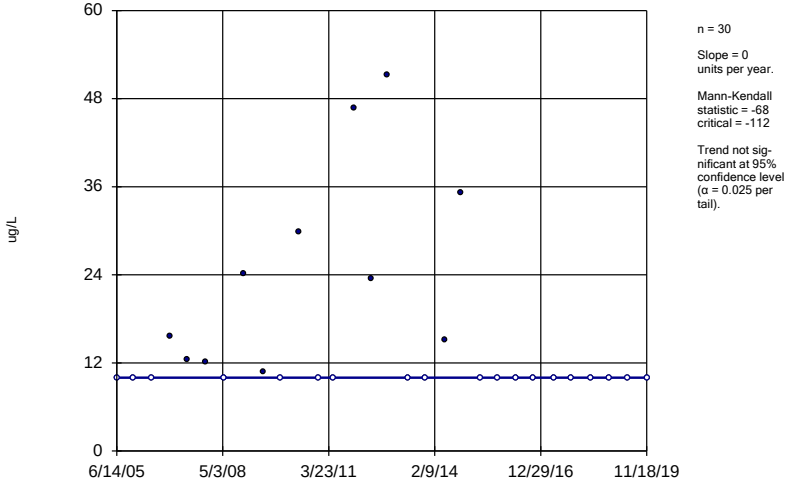
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = -68
critical = -112

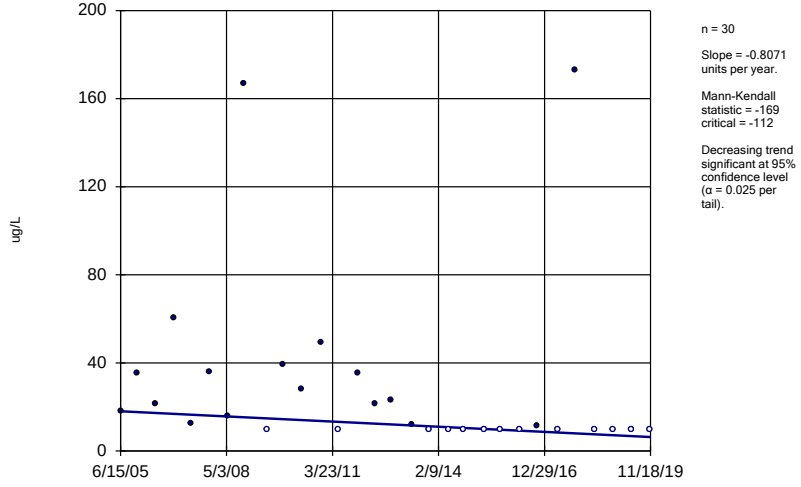
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = -0.8071 units per year.

Mann-Kendall statistic = -169
critical = -112

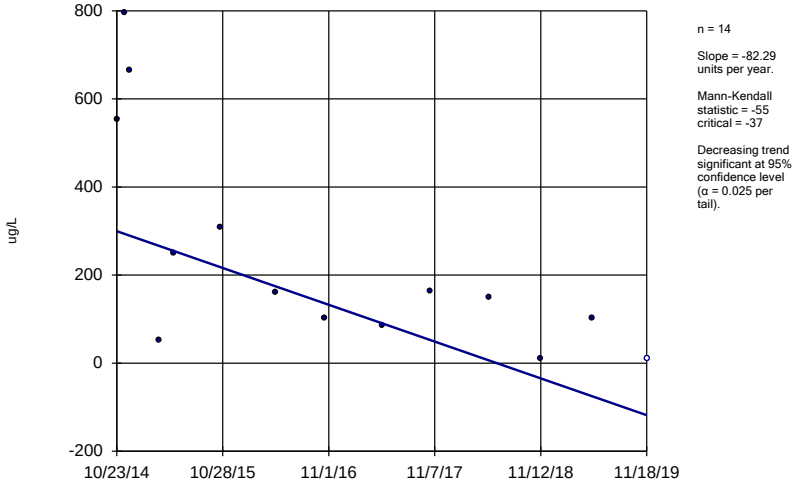
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -82.29 units per year.

Mann-Kendall statistic = -55 critical = -37

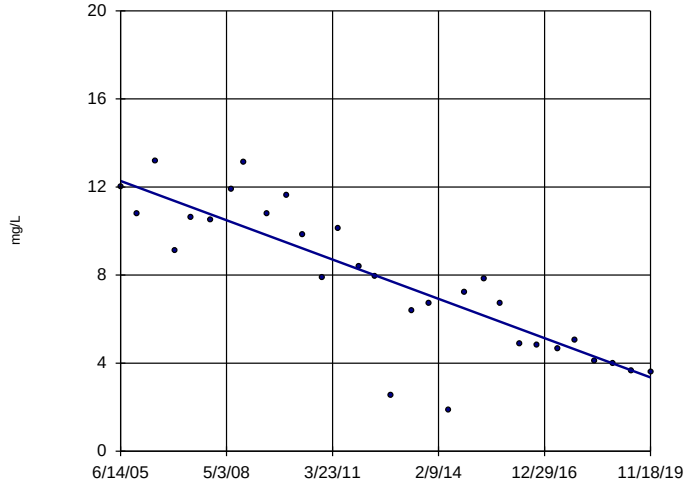
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese, Dissolved Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = -0.6181 units per year.

Mann-Kendall statistic = -308 critical = -112

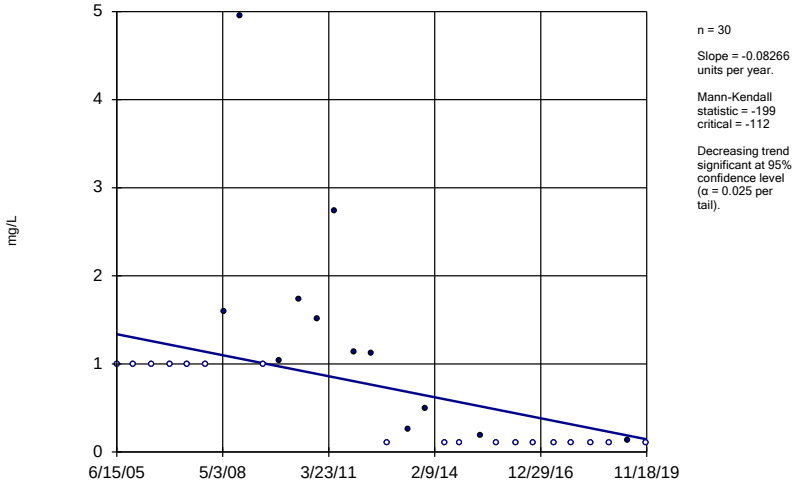
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = -0.08266 units per year.

Mann-Kendall statistic = -199 critical = -112

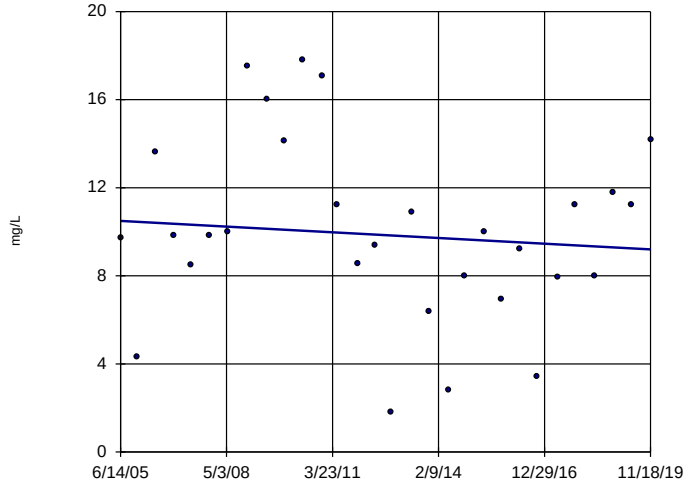
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = -0.08947 units per year.

Mann-Kendall statistic = -30 critical = -112

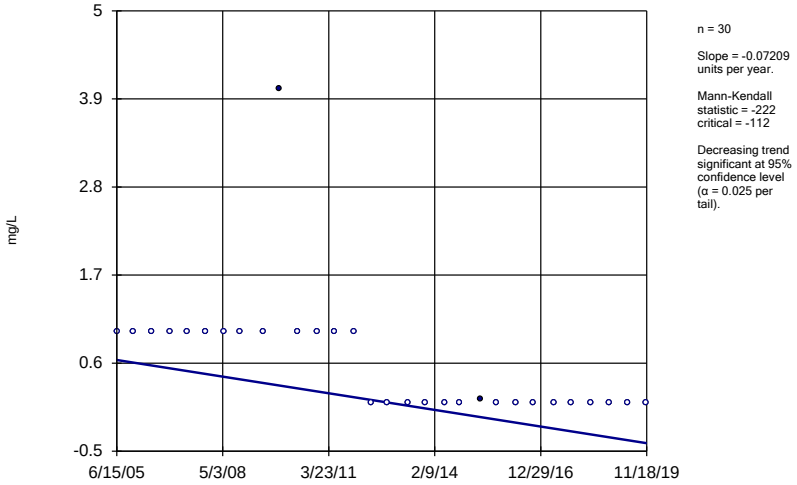
Trend not sig-nificant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = -0.07209 units per year.

Mann-Kendall statistic = -222
critical = -112

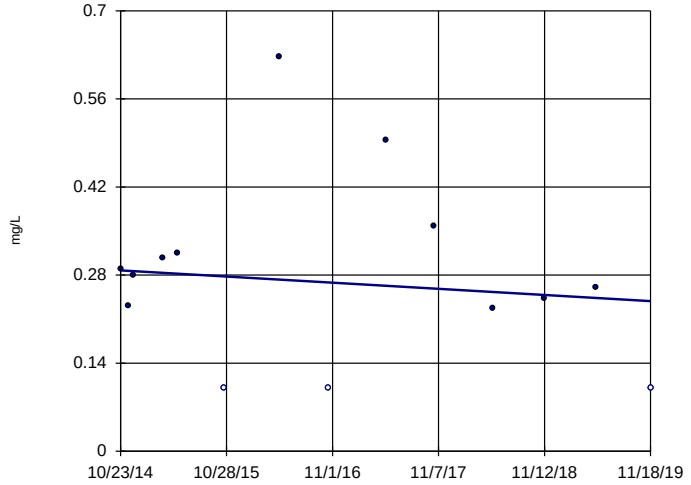
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -0.009639 units per year.

Mann-Kendall statistic = -10
critical = -37

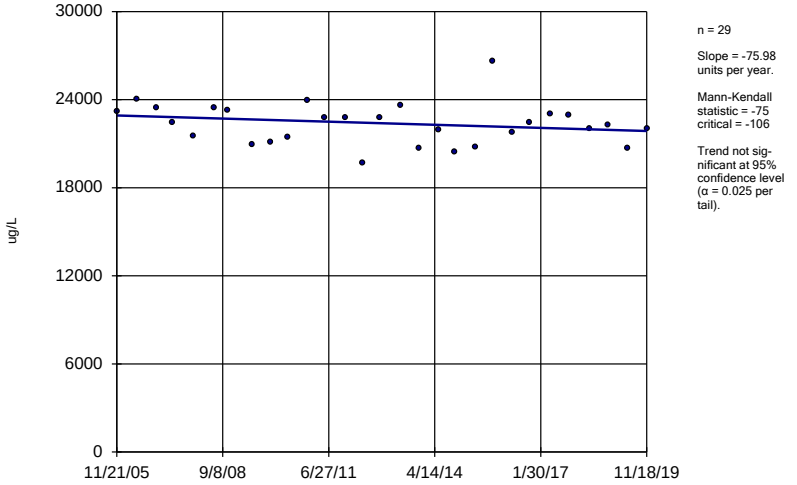
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Nitrate Nitrite as N  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-11 (bg)




n = 29

Slope = -75.98 units per year.

Mann-Kendall statistic = -75
critical = -106

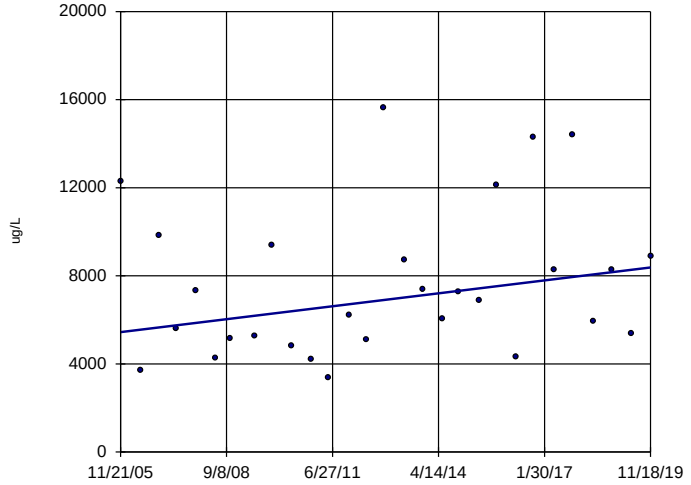
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Potassium  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 29

Slope = 209.2 units per year.

Mann-Kendall statistic = 72
critical = 106

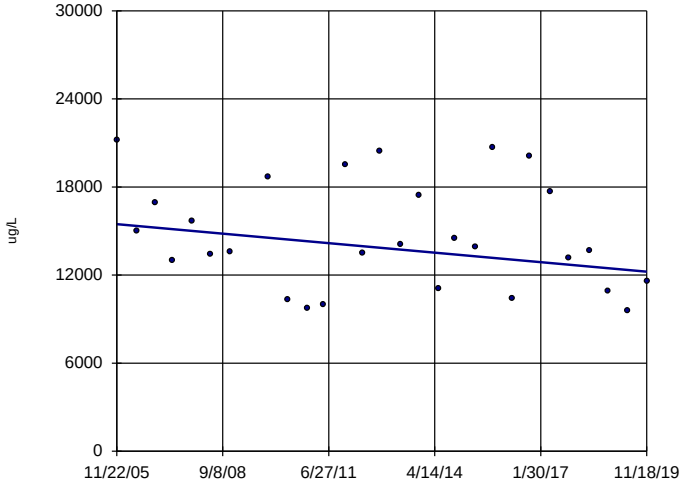
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Potassium  Analysis Run 2/14/2020 5:44 PM  View: Upgradient Evaluation
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 28

Slope = -231.4 units per year.

Mann-Kendall statistic = -58
critical = -101

Trend not significant at 95% confidence level (α = 0.025 per tail).

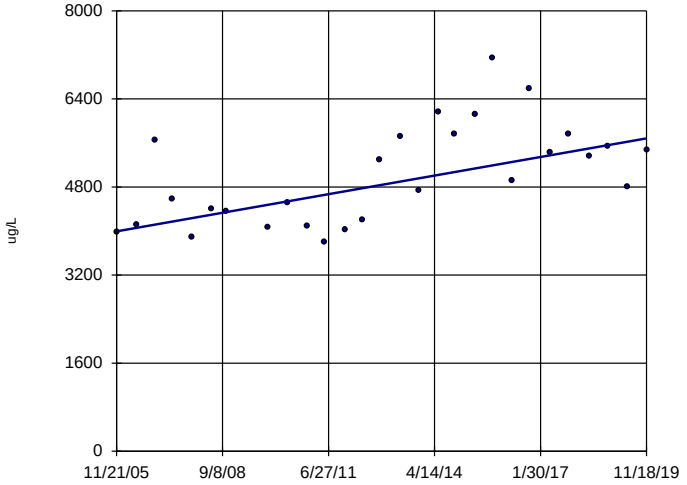
Constituent: Potassium Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 28

Slope = 120.6 units per year.

Mann-Kendall statistic = 158
critical = 101

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

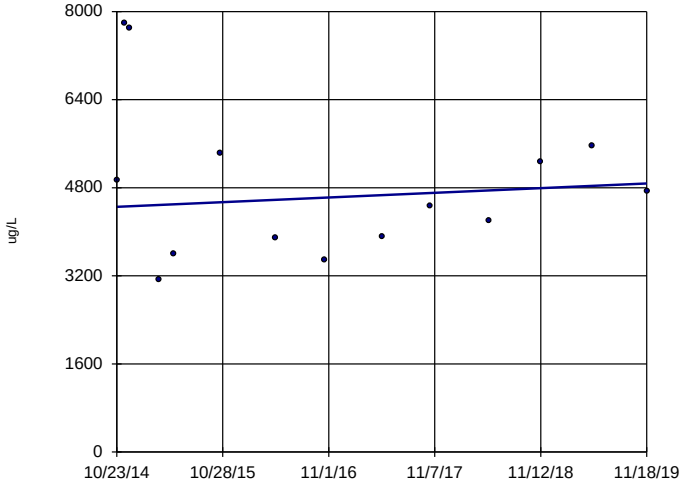
Constituent: Potassium Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 83.74 units per year.

Mann-Kendall statistic = 5
critical = 37

Trend not significant at 95% confidence level (α = 0.025 per tail).

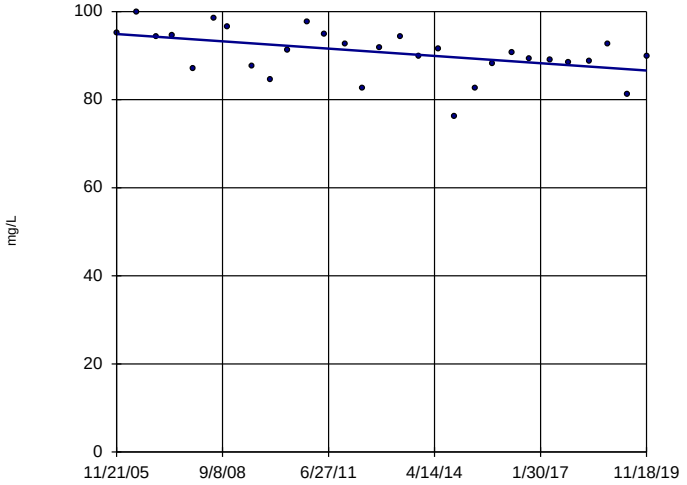
Constituent: Potassium Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-11 (bg)




n = 29

Slope = -0.5916 units per year.

Mann-Kendall statistic = -146
critical = -106

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

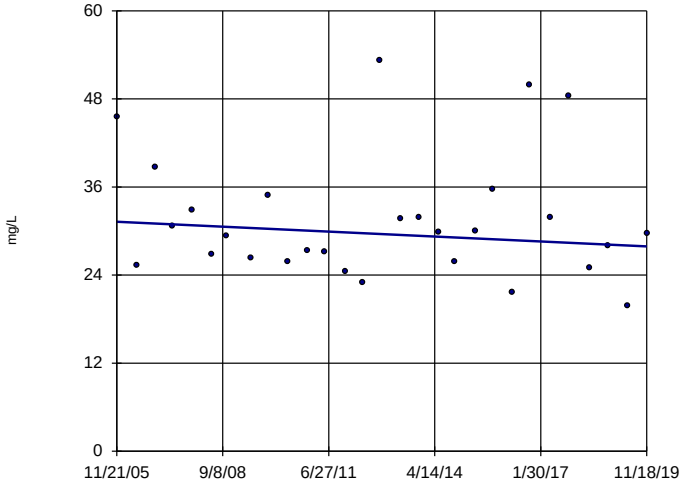
Constituent: Sodium [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 29

Slope = -0.2393 units per year.

Mann-Kendall statistic = -34 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

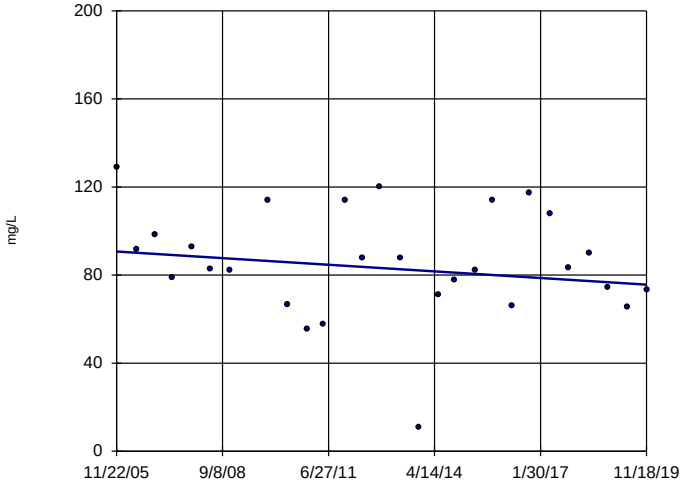
Constituent: Sodium [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 28

Slope = -1.073 units per year.

Mann-Kendall statistic = -65 critical = -101

Trend not significant at 95% confidence level (α = 0.025 per tail).

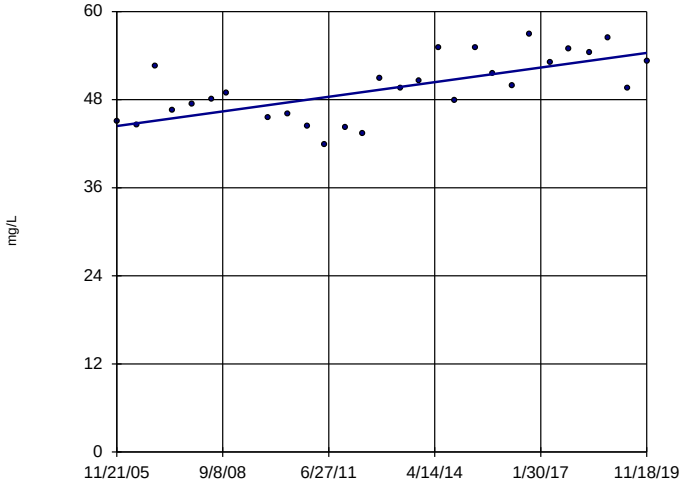
Constituent: Sodium [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 28

Slope = 0.7118 units per year.

Mann-Kendall statistic = 166 critical = 101

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

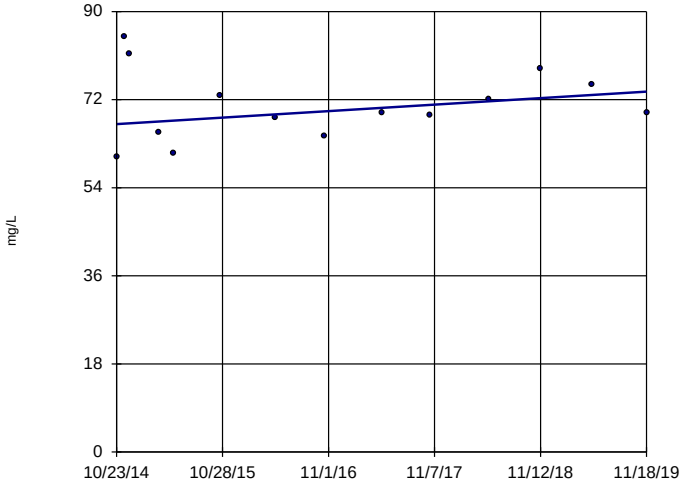
Constituent: Sodium [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 1.306 units per year.

Mann-Kendall statistic = 15 critical = 37

Trend not significant at 95% confidence level (α = 0.025 per tail).

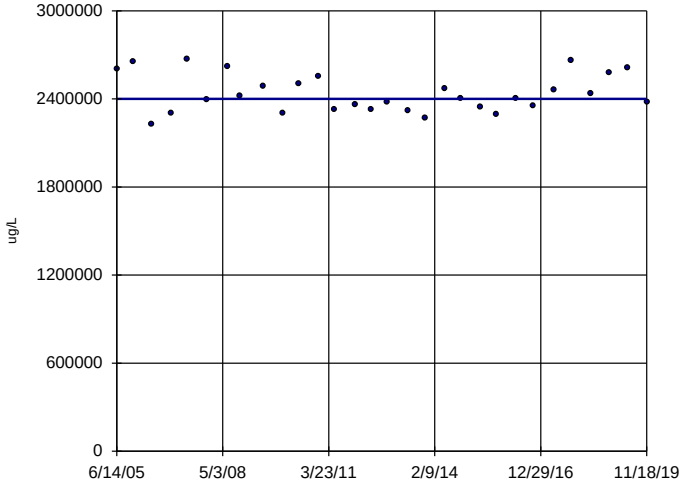
Constituent: Sodium [total] Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 3 critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

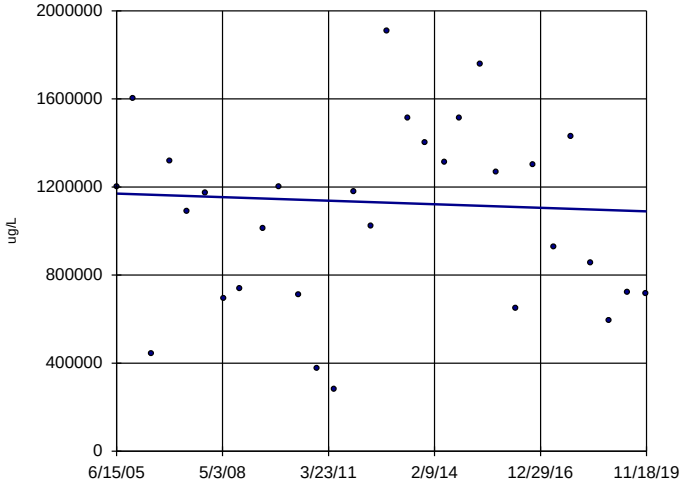
Constituent: Sulfate Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = -5615 units per year.

Mann-Kendall statistic = -15 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

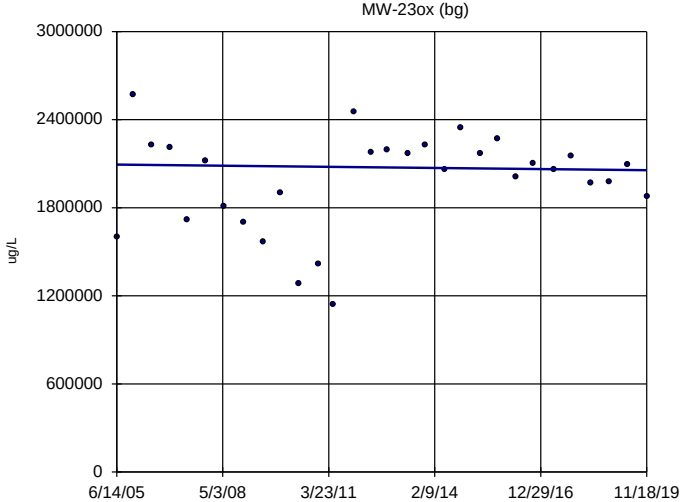
Constituent: Sulfate Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = -2612 units per year.

Mann-Kendall statistic = -8 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

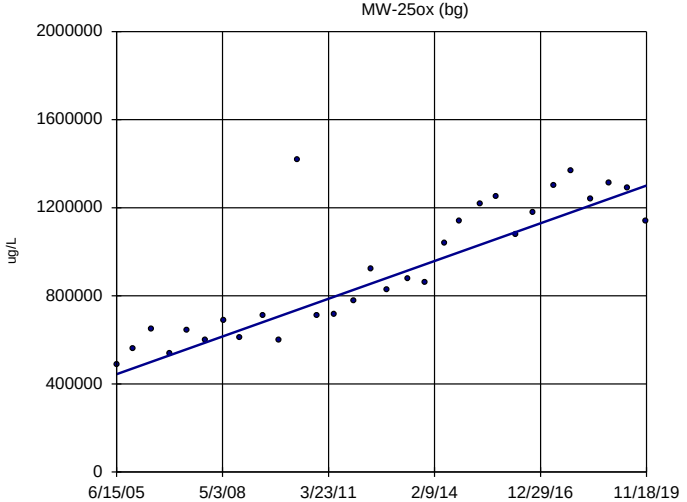
Constituent: Sulfate Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = 59372 units per year.

Mann-Kendall statistic = 319 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

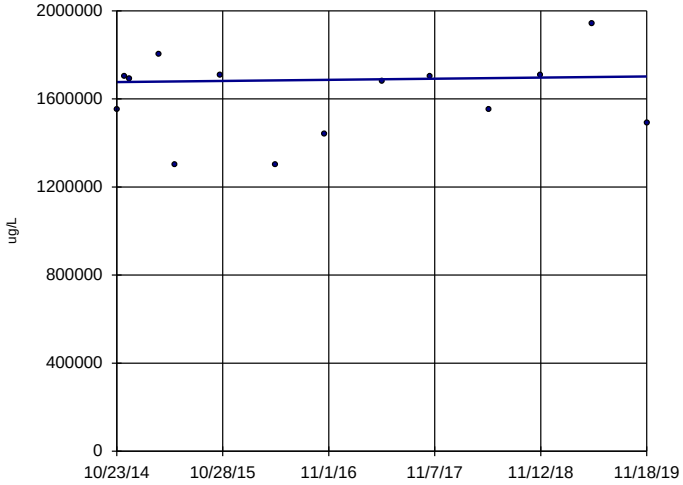
Constituent: Sulfate Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 5073 units per year.

Mann-Kendall statistic = 9 critical = 37

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfate Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

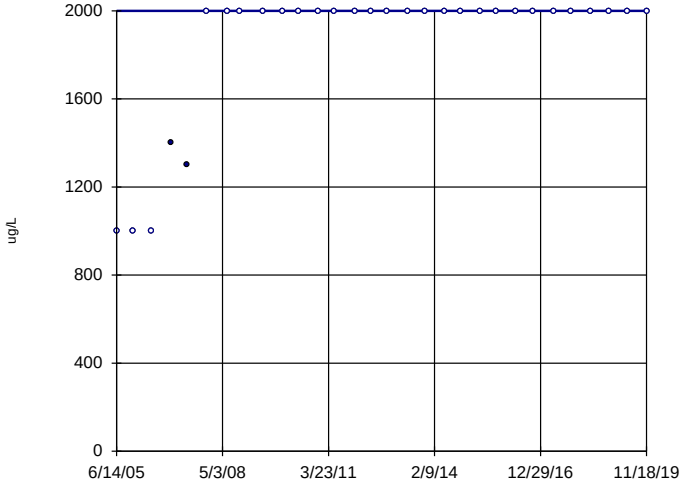
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 130 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfide Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

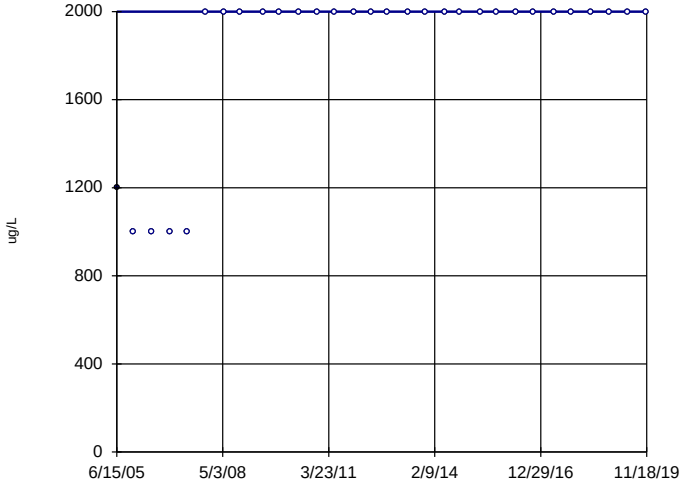
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 121 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Sulfide Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

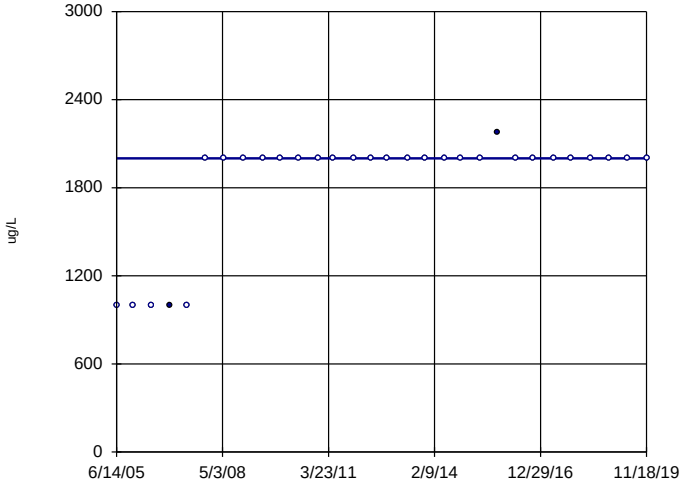
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-23ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 133 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

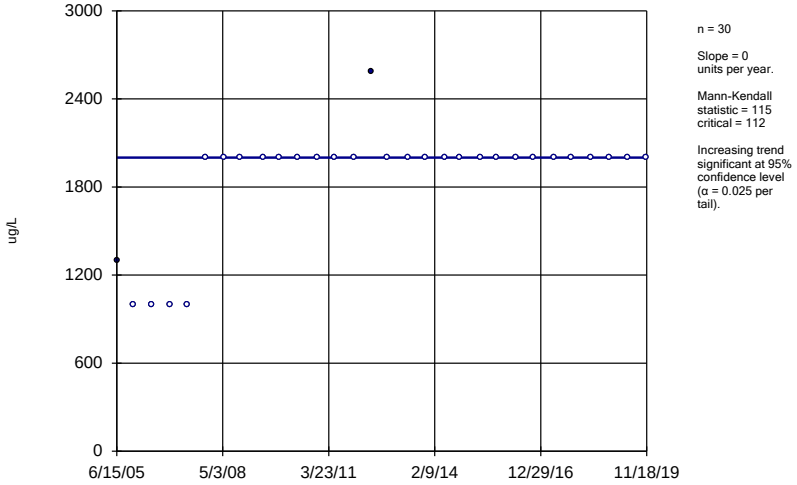
Constituent: Sulfide Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = 0 units per year.

Mann-Kendall statistic = 115 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

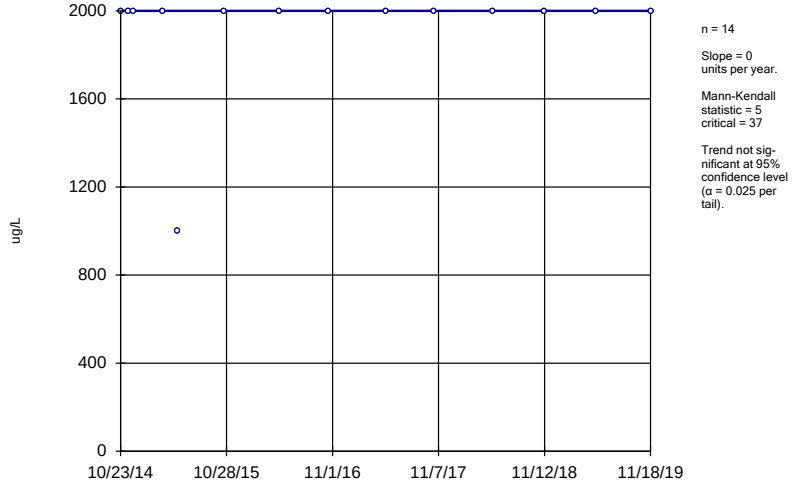
Constituent: Sulfide Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = 0 units per year.

Mann-Kendall statistic = 5 critical = 37

Trend not significant at 95% confidence level (α = 0.025 per tail).

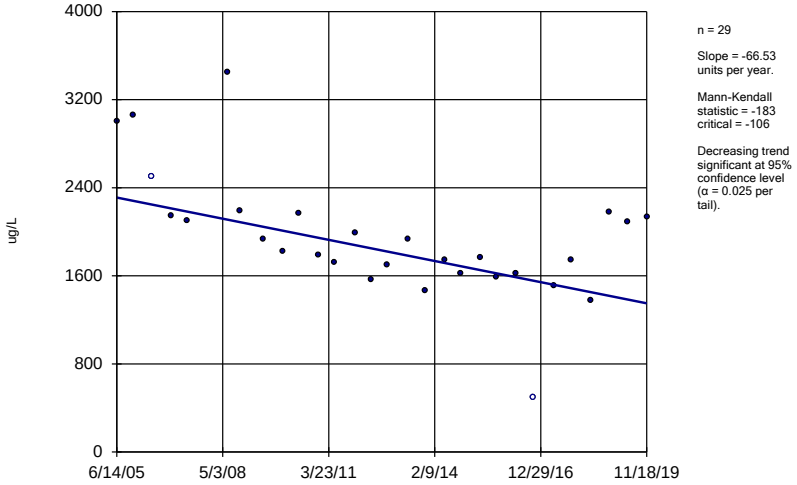
Constituent: Sulfide Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11 (bg)




n = 29

Slope = -66.53 units per year.

Mann-Kendall statistic = -183 critical = -106

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

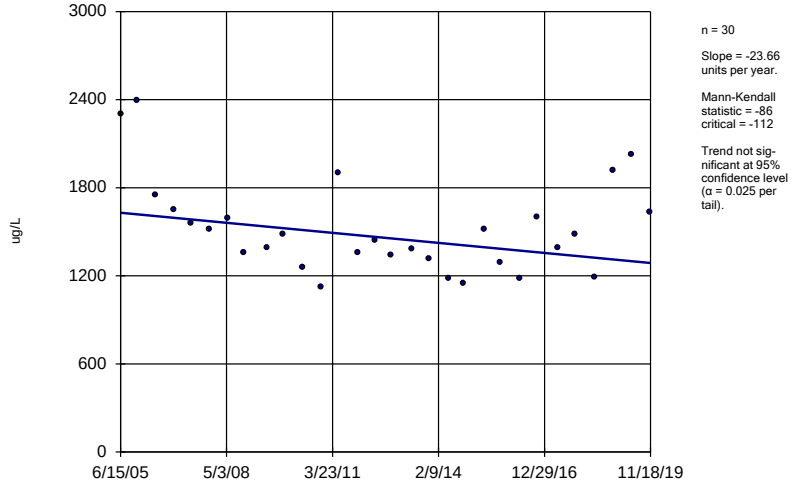
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-21ox (bg)




n = 30

Slope = -23.66 units per year.

Mann-Kendall statistic = -86 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

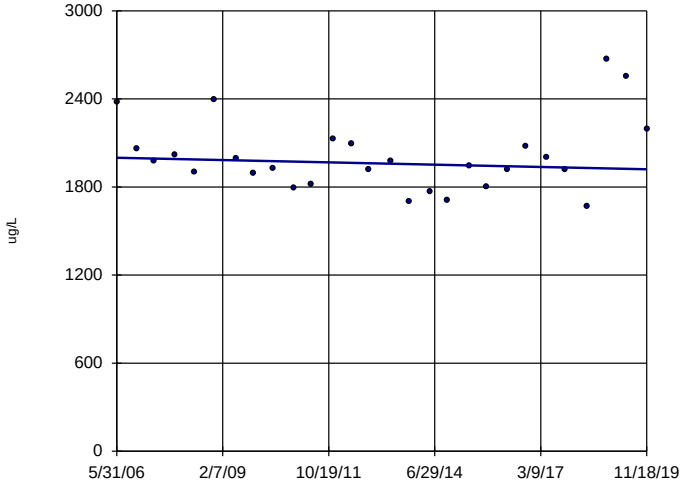
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-23ox (bg)




n = 28

Slope = -5.768 units per year.

Mann-Kendall statistic = -24 critical = -101

Trend not significant at 95% confidence level (α = 0.025 per tail).

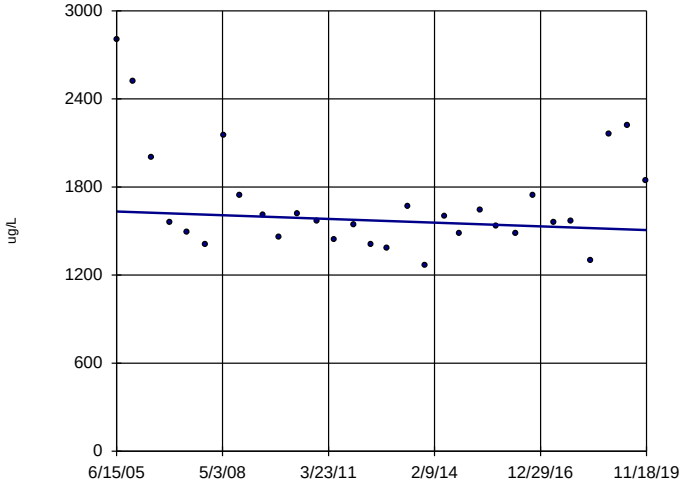
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-25ox (bg)




n = 30

Slope = -8.739 units per year.

Mann-Kendall statistic = -36 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

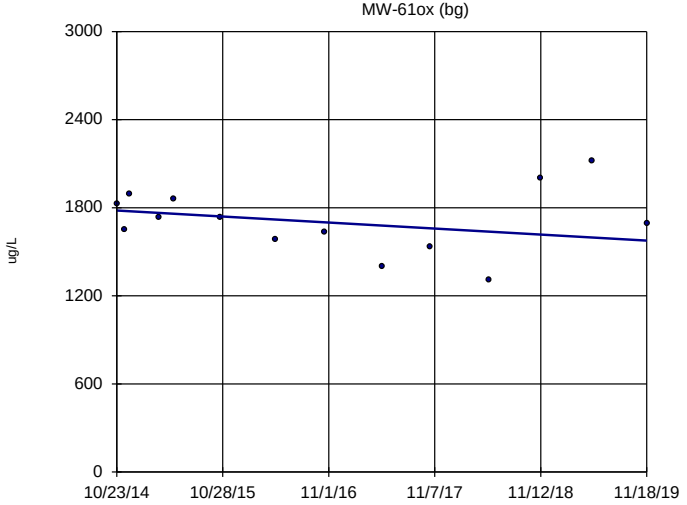
Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-61ox (bg)




n = 14

Slope = -40.35 units per year.

Mann-Kendall statistic = -14 critical = -37

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/14/2020 5:44 PM View: Upgradient Evaluation

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Inorganic Statistical Analysis

May 2019

# Prediction Limit

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 9:33 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-13R** | **377110** | **268602** | **5/15/2019** | **435000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-39ox | 377110 | 268602 | 5/14/2019 | 302000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-42ox** | **377110** | **268602** | **5/14/2019** | **426000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-44ox** | **377110** | **268602** | **5/14/2019** | **421000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-45ox | 377110 | 268602 | 5/14/2019 | 366000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-47ox** | **377110** | **268602** | **5/14/2019** | **470000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-48ox** | **377110** | **268602** | **5/13/2019** | **238000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-53ox** | **377110** | **268602** | **5/15/2019** | **428000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-54ox** | **377110** | **268602** | **5/14/2019** | **420000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-56ox | 377110 | 268602 | 5/15/2019 | 298000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-57ox** | **377110** | **268602** | **5/14/2019** | **210000** | **Yes** | **127** | **0** | **sqrt(x)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-58Rox | 377110 | 268602 | 5/15/2019 | 339000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-59ox | 377110 | 268602 | 5/14/2019 | 273000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-60ox | 377110 | 268602 | 5/14/2019 | 273000 | No | 127 | 0 | sqrt(x) | 0.008703 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-13R | 493706 | n/a | 5/15/2019 | 387000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-39ox | 493706 | n/a | 5/14/2019 | 183000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-42ox | 493706 | n/a | 5/14/2019 | 371000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-44ox | 493706 | n/a | 5/14/2019 | 222000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-45ox | 493706 | n/a | 5/14/2019 | 343000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-47ox | 493706 | n/a | 5/14/2019 | 444000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-48ox | 493706 | n/a | 5/13/2019 | 448000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-53ox | 493706 | n/a | 5/15/2019 | 277000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-54ox | 493706 | n/a | 5/14/2019 | 255000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-56ox | 493706 | n/a | 5/15/2019 | 172000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-57ox | 493706 | n/a | 5/14/2019 | 491000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-58Rox | 493706 | n/a | 5/15/2019 | 315000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-59ox | 493706 | n/a | 5/14/2019 | 460000 | No | 125 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| **Calcium (ug/L)** | **MW-60ox** | **493706** | **n/a** | **5/14/2019** | **495000** | **Yes** | **125** | **0** | **x^2** | **0.01741** | **Param Inter 1 of 2** |
| Chemical Oxygen Demand (ug/L) | MW-39ox | 12400 | n/a | 5/14/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-42ox | 12400 | n/a | 5/14/2019 | 7500 | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-44ox | 12400 | n/a | 5/14/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-45ox | 12400 | n/a | 5/14/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-47ox | 12400 | n/a | 5/14/2019 | 9120 | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-48ox | 12400 | n/a | 5/13/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-53ox | 12400 | n/a | 5/15/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| **Chemical Oxygen Demand (ug/L)** | **MW-54ox** | **12400** | **n/a** | **5/14/2019** | **14000** | **Yes** | **125** | **67.2** | **n/a** | **0.000...** | **NP Inter (NDs) 1 of 2** |
| Chemical Oxygen Demand (ug/L) | MW-57ox | 12400 | n/a | 5/14/2019 | 8150 | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-58Rox | 12400 | n/a | 5/15/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-59ox | 12400 | n/a | 5/14/2019 | 8480 | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-60ox | 12400 | n/a | 5/14/2019 | 5000ND | No | 125 | 67.2 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chloride (ug/L) | MW-13R | 31800 | n/a | 5/15/2019 | 15800 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-39ox | 31800 | n/a | 5/14/2019 | 5810 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-42ox | 31800 | n/a | 5/14/2019 | 29500 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-44ox | 31800 | n/a | 5/14/2019 | 11500 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-45ox | 31800 | n/a | 5/14/2019 | 5630 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-47ox** | **31800** | **n/a** | **5/14/2019** | **93300** | **Yes** | **133** | **21.8** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Chloride (ug/L) | MW-53ox | 31800 | n/a | 5/15/2019 | 27500 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-54ox** | **31800** | **n/a** | **5/14/2019** | **119000** | **Yes** | **133** | **21.8** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Chloride (ug/L) | MW-56ox | 31800 | n/a | 5/15/2019 | 2500ND | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-57ox** | **31800** | **n/a** | **5/14/2019** | **50900** | **Yes** | **133** | **21.8** | **n/a** | **0.000...** | **NP Inter (normality) ...** |

# Prediction Limit

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 9:33 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride (ug/L) | MW-58Rox | 31800 | n/a | 5/15/2019 | 18000 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-59ox | 31800 | n/a | 5/14/2019 | 7500 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-60ox | 31800 | n/a | 5/14/2019 | 30700 | No | 133 | 21.8 | n/a | 0.000... | NP Inter (normality) ... |
| Iron [total] (mg/L) | MW-53ox | 15 | n/a | 5/15/2019 | 0.5ND | No | 129 | 68.99 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Manganese (ug/L) | MW-39ox | 1670 | n/a | 5/14/2019 | 11.4 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-42ox | 1670 | n/a | 5/14/2019 | 11.4 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-44ox | 1670 | n/a | 5/14/2019 | 172 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-45ox | 1670 | n/a | 5/14/2019 | 30.6 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-53ox | 1670 | n/a | 5/15/2019 | 5ND | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-54ox | 1670 | n/a | 5/14/2019 | 1070 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-56ox | 1670 | n/a | 5/15/2019 | 12.8 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-57ox | 1670 | n/a | 5/14/2019 | 5ND | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-58Rox | 1670 | n/a | 5/15/2019 | 1660 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-59ox | 1670 | n/a | 5/14/2019 | 44.9 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-60ox | 1670 | n/a | 5/14/2019 | 163 | No | 127 | 20.47 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-39ox | 797 | n/a | 5/14/2019 | 10ND | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-42ox | 797 | n/a | 5/14/2019 | 10ND | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-44ox | 797 | n/a | 5/14/2019 | 132 | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-45ox | 797 | n/a | 5/14/2019 | 10ND | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **797** | **n/a** | **5/14/2019** | **1350** | **Yes** | **129** | **27.13** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese, Dissolved (ug/L) | MW-57ox | 797 | n/a | 5/14/2019 | 10ND | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **797** | **n/a** | **5/15/2019** | **1390** | **Yes** | **129** | **27.13** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese, Dissolved (ug/L) | MW-59ox | 797 | n/a | 5/14/2019 | 28.5 | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-60ox | 797 | n/a | 5/14/2019 | 130 | No | 129 | 27.13 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-13R | 17.8 | n/a | 5/15/2019 | 0.429 | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-42ox | 17.8 | n/a | 5/14/2019 | 1.03 | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-44ox | 17.8 | n/a | 5/14/2019 | 3.36 | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **17.8** | **n/a** | **5/15/2019** | **33.6** | **Yes** | **129** | **35.66** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Nitrate Nitrite as N (mg/L) | MW-56ox | 17.8 | n/a | 5/15/2019 | 0.232 | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-58Rox | 17.8 | n/a | 5/15/2019 | 0.1ND | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-60ox | 17.8 | n/a | 5/14/2019 | 0.138 | No | 129 | 35.66 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-13R | 26600 | n/a | 5/15/2019 | 10300 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-39ox | 26600 | n/a | 5/14/2019 | 3600 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-42ox | 26600 | n/a | 5/14/2019 | 8180 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-44ox | 26600 | n/a | 5/14/2019 | 2750 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-45ox | 26600 | n/a | 5/14/2019 | 6660 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-47ox | 26600 | n/a | 5/14/2019 | 7190 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-48ox | 26600 | n/a | 5/13/2019 | 11200 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-53ox | 26600 | n/a | 5/15/2019 | 6130 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-54ox | 26600 | n/a | 5/14/2019 | 500ND | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-56ox | 26600 | n/a | 5/15/2019 | 1630 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-57ox | 26600 | n/a | 5/14/2019 | 8760 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-58Rox | 26600 | n/a | 5/15/2019 | 7160 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-59ox | 26600 | n/a | 5/14/2019 | 18700 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-60ox | 26600 | n/a | 5/14/2019 | 17500 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-13R | 129 | n/a | 5/15/2019 | 68.5 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-39ox | 129 | n/a | 5/14/2019 | 15.3 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-42ox | 129 | n/a | 5/14/2019 | 75 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-44ox | 129 | n/a | 5/14/2019 | 15.3 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-45ox | 129 | n/a | 5/14/2019 | 33.9 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |

# Prediction Limit

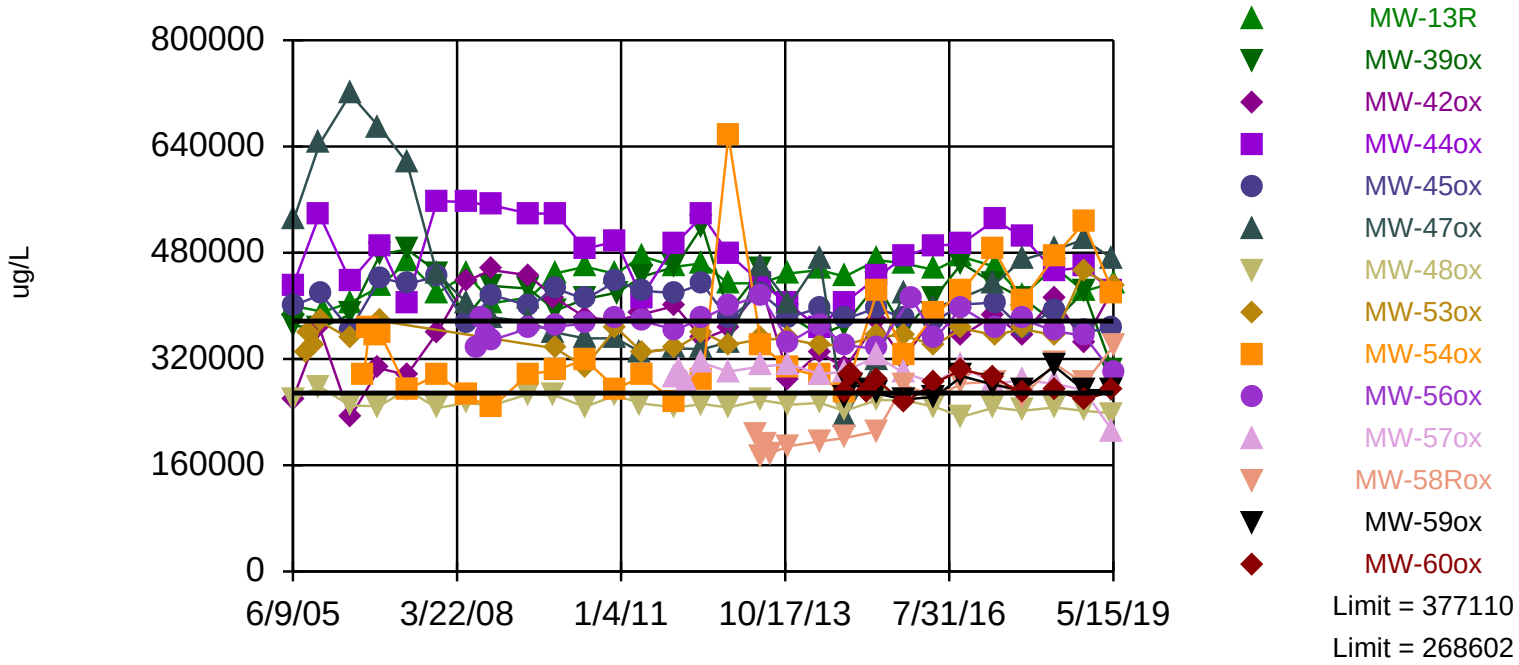
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 9:33 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium [total] (mg/L) | MW-47ox | 129 | n/a | 5/14/2019 | 33 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-48ox | 129 | n/a | 5/13/2019 | 69.8 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-53ox | 129 | n/a | 5/15/2019 | 70.4 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-54ox | 129 | n/a | 5/14/2019 | 104 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-56ox | 129 | n/a | 5/15/2019 | 26.8 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-57ox | 129 | n/a | 5/14/2019 | 98.6 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-58Rox | 129 | n/a | 5/15/2019 | 95.8 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-59ox | 129 | n/a | 5/14/2019 | 81.1 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-60ox | 129 | n/a | 5/14/2019 | 106 | No | 123 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-13R | 2670000 | n/a | 5/15/2019 | 1750000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-39ox | 2670000 | n/a | 5/14/2019 | 580000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-42ox | 2670000 | n/a | 5/14/2019 | 2240000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-44ox | 2670000 | n/a | 5/14/2019 | 668000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-45ox | 2670000 | n/a | 5/14/2019 | 976000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-47ox | 2670000 | n/a | 5/14/2019 | 1600000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-48ox | 2670000 | n/a | 5/13/2019 | 2120000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-53ox | 2670000 | n/a | 5/15/2019 | 1400000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-54ox | 2670000 | n/a | 5/14/2019 | 847000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-56ox | 2670000 | n/a | 5/15/2019 | 1090000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-57ox | 2670000 | n/a | 5/14/2019 | 1600000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-58Rox | 2670000 | n/a | 5/15/2019 | 1520000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-59ox | 2670000 | n/a | 5/14/2019 | 2050000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-60ox | 2670000 | n/a | 5/14/2019 | 2180000 | No | 129 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| **Total Organic Carbon (ug/L)** | **MW-13R** | **2251** | **n/a** | **5/15/2019** | **2690** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **2251** | **n/a** | **5/14/2019** | **3310** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-42ox** | **2251** | **n/a** | **5/14/2019** | **3640** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-44ox | 2251 | n/a | 5/14/2019 | 2040 | No | 126 | 1.587 | No | 0.01741 | Param Inter 1 of 2 |
| Total Organic Carbon (ug/L) | MW-45ox | 2251 | n/a | 5/14/2019 | 2000 | No | 126 | 1.587 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **2251** | **n/a** | **5/14/2019** | **4260** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-48ox | 2251 | n/a | 5/13/2019 | 2150 | No | 126 | 1.587 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **2251** | **n/a** | **5/15/2019** | **3290** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-54ox** | **2251** | **n/a** | **5/14/2019** | **5130** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-56ox | 2251 | n/a | 5/15/2019 | 1760 | No | 126 | 1.587 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **2251** | **n/a** | **5/14/2019** | **2950** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-58Rox** | **2251** | **n/a** | **5/15/2019** | **2470** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-59ox | 2251 | n/a | 5/14/2019 | 1950 | No | 126 | 1.587 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-60ox** | **2251** | **n/a** | **5/14/2019** | **2280** | **Yes** | **126** | **1.587** | **No** | **0.01741** | **Param Inter 1 of 2** |

Exceeds Limits: MW-13R, MW-42ox, MW-44ox, MW-47ox, MW-48ox, MW-53ox, MW-54ox, MW-57ox

# Prediction Limit

## Interwell Parametric




Background Data Summary (based on square root transformation): Mean=566.2, Std. Dev.=42.06, n=127. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 12.61, critical = 14.07. Kappa = 1.139 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.008703. Comparing 14 points to limit.

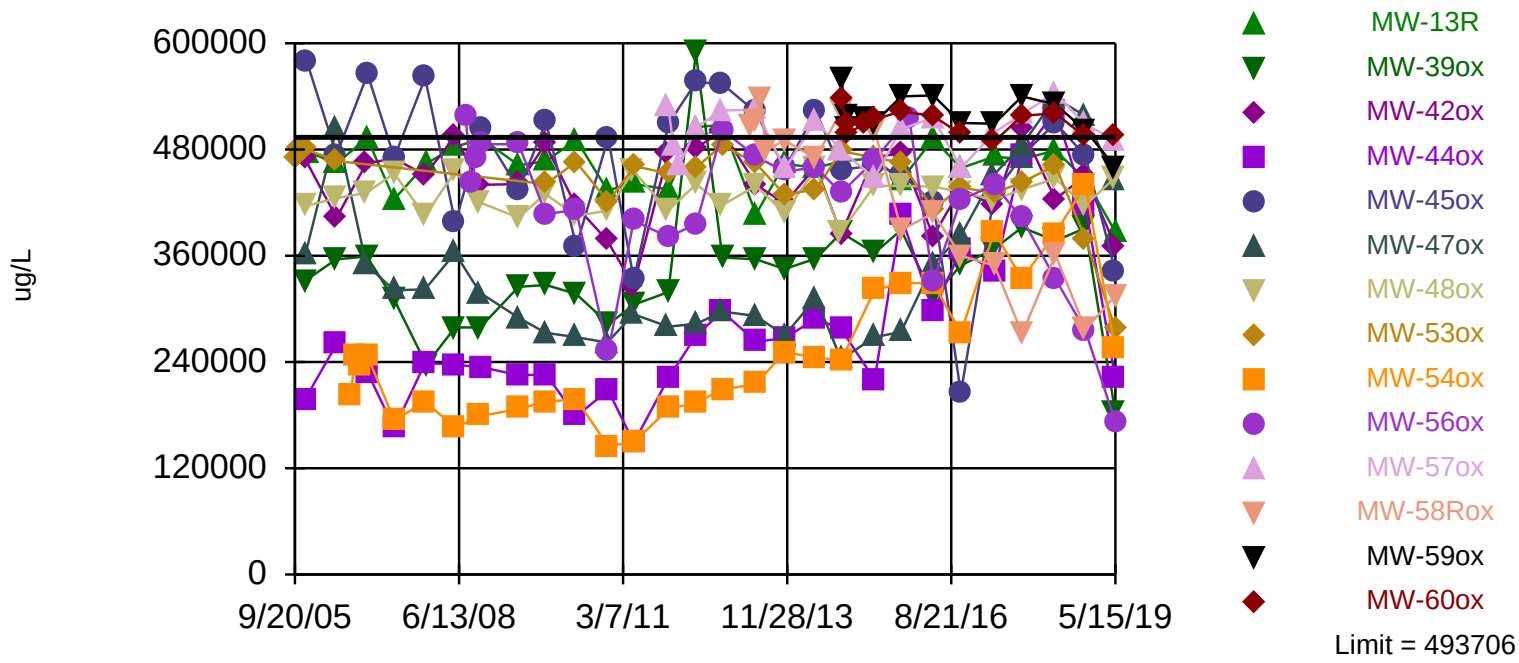
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Predicti

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Exceeds Limit: MW-60ox

# Prediction Limit

## Interwell Parametric




Background Data Summary (based on square transformation): Mean=1.5e11, Std. Dev.=8.1e10, n=125. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 11.24, critical = 14.07. Kappa = 1.14 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.01741. Comparing 14 points to limit.

Constituent: Calcium Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

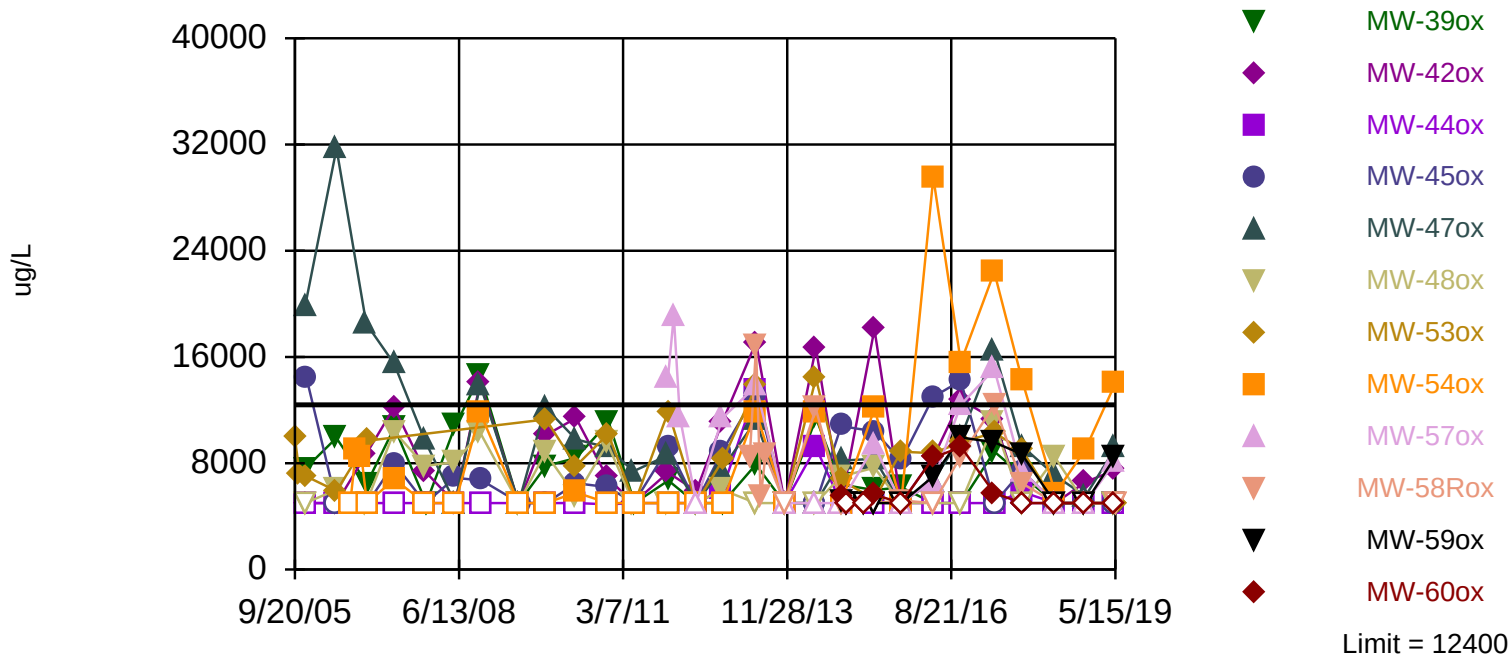
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-54ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 125 background values. 67.2% NDs. Annual per-constituent alpha = 0.0003795. Individual comparison alpha = 0.0001265 (1 of 2). Comparing 12 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Predi

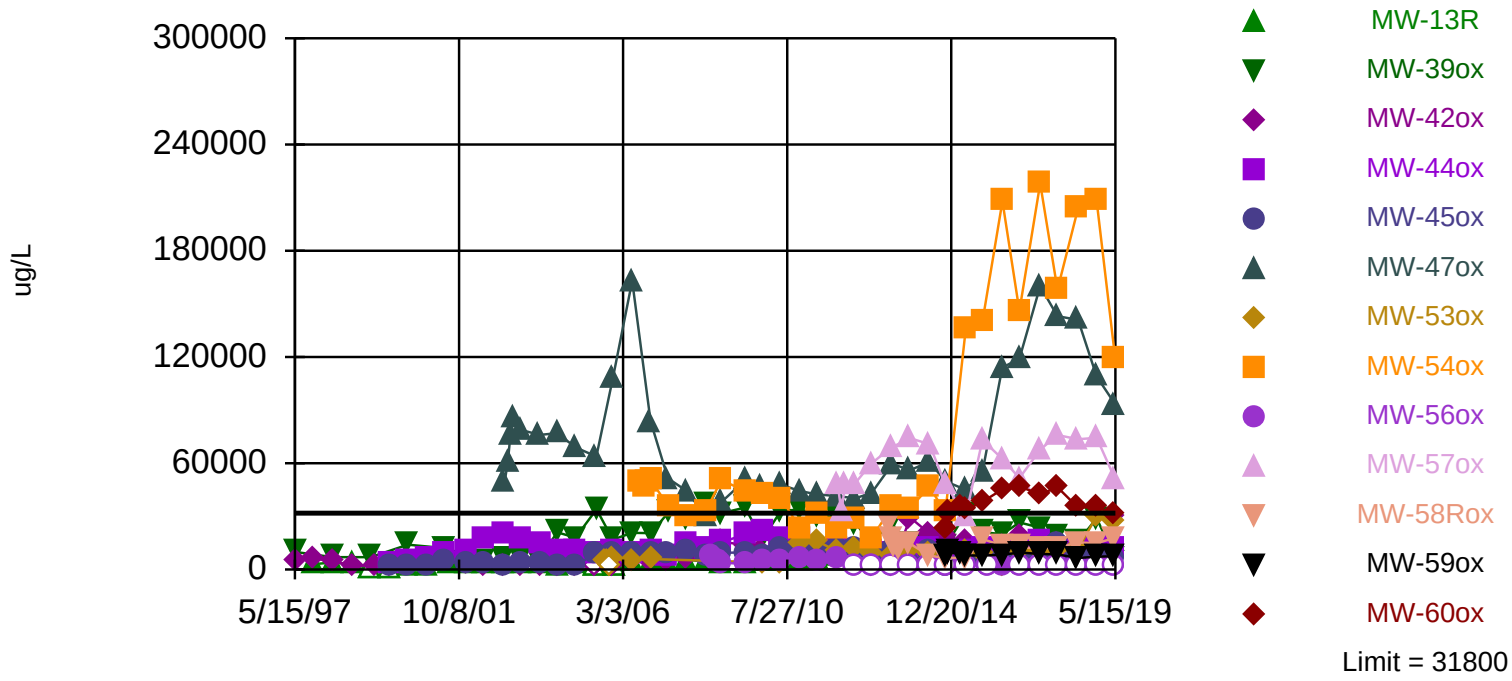
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-47ox, MW-54ox, MW-57ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 133 background values. 21.8% NDs. Annual per-constituent alpha = 0.0003368. Individual comparison alpha = 0.0001123 (1 of 2). Comparing 13 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Chloride Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

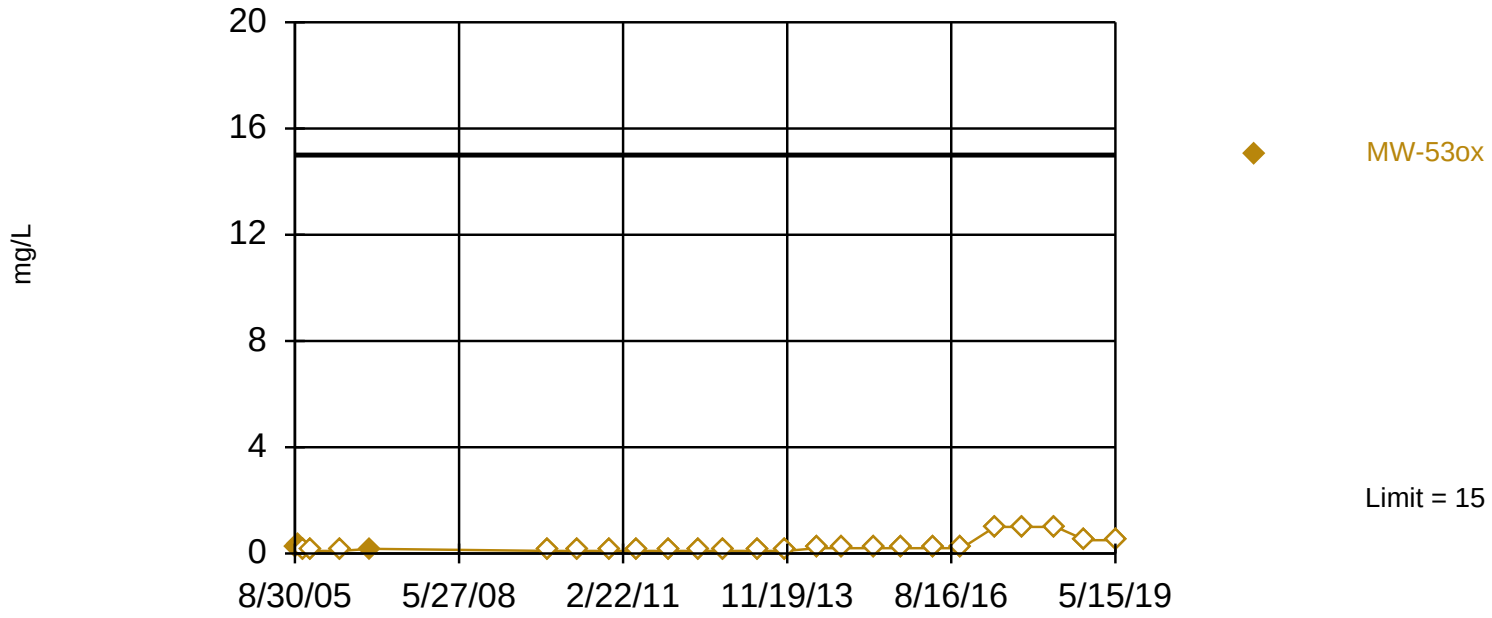
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 129 background values. 68.99% NDs. Annual per-constituent alpha = 0.0003581. Individual comparison alpha = 0.0001194 (1 of 2). Assumes 2 future values. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Iron [total] Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

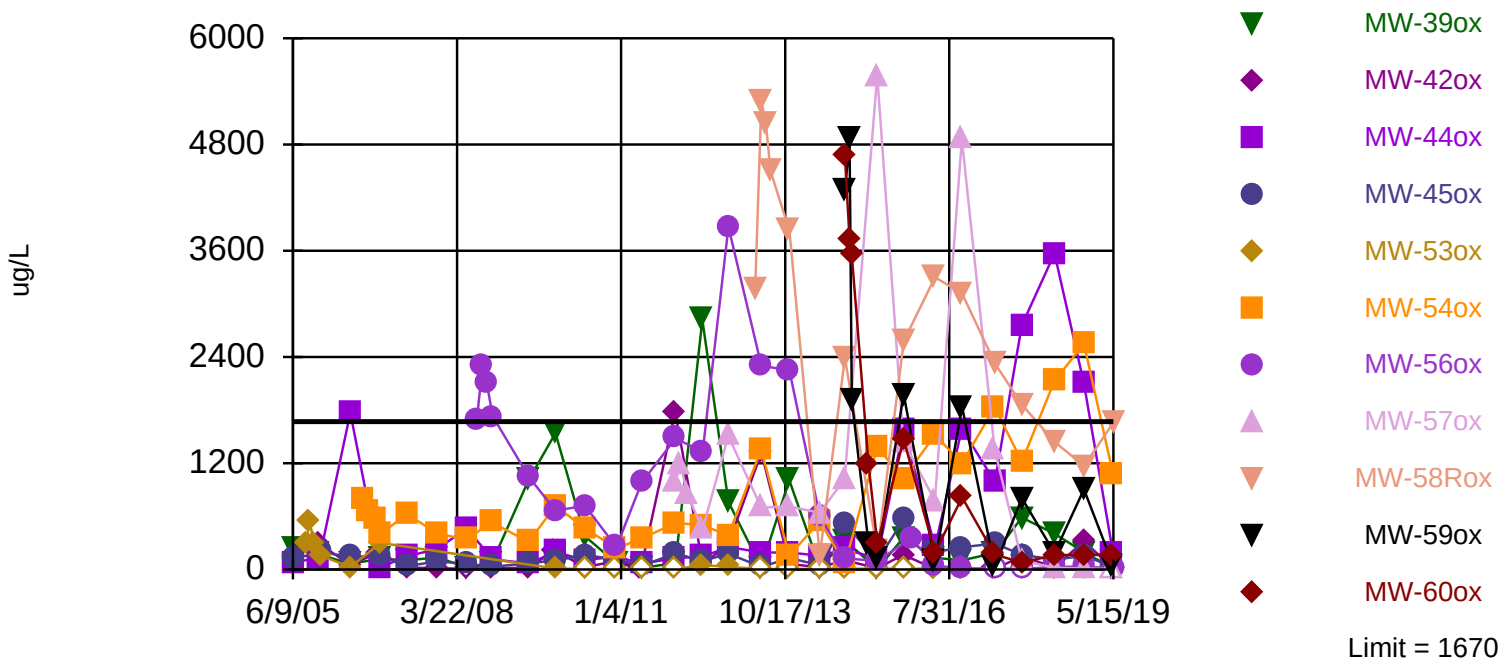
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 127 background values. 20.47% NDs. Annual per-constituent alpha = 0.0003688. Individual comparison alpha = 0.0001229 (1 of 2). Comparing 11 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Manganese Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

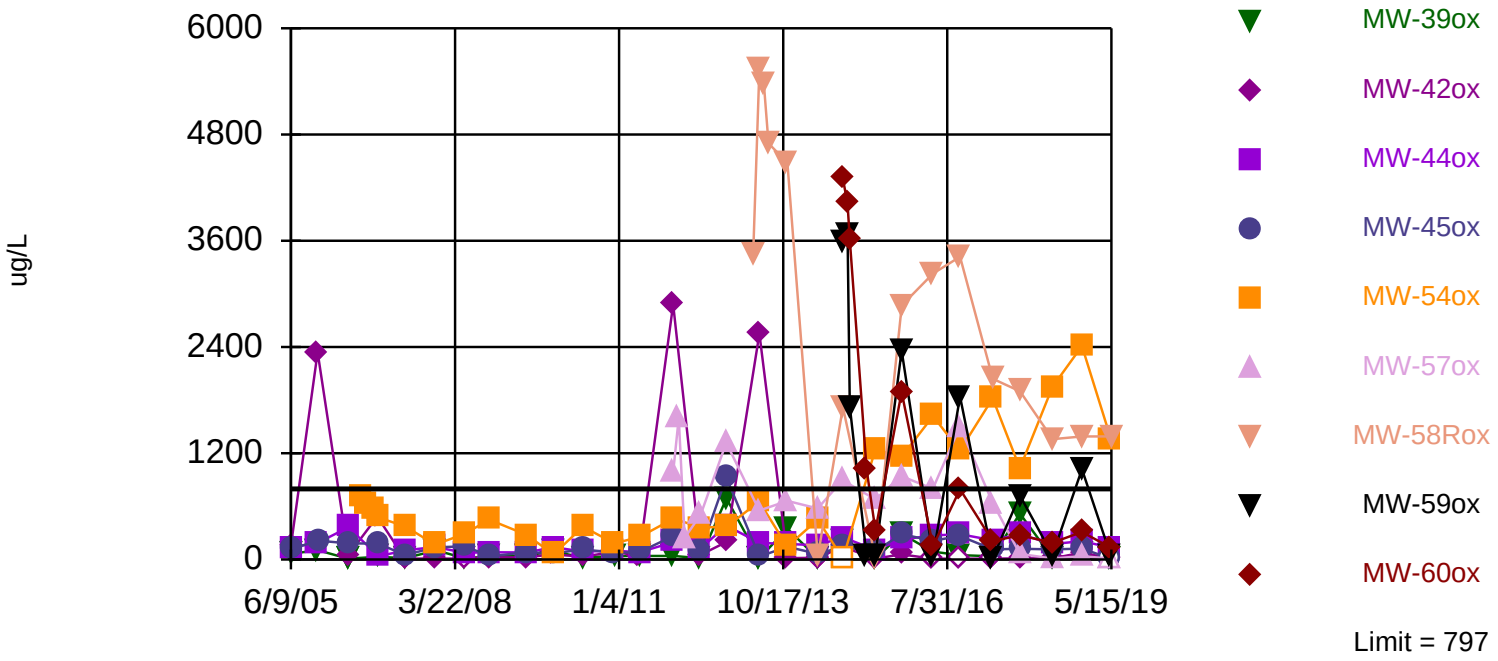
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-54ox, MW-58Rox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 129 background values. 27.13% NDs. Annual per-constituent alpha = 0.0003581. Individual comparison alpha = 0.0001194 (1 of 2). Comparing 9 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Manganese, Dissolved Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction

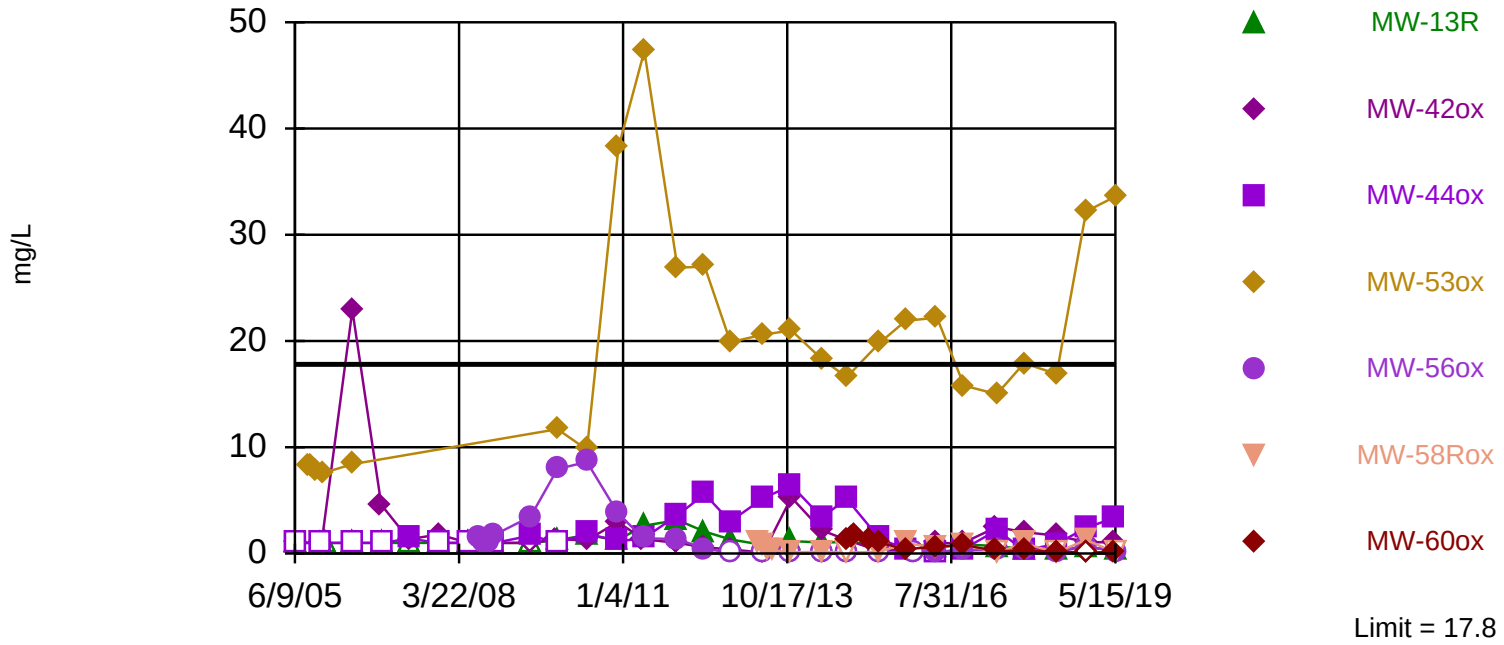
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-53ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 129 background values. 35.66% NDs. Annual per-constituent alpha = 0.0003581. Individual comparison alpha = 0.0001194 (1 of 2). Comparing 7 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Lim

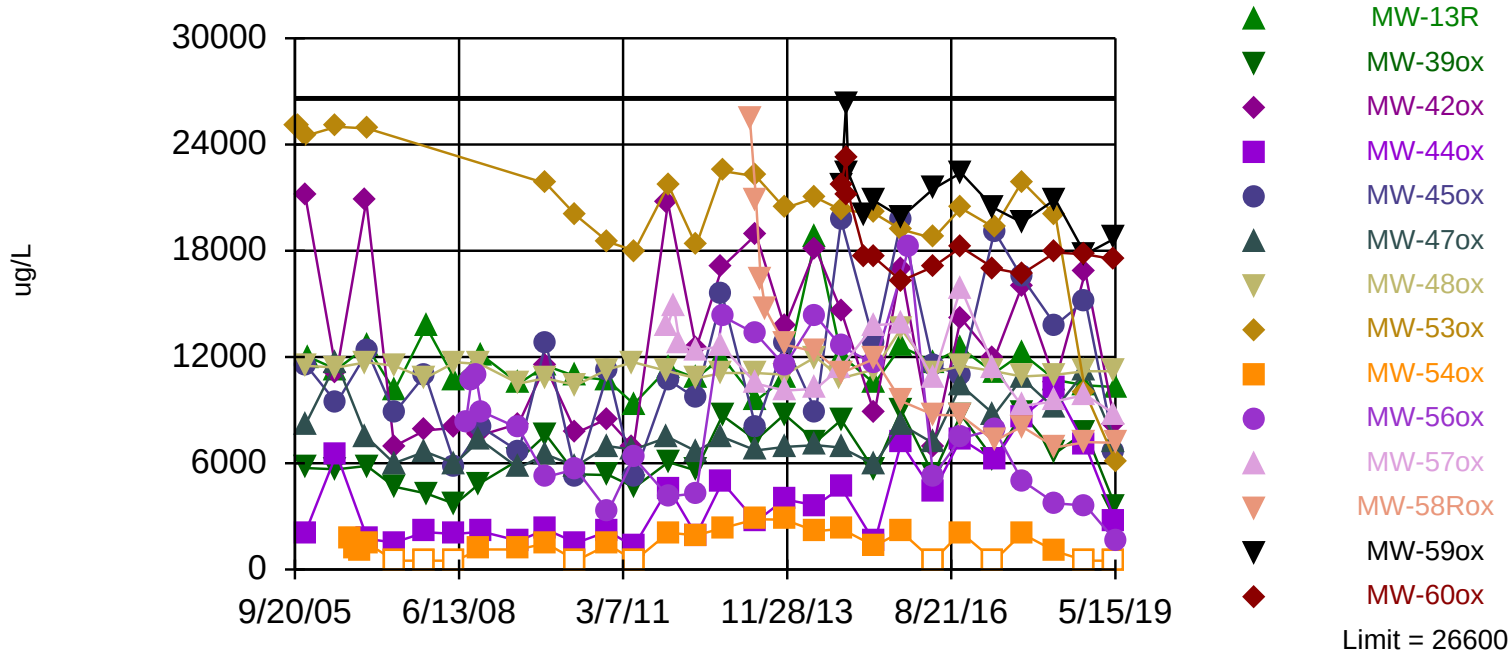
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. Annual per-constituent alpha = 0.0003901. Individual comparison alpha = 0.0001301 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Potassium Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

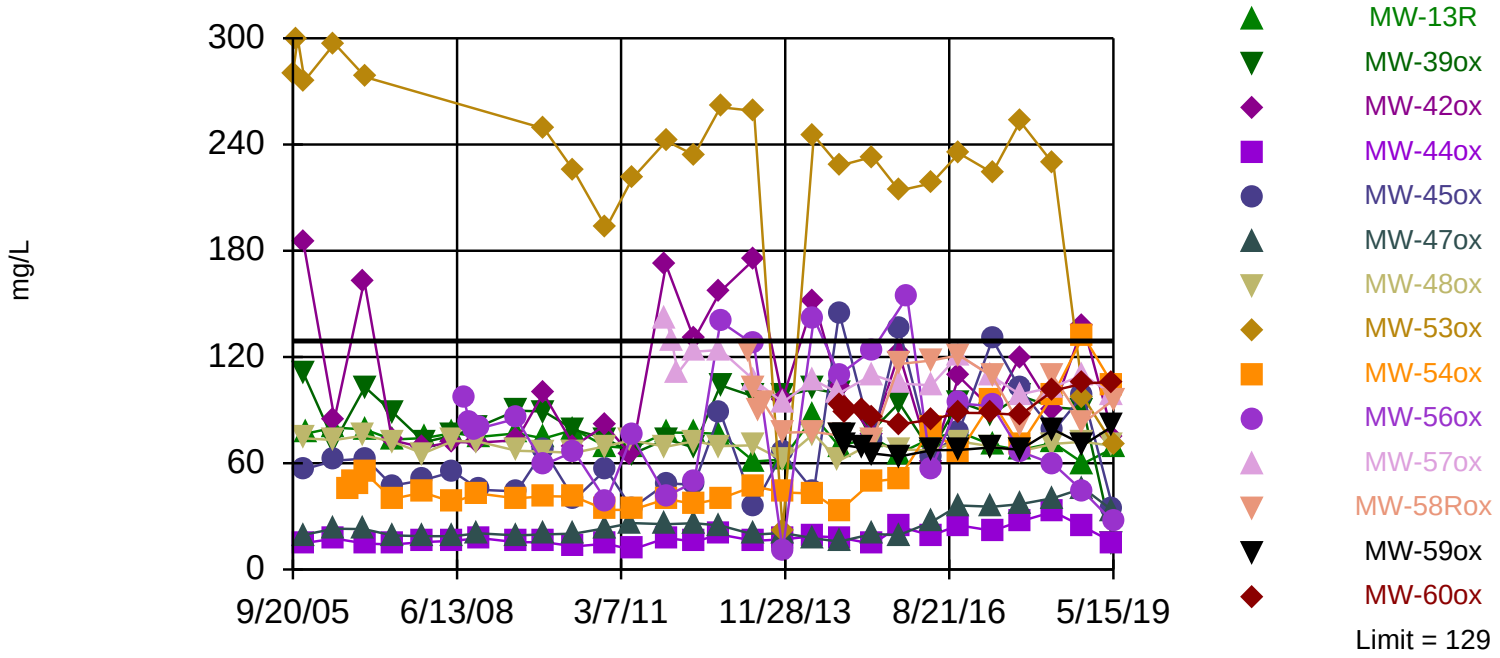
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. Annual per-constituent alpha = 0.0003901. Individual comparison alpha = 0.0001301 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Sodium [total] Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

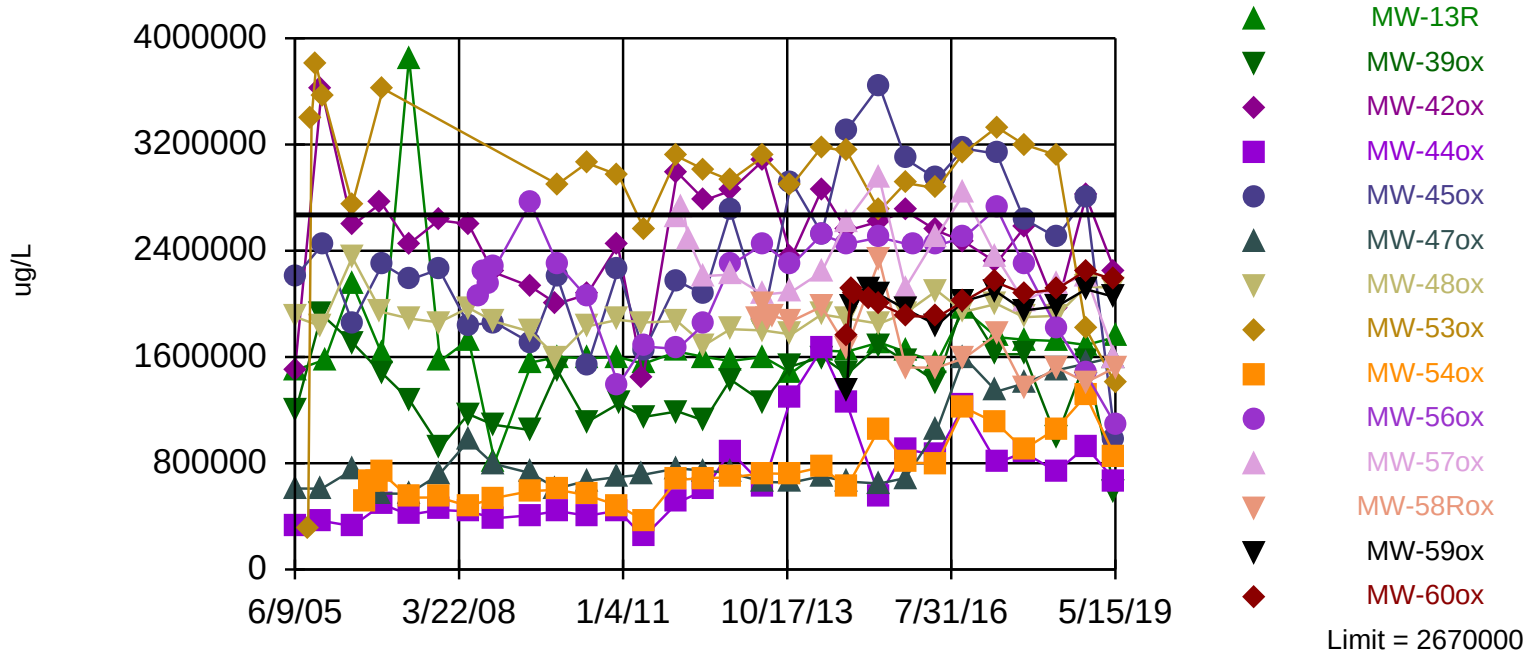
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 129 background values. Annual per-constituent alpha = 0.0003581. Individual comparison alpha = 0.0001194 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Sulfate Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction Limits

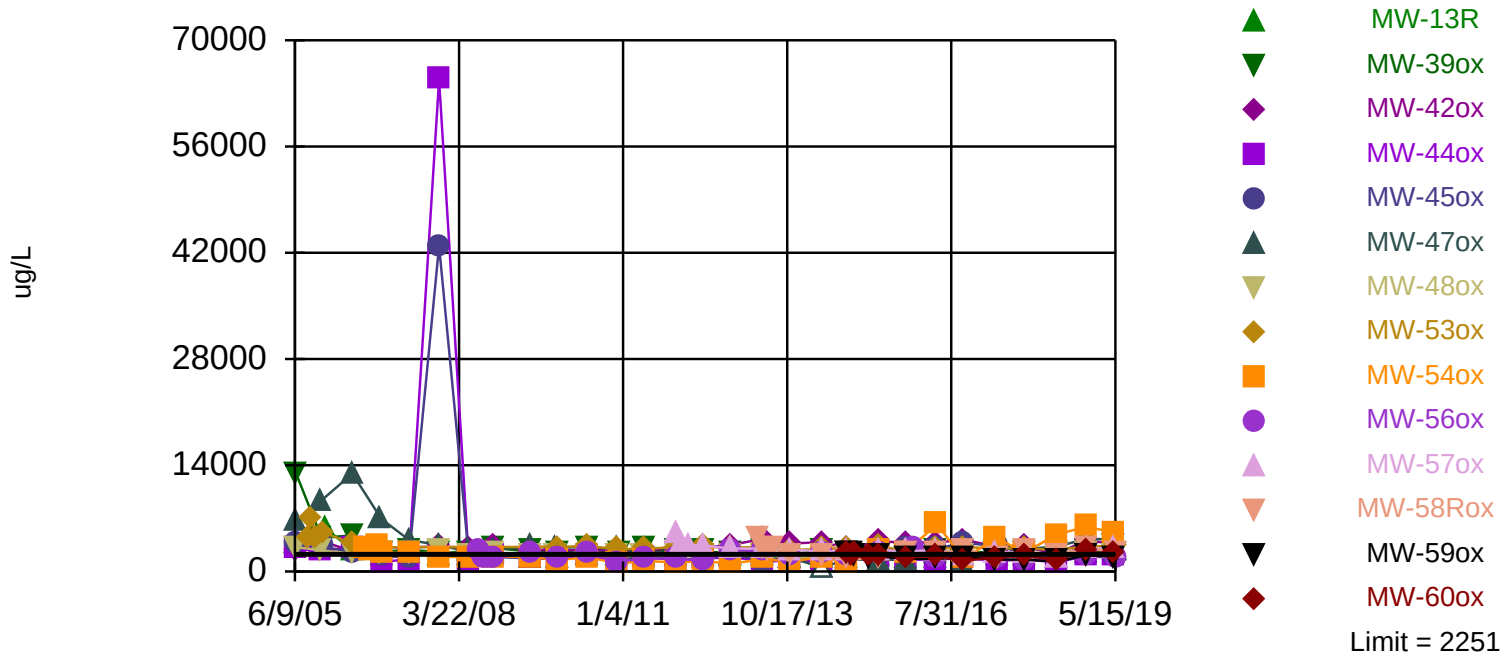
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-13R, MW-39ox, MW-42ox, MW-47ox, MW-53ox, MW-54ox, MW-57ox, MW-58Rox, MW-60ox

# Prediction Limit

## Interwell Parametric




Background Data Summary: Mean=1774, Std. Dev.=418.8, n=126, 1.587% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 14, critical = 14.07. Kappa = 1.14 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.01741. Comparing 14 points to limit.

Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:32 AM View: First Half - Interwell Prediction

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Trend Test

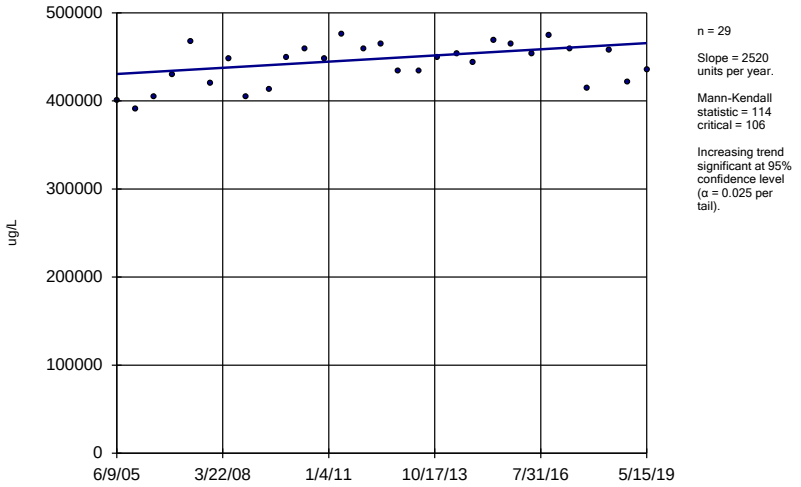
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:00 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-13R** | **2520** | **114** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-42ox | 2141 | 32 | 106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Alkalinity, Total [CaCO3] (ug/L) | MW-44ox | -4024 | -78 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| Alkalinity, Total [CaCO3] (ug/L) | MW-47ox | -6294 | -42 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-48ox** | **-1263** | **-172** | **-106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-53ox** | **1738** | **99** | **90** | **Yes** | **26** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-54ox** | **11038** | **148** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-57ox** | **-4314** | **-64** | **-53** | **Yes** | **18** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Calcium (ug/L) | MW-60ox | -3247 | -18 | -34 | No | 13 | 0 | n/a | n/a | 0.05 | NP |
| **Chemical Oxygen Demand (ug/L)** | **MW-54ox** | **102.8** | **114** | **106** | **Yes** | **29** | **48.28** | **n/a** | **n/a** | **0.05** | **NP** |
| Chloride (ug/L) | MW-47ox | 951.7 | 49 | 151 | No | 37 | 0 | n/a | n/a | 0.05 | NP |
| **Chloride (ug/L)** | **MW-54ox** | **8861** | **116** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Chloride (ug/L)** | **MW-57ox** | **2504** | **63** | **53** | **Yes** | **18** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **84.9** | **129** | **106** | **Yes** | **29** | **3.448** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **-586.8** | **-57** | **-45** | **Yes** | **16** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **0.8394** | **92** | **85** | **Yes** | **25** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-13R | -19.95 | -99 | -106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **-51.51** | **-136** | **-106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Total Organic Carbon (ug/L)** | **MW-42ox** | **59.57** | **107** | **106** | **Yes** | **29** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **-256.2** | **-154** | **-106** | **Yes** | **29** | **3.448** | **n/a** | **n/a** | **0.05** | **NP** |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **-49.72** | **-120** | **-90** | **Yes** | **26** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-54ox | 29.28 | 24 | 106 | No | 29 | 0 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **-192.1** | **-89** | **-53** | **Yes** | **18** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-58Rox | -79.05 | -14 | -45 | No | 16 | 0 | n/a | n/a | 0.05 | NP |
| Total Organic Carbon (ug/L) | MW-60ox | -87.9 | -18 | -34 | No | 13 | 0 | n/a | n/a | 0.05 | NP |

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## Sen's Slope Estimator

MW-13R




n = 29

Slope = 2520 units per year.

Mann-Kendall statistic = 114 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

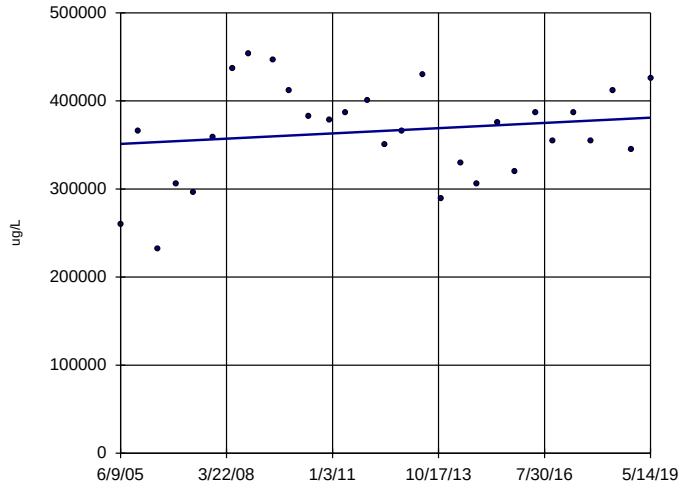
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-42ox




n = 29

Slope = 2141 units per year.

Mann-Kendall statistic = 32 critical = 106

Trend not significant at 95% confidence level (α = 0.025 per tail).

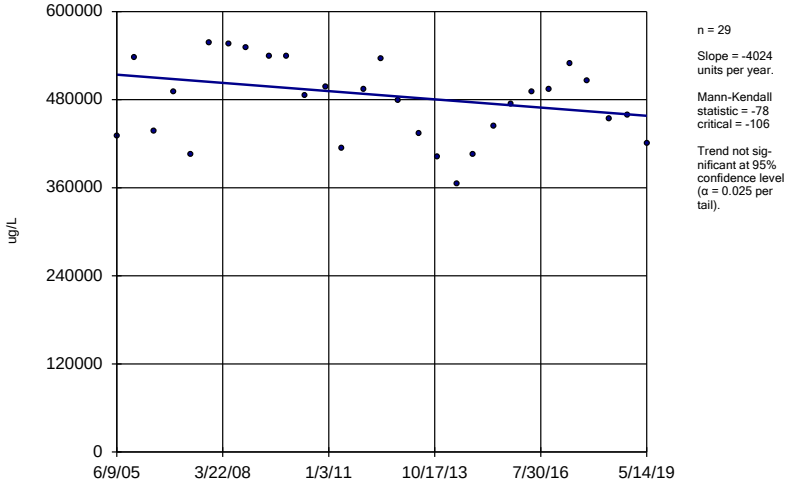
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-44ox




n = 29

Slope = -4024 units per year.

Mann-Kendall statistic = -78 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

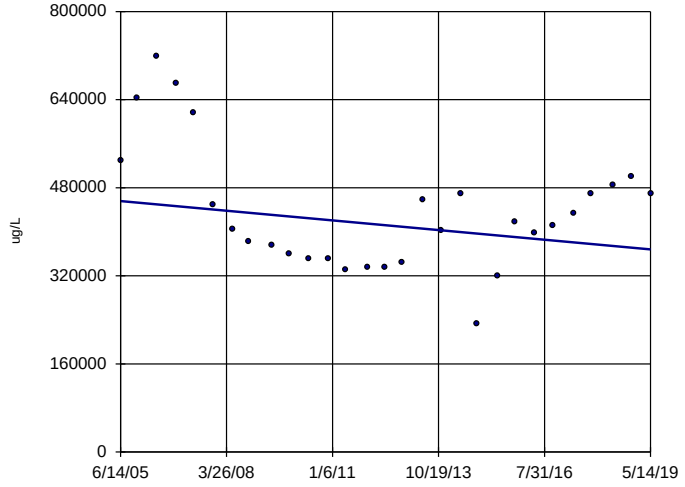
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-47ox




n = 29

Slope = -6294 units per year.

Mann-Kendall statistic = -42 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

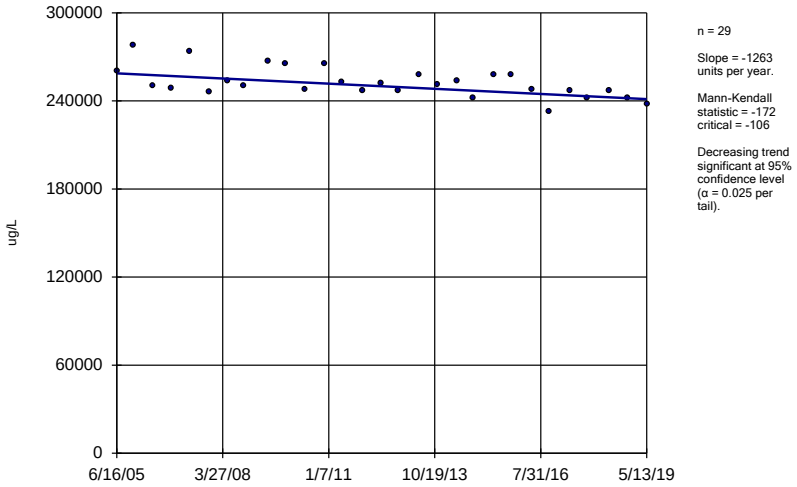
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-48ox




n = 29

Slope = -1263 units per year.

Mann-Kendall statistic = -172 critical = -106

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

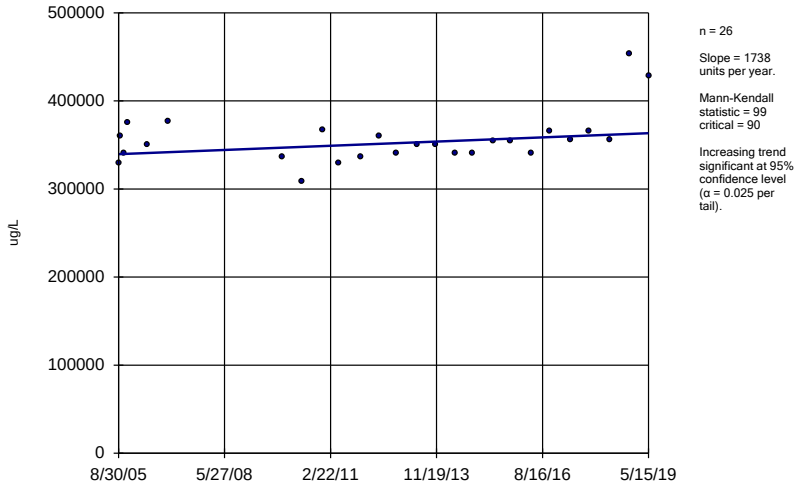
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-53ox




n = 26

Slope = 1738 units per year.

Mann-Kendall statistic = 99 critical = 90

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

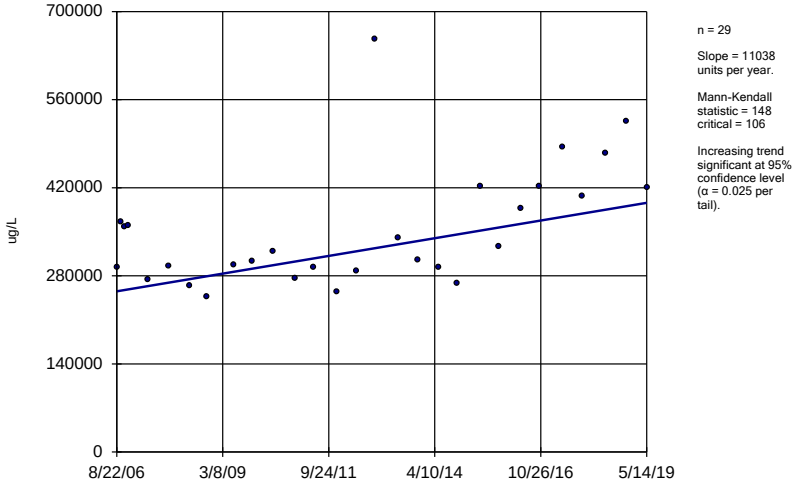
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 29

Slope = 11038 units per year.

Mann-Kendall statistic = 148 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

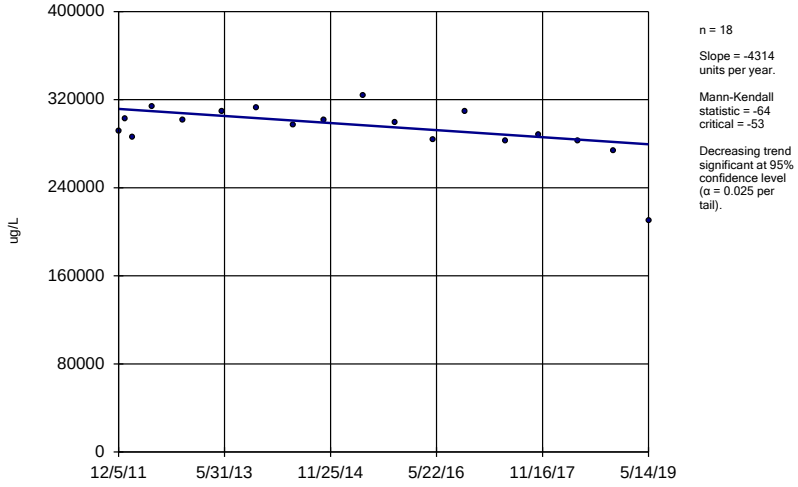
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-57ox




n = 18

Slope = -4314 units per year.

Mann-Kendall statistic = -64 critical = -53

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

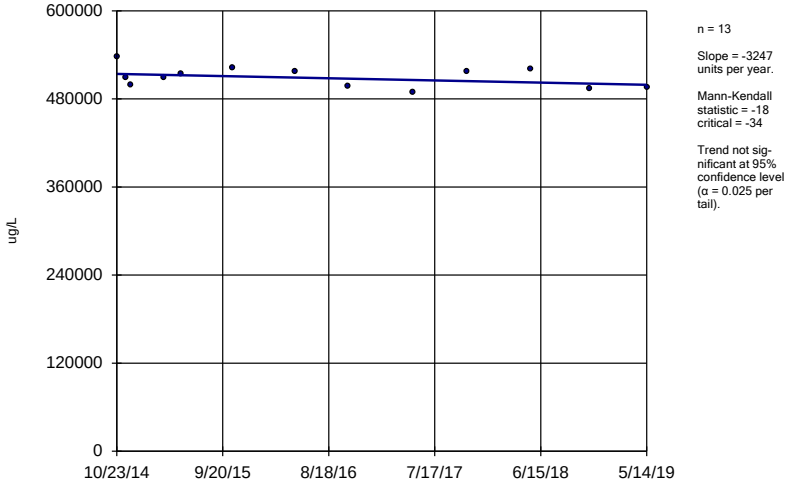
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-60ox




n = 13

Slope = -3247 units per year.

Mann-Kendall statistic = -18 critical = -34

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Calcium Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

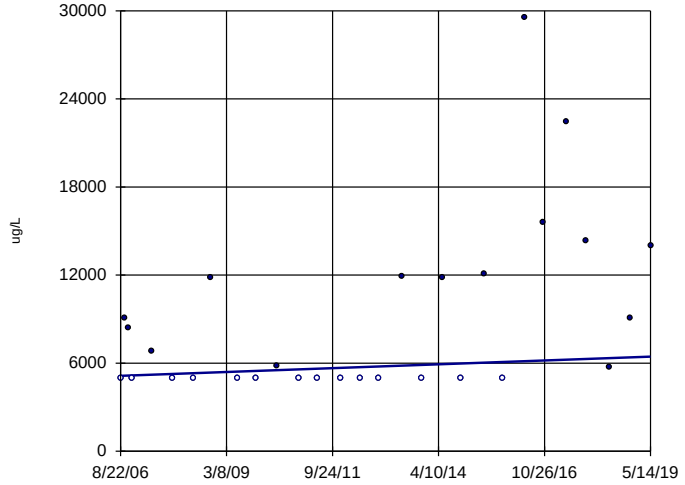
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-54ox




n = 29

Slope = 102.8 units per year.

Mann-Kendall statistic = 114 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

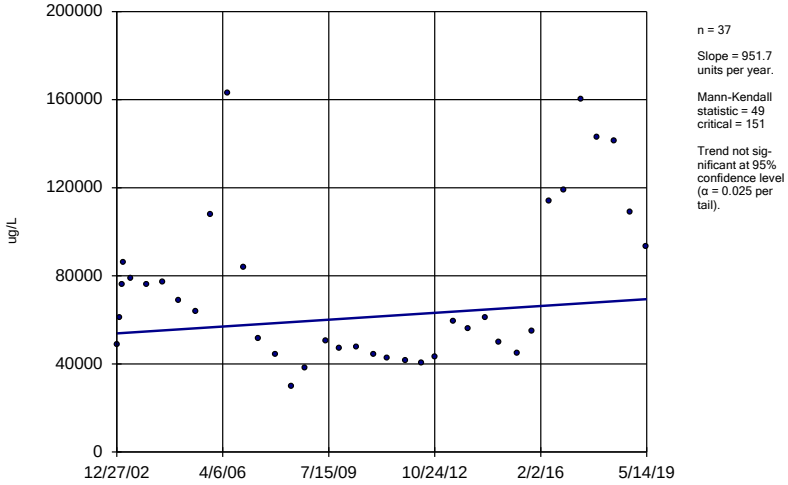
Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedanc

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-47ox




n = 37

Slope = 951.7 units per year.

Mann-Kendall statistic = 49 critical = 151

Trend not significant at 95% confidence level (α = 0.025 per tail).

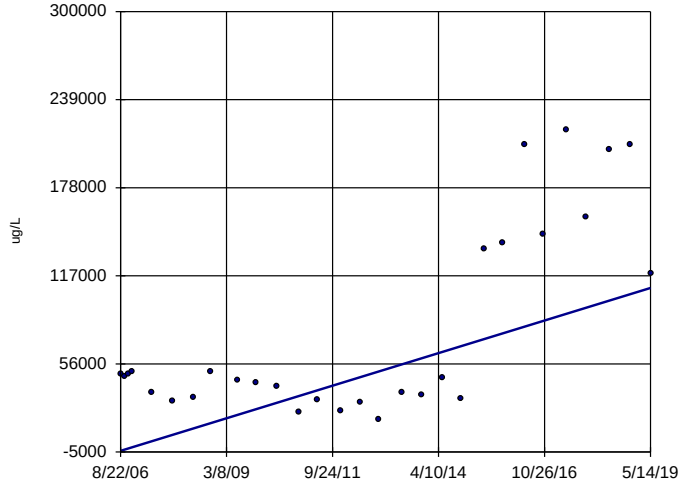
Constituent: Chloride Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 29

Slope = 8861 units per year.

Mann-Kendall statistic = 116 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

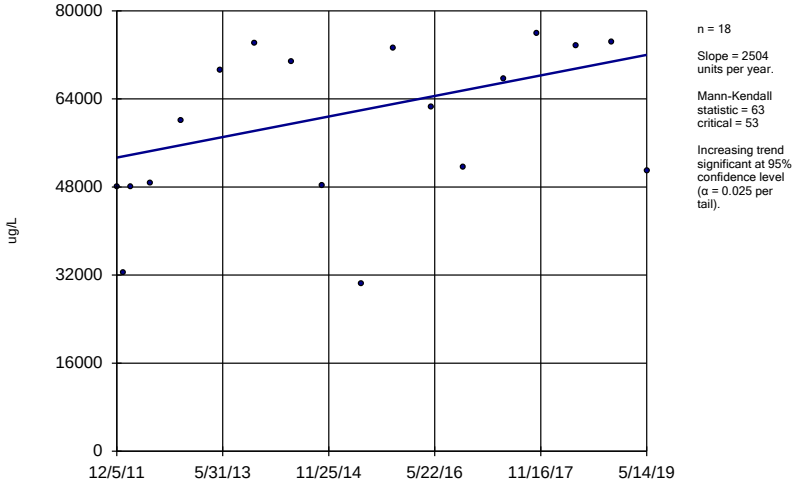
Constituent: Chloride Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-57ox




Constituent: Chloride Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

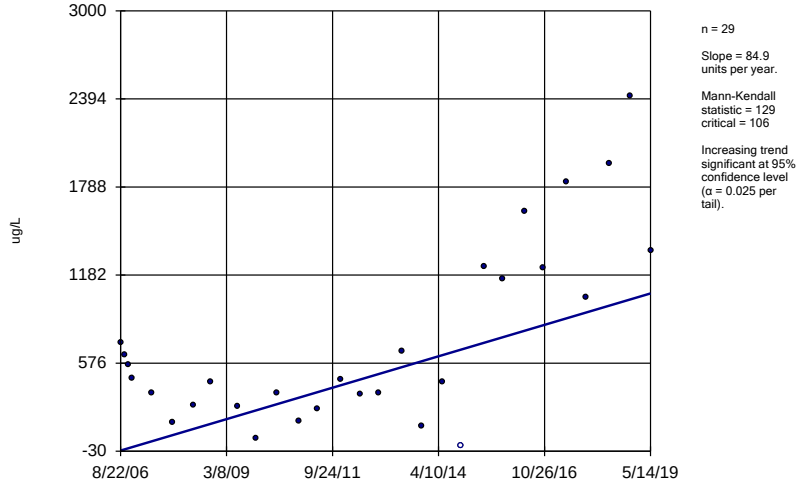
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-54ox



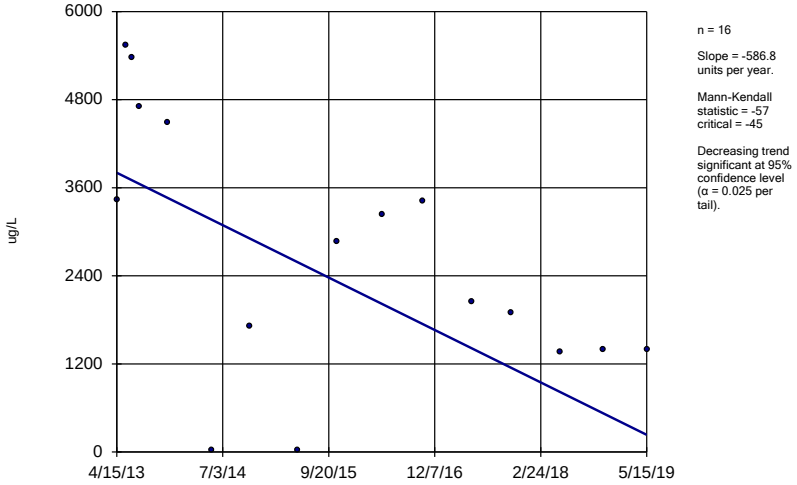

Constituent: Manganese, Dissolved Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-58Rox



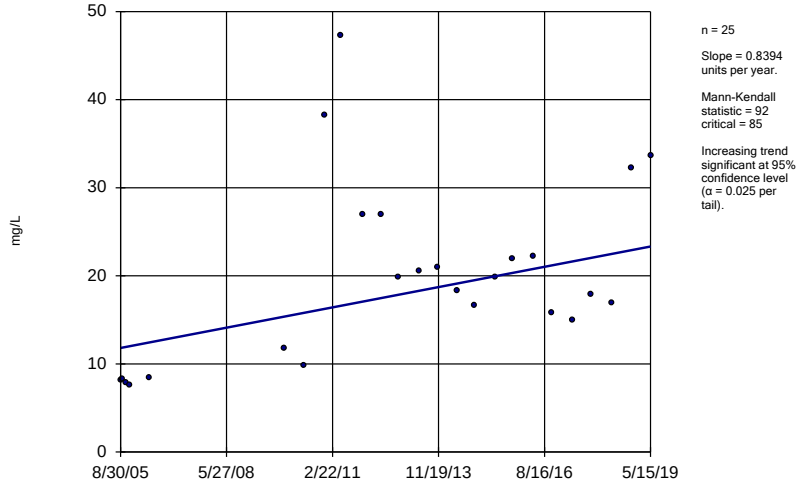

Constituent: Manganese, Dissolved Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-53ox



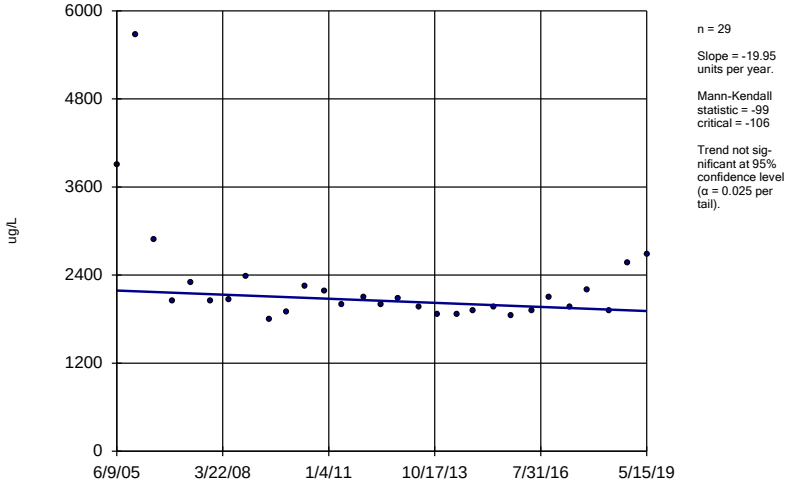

Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-13R




n = 29

Slope = -19.95 units per year.

Mann-Kendall statistic = -99 critical = -106

Trend not significant at 95% confidence level (α = 0.025 per tail).

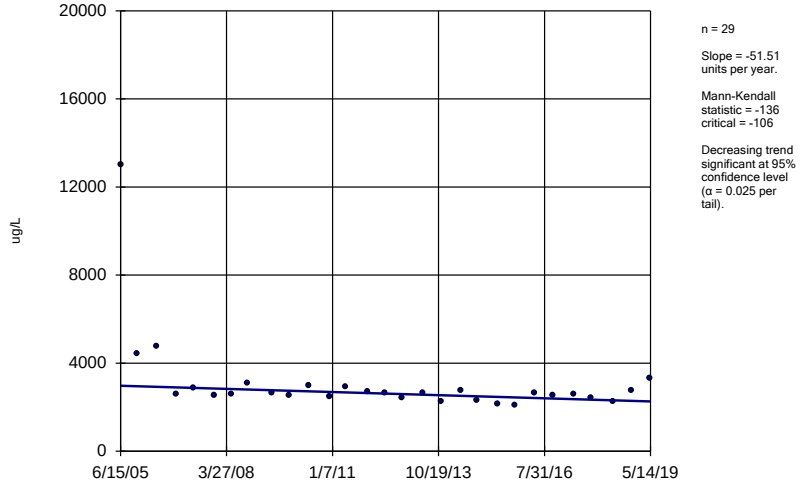
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-39ox




n = 29

Slope = -51.51 units per year.

Mann-Kendall statistic = -136 critical = -106

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

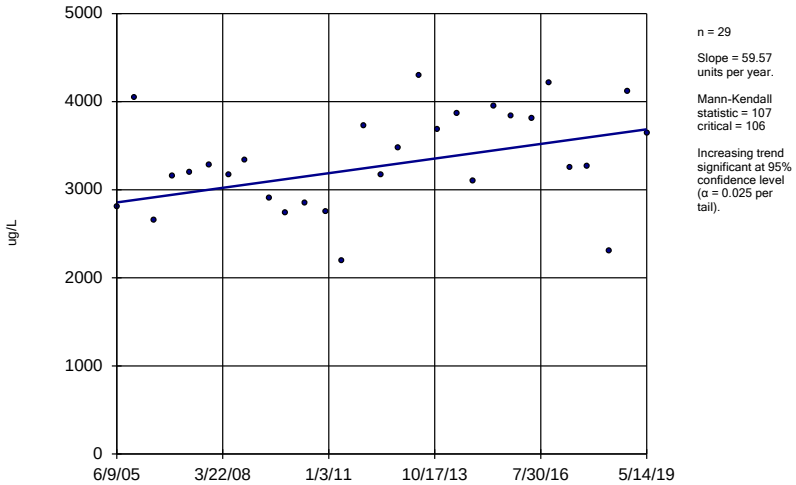
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-42ox




n = 29

Slope = 59.57 units per year.

Mann-Kendall statistic = 107 critical = 106

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

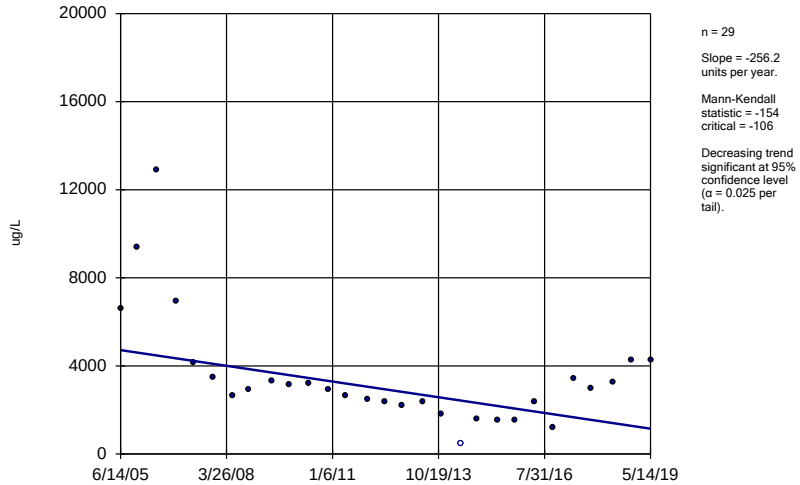
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-47ox




n = 29

Slope = -256.2 units per year.

Mann-Kendall statistic = -154 critical = -106

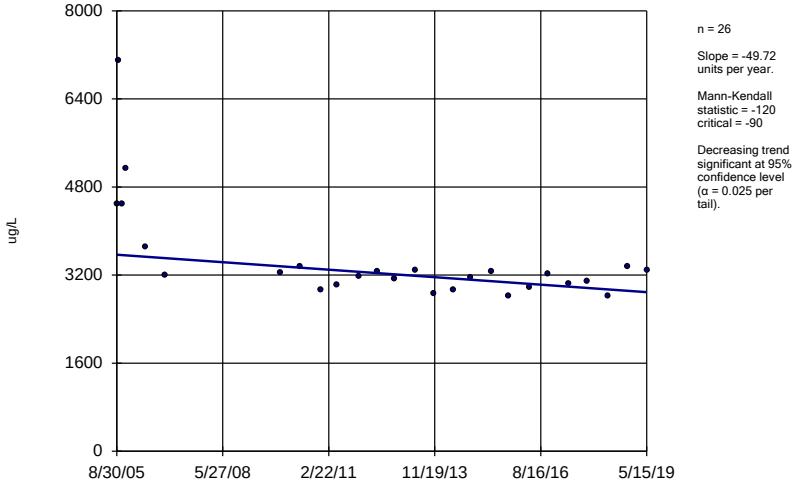
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-53ox




n = 26

Slope = -49.72 units per year.

Mann-Kendall statistic = -120
critical = -90

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

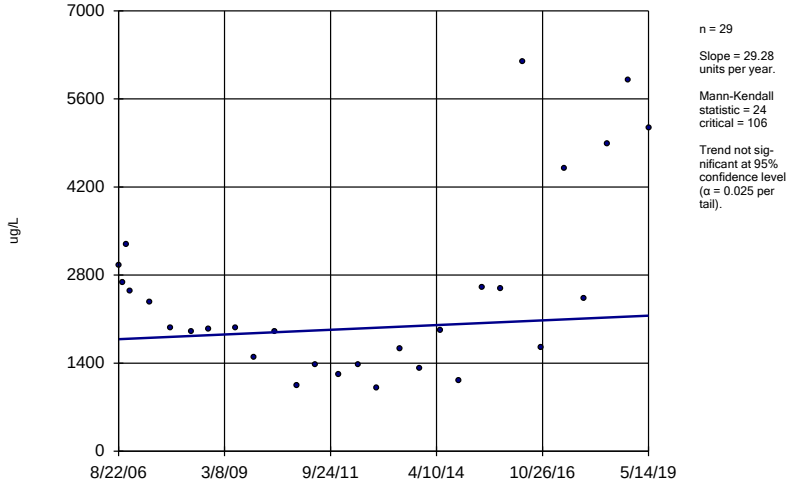
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 29

Slope = 29.28 units per year.

Mann-Kendall statistic = 24
critical = 106

Trend not significant at 95% confidence level (α = 0.025 per tail).

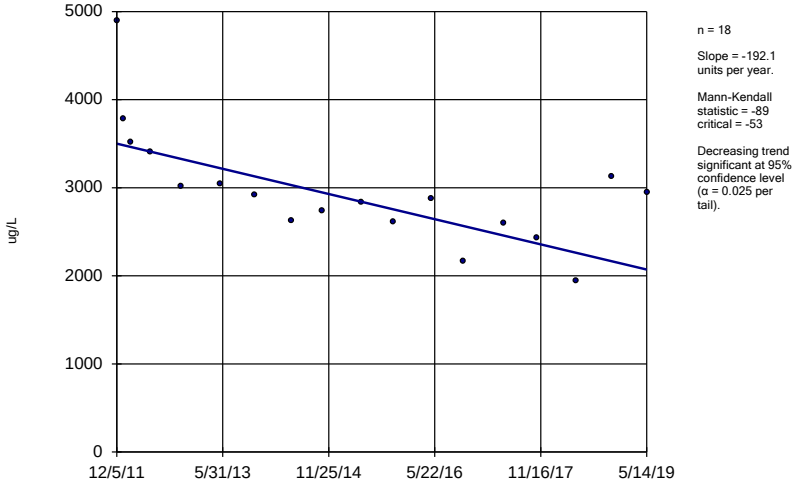
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-57ox




n = 18

Slope = -192.1 units per year.

Mann-Kendall statistic = -89
critical = -53

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

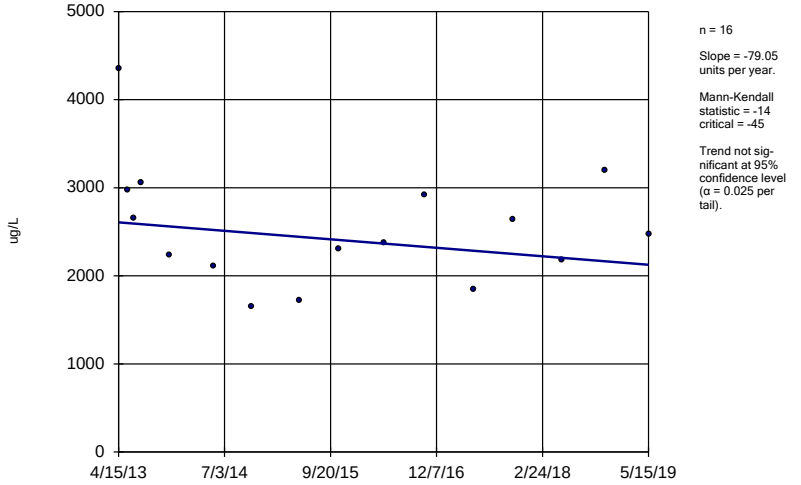
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-58Rox




n = 16

Slope = -79.05 units per year.

Mann-Kendall statistic = -14
critical = -45

Trend not significant at 95% confidence level (α = 0.025 per tail).

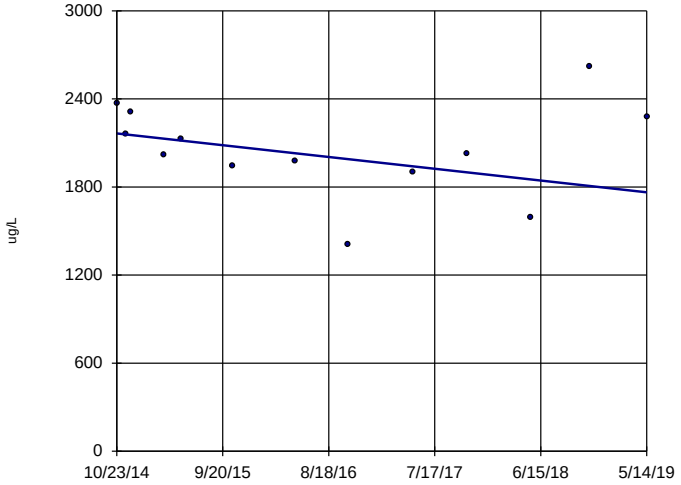
Constituent: Total Organic Carbon Analysis Run 2/17/2020 9:39 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-60ox




n = 13

Slope = -87.9 units per year.

Mann-Kendall statistic = -18 critical = -34

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon  Analysis Run 2/17/2020 9:39 AM  View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

# Confidence Interval

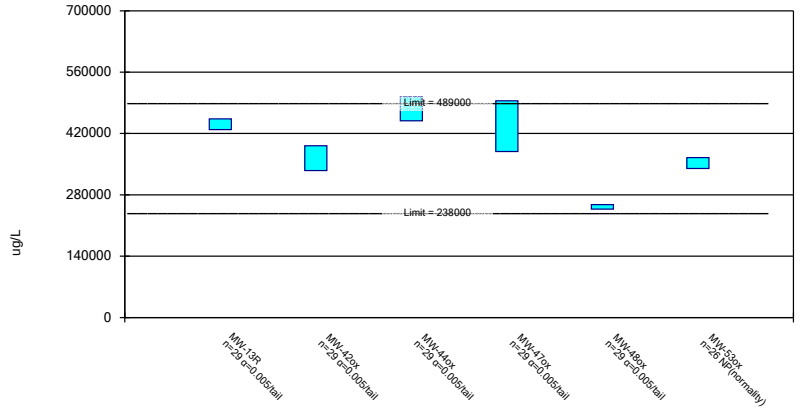
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:11 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Compliance | Sig. | N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-13R | 453500 | 428983 | 489000 | No | 29 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-42ox | 392012 | 335298 | 489000 | No | 29 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-44ox | 504225 | 448947 | 489000 | No | 29 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-47ox | 494482 | 378829 | 489000 | No | 29 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-48ox | 257775 | 247260 | 489000 | No | 29 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-53ox | 365000 | 340000 | 489000 | No | 26 | 0 | No | 0.01 | NP (normality) |
| Alkalinity, Total [CaCO3] (ug/L) | MW-54ox | 393504 | 303551 | 489000 | No | 29 | 0 | sqrt(x) | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-57ox | 307612 | 280932 | 489000 | No | 18 | 0 | x^4 | 0.005 | Param. |
| **Calcium (ug/L)** | **MW-60ox** | **519919** | **499005** | **371502** | **Yes** | **13** | **0** | **No** | **0.01** | **Param.** |
| **Chemical Oxygen Demand (ug/L)** | **MW-54ox** | **11800** | **5000** | **4149** | **Yes** | **29** | **48.28** | **No** | **0.01** | **NP (normality)** |
| **Chloride (ug/L)** | **MW-47ox** | **81997** | **56732** | **6292** | **Yes** | **37** | **0** | **x^(1/3)** | **0.01** | **Param.** |
| **Chloride (ug/L)** | **MW-54ox** | **136000** | **33000** | **6292** | **Yes** | **29** | **0** | **No** | **0.01** | **NP (normality)** |
| **Chloride (ug/L)** | **MW-57ox** | **68172** | **51827** | **6292** | **Yes** | **18** | **0** | **x^2** | **0.01** | **Param.** |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **885.1** | **373.3** | **96.13** | **Yes** | **29** | **3.448** | **sqrt(x)** | **0.01** | **Param.** |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **3812** | **1551** | **96.13** | **Yes** | **16** | **0** | **No** | **0.01** | **Param.** |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **24.77** | **14.65** | **4.272** | **Yes** | **25** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-13R** | **2240** | **1920** | **1774** | **Yes** | **29** | **0** | **No** | **0.01** | **NP (normality)** |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **2870** | **2460** | **1774** | **Yes** | **29** | **0** | **No** | **0.01** | **NP (normality)** |
| **Total Organic Carbon (ug/L)** | **MW-42ox** | **3593** | **3082** | **1774** | **Yes** | **29** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **4100** | **2282** | **1774** | **Yes** | **29** | **3.448** | **x^(1/3)** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **3350** | **3010** | **1774** | **Yes** | **26** | **0** | **No** | **0.01** | **NP (normality)** |
| Total Organic Carbon (ug/L) | MW-54ox | 2901 | 1774 | 1774 | No | 29 | 0 | x^(1/3) | 0.01 | Param. |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **3370** | **2573** | **1774** | **Yes** | **18** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-58Rox** | **2978** | **2104** | **1774** | **Yes** | **16** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-60ox** | **2295** | **1819** | **1774** | **Yes** | **13** | **0** | **No** | **0.01** | **Param.** |

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

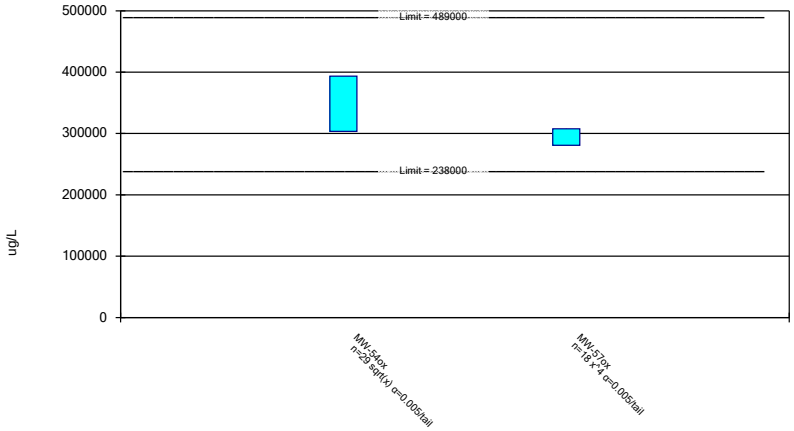



Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:10 AM View: 1H - Interwell Exceedance
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.




Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:10 AM View: 1H - Interwell Exceedance
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

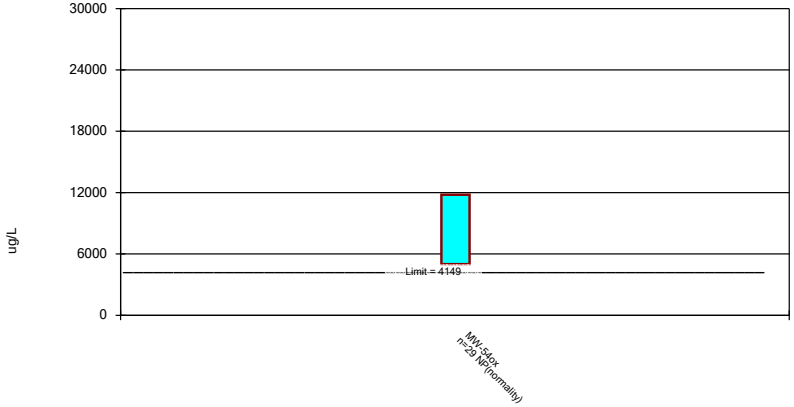



Constituent: Calcium Analysis Run 2/17/2020 10:10 AM View: 1H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Non-Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01.

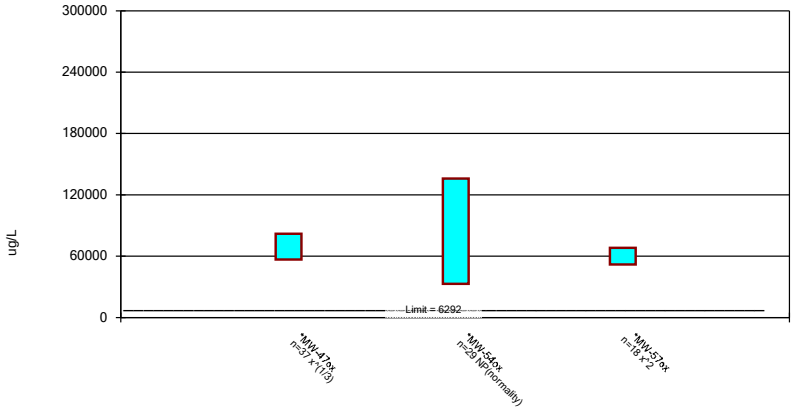



Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 10:10 AM View: 1H - Interwell Exceedan
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

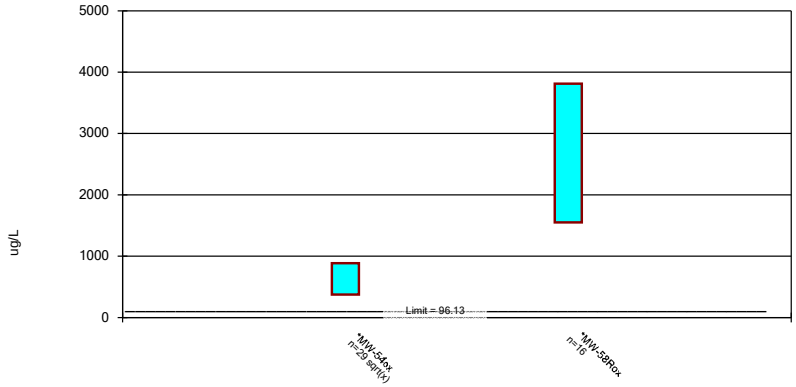



Constituent: Chloride Analysis Run 2/17/2020 10:10 AM View: 1H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

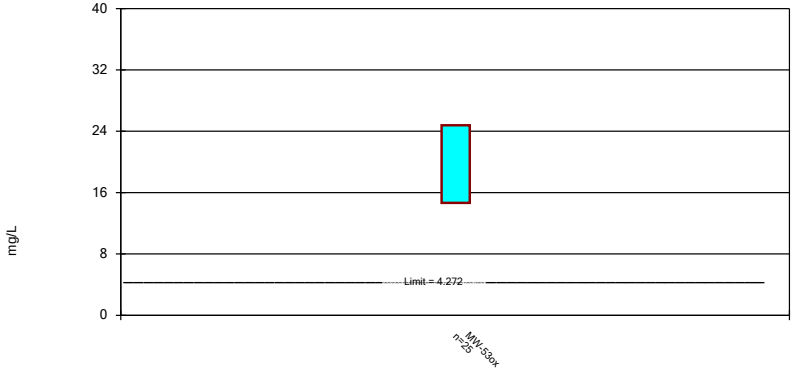



Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:11 AM View: 1H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

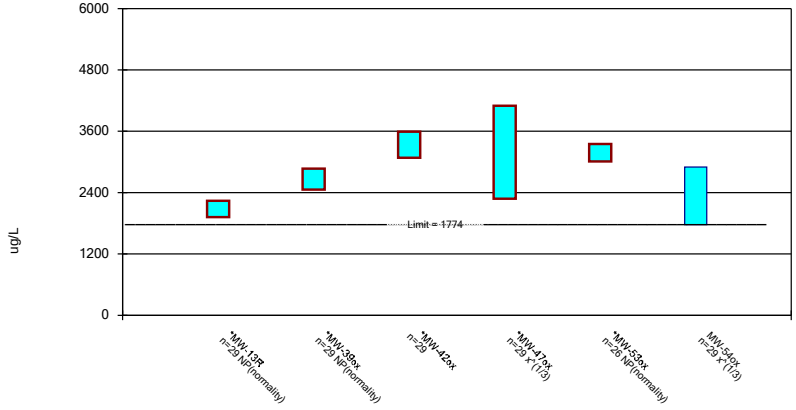



Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 10:11 AM View: 1H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

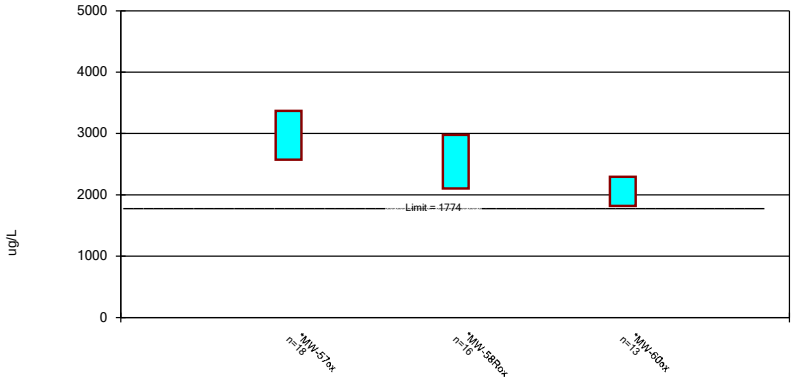



Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:11 AM View: 1H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.




Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:11 AM View: 1H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

November 2019

# Prediction Limit

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:35 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-13R** | **378074** | **268850** | **11/20/2019** | **397000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-39ox** | **378074** | **268850** | **11/19/2019** | **453000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-42ox | 378074 | 268850 | 11/19/2019 | 371000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-44ox** | **378074** | **268850** | **11/20/2019** | **443000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-45ox | 378074 | 268850 | 11/19/2019 | 371000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-47ox** | **378074** | **268850** | **11/19/2019** | **417000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-48ox** | **378074** | **268850** | **11/18/2019** | **242000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-53ox** | **378074** | **268850** | **11/20/2019** | **412000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-54ox** | **378074** | **268850** | **11/19/2019** | **500000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-56ox** | **378074** | **268850** | **11/19/2019** | **386000** | **Yes** | **132** | **0** | **x^(1/3)** | **0.008703** | **Param Inter 1 of 2** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-57ox | 378074 | 268850 | 11/19/2019 | 299000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-58Rox | 378074 | 268850 | 11/20/2019 | 299000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-59ox | 378074 | 268850 | 11/19/2019 | 330000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| Alkalinity, Total [CaCO3] (ug/L) | MW-60ox | 378074 | 268850 | 11/19/2019 | 273000 | No | 132 | 0 | x^(1/3) | 0.008703 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-13R | 492589 | n/a | 11/20/2019 | 408000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-39ox | 492589 | n/a | 11/19/2019 | 368000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-42ox | 492589 | n/a | 11/19/2019 | 487000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-44ox | 492589 | n/a | 11/20/2019 | 385000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-45ox | 492589 | n/a | 11/19/2019 | 477000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-47ox | 492589 | n/a | 11/19/2019 | 389000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-48ox | 492589 | n/a | 11/18/2019 | 426000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| **Calcium (ug/L)** | **MW-53ox** | **492589** | **n/a** | **11/20/2019** | **493000** | **Yes** | **130** | **0** | **x^2** | **0.01741** | **Param Inter 1 of 2** |
| Calcium (ug/L) | MW-54ox | 492589 | n/a | 11/19/2019 | 294000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| Calcium (ug/L) | MW-56ox | 492589 | n/a | 11/19/2019 | 263000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| **Calcium (ug/L)** | **MW-57ox** | **492589** | **n/a** | **11/19/2019** | **517000** | **Yes** | **130** | **0** | **x^2** | **0.01741** | **Param Inter 1 of 2** |
| Calcium (ug/L) | MW-58Rox | 492589 | n/a | 11/20/2019 | 225000 | No | 130 | 0 | x^2 | 0.01741 | Param Inter 1 of 2 |
| **Calcium (ug/L)** | **MW-59ox** | **492589** | **n/a** | **11/19/2019** | **513000** | **Yes** | **130** | **0** | **x^2** | **0.01741** | **Param Inter 1 of 2** |
| **Calcium (ug/L)** | **MW-60ox** | **492589** | **n/a** | **11/19/2019** | **498000** | **Yes** | **130** | **0** | **x^2** | **0.01741** | **Param Inter 1 of 2** |
| Chemical Oxygen Demand (ug/L) | MW-39ox | 12400 | n/a | 11/19/2019 | 8360 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| **Chemical Oxygen Demand (ug/L)** | **MW-42ox** | **12400** | **n/a** | **11/19/2019** | **12600** | **Yes** | **130** | **66.92** | **n/a** | **0.000...** | **NP Inter (NDs) 1 of 2** |
| Chemical Oxygen Demand (ug/L) | MW-44ox | 12400 | n/a | 11/20/2019 | 6050 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-45ox | 12400 | n/a | 11/19/2019 | 10100 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-47ox | 12400 | n/a | 11/19/2019 | 7290 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-48ox | 12400 | n/a | 11/18/2019 | 6040 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-53ox | 12400 | n/a | 11/20/2019 | 5410 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-54ox | 12400 | n/a | 11/19/2019 | 5710 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-57ox | 12400 | n/a | 11/19/2019 | 10500 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-58Rox | 12400 | n/a | 11/20/2019 | 11200 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chemical Oxygen Demand (ug/L) | MW-60ox | 12400 | n/a | 11/19/2019 | 5150 | No | 130 | 66.92 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Chloride (ug/L) | MW-13R | 31800 | n/a | 11/20/2019 | 14900 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-39ox | 31800 | n/a | 11/19/2019 | 31700 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-42ox | 31800 | n/a | 11/19/2019 | 17200 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-44ox | 31800 | n/a | 11/20/2019 | 11200 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-45ox | 31800 | n/a | 11/19/2019 | 6610 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-47ox** | **31800** | **n/a** | **11/19/2019** | **67000** | **Yes** | **137** | **22.63** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Chloride (ug/L) | MW-53ox | 31800 | n/a | 11/20/2019 | 14500 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-54ox** | **31800** | **n/a** | **11/19/2019** | **107000** | **Yes** | **137** | **22.63** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Chloride (ug/L) | MW-56ox | 31800 | n/a | 11/19/2019 | 7750 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| **Chloride (ug/L)** | **MW-57ox** | **31800** | **n/a** | **11/19/2019** | **72300** | **Yes** | **137** | **22.63** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Chloride (ug/L) | MW-58Rox | 31800 | n/a | 11/20/2019 | 16700 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |

# Prediction Limit

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:35 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride (ug/L) | MW-59ox | 31800 | n/a | 11/19/2019 | 6850 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Chloride (ug/L) | MW-60ox | 31800 | n/a | 11/19/2019 | 29100 | No | 137 | 22.63 | n/a | 0.000... | NP Inter (normality) ... |
| Iron [total] (mg/L) | MW-53ox | 15 | n/a | 11/20/2019 | 2.17 | No | 134 | 70.15 | n/a | 0.000... | NP Inter (NDs) 1 of 2 |
| Manganese (ug/L) | MW-39ox | 1670 | n/a | 11/19/2019 | 93.4 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-42ox | 1670 | n/a | 11/19/2019 | 142 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-44ox | 1670 | n/a | 11/20/2019 | 1310 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-45ox | 1670 | n/a | 11/19/2019 | 184 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-53ox | 1670 | n/a | 11/20/2019 | 119 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese (ug/L)** | **MW-54ox** | **1670** | **n/a** | **11/19/2019** | **1920** | **Yes** | **132** | **21.21** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese (ug/L) | MW-57ox | 1670 | n/a | 11/19/2019 | 10 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese (ug/L)** | **MW-58Rox** | **1670** | **n/a** | **11/20/2019** | **2080** | **Yes** | **132** | **21.21** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese (ug/L) | MW-59ox | 1670 | n/a | 11/19/2019 | 890 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese (ug/L) | MW-60ox | 1670 | n/a | 11/19/2019 | 301 | No | 132 | 21.21 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-39ox | 797 | n/a | 11/19/2019 | 46.2 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-42ox | 797 | n/a | 11/19/2019 | 48.5 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-44ox | 797 | n/a | 11/20/2019 | 232 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| Manganese, Dissolved (ug/L) | MW-45ox | 797 | n/a | 11/19/2019 | 120 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **797** | **n/a** | **11/19/2019** | **2000** | **Yes** | **134** | **28.36** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese, Dissolved (ug/L) | MW-57ox | 797 | n/a | 11/19/2019 | 12.2 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **797** | **n/a** | **11/20/2019** | **1360** | **Yes** | **134** | **28.36** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| **Manganese, Dissolved (ug/L)** | **MW-59ox** | **797** | **n/a** | **11/19/2019** | **864** | **Yes** | **134** | **28.36** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Manganese, Dissolved (ug/L) | MW-60ox | 797 | n/a | 11/19/2019 | 392 | No | 134 | 28.36 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-13R | 17.8 | n/a | 11/20/2019 | 0.328 | No | 134 | 36.57 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-42ox | 17.8 | n/a | 11/19/2019 | 0.602 | No | 134 | 36.57 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-44ox | 17.8 | n/a | 11/20/2019 | 2.46 | No | 134 | 36.57 | n/a | 0.000... | NP Inter (normality) ... |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **17.8** | **n/a** | **11/20/2019** | **32.7** | **Yes** | **134** | **36.57** | **n/a** | **0.000...** | **NP Inter (normality) ...** |
| Nitrate Nitrite as N (mg/L) | MW-56ox | 17.8 | n/a | 11/19/2019 | 2.09 | No | 134 | 36.57 | n/a | 0.000... | NP Inter (normality) ... |
| Nitrate Nitrite as N (mg/L) | MW-58Rox | 17.8 | n/a | 11/20/2019 | 0.509 | No | 134 | 36.57 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-13R | 26600 | n/a | 11/20/2019 | 10300 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-39ox | 26600 | n/a | 11/19/2019 | 7360 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-42ox | 26600 | n/a | 11/19/2019 | 15500 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-44ox | 26600 | n/a | 11/20/2019 | 7000 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-45ox | 26600 | n/a | 11/19/2019 | 17300 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-47ox | 26600 | n/a | 11/19/2019 | 9100 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-48ox | 26600 | n/a | 11/18/2019 | 11400 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-53ox | 26600 | n/a | 11/20/2019 | 14100 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-54ox | 26600 | n/a | 11/19/2019 | 1490 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-56ox | 26600 | n/a | 11/19/2019 | 2430 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-57ox | 26600 | n/a | 11/19/2019 | 10100 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-58Rox | 26600 | n/a | 11/20/2019 | 5540 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-59ox | 26600 | n/a | 11/19/2019 | 20600 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Potassium (ug/L) | MW-60ox | 26600 | n/a | 11/19/2019 | 18200 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-13R | 129 | n/a | 11/20/2019 | 63.3 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-39ox | 129 | n/a | 11/19/2019 | 84.9 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-42ox | 129 | n/a | 11/19/2019 | 127 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-44ox | 129 | n/a | 11/20/2019 | 23.8 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-45ox | 129 | n/a | 11/19/2019 | 113 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-47ox | 129 | n/a | 11/19/2019 | 36.2 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-48ox | 129 | n/a | 11/18/2019 | 70.2 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-53ox | 129 | n/a | 11/20/2019 | 121 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |

# Prediction Limit

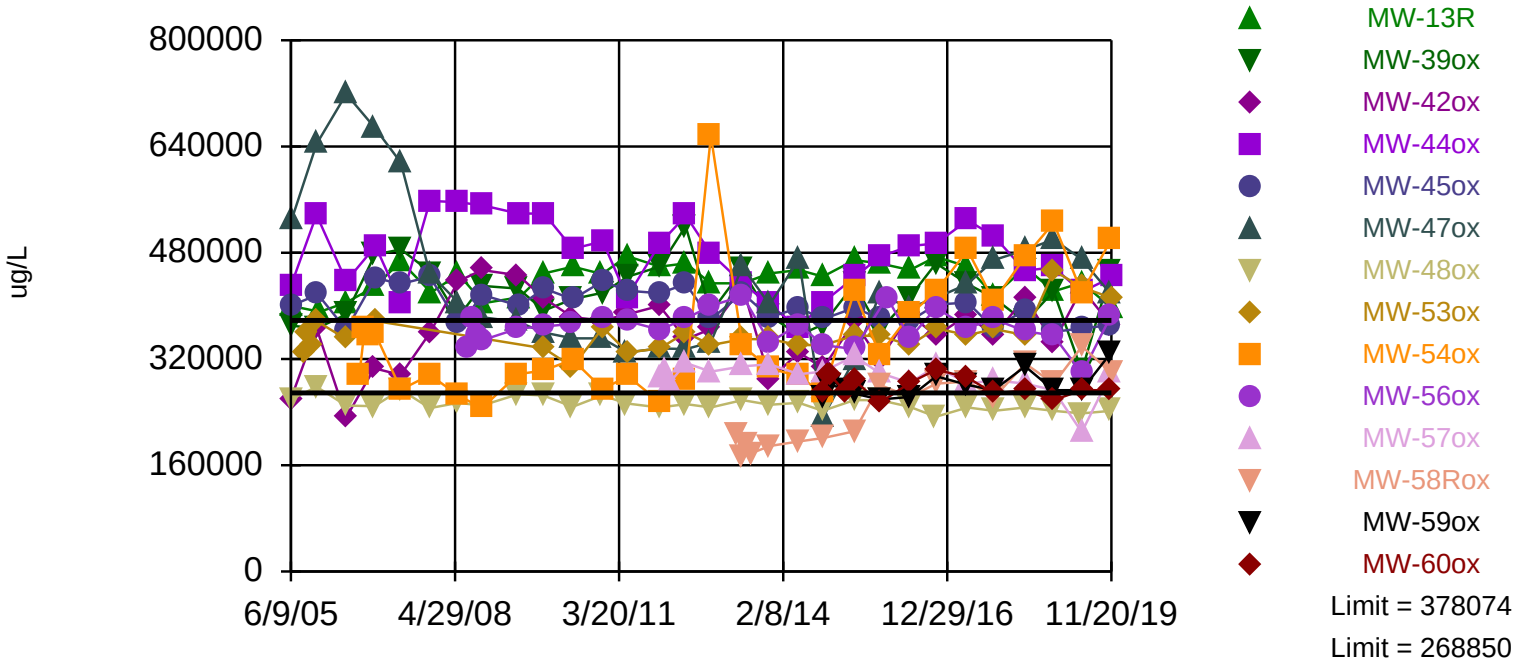
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:35 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium [total] (mg/L) | MW-54ox | 129 | n/a | 11/19/2019 | 87.9 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-56ox | 129 | n/a | 11/19/2019 | 37.5 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-57ox | 129 | n/a | 11/19/2019 | 108 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-58Rox | 129 | n/a | 11/20/2019 | 71.9 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-59ox | 129 | n/a | 11/19/2019 | 80.8 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sodium [total] (mg/L) | MW-60ox | 129 | n/a | 11/19/2019 | 111 | No | 128 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-13R | 2670000 | n/a | 11/20/2019 | 1500000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-39ox | 2670000 | n/a | 11/19/2019 | 1430000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-42ox | 2670000 | n/a | 11/19/2019 | 2510000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-44ox | 2670000 | n/a | 11/20/2019 | 627000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-45ox | 2670000 | n/a | 11/19/2019 | 2400000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-47ox | 2670000 | n/a | 11/19/2019 | 1080000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-48ox | 2670000 | n/a | 11/18/2019 | 1860000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-53ox | 2670000 | n/a | 11/20/2019 | 2210000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-54ox | 2670000 | n/a | 11/19/2019 | 817000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-56ox | 2670000 | n/a | 11/19/2019 | 1140000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-57ox | 2670000 | n/a | 11/19/2019 | 1920000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-58Rox | 2670000 | n/a | 11/20/2019 | 1200000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-59ox | 2670000 | n/a | 11/19/2019 | 1830000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| Sulfate (ug/L) | MW-60ox | 2670000 | n/a | 11/19/2019 | 1970000 | No | 134 | 0 | n/a | 0.000... | NP Inter (normality) ... |
| **Total Organic Carbon (ug/L)** | **MW-13R** | **2249** | **n/a** | **11/20/2019** | **2440** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **2249** | **n/a** | **11/19/2019** | **2590** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-42ox** | **2249** | **n/a** | **11/19/2019** | **3390** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-44ox | 2249 | n/a | 11/20/2019 | 1500 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |
| Total Organic Carbon (ug/L) | MW-45ox | 2249 | n/a | 11/19/2019 | 2170 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **2249** | **n/a** | **11/19/2019** | **2810** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-48ox | 2249 | n/a | 11/18/2019 | 2090 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **2249** | **n/a** | **11/20/2019** | **3350** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-54ox** | **2249** | **n/a** | **11/19/2019** | **3140** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-56ox | 2249 | n/a | 11/19/2019 | 1490 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **2249** | **n/a** | **11/19/2019** | **3290** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| **Total Organic Carbon (ug/L)** | **MW-58Rox** | **2249** | **n/a** | **11/20/2019** | **2870** | **Yes** | **131** | **1.527** | **No** | **0.01741** | **Param Inter 1 of 2** |
| Total Organic Carbon (ug/L) | MW-59ox | 2249 | n/a | 11/19/2019 | 1840 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |
| Total Organic Carbon (ug/L) | MW-60ox | 2249 | n/a | 11/19/2019 | 2230 | No | 131 | 1.527 | No | 0.01741 | Param Inter 1 of 2 |

Exceeds Limits: MW-13R, MW-39ox, MW-44ox, MW-47ox, MW-48ox, MW-53ox, MW-54ox, MW-56ox

# Prediction Limit

## Interwell Parametric




Background Data Summary (based on cube root transformation): Mean=68.43, Std. Dev.=3.415, n=132. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 13.15, critical = 14.07. Kappa = 1.137 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.008703. Comparing 14 points to limit.

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Pre

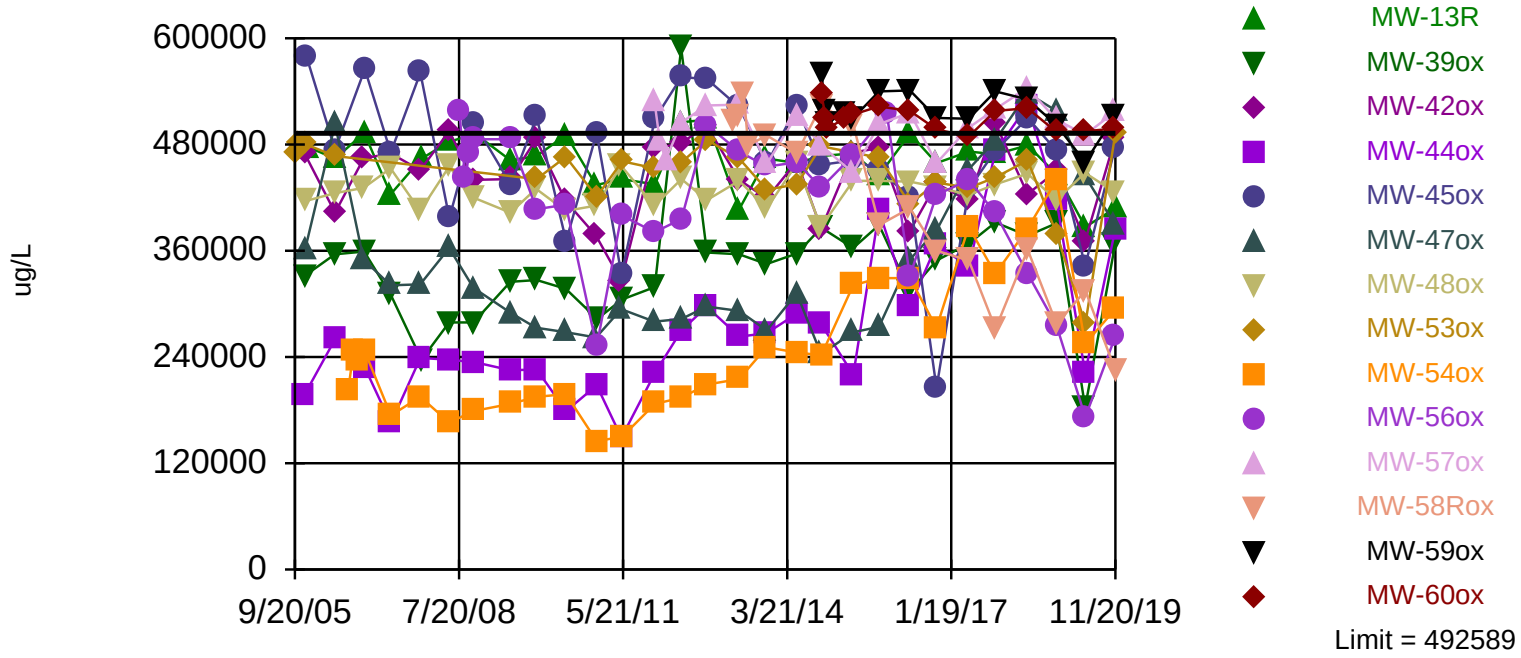
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Exceeds Limit: MW-53ox, MW-57ox, MW-59ox, MW-60ox

# Prediction Limit

## Interwell Parametric




Background Data Summary (based on square transformation): Mean=1.5e11, Std. Dev.=8.1e10, n=130. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 11.08, critical = 14.07. Kappa = 1.138 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.01741. Comparing 14 points to limit.

Constituent: Calcium Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

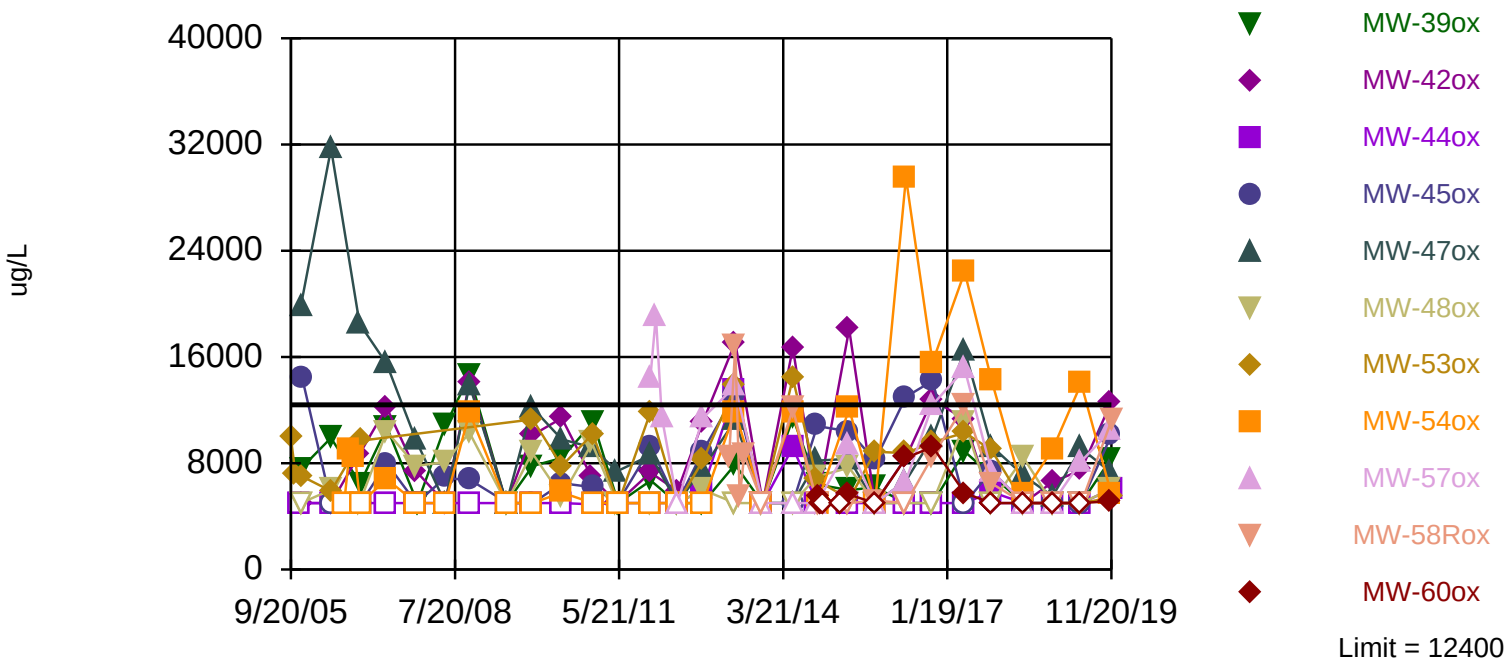
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-42ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 130 background values. 66.92% NDs. Annual per-constituent alpha = 0.0003528. Individual comparison alpha = 0.0001176 (1 of 2). Comparing 11 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell P

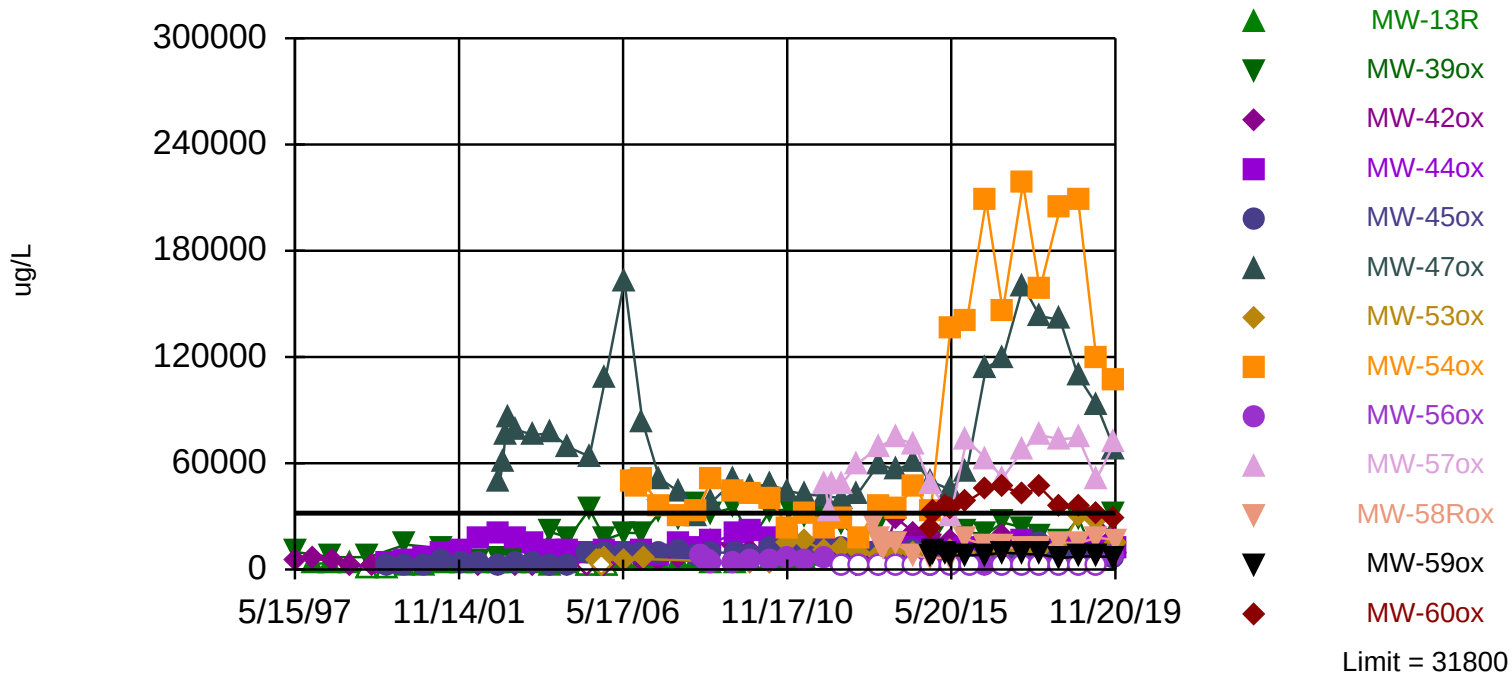
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-47ox, MW-54ox, MW-57ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 137 background values. 22.63% NDs. Annual per-constituent alpha = 0.0003155. Individual comparison alpha = 0.0001052 (1 of 2). Comparing 13 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Chloride Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

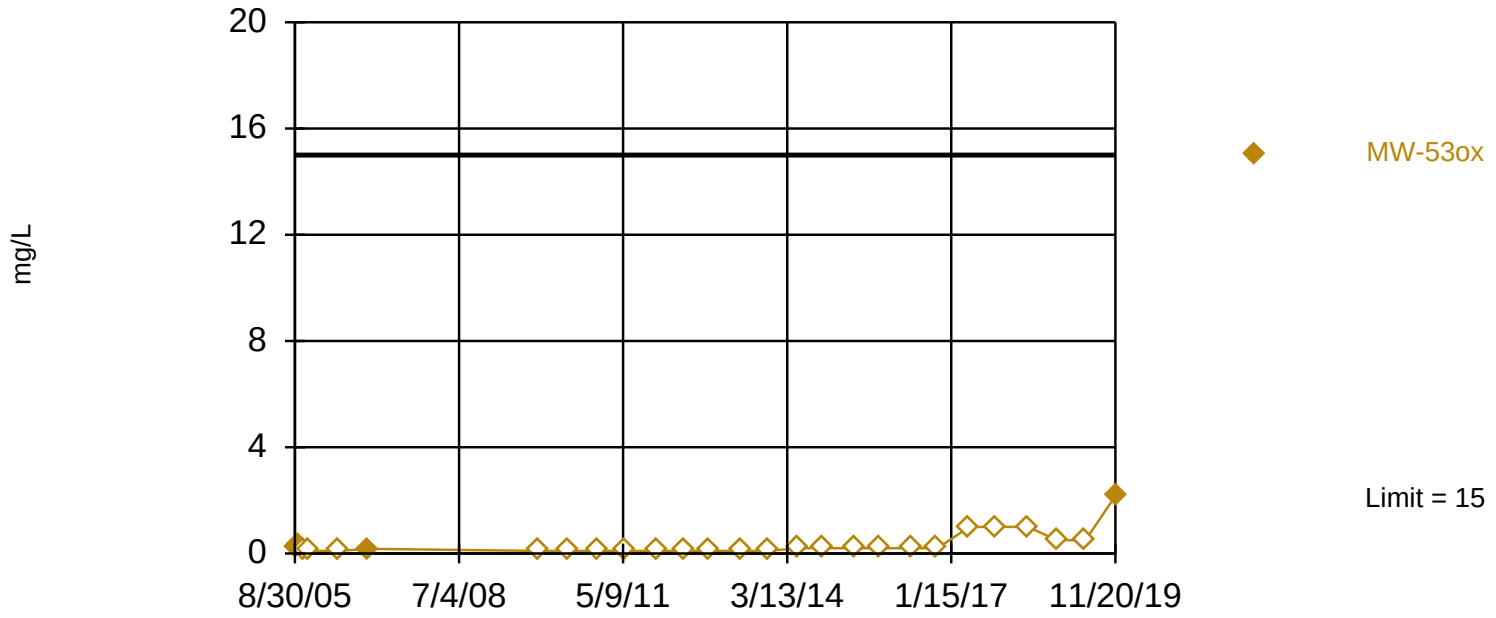
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 134 background values. 70.15% NDs. Annual per-constituent alpha = 0.0003315. Individual comparison alpha = 0.0001105 (1 of 2). Assumes 2 future values. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Iron [total] Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

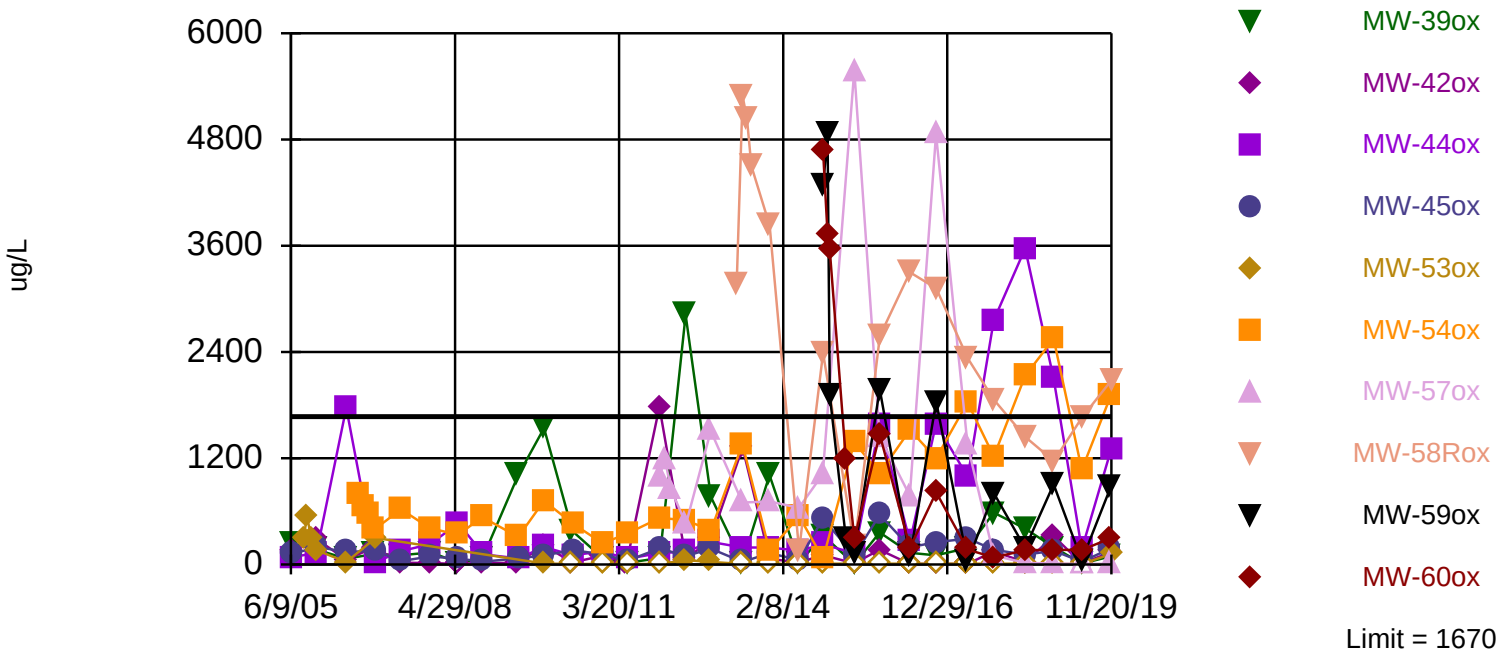
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-54ox, MW-58Rox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 132 background values. 21.21% NDs. Annual per-constituent alpha = 0.0003421. Individual comparison alpha = 0.0001141 (1 of 2). Comparing 10 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Manganese Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

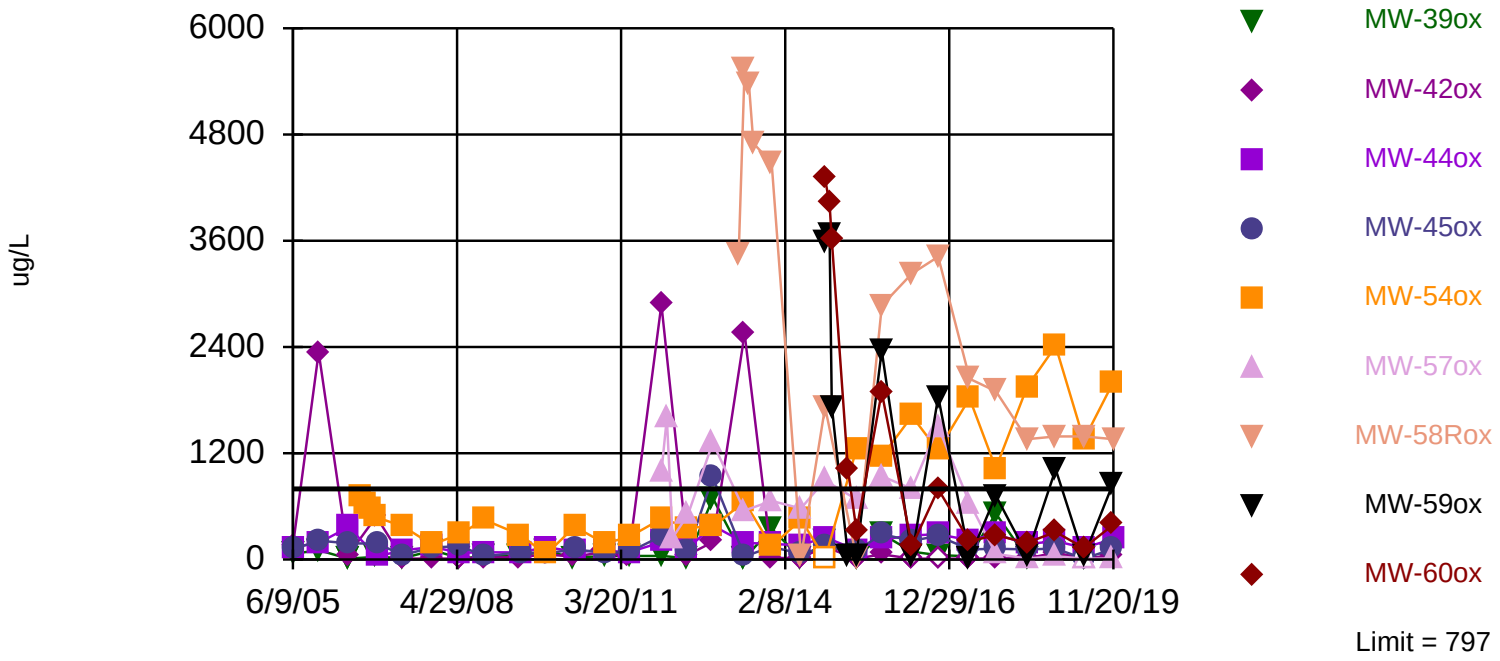
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-54ox, MW-58Rox, MW-59ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 134 background values. 28.36% NDs. Annual per-constituent alpha = 0.0003315. Individual comparison alpha = 0.0001105 (1 of 2). Comparing 9 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Predi

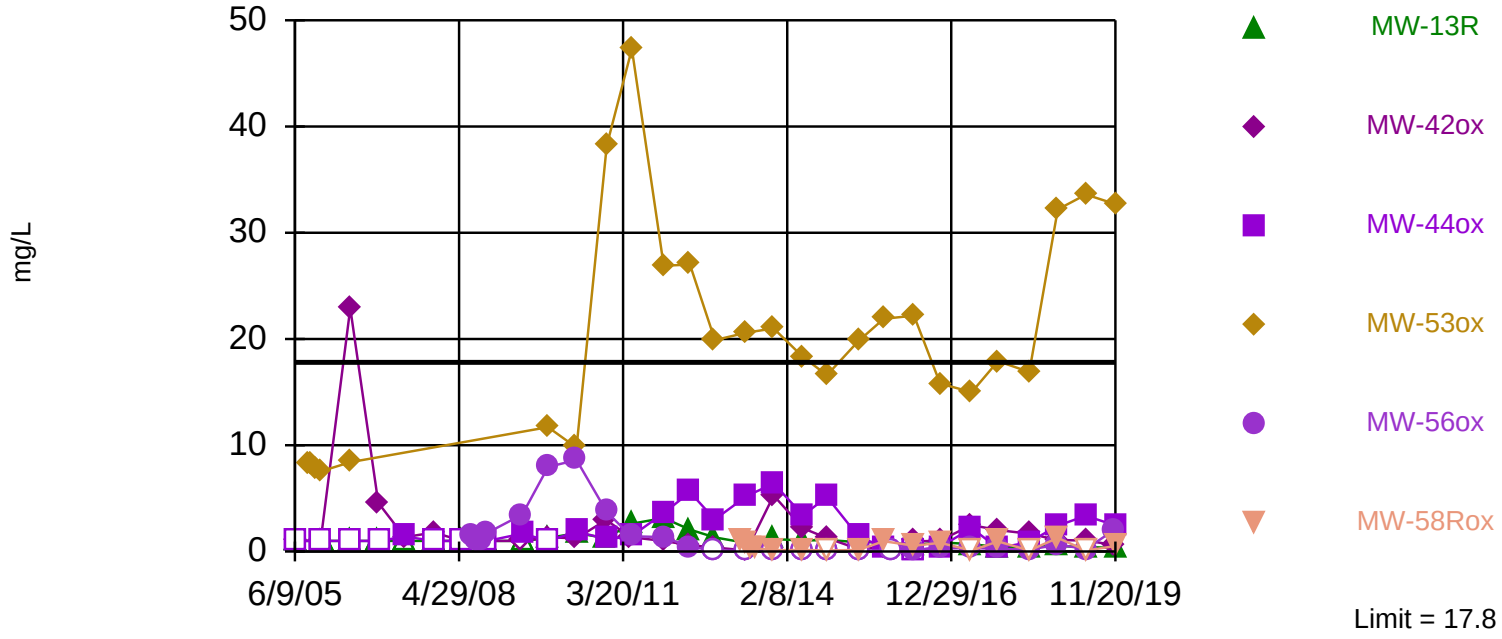
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-53ox

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 134 background values. 36.57% NDs. Annual per-constituent alpha = 0.0003315. Individual comparison alpha = 0.0001105 (1 of 2). Comparing 6 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction

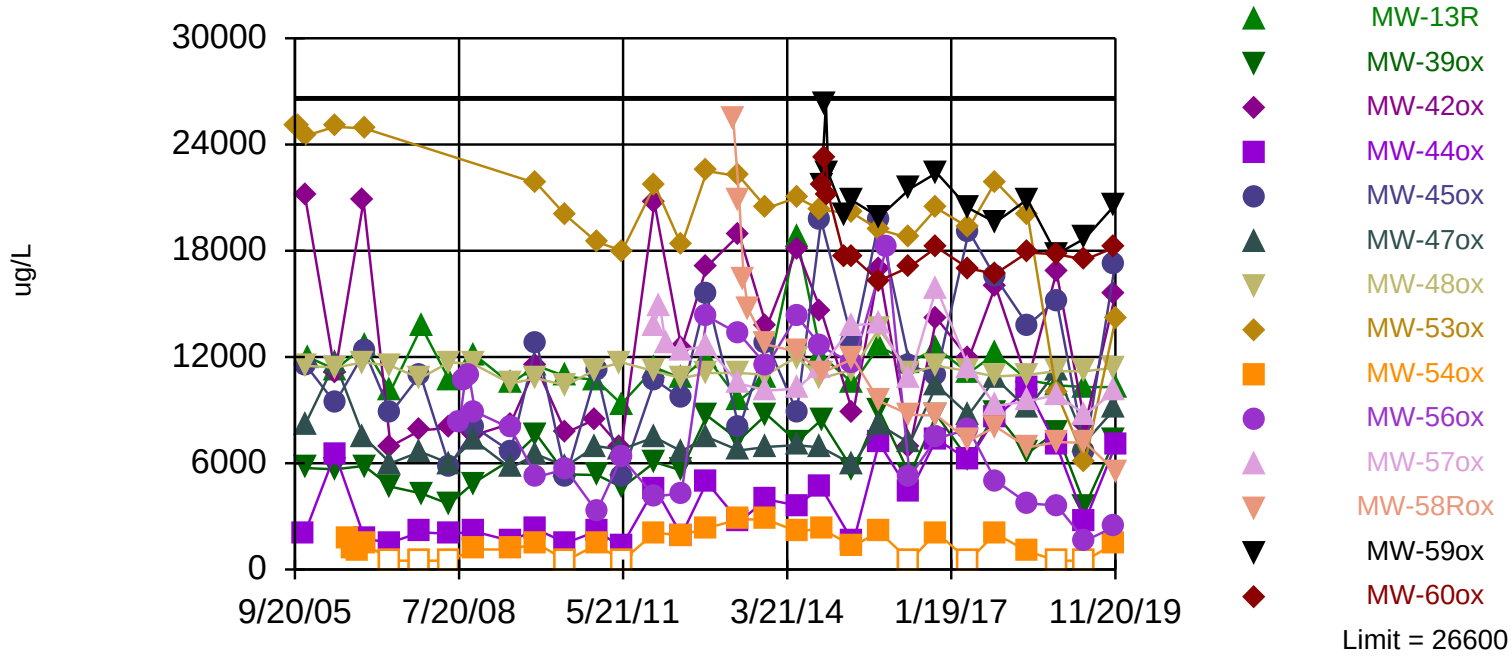
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 128 background values. Annual per-constituent alpha = 0.0003635. Individual comparison alpha = 0.0001212 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

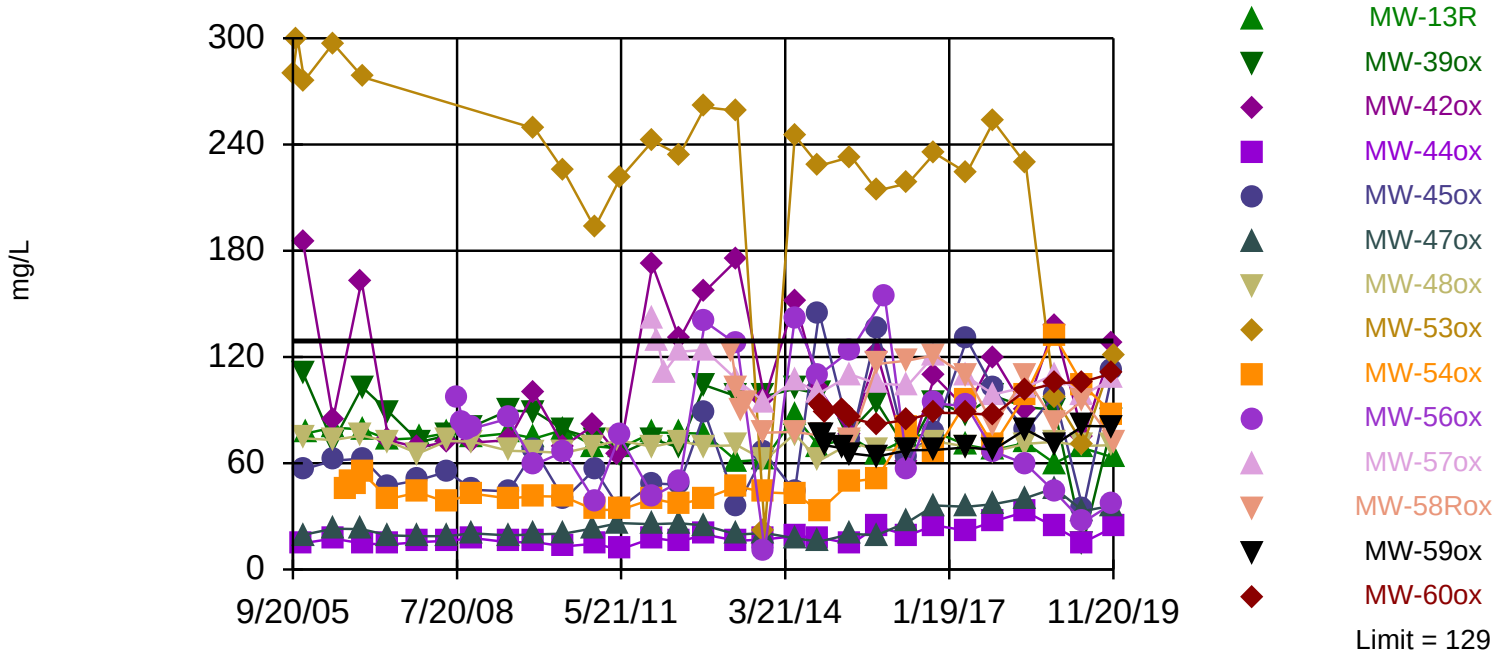
Constituent: Potassium Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 128 background values. Annual per-constituent alpha = 0.0003635. Individual comparison alpha = 0.0001212 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

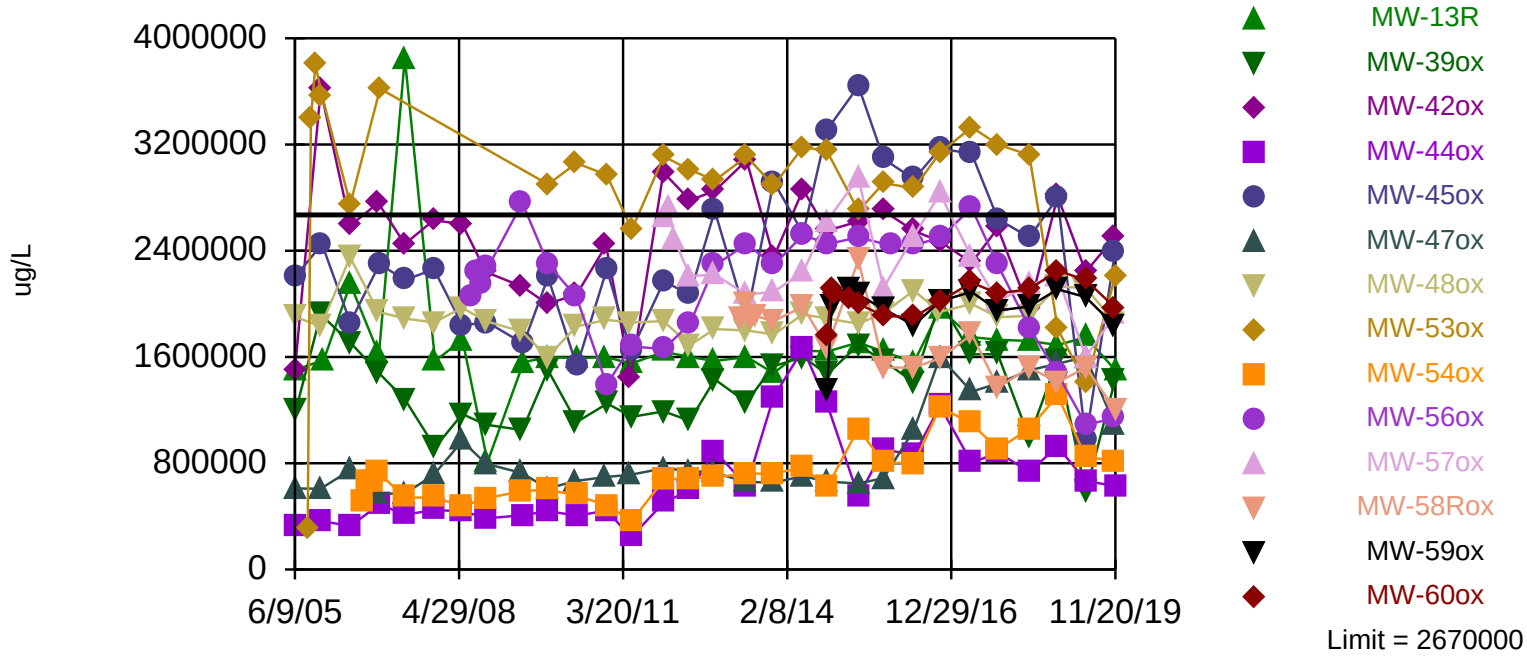
Constituent: Sodium [total] Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limi

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Within Limit

# Prediction Limit

## Interwell Non-parametric




Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 134 background values. Annual per-constituent alpha = 0.0003315. Individual comparison alpha = 0.0001105 (1 of 2). Comparing 14 points to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Sulfate Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Prediction Limits

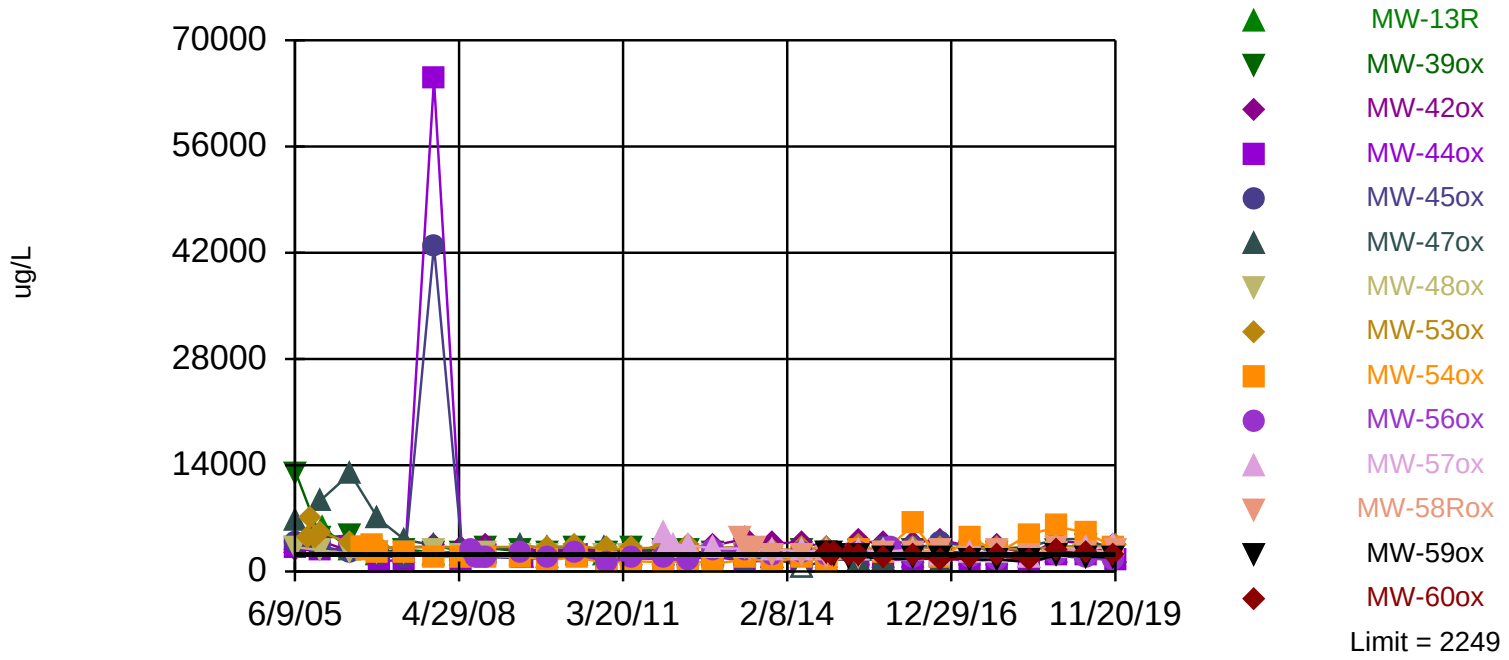
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

Exceeds Limit: MW-13R, MW-39ox, MW-42ox, MW-47ox, MW-53ox, MW-54ox, MW-57ox, MW-58Rox

# Prediction Limit

## Interwell Parametric




Background Data Summary: Mean=1778, Std. Dev.=413.7, n=131, 1.527% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Chi Squared @alpha = 0.01, calculated = 13.2, critical = 14.07. Kappa = 1.138 (c=2, w=3, 1 of 2, event alpha = 0.1). Report alpha = 0.05132. Individual comparison alpha = 0.01741. Comparing 14 points to limit.

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:31 AM View: Second Half - Interwell Predict

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

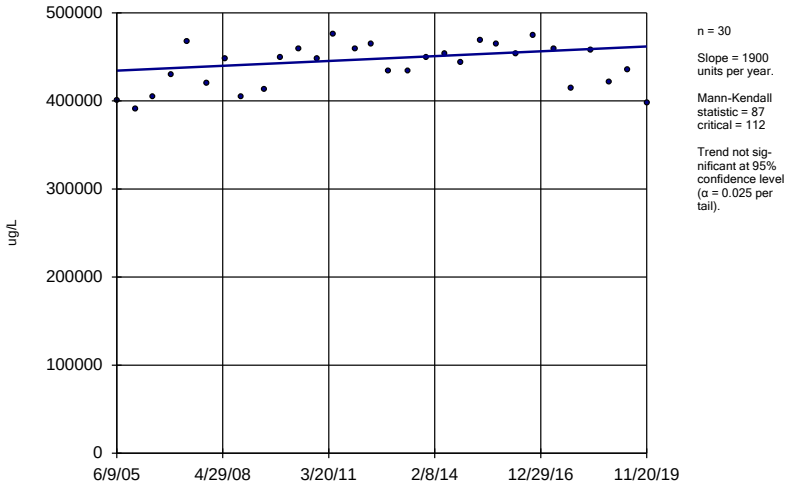
# Trend Test

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/17/2020, 10:41 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-13R | 1900 | 87 | 112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Alkalinity, Total [CaCO3] (ug/L) | MW-39ox | -919.2 | -20 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Alkalinity, Total [CaCO3] (ug/L) | MW-44ox | -4290 | -88 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| Alkalinity, Total [CaCO3] (ug/L) | MW-47ox | -5088 | -40 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-48ox** | **-1271** | **-194** | **-112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-53ox** | **2535** | **121** | **96** | **Yes** | **27** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Alkalinity, Total [CaCO3] (ug/L)** | **MW-54ox** | **11702** | **173** | **112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Alkalinity, Total [CaCO3] (ug/L) | MW-56ox | 266.2 | 6 | 90 | No | 26 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-53ox | -2995 | -85 | -85 | No | 25 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-57ox | 1089 | 9 | 58 | No | 19 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-59ox | -4056 | -27 | -37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| Calcium (ug/L) | MW-60ox | -3125 | -23 | -37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| Chemical Oxygen Demand (ug/L) | MW-42ox | 0 | 33 | 106 | No | 29 | 31.03 | n/a | n/a | 0.05 | NP |
| Chloride (ug/L) | MW-47ox | 1008 | 54 | 158 | No | 38 | 0 | n/a | n/a | 0.05 | NP |
| **Chloride (ug/L)** | **MW-54ox** | **7828** | **127** | **112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Chloride (ug/L)** | **MW-57ox** | **2504** | **71** | **58** | **Yes** | **19** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-54ox** | **82.87** | **151** | **112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese (ug/L)** | **MW-58Rox** | **-437.2** | **-64** | **-49** | **Yes** | **17** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **95.17** | **156** | **112** | **Yes** | **30** | **3.333** | **n/a** | **n/a** | **0.05** | **NP** |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **-526.8** | **-68** | **-49** | **Yes** | **17** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Manganese, Dissolved (ug/L) | MW-59ox | -366.7 | -29 | -37 | No | 14 | 0 | n/a | n/a | 0.05 | NP |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **0.941** | **111** | **90** | **Yes** | **26** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-13R | -15.43 | -80 | -112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **-42.89** | **-139** | **-112** | **Yes** | **30** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-42ox | 55.71 | 112 | 112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **-243.5** | **-157** | **-112** | **Yes** | **30** | **3.333** | **n/a** | **n/a** | **0.05** | **NP** |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **-43.13** | **-106** | **-96** | **Yes** | **27** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-54ox | 54.33 | 41 | 112 | No | 30 | 0 | n/a | n/a | 0.05 | NP |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **-163.3** | **-79** | **-58** | **Yes** | **19** | **0** | **n/a** | **n/a** | **0.05** | **NP** |
| Total Organic Carbon (ug/L) | MW-58Rox | -15.79 | -8 | -49 | No | 17 | 0 | n/a | n/a | 0.05 | NP |

## Sen's Slope Estimator

MW-13R




n = 30

Slope = 1900 units per year.

Mann-Kendall statistic = 87 critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

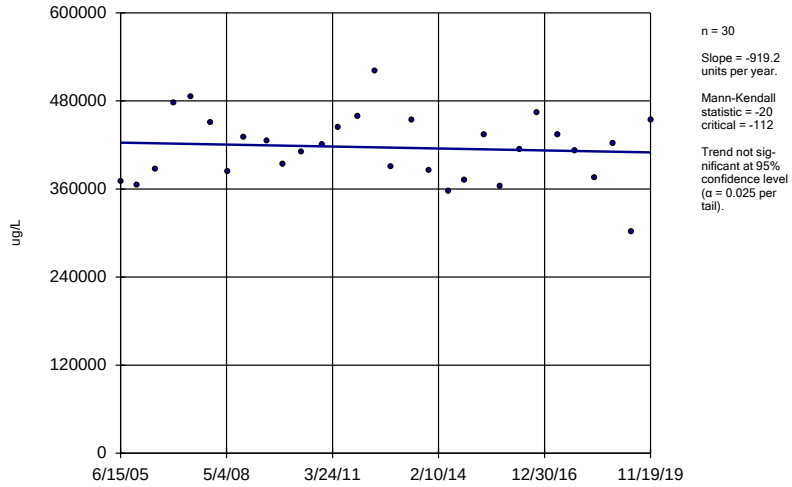
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-39ox




n = 30

Slope = -919.2 units per year.

Mann-Kendall statistic = -20 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

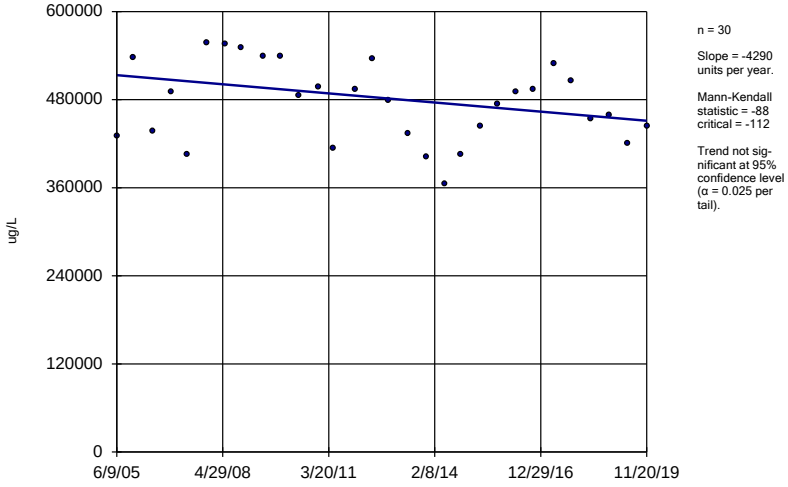
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-44ox




n = 30

Slope = -4290 units per year.

Mann-Kendall statistic = -88 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

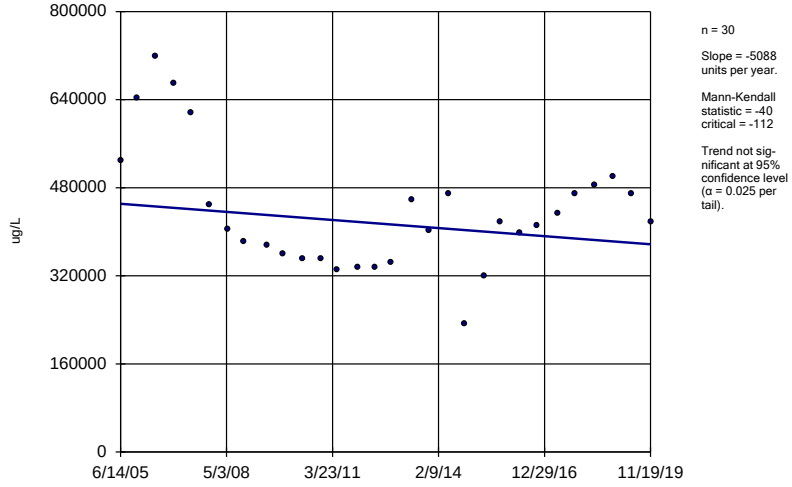
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-47ox




n = 30

Slope = -5088 units per year.

Mann-Kendall statistic = -40 critical = -112

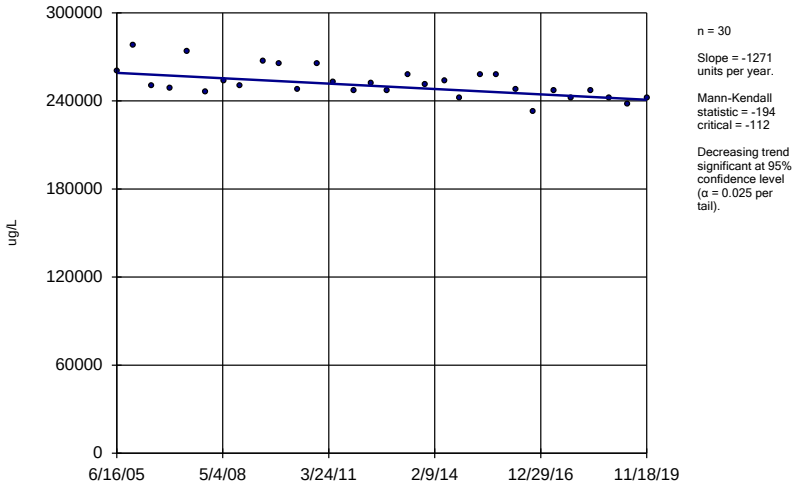
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-48ox




n = 30

Slope = -1271 units per year.

Mann-Kendall statistic = -194 critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

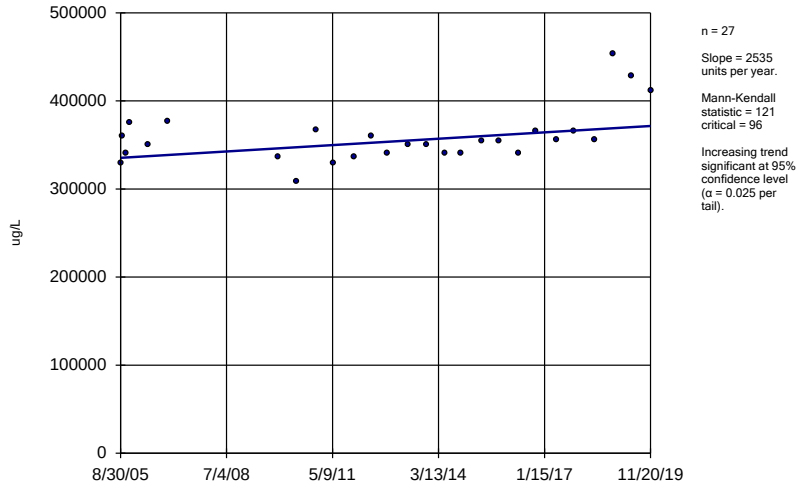
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-53ox




n = 27

Slope = 2535 units per year.

Mann-Kendall statistic = 121 critical = 96

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

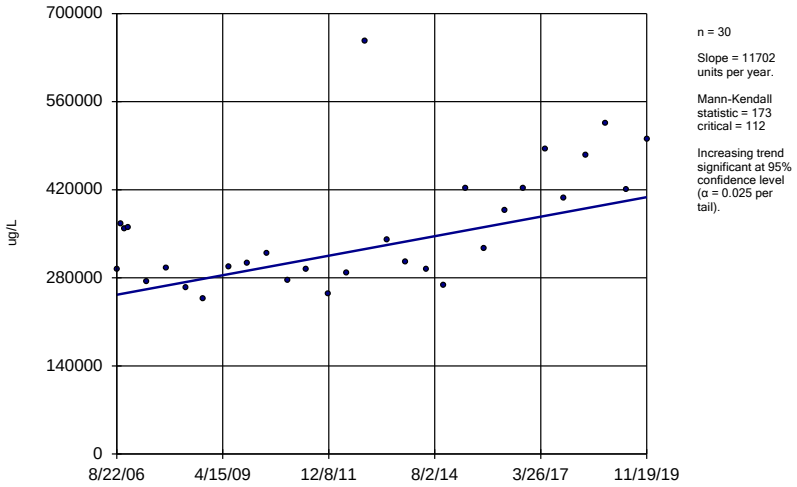
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 30

Slope = 11702 units per year.

Mann-Kendall statistic = 173 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

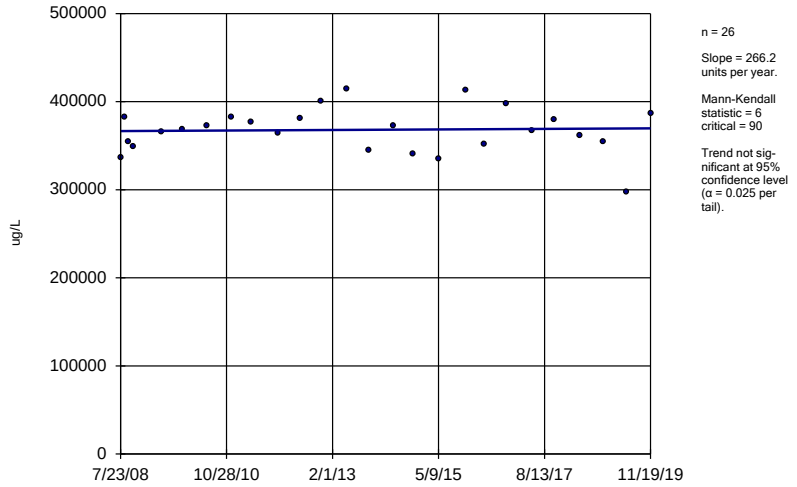
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-56ox




n = 26

Slope = 266.2 units per year.

Mann-Kendall statistic = 6 critical = 90

Trend not significant at 95% confidence level (α = 0.025 per tail).

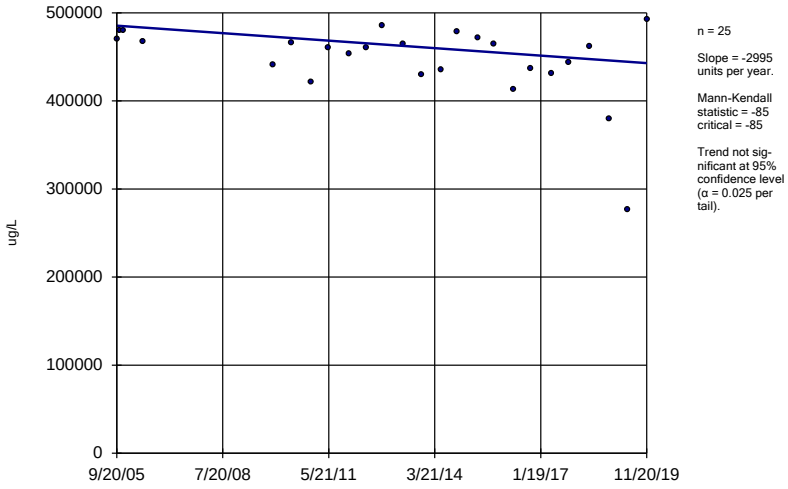
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedance

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-53ox




n = 25

Slope = -2995 units per year.

Mann-Kendall statistic = -85 critical = -85

Trend not significant at 95% confidence level (α = 0.025 per tail).

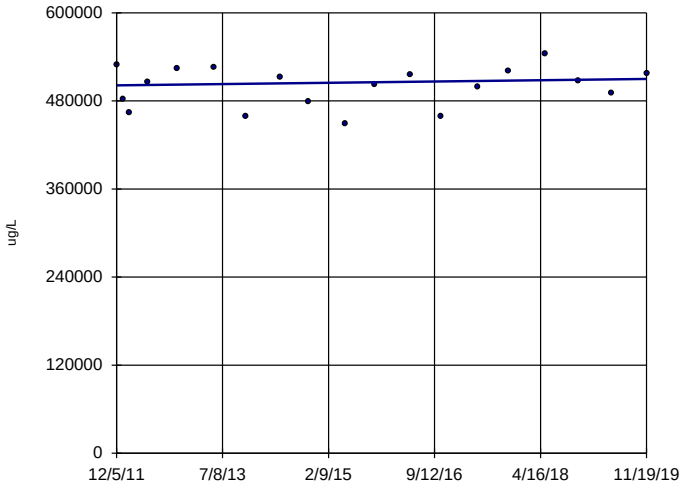
Constituent: Calcium Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-57ox




n = 19

Slope = 1089 units per year.

Mann-Kendall statistic = 9 critical = 58

Trend not significant at 95% confidence level (α = 0.025 per tail).

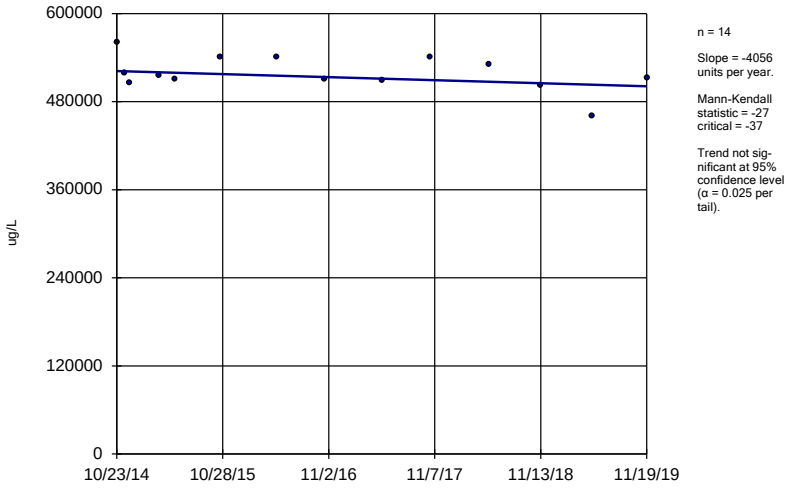
Constituent: Calcium Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-59ox




n = 14

Slope = -4056 units per year.

Mann-Kendall statistic = -27 critical = -37

Trend not significant at 95% confidence level (α = 0.025 per tail).

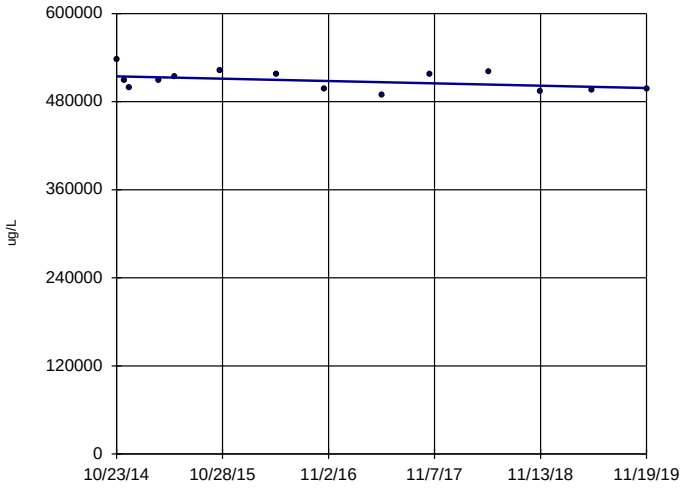
Constituent: Calcium Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-60ox




n = 14

Slope = -3125 units per year.

Mann-Kendall statistic = -23 critical = -37

Trend not significant at 95% confidence level (α = 0.025 per tail).

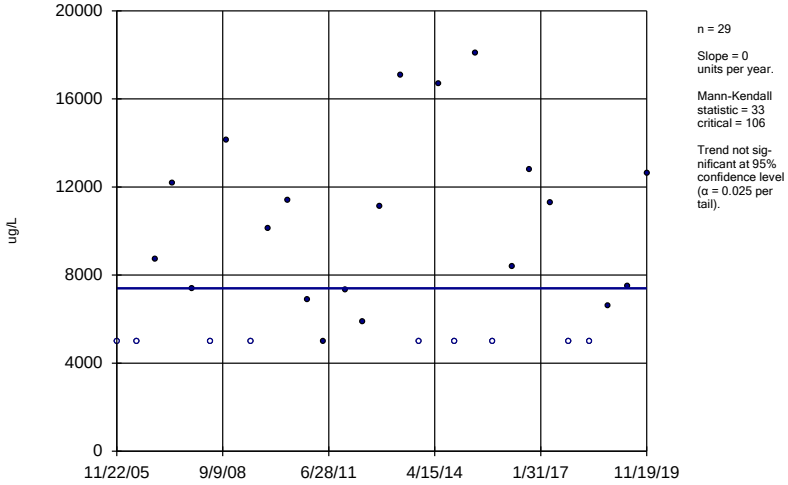
Constituent: Calcium Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-42ox




n = 29

Slope = 0 units per year.

Mann-Kendall statistic = 33 critical = 106

Trend not significant at 95% confidence level (α = 0.025 per tail).

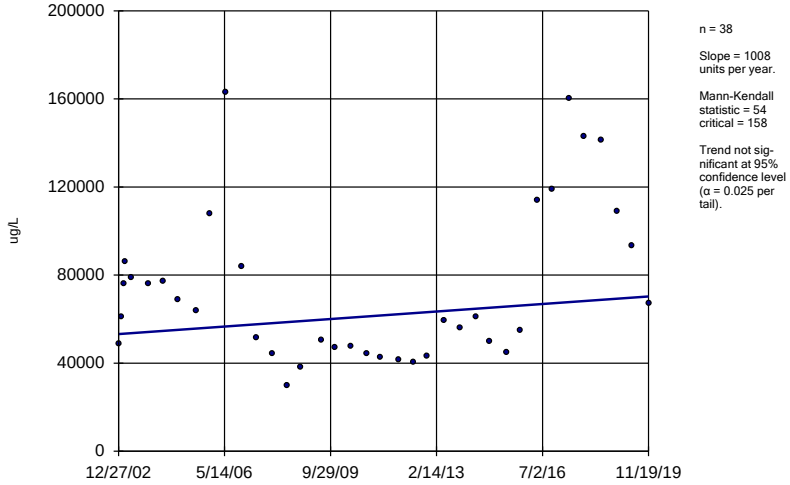
Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedan

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-47ox




n = 38

Slope = 1008 units per year.

Mann-Kendall statistic = 54 critical = 158

Trend not significant at 95% confidence level (α = 0.025 per tail).

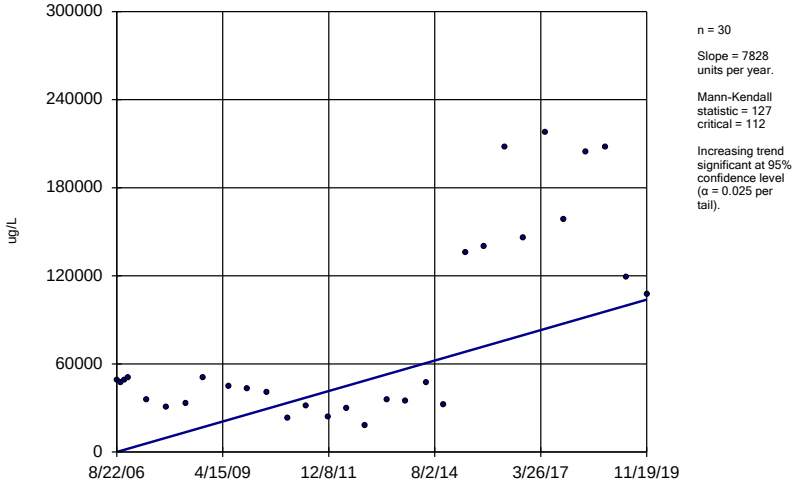
Constituent: Chloride Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 30

Slope = 7828 units per year.

Mann-Kendall statistic = 127 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

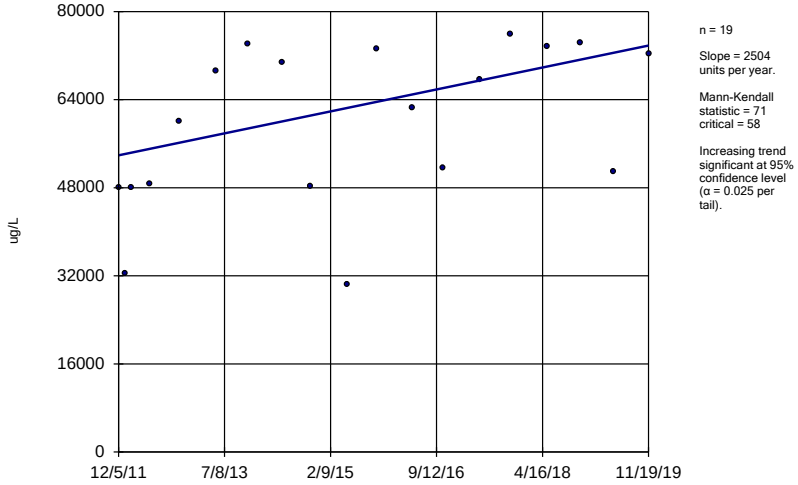
Constituent: Chloride Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-57ox




n = 19

Slope = 2504 units per year.

Mann-Kendall statistic = 71 critical = 58

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

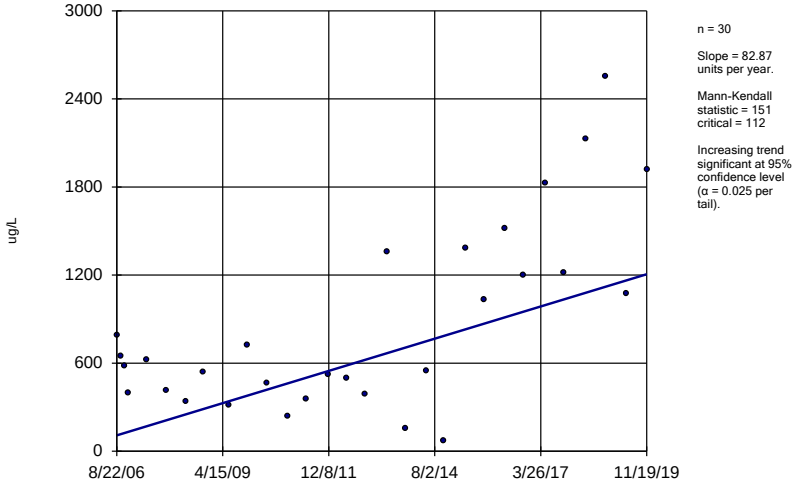
Constituent: Chloride Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 30

Slope = 82.87 units per year.

Mann-Kendall statistic = 151 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

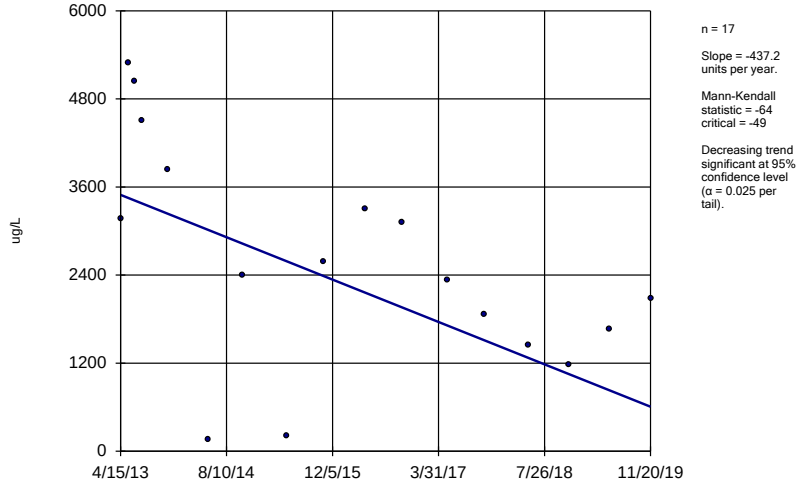
Constituent: Manganese Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-58Rox




n = 17

Slope = -437.2 units per year.

Mann-Kendall statistic = -64 critical = -49

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Manganese Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

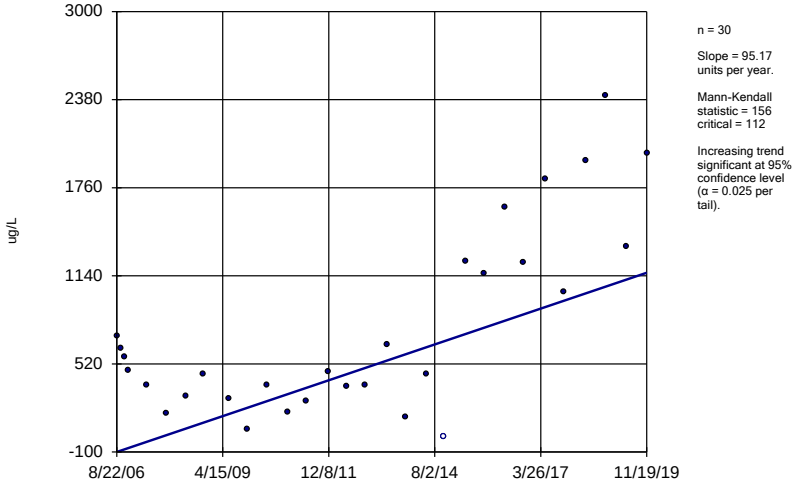
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-54ox




n = 30

Slope = 95.17 units per year.

Mann-Kendall statistic = 156 critical = 112

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

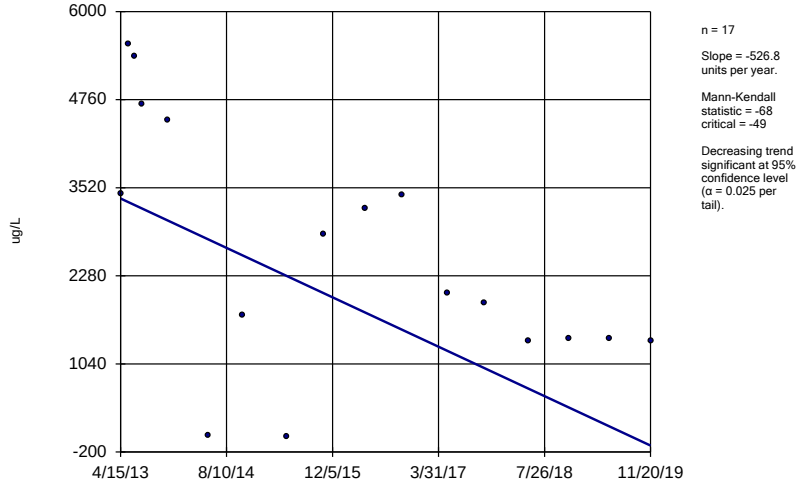
Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-58Rox




n = 17

Slope = -526.8 units per year.

Mann-Kendall statistic = -68 critical = -49

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

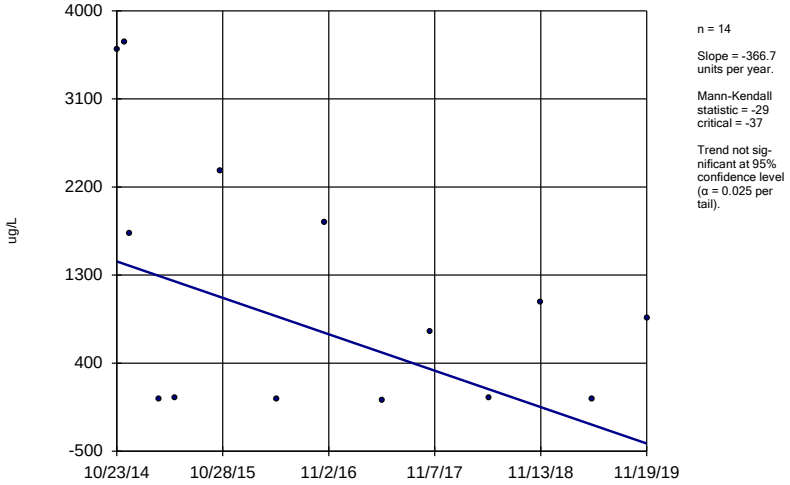
Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-59ox




n = 14

Slope = -366.7 units per year.

Mann-Kendall statistic = -29 critical = -37

Trend not significant at 95% confidence level (α = 0.025 per tail).

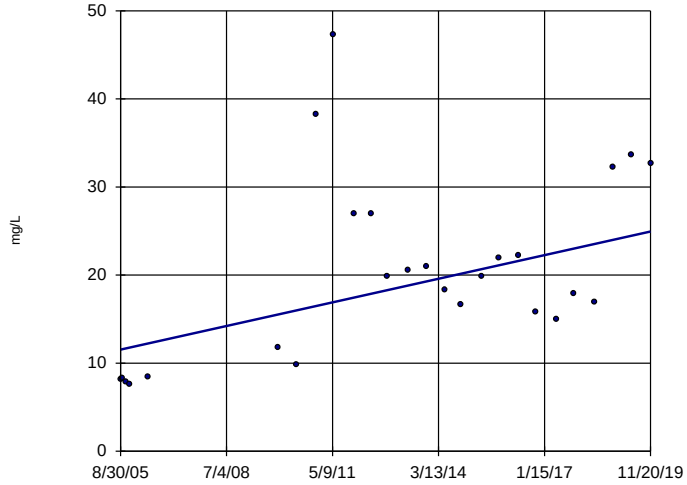
Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:39 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-53ox




n = 26

Slope = 0.941 units per year.

Mann-Kendall statistic = 111 critical = 90

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

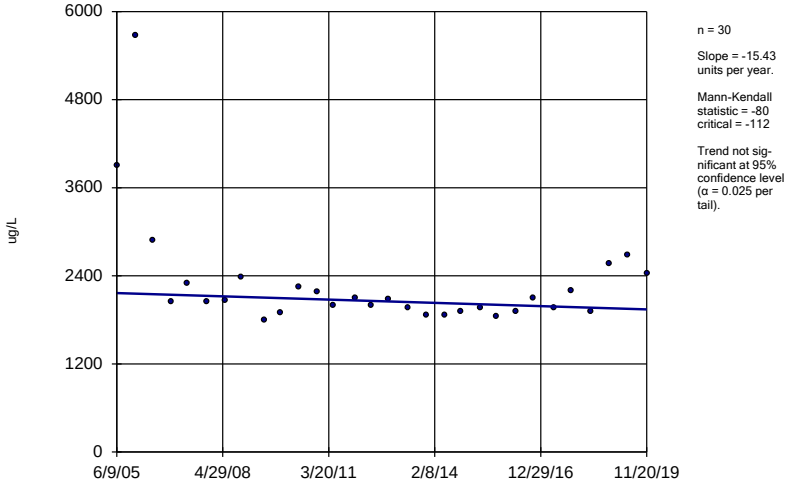
Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-13R




n = 30

Slope = -15.43 units per year.

Mann-Kendall statistic = -80 critical = -112

Trend not significant at 95% confidence level (α = 0.025 per tail).

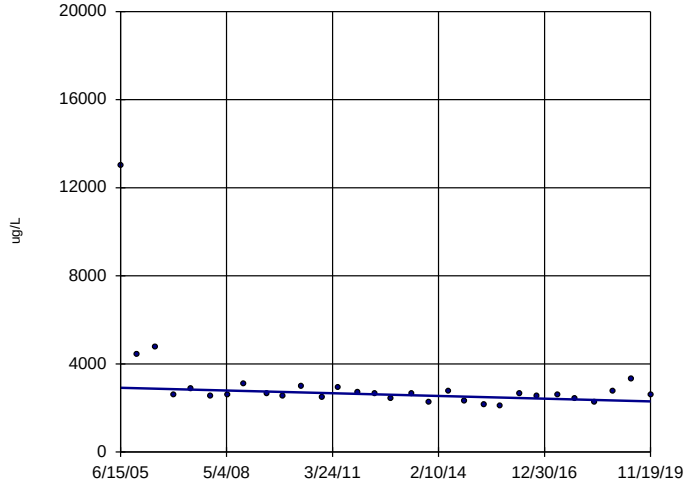
Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-39ox




n = 30

Slope = -42.89 units per year.

Mann-Kendall statistic = -139 critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

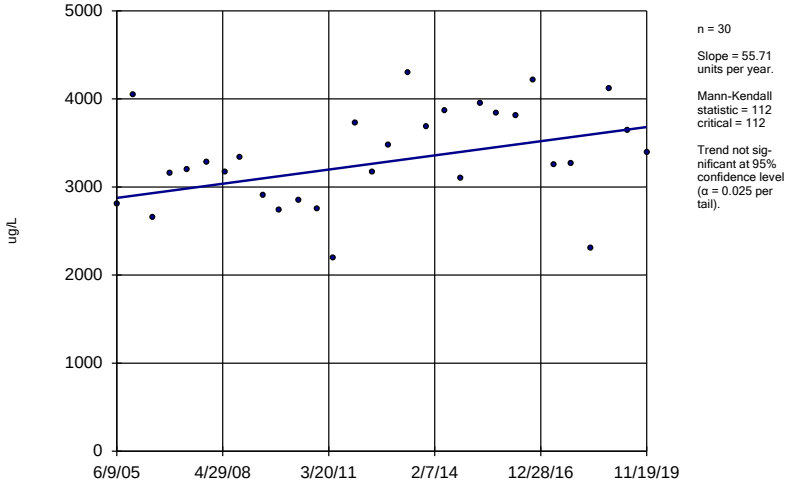
Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-42ox




n = 30

Slope = 55.71 units per year.

Mann-Kendall statistic = 112 critical = 112

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

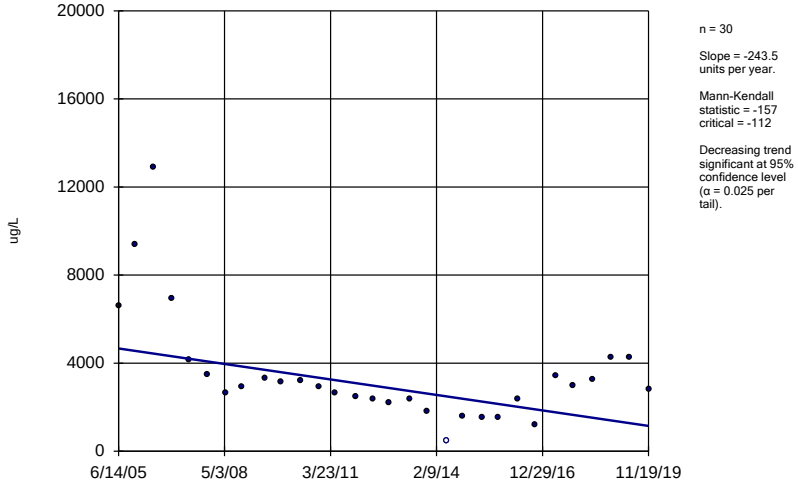
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-47ox




n = 30

Slope = -243.5 units per year.

Mann-Kendall statistic = -157 critical = -112

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

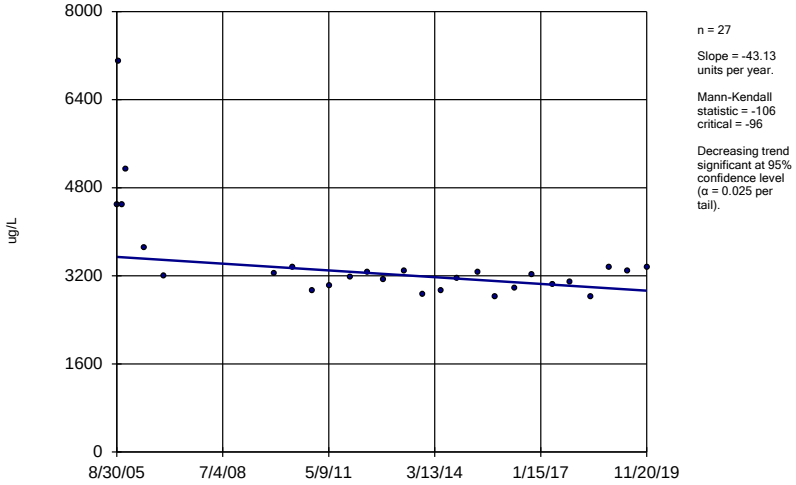
Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-53ox




n = 27

Slope = -43.13 units per year.

Mann-Kendall statistic = -106 critical = -96

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

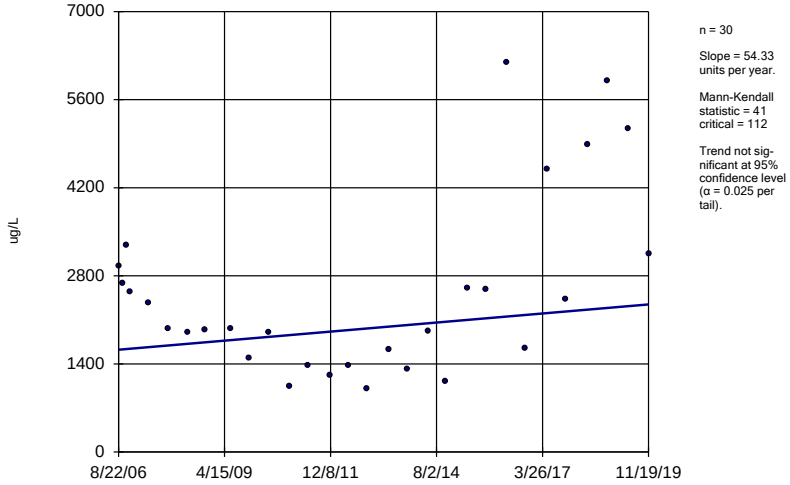
Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Sen's Slope Estimator

MW-54ox




n = 30

Slope = 54.33 units per year.

Mann-Kendall statistic = 41 critical = 112

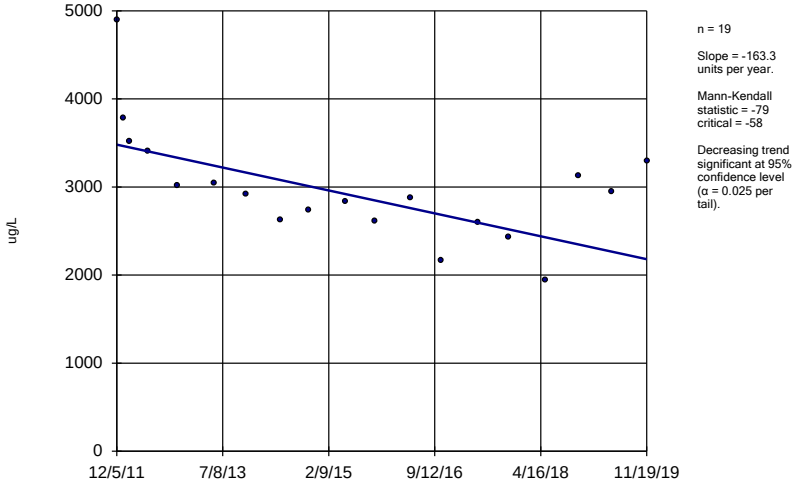
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Sen's Slope Estimator

MW-57ox




n = 19

Slope = -163.3 units per year.

Mann-Kendall statistic = -79 critical = -58

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

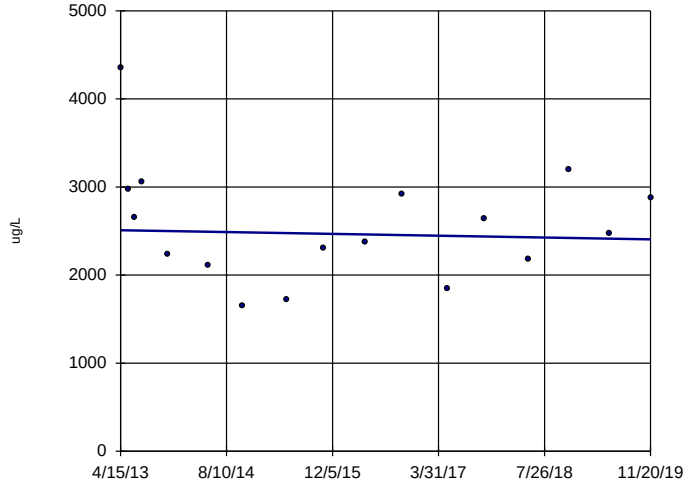
Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Sen's Slope Estimator

MW-58Rox




n = 17

Slope = -15.79 units per year.

Mann-Kendall statistic = -8 critical = -49

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:40 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Confidence Interval

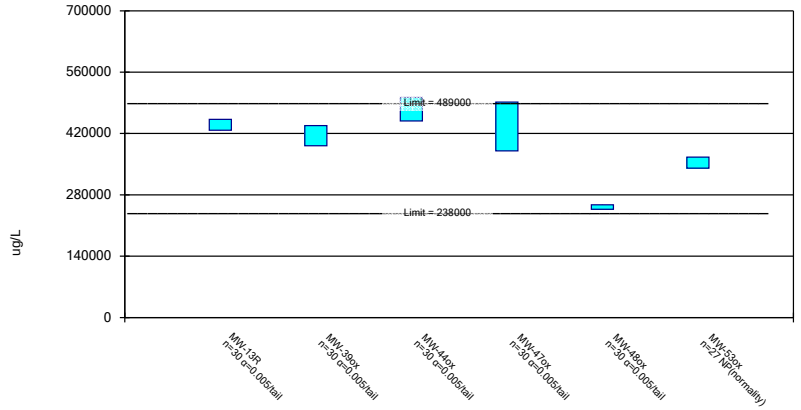
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master Printed 2/17/2020, 10:44 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Compliance | Sig. | N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total [CaCO3] (ug/L) | MW-13R | 452260 | 427273 | 489000 | No | 30 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-39ox | 437978 | 391889 | 489000 | No | 30 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-44ox | 502280 | 448653 | 489000 | No | 30 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-47ox | 491756 | 380244 | 489000 | No | 30 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-48ox | 257324 | 247009 | 489000 | No | 30 | 0 | No | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-53ox | 366000 | 341000 | 489000 | No | 27 | 0 | No | 0.01 | NP (normality) |
| Alkalinity, Total [CaCO3] (ug/L) | MW-54ox | 398678 | 307702 | 489000 | No | 30 | 0 | sqrt(x) | 0.005 | Param. |
| Alkalinity, Total [CaCO3] (ug/L) | MW-56ox | 381489 | 353280 | 489000 | No | 26 | 0 | No | 0.005 | Param. |
| **Calcium (ug/L)** | **MW-53ox** | **466740** | **434867** | **371821** | **Yes** | **25** | **0** | **x^4** | **0.01** | **Param.** |
| **Calcium (ug/L)** | **MW-57ox** | **515198** | **483118** | **371821** | **Yes** | **19** | **0** | **No** | **0.01** | **Param.** |
| **Calcium (ug/L)** | **MW-59ox** | **535250** | **501321** | **371821** | **Yes** | **14** | **0** | **No** | **0.01** | **Param.** |
| **Calcium (ug/L)** | **MW-60ox** | **518456** | **498830** | **371821** | **Yes** | **14** | **0** | **No** | **0.01** | **Param.** |
| **Chemical Oxygen Demand (ug/L)** | **MW-42ox** | **11400** | **5000** | **4152** | **Yes** | **29** | **31.03** | **No** | **0.01** | **NP (normality)** |
| **Chloride (ug/L)** | **MW-47ox** | **81554** | **57005** | **8161** | **Yes** | **38** | **0** | **x^(1/3)** | **0.01** | **Param.** |
| **Chloride (ug/L)** | **MW-54ox** | **119000** | **34700** | **8161** | **Yes** | **30** | **0** | **No** | **0.01** | **NP (normality)** |
| **Chloride (ug/L)** | **MW-57ox** | **73600** | **48100** | **8161** | **Yes** | **19** | **0** | **No** | **0.01** | **NP (normality)** |
| **Manganese (ug/L)** | **MW-54ox** | **1034** | **518.9** | **133.3** | **Yes** | **30** | **0** | **sqrt(x)** | **0.01** | **Param.** |
| **Manganese (ug/L)** | **MW-58Rox** | **3539** | **1651** | **133.3** | **Yes** | **17** | **0** | **No** | **0.01** | **Param.** |
| **Manganese, Dissolved (ug/L)** | **MW-54ox** | **930.4** | **396.6** | **94.05** | **Yes** | **30** | **3.333** | **sqrt(x)** | **0.01** | **Param.** |
| **Manganese, Dissolved (ug/L)** | **MW-58Rox** | **3677** | **1531** | **94.05** | **Yes** | **17** | **0** | **No** | **0.01** | **Param.** |
| Manganese, Dissolved (ug/L) | MW-59ox | 2360 | 36.8 | 94.05 | No | 14 | 0 | No | 0.01 | NP (normality) |
| **Nitrate Nitrite as N (mg/L)** | **MW-53ox** | **25.22** | **15.21** | **4.247** | **Yes** | **26** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-13R** | **2240** | **1920** | **1778** | **Yes** | **30** | **0** | **No** | **0.01** | **NP (normality)** |
| **Total Organic Carbon (ug/L)** | **MW-39ox** | **2760** | **2460** | **1778** | **Yes** | **30** | **0** | **No** | **0.01** | **NP (normality)** |
| **Total Organic Carbon (ug/L)** | **MW-42ox** | **3586** | **3093** | **1778** | **Yes** | **30** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-47ox** | **4050** | **2300** | **1778** | **Yes** | **30** | **3.333** | **x^(1/3)** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-53ox** | **3350** | **3010** | **1778** | **Yes** | **27** | **0** | **No** | **0.01** | **NP (normality)** |
| **Total Organic Carbon (ug/L)** | **MW-54ox** | **2975** | **1831** | **1778** | **Yes** | **30** | **0** | **sqrt(x)** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-57ox** | **3365** | **2611** | **1778** | **Yes** | **19** | **0** | **No** | **0.01** | **Param.** |
| **Total Organic Carbon (ug/L)** | **MW-58Rox** | **2971** | **2150** | **1778** | **Yes** | **17** | **0** | **No** | **0.01** | **Param.** |

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

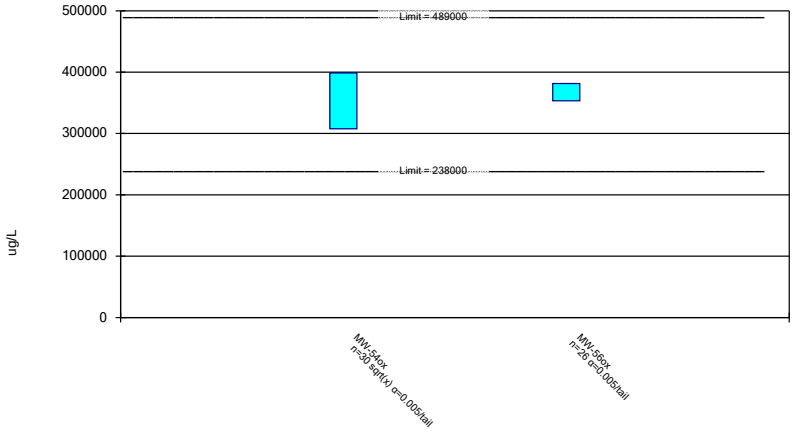



Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedance
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.

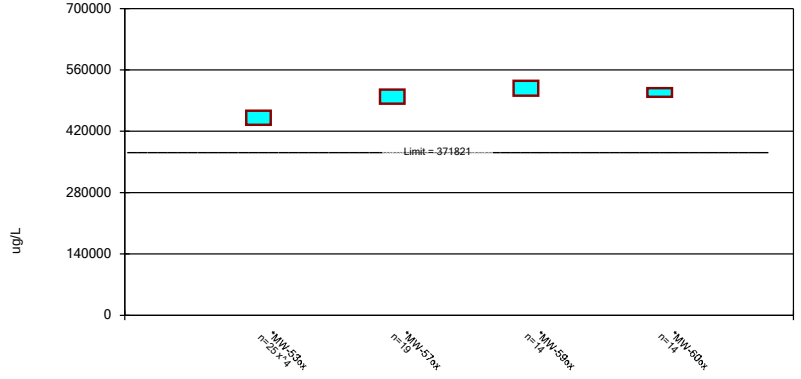



Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedance
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

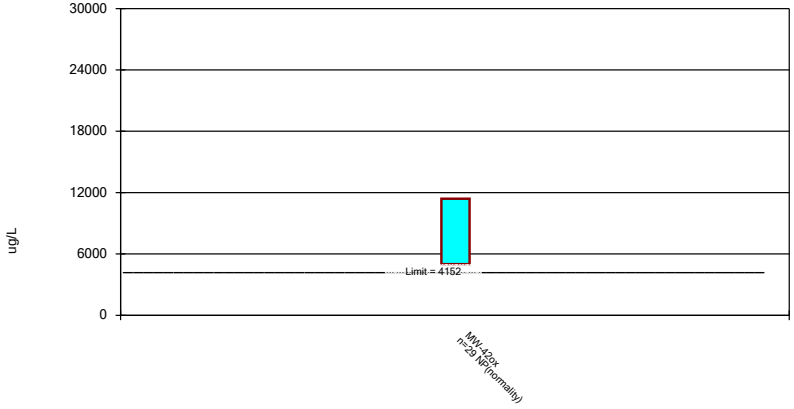



Constituent: Calcium Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Non-Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01.

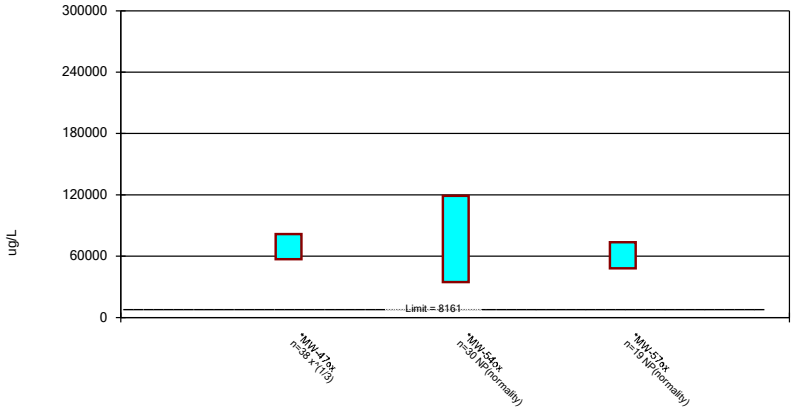



Constituent: Chemical Oxygen Demand Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedan
Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



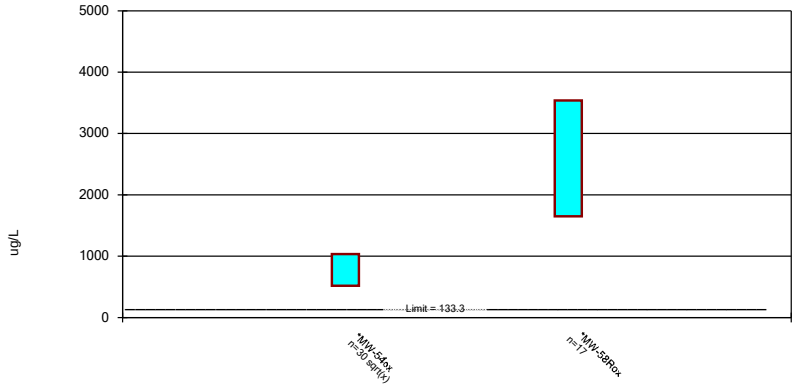

Constituent: Chloride Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG

## Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



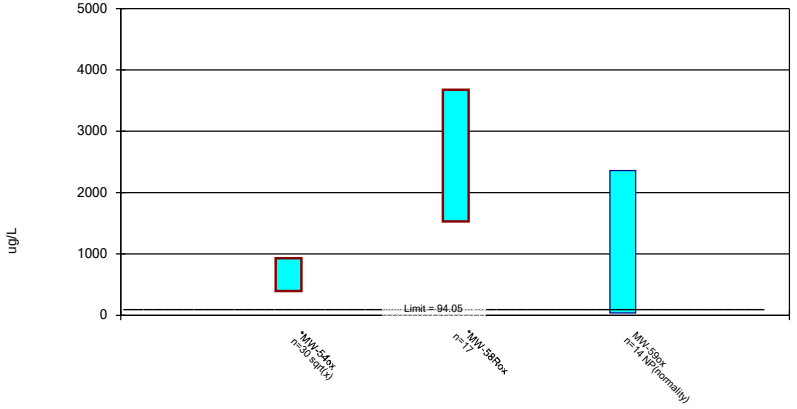

Constituent: Manganese Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



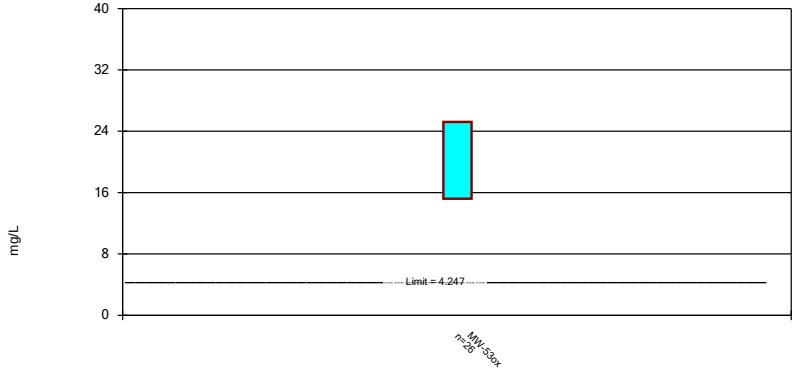

Constituent: Manganese, Dissolved Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

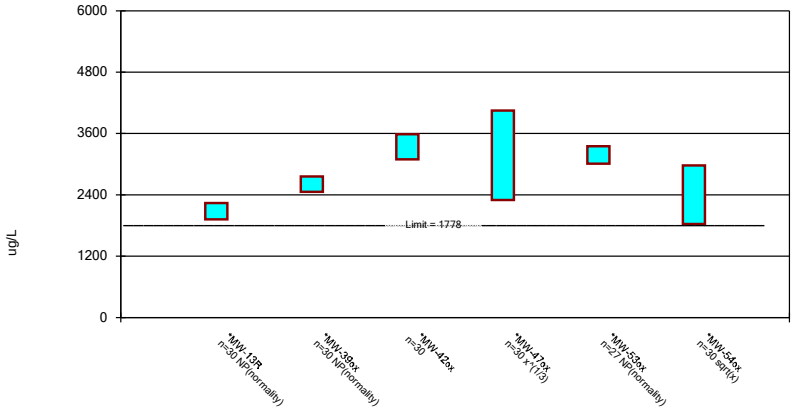



Constituent: Nitrate Nitrite as N Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



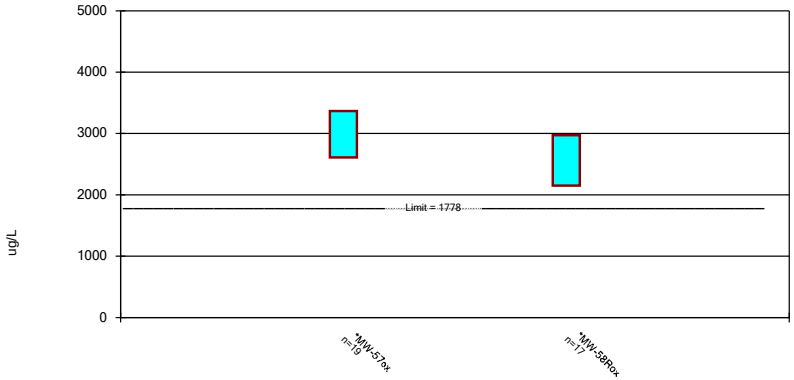

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

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## Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



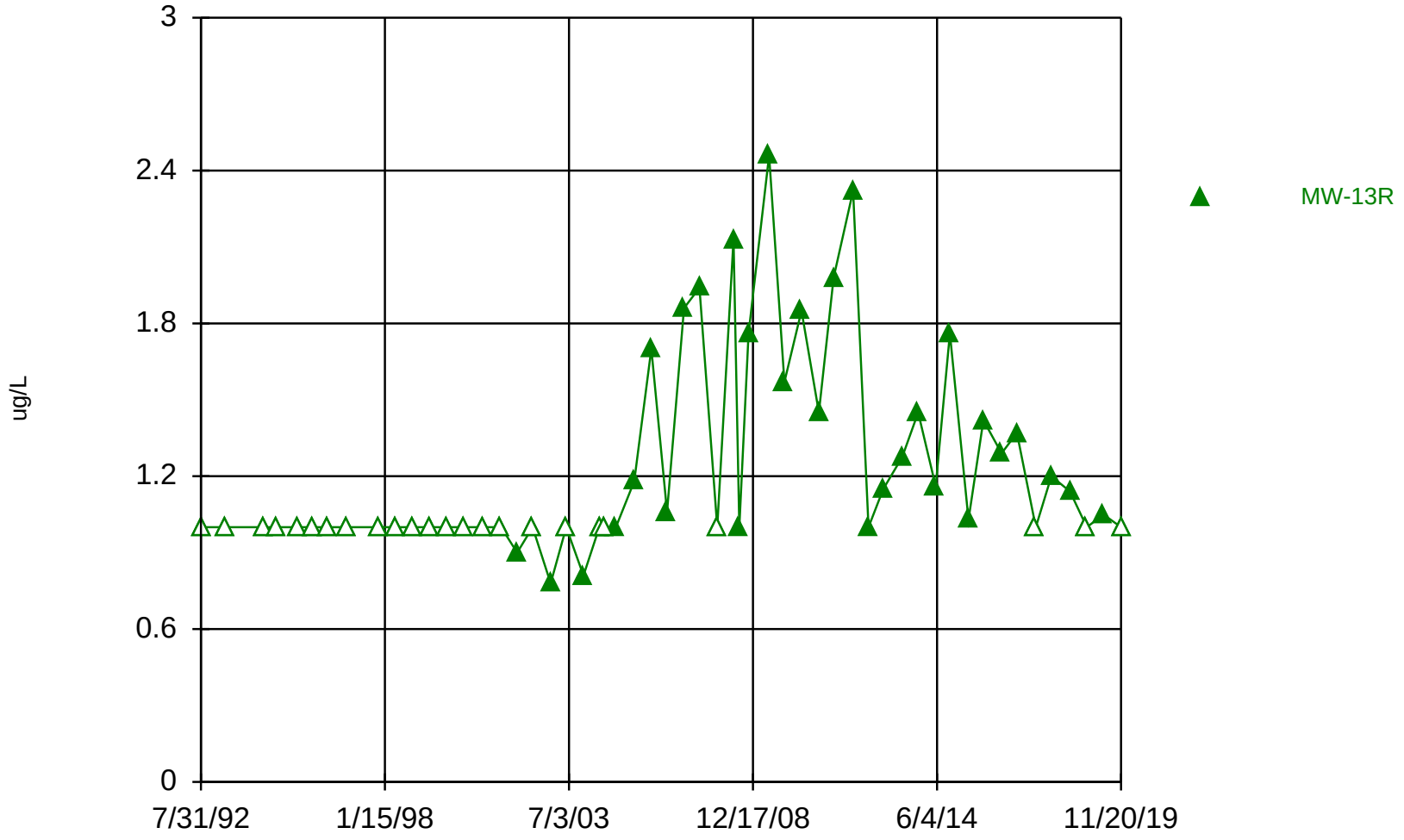

Constituent: Total Organic Carbon Analysis Run 2/17/2020 10:43 AM View: 2H - Interwell Exceedances

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Organic Statistical Analysis

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

# Time Series




Constituent: 1,1-Dichloroethane Analysis Run 2/13/2020 4:10 PM View: VOC Detections

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Trend Test

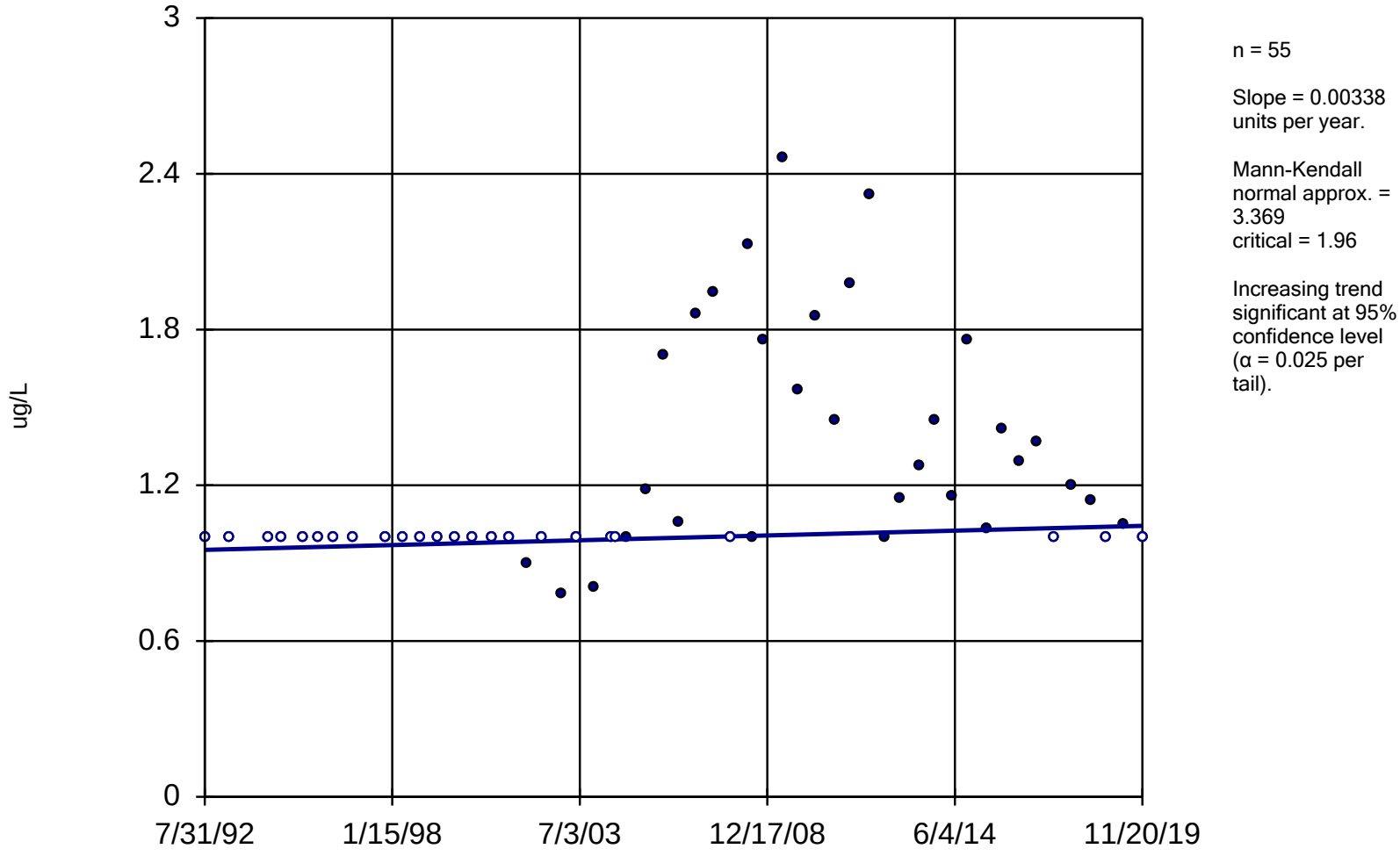
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/13/2020, 3:55 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1,1-Dichloroethane (ug/L)** | **MW-13R** | **0.00338** | **3.369** | **1.96** | **Yes** | **55** | **43.64** | **n/a** | **n/a** | **0.05** | **NP** |

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-13R




n = 55

Slope = 0.00338 units per year.

Mann-Kendall normal approx. = 3.369
critical = 1.96

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: 1,1-Dichloroethane  Analysis Run 2/13/2020 3:48 PM  View: VOC Detections

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

# Trend Test

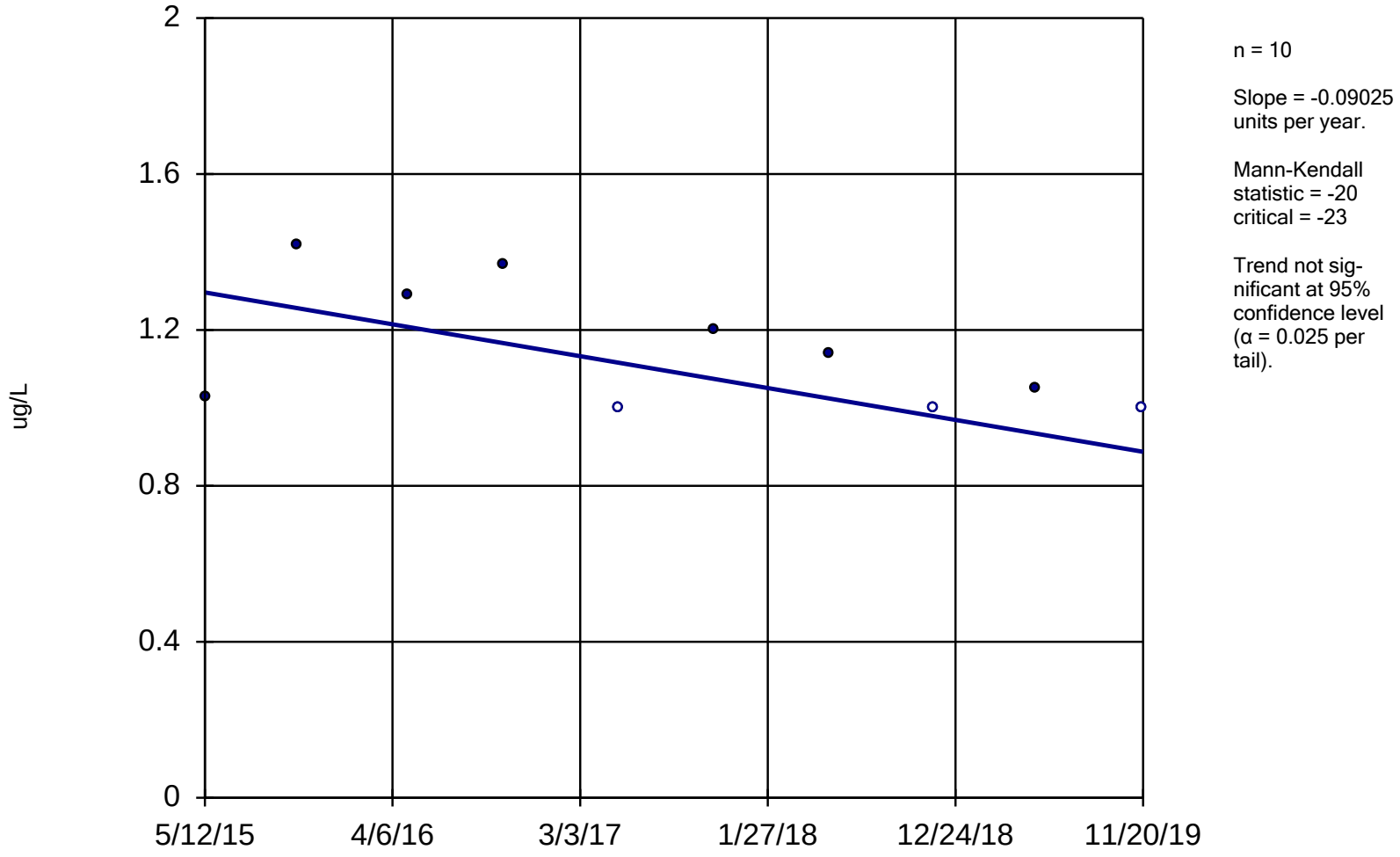
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/13/2020, 4:09 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethane (ug/L) | MW-13R | -0.09025 | -20 | -23 | No | 10 | 30 | n/a | n/a | 0.05 | NP |

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-13R




n = 10

Slope = -0.09025 units per year.

Mann-Kendall statistic = -20
critical = -23

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: 1,1-Dichloroethane  Analysis Run 2/13/2020 4:05 PM  View: VOC Detections

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

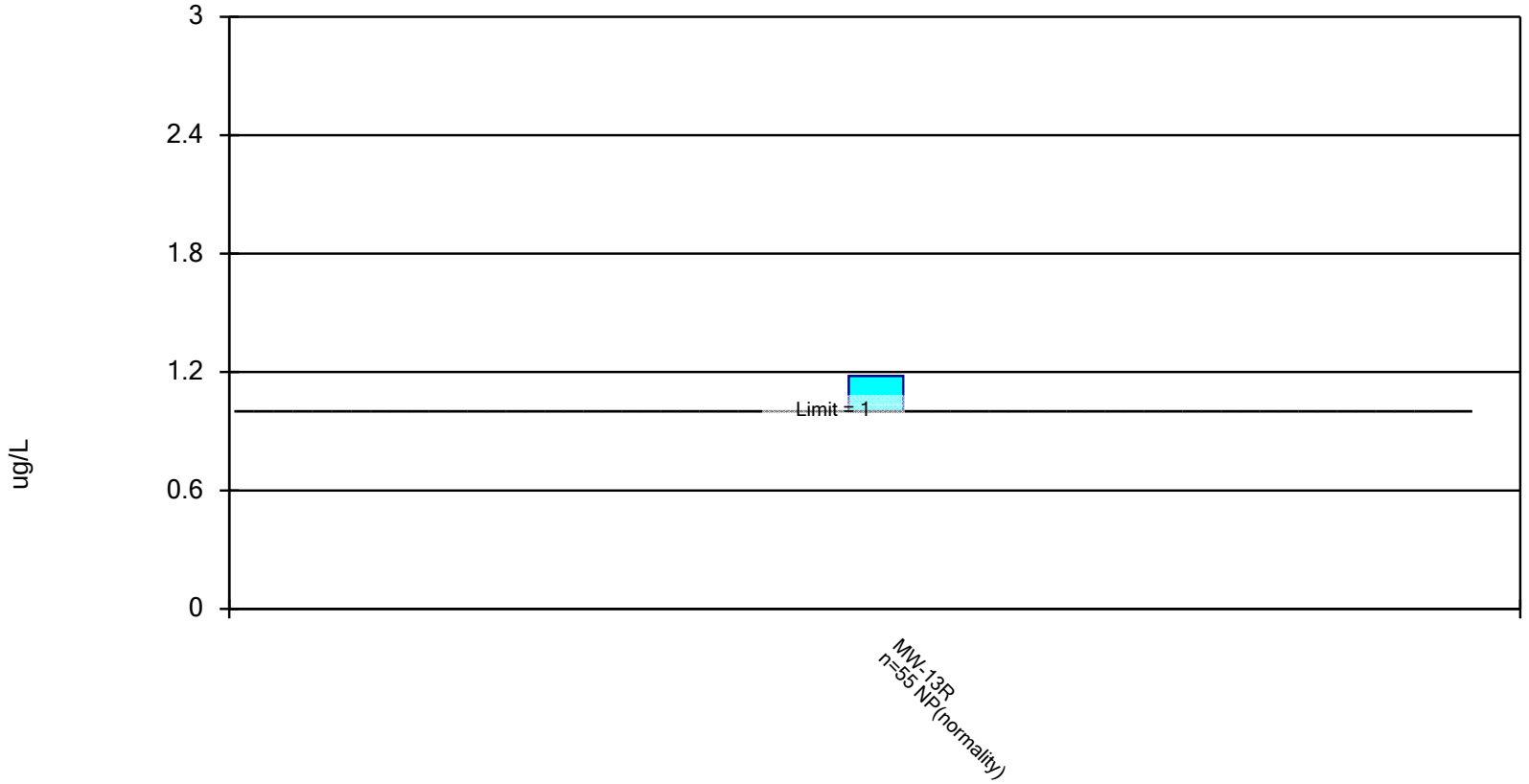
# Confidence Interval

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master  Printed 2/13/2020, 4:12 PM

| Constituent | Well | Upper Lim. | Lower Lim. | Compliance | Sig. | N | %NDs | Transform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethane (ug/L) | MW-13R | 1.18 | 1 | 1 | No | 55 | 43.64 | No | 0.01 | NP (normality) |

# Non-Parametric Confidence Interval

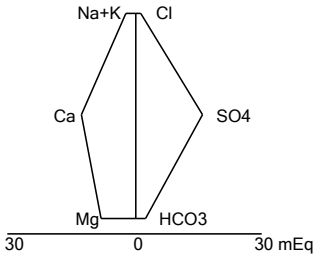
Compliance Limit is not exceeded. Per-well alpha = 0.01.



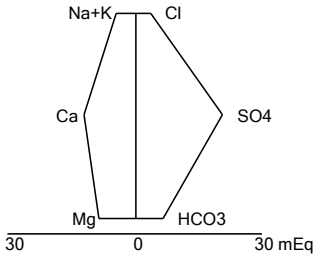

Constituent: 1,1-Dichloroethane Analysis Run 2/13/2020 4:11 PM View: VOC Detections

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

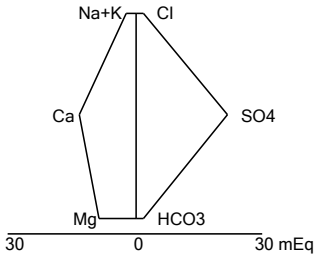
# Stiff and Piper Plots



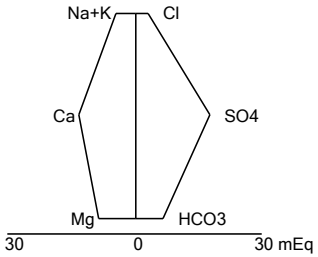
Stormwater 5/14/2018



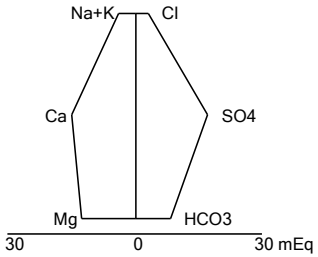
Stormwater 5/15/2019



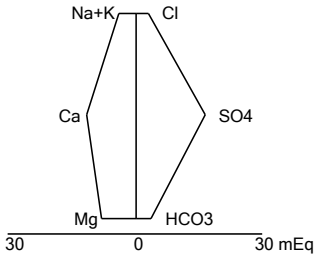
Stormwater 11/20/2019



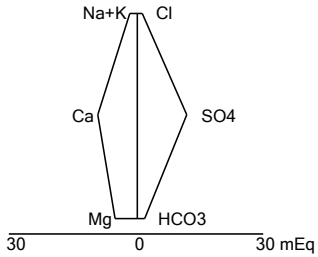
MW-54ox 5/14/2019



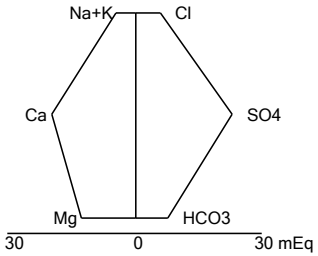
MW-54ox 11/19/2019



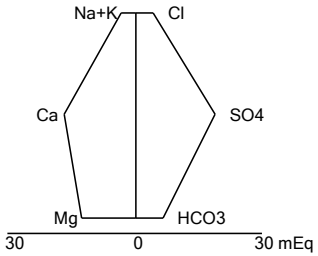
Stormwater 5/9/2017



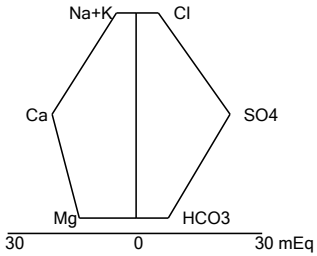
Stormwater 10/25/2017



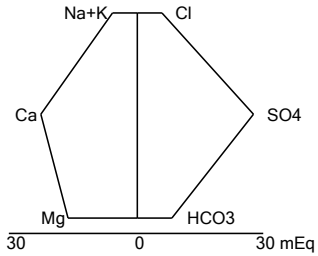
MW-54ox 5/9/2017



MW-54ox 10/25/2017



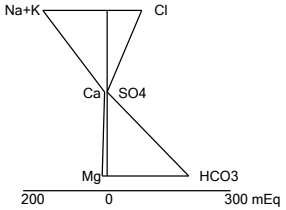
MW-54ox 5/15/2018



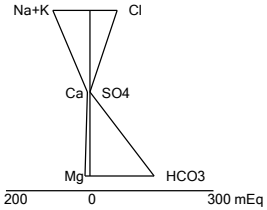
MW-54ox 11/14/2018

Stiff Diagram  Analysis Run 2/13/2020 5:02 PM  View: Stiff & Piper Plots

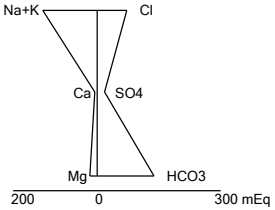
Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master



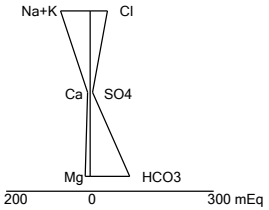
WetWell10 11/14/2018



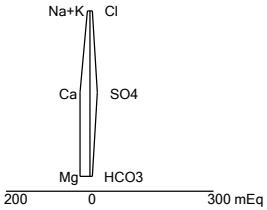
WetWell10 5/15/2019



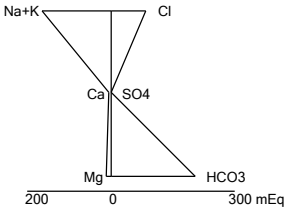
WetWell10 11/20/2019



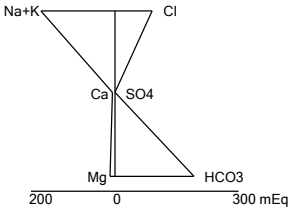
WetWell9 5/15/2019



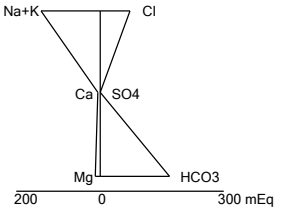
WetWell9 11/20/2019



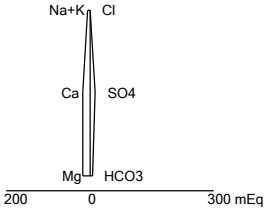
WetWell10 5/9/2017



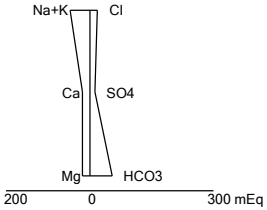
WetWell10 10/25/2017



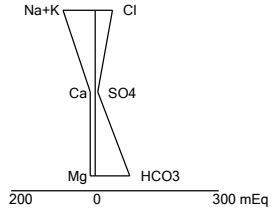
WetWell10 5/14/2018



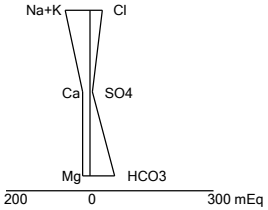
MW-54ox 11/19/2019



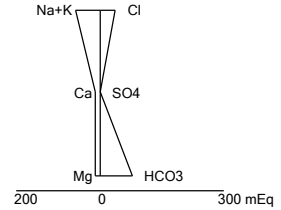
WetWell9 5/9/2017



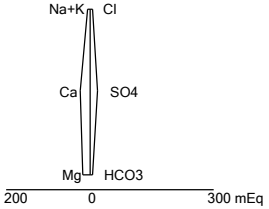
WetWell9 10/25/2017



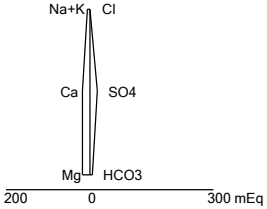
WetWell9 5/14/2018



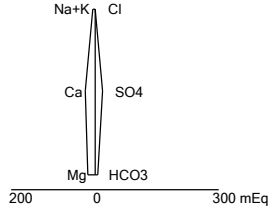
WetWell9 11/14/2018



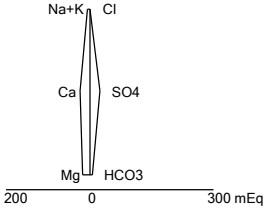
MW-54ox 5/9/2017



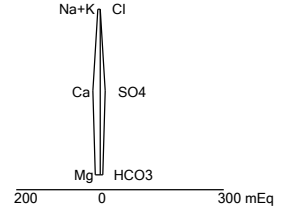
MW-54ox 10/25/2017



MW-54ox 5/15/2018



MW-54ox 11/14/2018



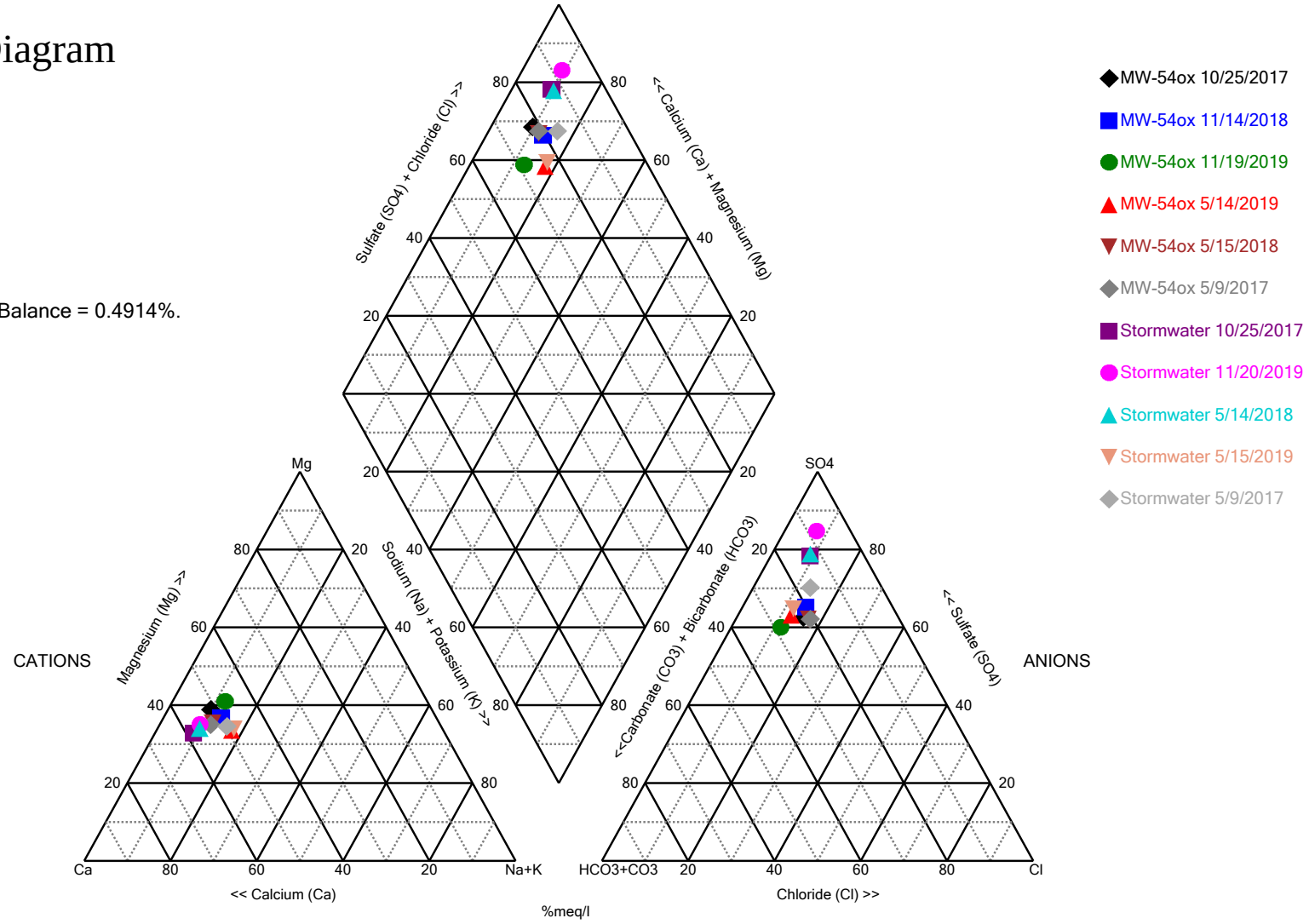
MW-54ox 5/14/2019

Stiff Diagram  Analysis Run 2/13/2020 5:08 PM  View: Stiff & Piper Plots

Sioux Falls Regional Sanitary LF  Client: SCS Engineers  Data: SFRSL Master

# Piper Diagram

Cation-Anion Balance = 0.4914%.

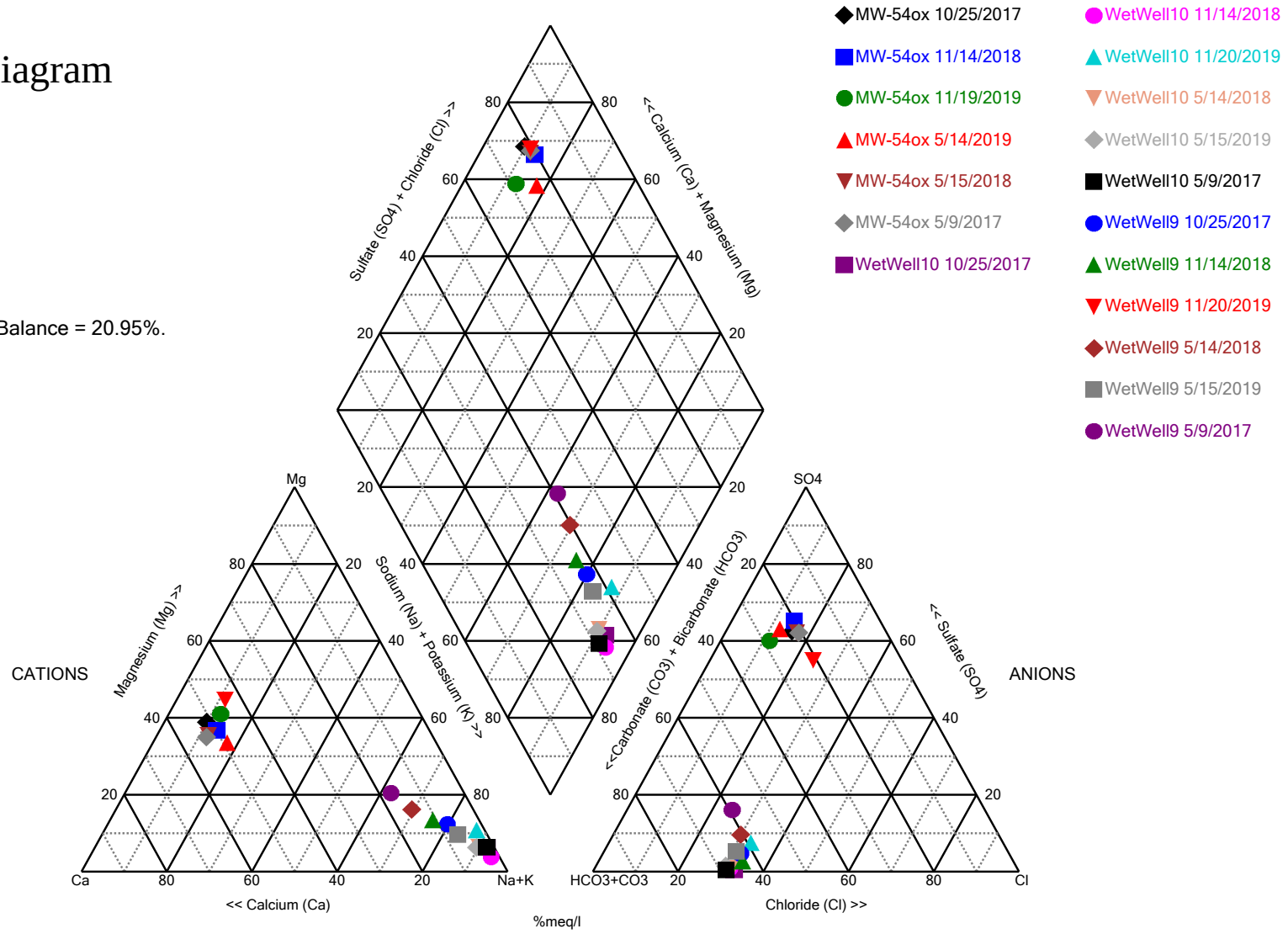



Analysis Run 2/13/2020 5:01 PM View: Stiff & Piper Plots

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master

# Piper Diagram

Cation-Anion Balance = 20.95%.




Analysis Run 2/13/2020 5:05 PM View: Stiff & Piper Plots

Sioux Falls Regional Sanitary LF Client: SCS Engineers Data: SFRSL Master